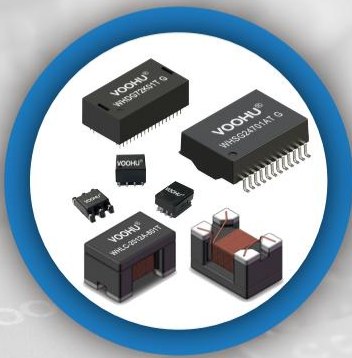
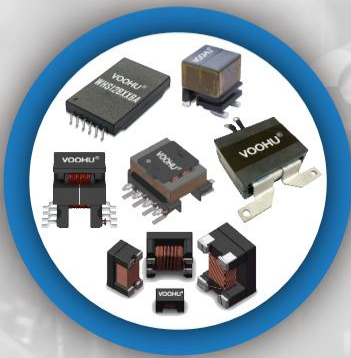


# 网络变压器系列选型手册

Network transformer series Selection Guide



NETWORK



AUTOMOTIVE



POWER



CUSTOMIZED

致力于成为世界一流的通信电子  
“元器件供应商”、“方案解决商”、“互联网电商”

Committed to becoming a world-class communications electronics  
"Component supplier", "solution provider", "high-quality Internet e-commerce"

苏州沃虎电子科技有限公司  
Suzhou VOOHU Electronic Technology Co., Ltd.

VOOHU 沃虎

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Suzhou City, Jiangsu Province



公司官网



阿里巴巴



## 沃虎电子科技

苏州沃虎电子科技有限公司,成立于2018年,注册资金1000万元,拥有自主品牌(VOOHU)和代理品牌相结合补充的产品矩阵。致力于成为世界一流的通信电子"元器件供应商"、"方案解决商"、"互联网电商"。

沃虎(VOOHU)采用互联网模式为用户提供产品和方案的数字化选型设计定制,提供给客户最优的设计方案,坚持为客户创造价值,通过自主互联网平台提升效率,将可靠稳定的产品提供给全球用户。

Suzhou VOOHU Electronic Technology Co., Ltd. was established in 2018 with a registered capital of 10 million yuan. It has a product matrix that combines independent brands (VOOHU) and agent brands. Committed to becoming a world-class communication component solution provider.

VOOHU uses the Internet model to provide users with digital selection, design and customization of products and solutions, provides customers with the best design solutions, insists on creating value for customers, improves efficiency through its own Internet platform, and provides reliable and stable products to Global users.

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2.5G/5G/10GBASE-T LAN TRANSFORMER  
RF Balun Transformer  
G.FAST TRANSFORMERS  
CHIP LAN

### 103 功率类产品

POWER PRODUCT

POWER OVER ETHERNET LAN TRANSFORMER  
PLANAR TRANSFORMER  
HIGH CURRENT FLAT WIRE INDUCTOR  
HIGH CURRENT FLAT WIRE CM CHOKE  
HIGH CURRENT POWER BEAD INDUCTOR

### 137 汽车品

AUTOMOTIVE

IVN (IN-VEHICLE NETWORK)  
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### 165 定制化产品

CUSTOM PRODUCT

Custom Power Magnetics



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## NETWORK PRODUCT

### LAN TRANSFORMER

VOOHU的网络变压器符合欧盟RoHS2.0规范、兼容于世界主要PHY IC供货商的产品。100/1000/2.5G/5G/10GBASE-T网络变压器均符合IEEE 802.3有线网络的相关标准、提供抑制EMI的解决方案、以及专业的直流隔离方案、同时保持最苛刻的应用所需的信号完整性。VOOHU的网络变压器主要应用于网络通信、消费电子、工业、物联网、交通等领域。

VOOHU Discrete Lan Magnetics (Ethernet Transformers, Lan Filters, Pulse Transformers) Are RoHS2.0 Compliant And Compatible With Major PHY Suppliers Worldwide. VOOHU 100/1000/2.5G/5G/10GBase-T Discrete Lan Magnetics Are Optimized For All Major Lan Transceivers. All Lan Magnetics Are Compliant With IEEE 802.3 Standards And Have Proven Parametric And EMI Suppression And Professional DC Isolation Solutions. The Network Transformers Of VOOHU Are Mainly Used In Network Communication, Consumer Electronics, Industry, Internet Of Things, Transportation And Other Fields.

#### Features And Benefits

- IEEE 802.3 Compliant To 10G
- High Isolation Up To 6kV
- Higher Reliability (Carrier Class & AEC-Q200)
- Single, Dual, Quad, Five Packages
- SMT & DIP Options
- Extended Temperature -40°C To +85°C
- 2P/4P PoE/PoE+PoE++ Capable Up To 200W Max

#### Applications

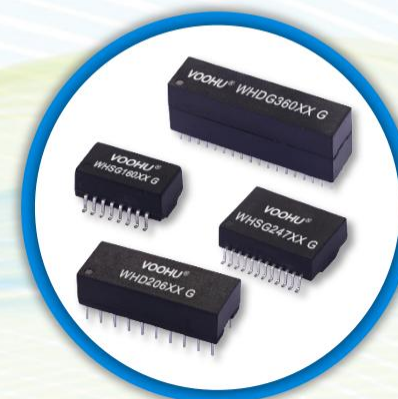
- Switches/Routers
- Servers
- Gateways
- Access Points
- Base Stations
- Automotive

## NETWORK PRODUCT

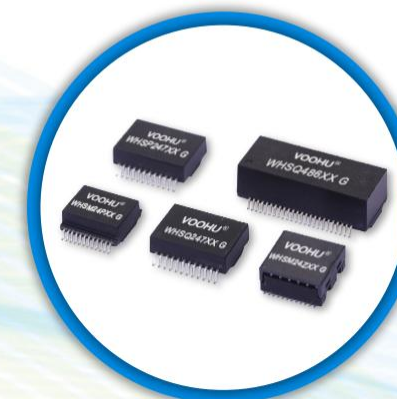
### VOOHU LAN TRANSFORMER FAMILY PLATFORMS GUIDE

# VOOHU 沃虎

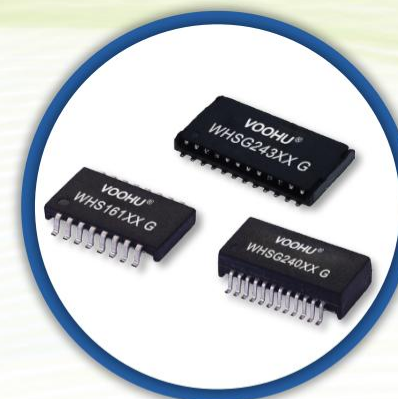
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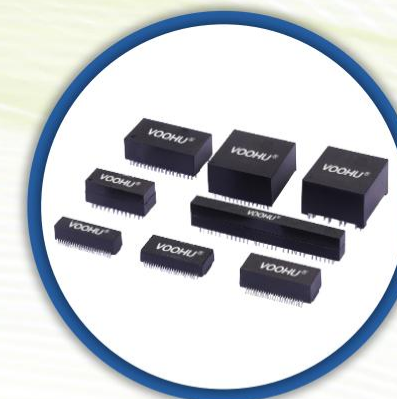
10/100/1000BASE-T  
LAN TRANSFORMER



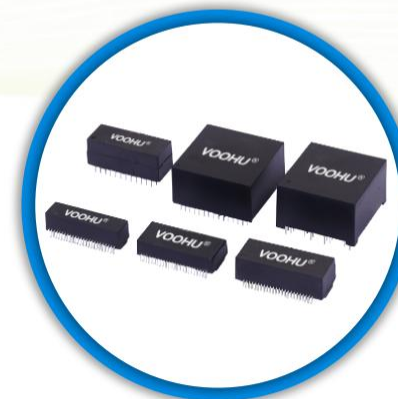
2.5G/5G/10GBASE-T  
LAN TRANSFORMER



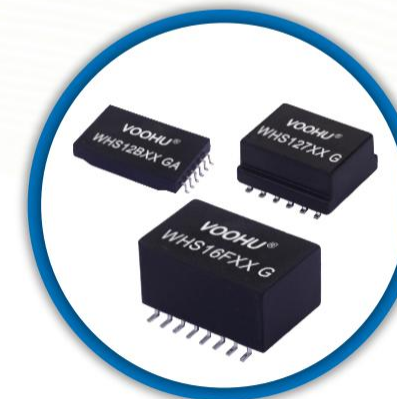
LOW PROFILE  
LAN TRANSFORMER



HIGH INTEGRATION  
LAN TRANSFORMER

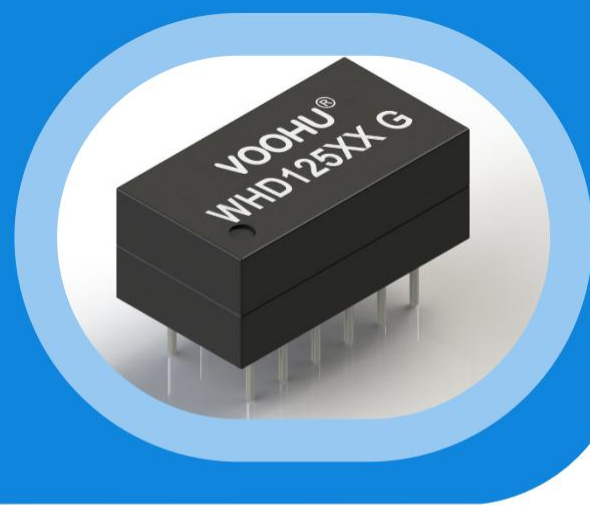


POWER OVER ETHERNET  
LAN TRANSFORMER



HIGH ISOLATION  
LAN TRANSFORMER





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## NETWORK PRODUCT

LAN TRANSFORMER WHD125XX G-Series

10/100 Base-TX Single Port Magnetic Modules DIP

### Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS

Requirements

### Electrical Performance Summary

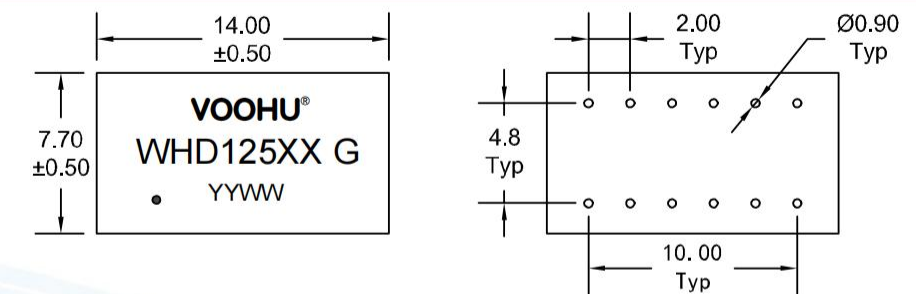
Designed For Ethernet 10/100 Base-TX, Full Single Port Applications

Compliant With IEEE 802.3 Standard For 10/100 Base-TX

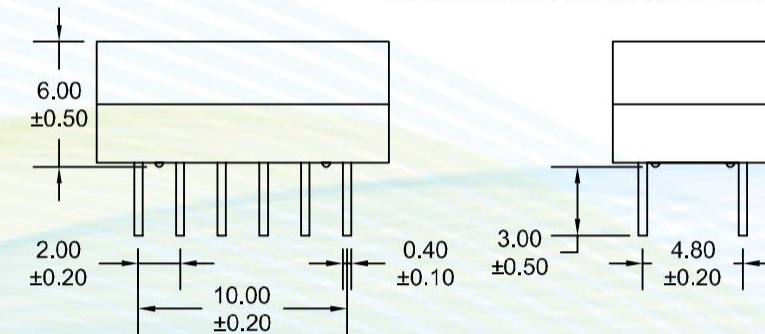
#### Electrical Specifications @ 25°C

| Part Number | OCL (μH)                    | Insertion Loss (dB) | Return Loss (dB) |        |        |           | Cross Talk (dB) | CMRR (dB) | Isolation Hipot (V) | PoE Rating | Operating Temperature (°C) |
|-------------|-----------------------------|---------------------|------------------|--------|--------|-----------|-----------------|-----------|---------------------|------------|----------------------------|
|             | Min                         | Max                 | Min              |        |        |           | Min             | Min       | Min                 |            |                            |
|             | 100kHz, 0.1V<br>8mA DC BIAS | 1-100MHz            | 1-30 MHz         | 40 MHz | 50 MHz | 60-80 MHz | 1-100 MHz       | 1-100 MHz | 1mA, 60s            |            |                            |
| WHD12501 G  | 350                         | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |
| WHD12501T G | 350                         | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | -40 to 85                  |
| WHD12503 G  | 350                         | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |
| WHD12502 G  | 350                         | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | PoE-af     | 0 to 70                    |

### Mechanical

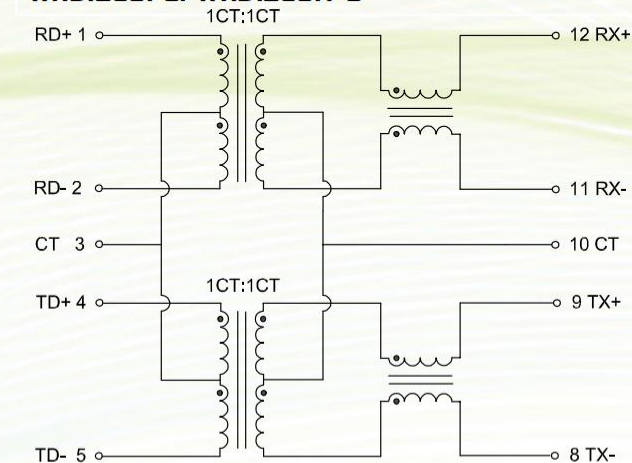


### SUGGESTED PAD LAYOUT

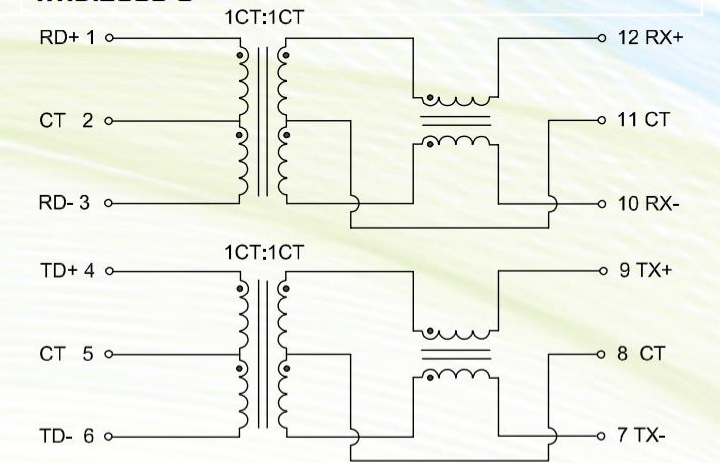


### Schematics

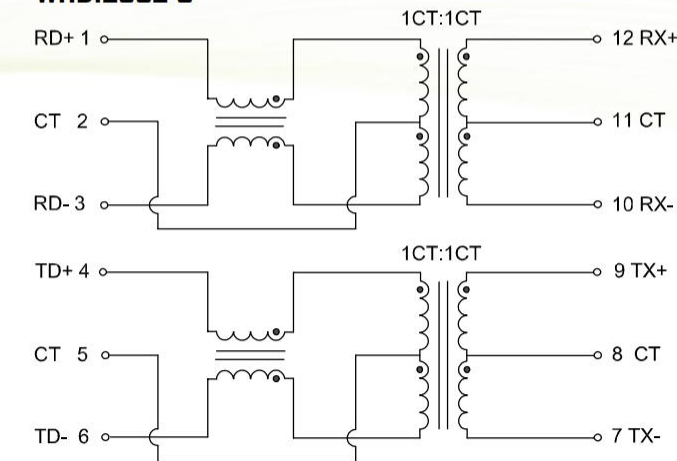
#### WHD12501 G/WH12501T G



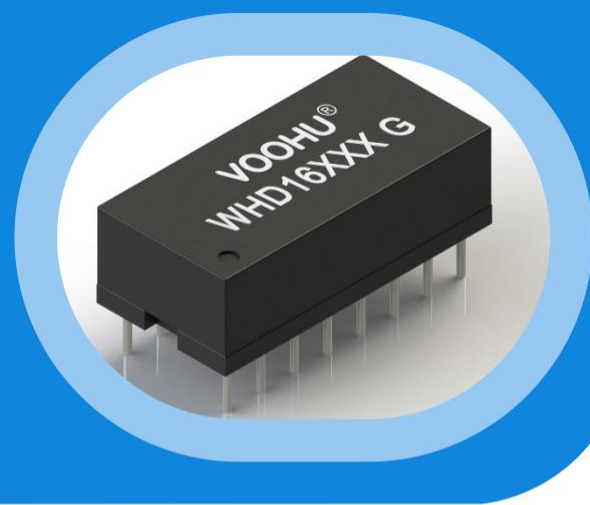
#### WHD12503 G



#### WHD12502 G







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## NETWORK PRODUCT

### LAN TRANSFORMER WHD16XXX G-Series

### 10/100 Base-TX Single Port Magnetic Modules DIP

#### Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements

#### Electrical Performance Summary

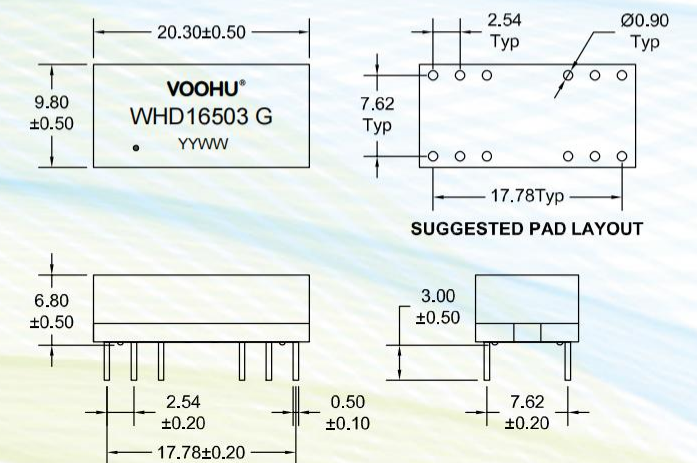
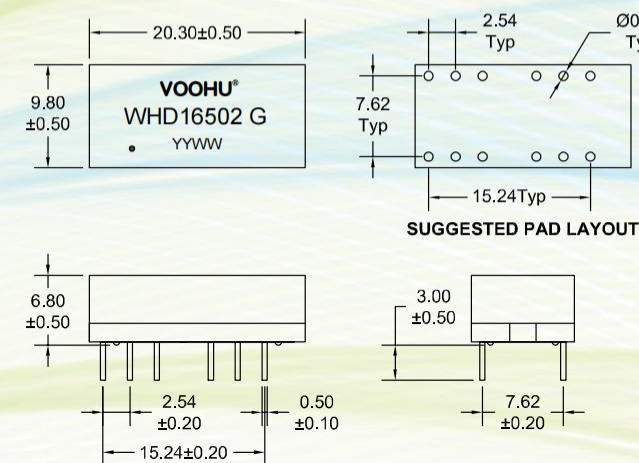
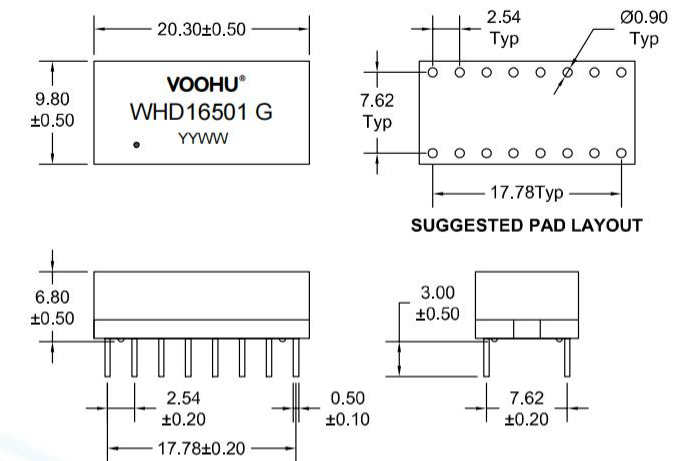
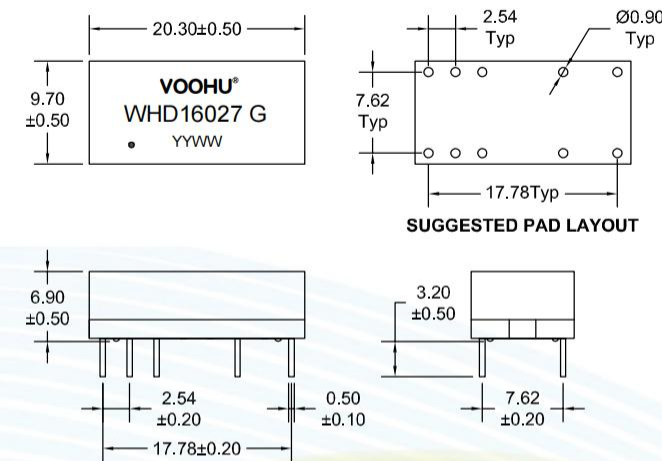
Designed For Ethernet 10/100 Base-TX, Full Single Port Applications

Compliant With IEEE 802.3 Standard For 10/100 Base-TX

#### Electrical Specifications @ 25°C

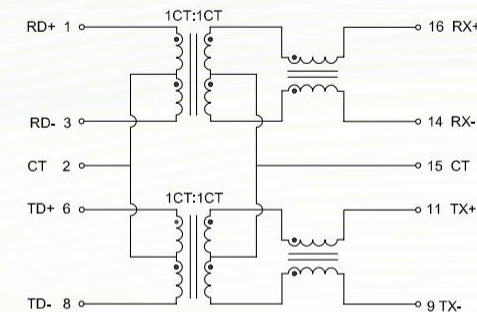
| Part Number | OCL (μH)                   | Insertion Loss (dB) | Return Loss (dB) |        |        |           | Cross Talk (dB) | CMRR (dB) | Isolation Hipot (V) | PoE Rating | Operating Temperature (°C) |
|-------------|----------------------------|---------------------|------------------|--------|--------|-----------|-----------------|-----------|---------------------|------------|----------------------------|
|             | Min                        | Max                 | Min              |        |        |           | Min             | Min       | Min                 |            |                            |
|             | 100kHz,0.1V<br>8mA DC BIAS | 1-100MHz            | 1-30 MHz         | 40 MHz | 50 MHz | 60-80 MHz | 1-100 MHz       | 1-100 MHz | 1mA,60s             |            |                            |
| WHD16027 G  | 350                        | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |
| WHD16501 G  | 350                        | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |
| WHD16502 G  | 350                        | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |
| WHD16503 G  | 350                        | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |

#### Mechanical

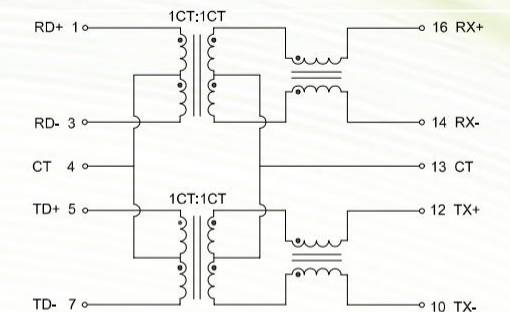


#### Schematics

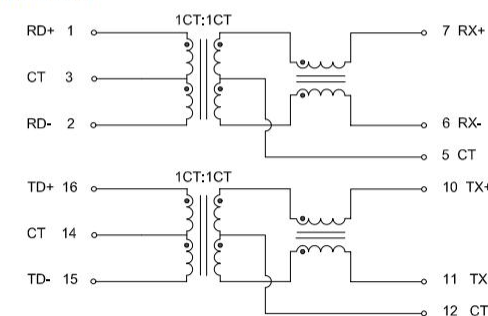
##### WHD16027 G



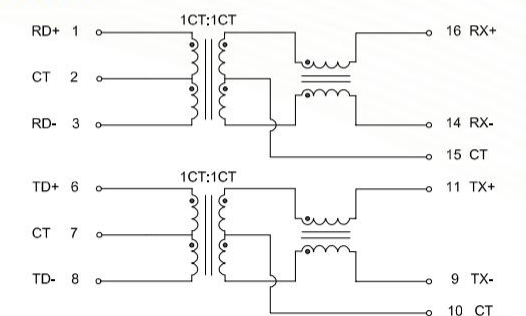
##### WHD16501 G



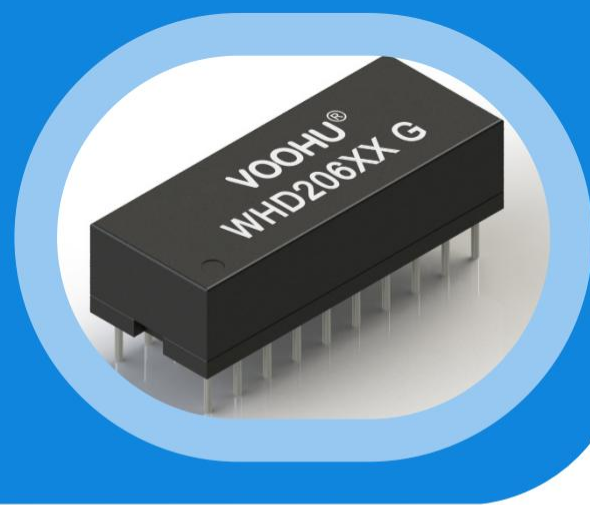
##### WHD16502 G



##### WHD16503 G







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## NETWORK PRODUCT

LAN TRANSFORMER WHD206XX G-Series

10/100 Base-TX Dual Ports Magnetic Modules DIP

### Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements

### Electrical Performance Summary

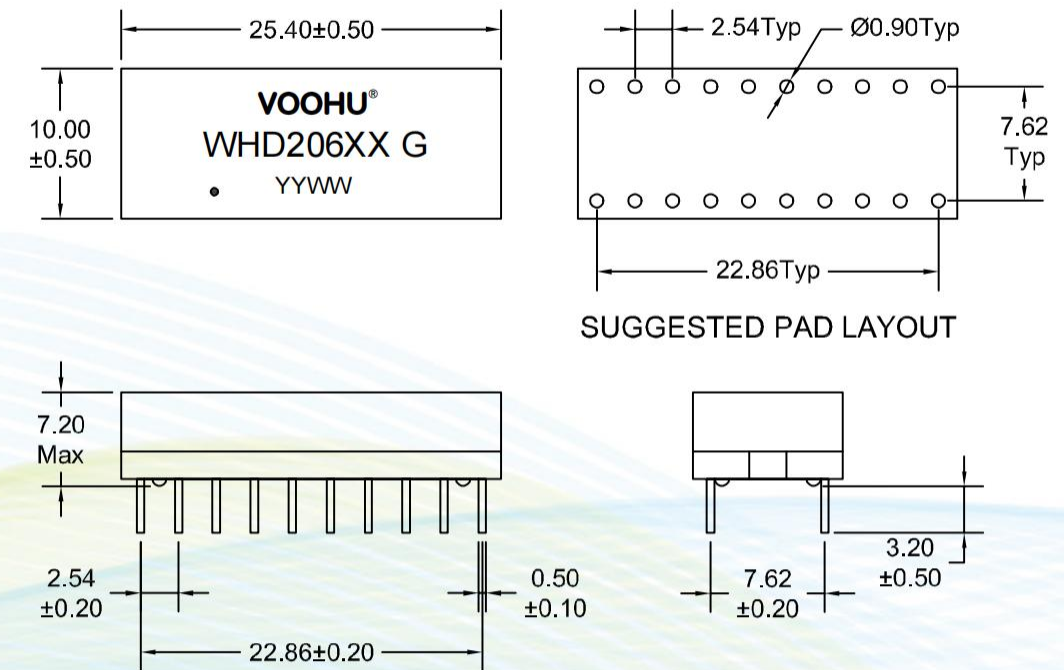
Designed For Ethernet 10/100 Base-TX, Full Dual Ports Applications

Compliant With IEEE 802.3 Standard For 10/100 Base-TX

#### Electrical Specifications @ 25°C

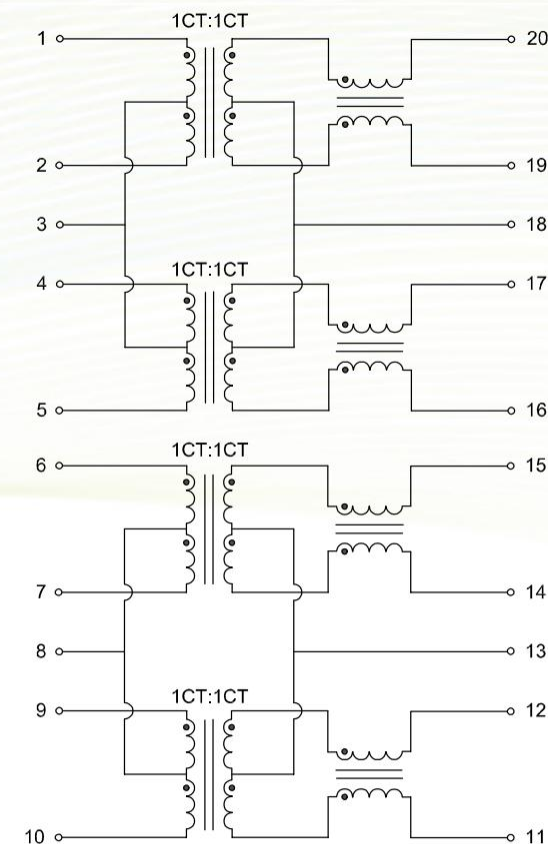
| Part Number | DCL (μH)                    | Insertion Loss (dB) | Return Loss (dB) |        |        |           | Cross Talk (dB) | CMRR (dB) | Isolation Hipot (V) | PoE Rating | Operating Temperature (°C) |
|-------------|-----------------------------|---------------------|------------------|--------|--------|-----------|-----------------|-----------|---------------------|------------|----------------------------|
|             | Min                         | Max                 | Min              |        |        |           | Min             | Min       | Min                 |            |                            |
|             | 100kHz, 0.1V<br>8mA DC BIAS | 1-100MHz            | 1-30 MHz         | 40 MHz | 50 MHz | 60-80 MHz | 1-100 MHz       | 1-100 MHz | 1mA, 60s            |            |                            |
| WHD20601 G  | 350                         | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |
| WHD20601T G | 350                         | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | -40 to 85                  |
| WHD20602 G  | 350                         | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |

### Mechanical

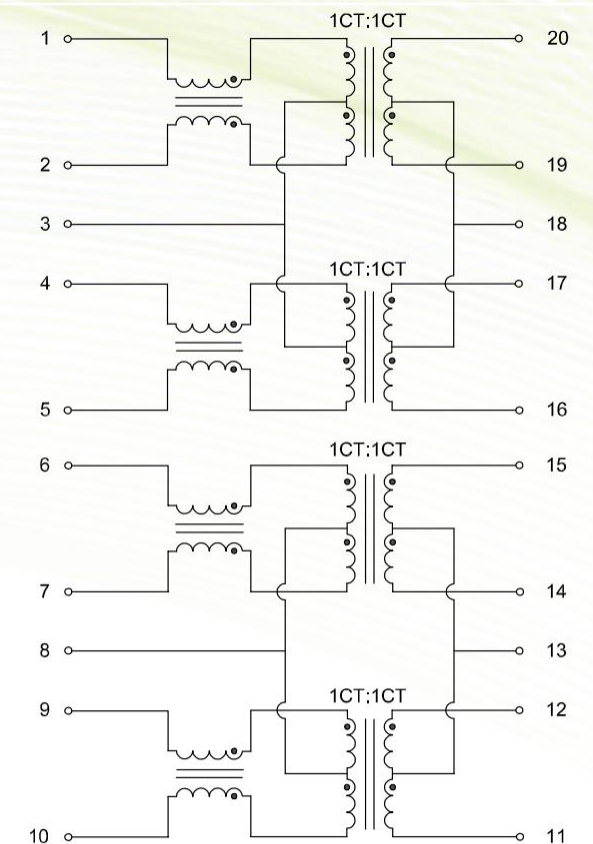


### Schematics

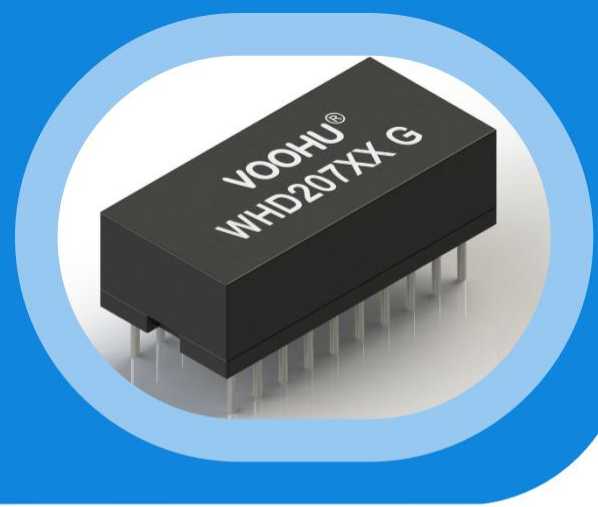
#### WHD20601 G/WHD20601T G



#### WHD20602 G







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# NETWORK PRODUCT

LAN TRANSFORMER WHD207XX G-Series  
10/100 Base-TX Dual Ports Magnetic Modules DIP

## Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS

Requirements

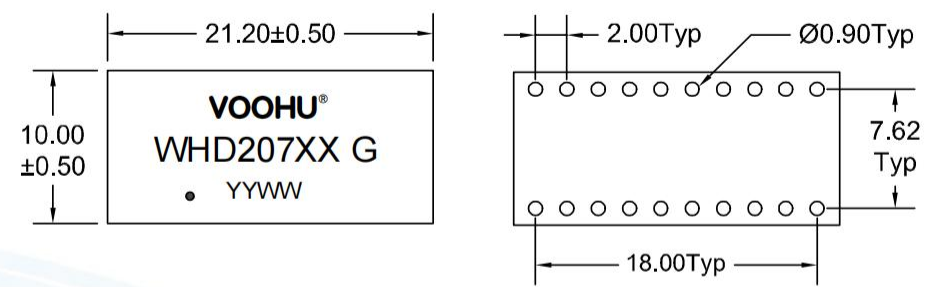
## Electrical Performance Summary

Designed For Ethernet 10/100 Base-TX, Full Dual Ports Applications

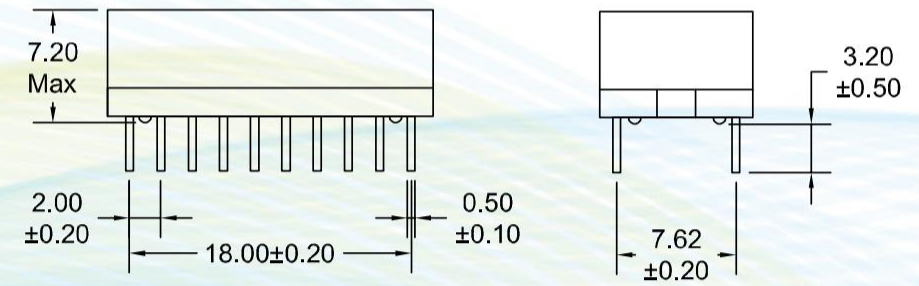
Compliant With IEEE 802.3 Standard For 10/100 Base-TX

| Electrical Specifications @ 25°C |                            |                     |                  |        |        |           |                 |           |                     |            |                            |
|----------------------------------|----------------------------|---------------------|------------------|--------|--------|-----------|-----------------|-----------|---------------------|------------|----------------------------|
| Part Number                      | OCL (μH)                   | Insertion Loss (dB) | Return Loss (dB) |        |        |           | Cross Talk (dB) | CMRR (dB) | Isolation Hipot (V) | PoE Rating | Operating Temperature (°C) |
|                                  | Min                        | Max                 | Min              |        |        |           | Min             | Min       | Min                 |            |                            |
|                                  | 100kHz,0.4V<br>8mA DC BIAS | 1-100MHz            | 1-30 MHz         | 40 MHz | 50 MHz | 60-80 MHz | 1-100 MHz       | 1-100 MHz | 1mA,60s             |            |                            |
| WHD20702 G                       | 350                        | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |
| WHD20704 G                       | 350                        | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |

## Mechanical

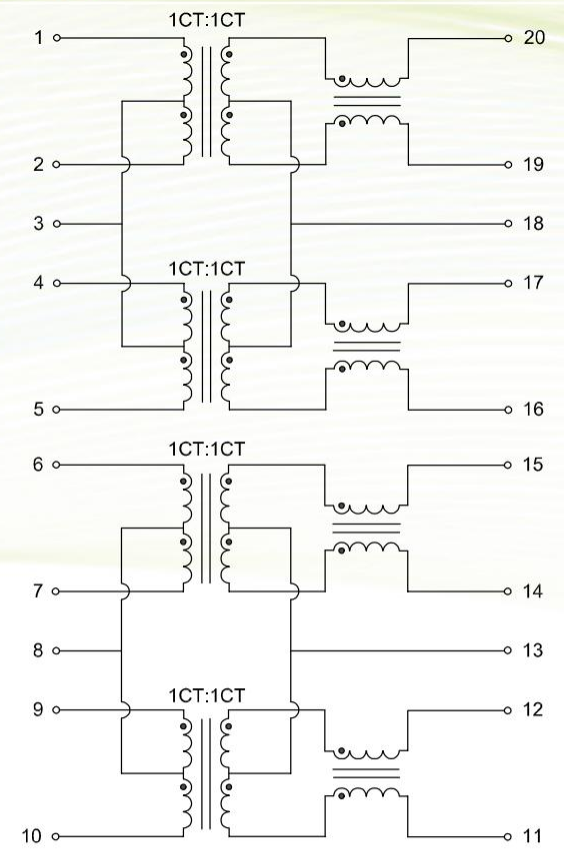


SUGGESTED PAD LAYOUT

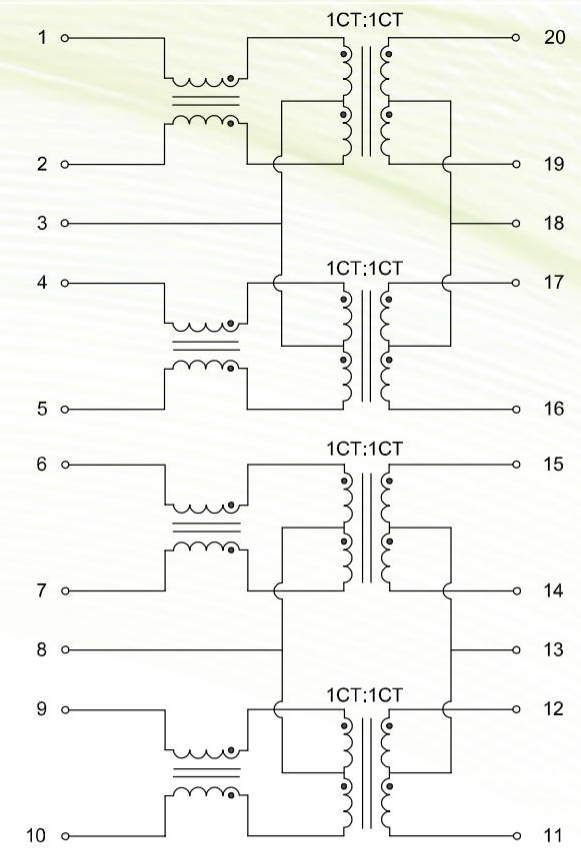


## Schematics

WHD20702 G



WHD20704 G







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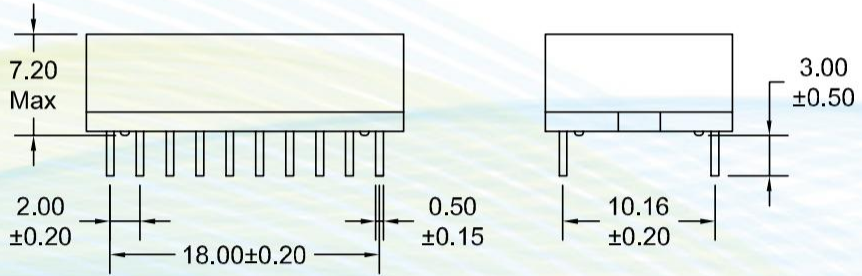
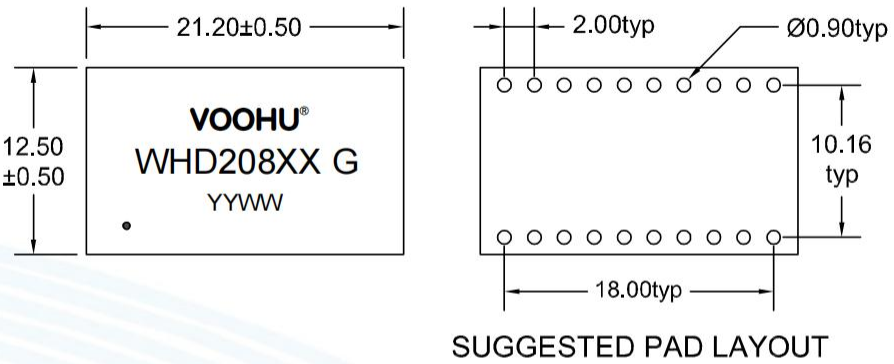


# **NETWORK PRODUCT** **LAN TRANSFORMER WHD208XX G-Series** **10/100 Base-TX Dual Ports Magnetic Modules DIP**

**Features And Benefits**  
 Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements  
**Electrical Performance Summary**  
 Designed For Ethernet 10/100 Base-TX, Full Dual Ports Applications  
 Compliant With IEEE 802.3 Standard For 10/100 Base-TX

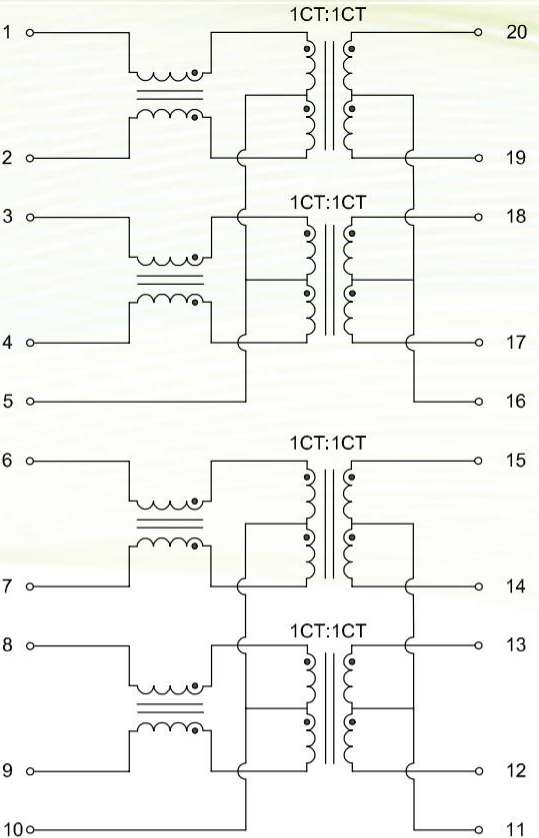
| Electrical Specifications @ 25°C |                            |                     |                  |        |        |           |                 |           |                     |            |                            |
|----------------------------------|----------------------------|---------------------|------------------|--------|--------|-----------|-----------------|-----------|---------------------|------------|----------------------------|
| Part Number                      | DCL (μH)                   | Insertion Loss (dB) | Return Loss (dB) |        |        |           | Cross Talk (dB) | CMRR (dB) | Isolation Hipot (V) | PoE Rating | Operating Temperature (°C) |
|                                  | Min                        | Max                 | Min              |        |        |           | Min             | Min       | Min                 |            |                            |
|                                  | 100kHz,0.1V<br>8mA DC BIAS | 1-100MHz            | 1-30 MHz         | 40 MHz | 50 MHz | 60-80 MHz | 1-100 MHz       | 1-100 MHz | 1mA,60s             |            |                            |
| WHD20806 G                       | 350                        | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |
| WHD20805 G                       | 350                        | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |

## **Mechanical**

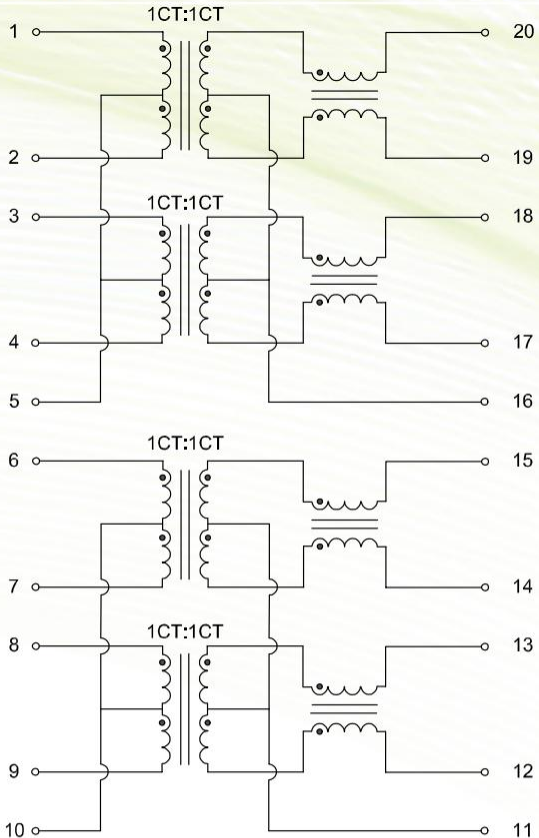


## **Schematics**

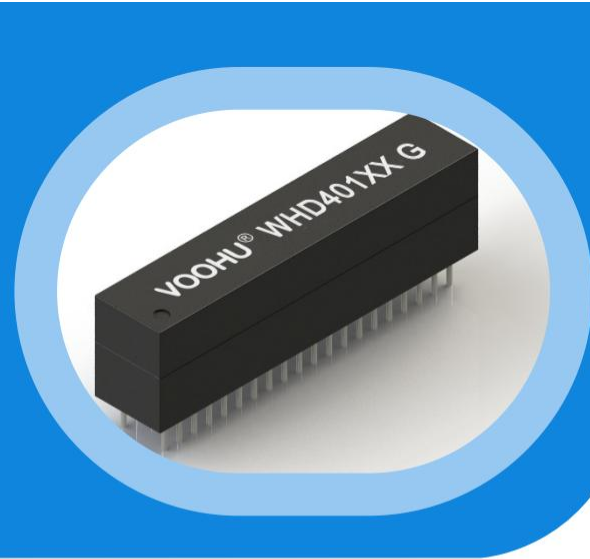
**WHD20805 G**



**WHD20806 G**







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# NETWORK PRODUCT

LAN TRANSFORMER WHD401XX G-Series

10/100 Base-TX Quad Ports Magnetic Modules DIP

## Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements

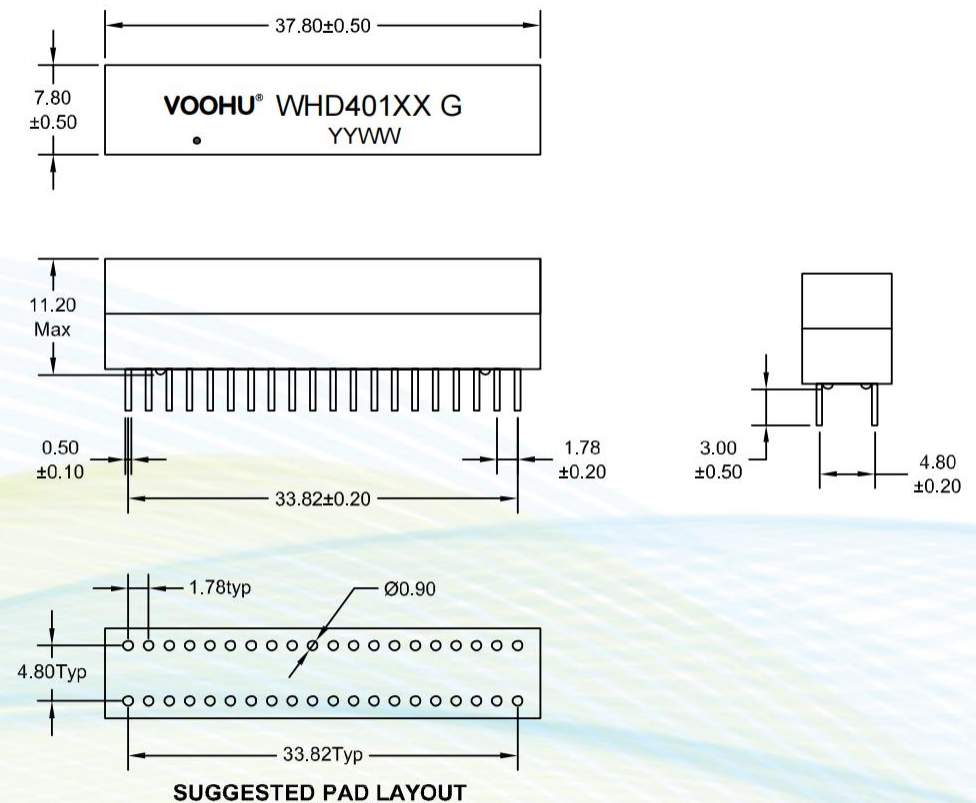
## Electrical Performance Summary

Designed For Ethernet 10/100 Base-TX, Full Quad Ports Applications  
Compliant With IEEE 802.3 Standard For 10/100 Base-TX

### Electrical Specifications @ 25°C

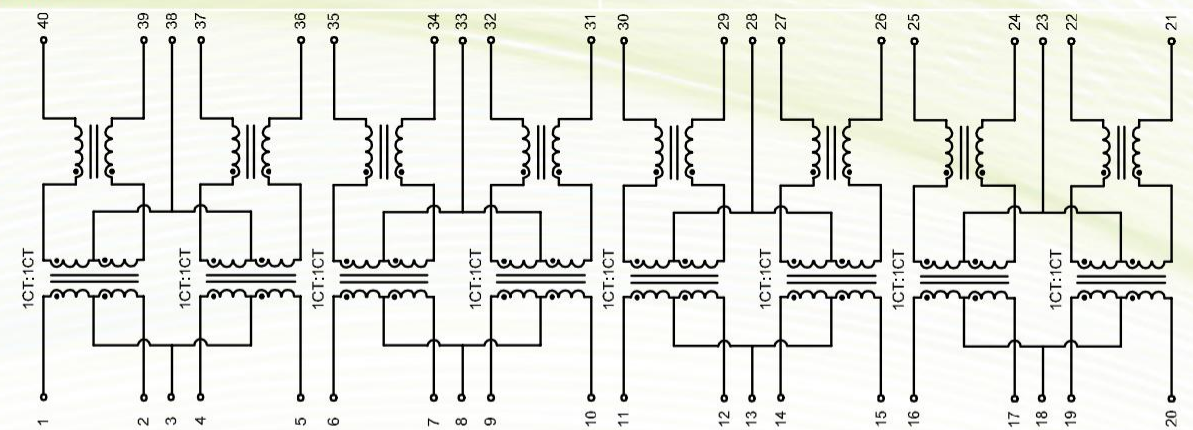
| Part Number | OCL (μH)                   | Insertion Loss (dB) | Return Loss (dB) |        |        |           | Cross Talk (dB) | CMRR (dB) | Isolation Hipot (V) | PoE Rating | Operating Temperature (°C) |
|-------------|----------------------------|---------------------|------------------|--------|--------|-----------|-----------------|-----------|---------------------|------------|----------------------------|
|             | Min                        | Max                 | Min              |        |        |           | Min             | Min       | Min                 |            |                            |
|             | 100kHz,0.1V<br>8mA DC BIAS | 1-100MHz            | 1-30 MHz         | 40 MHz | 50 MHz | 60-80 MHz | 1-100 MHz       | 1-100 MHz | 1mA,60s             |            |                            |
| WHD40101 G  | 350                        | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |
| WHD40103 G  | 350                        | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |

## Mechanical

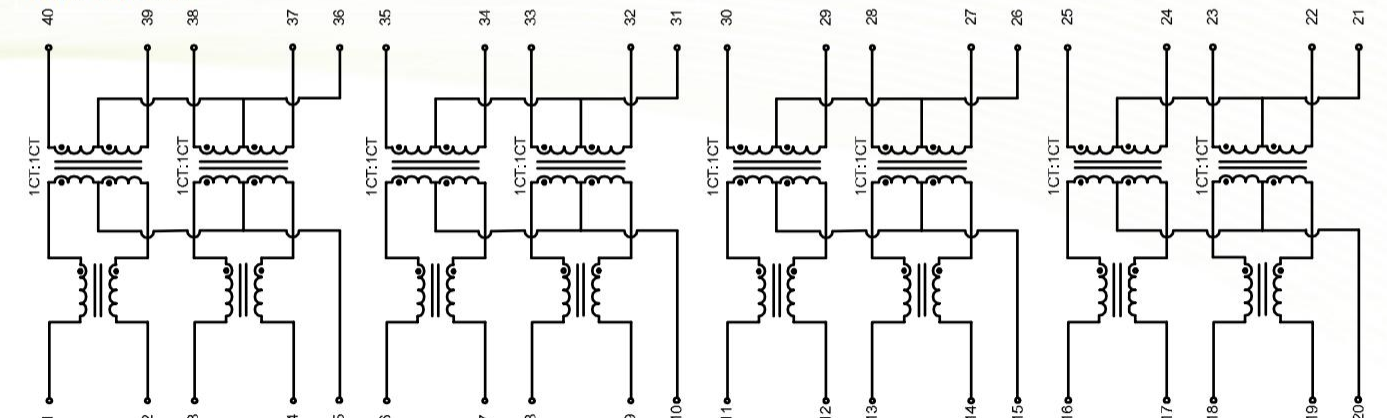


## Schematics

### WHD40101 G



### WHD40103 G







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# NETWORK PRODUCT

## LAN TRANSFORMER WHD723XX G-Series

### 10/100 Base-TX Five Ports Magnetic Modules DIP

#### Features And Benefits

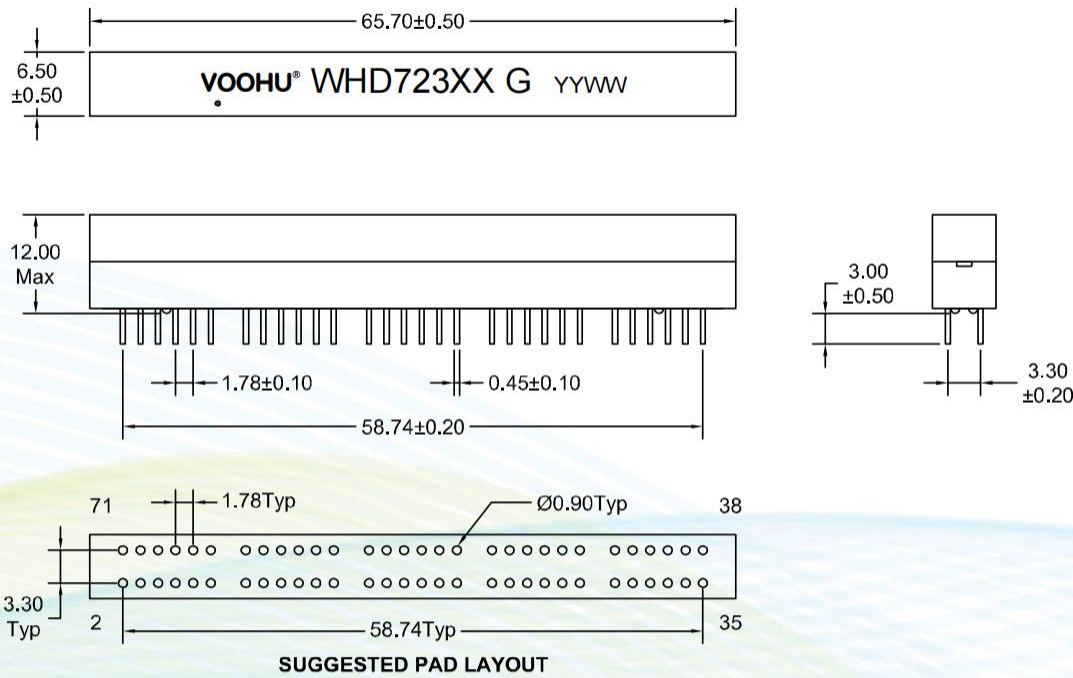
Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements

#### Electrical Performance Summary

Designed For Ethernet 10/100 Base-TX, Full Five Ports Applications  
Compliant With IEEE 802.3 Standard For 10/100 Base-TX

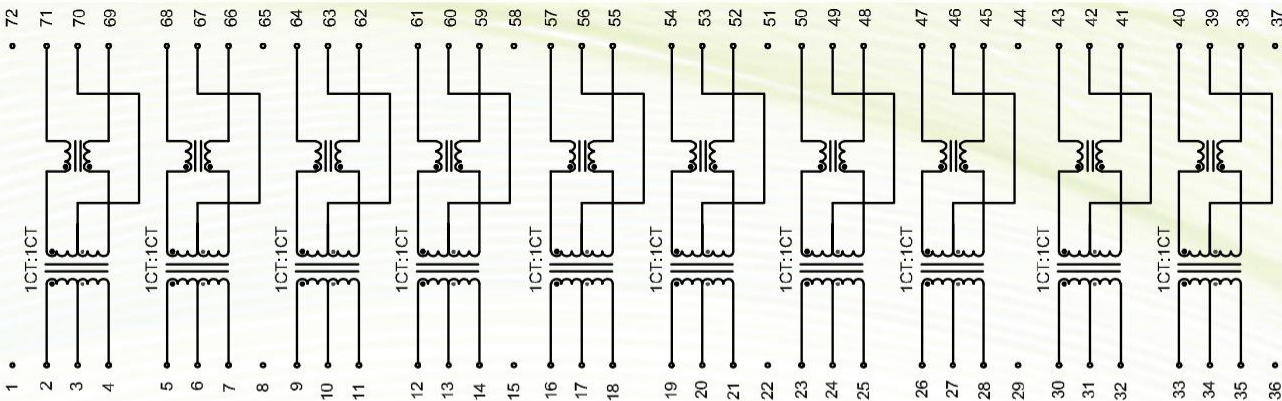
| Electrical Specifications @ 25°C |                         |                     |                  |        |        |           |                 |           |                     |            |                            |
|----------------------------------|-------------------------|---------------------|------------------|--------|--------|-----------|-----------------|-----------|---------------------|------------|----------------------------|
| Part Number                      | OCL (μH)                | Insertion Loss (dB) | Return Loss (dB) |        |        |           | Cross Talk (dB) | CMRR (dB) | Isolation Hipot (V) | PoE Rating | Operating Temperature (°C) |
|                                  | Min                     | Max                 | Min              |        |        |           | Min             | Min       | Min                 |            |                            |
|                                  | 100kHz,0.4V 8mA DC BIAS | 1-100MHz            | 1-30 MHz         | 40 MHz | 50 MHz | 60-80 MHz | 1-100 MHz       | 1-100 MHz | 1mA,60s             |            |                            |
| WHD72302 G                       | 350                     | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |
| WHD72301 G                       | 350                     | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |

#### Mechanical

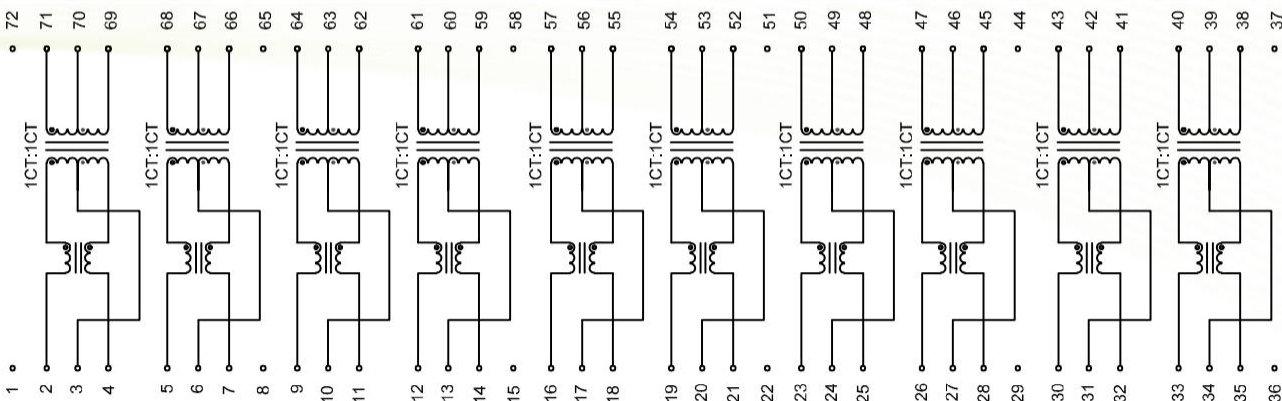


#### Schematics

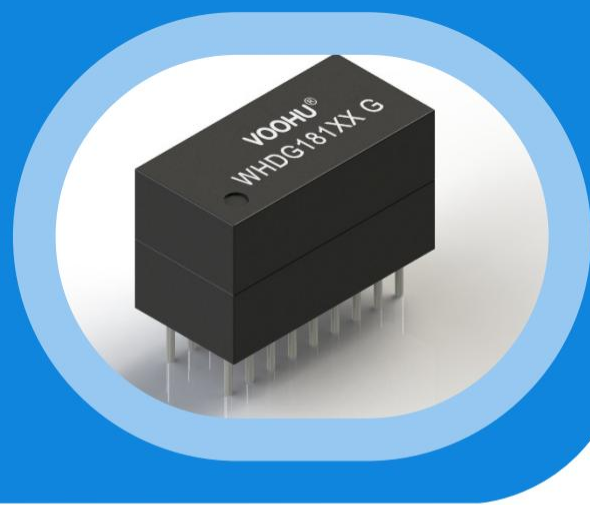
##### WHD72302 G



##### WHD72301 G







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# **NETWORK PRODUCT** **LAN TRANSFORMER WHDG181XX G-Series** **100/1000 Base-T Single Port Magnetic Modules DIP**

## **Features And Benefits**

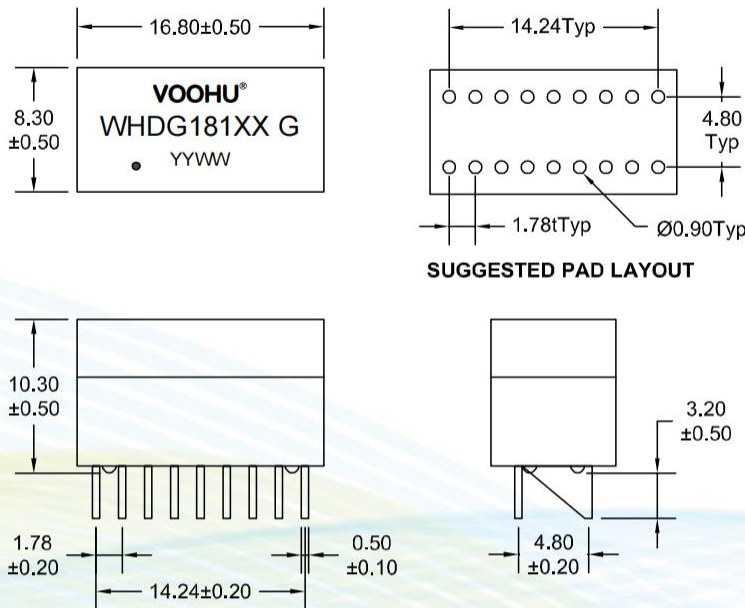
Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements

## **Electrical Performance Summary**

Designed For Ethernet 100/1000 Base-T, Full Single Port Applications  
Compliant With IEEE 802.3 Standard For 100/1000 Base-T

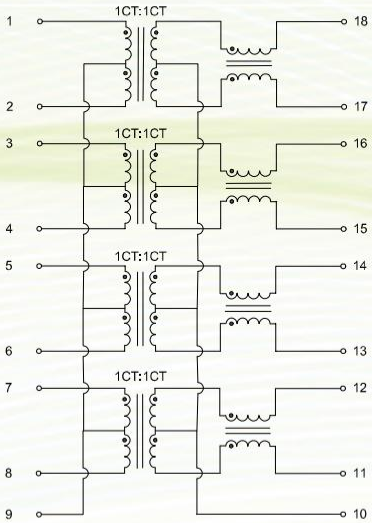
| Electrical Specifications @ 25°C |                            |                        |                             |                     |                  |                       |              |                           |                                  |
|----------------------------------|----------------------------|------------------------|-----------------------------|---------------------|------------------|-----------------------|--------------|---------------------------|----------------------------------|
| Part Number                      | OCL<br>(μH)                | Insertion Loss<br>(dB) |                             | Return Loss<br>(dB) |                  | Cross<br>Talk<br>(dB) | CMRR<br>(dB) | Isolation<br>Hipot<br>(V) | Operating<br>Temperature<br>(°C) |
|                                  | Min                        | Max                    |                             | Min                 |                  | Min                   | Min          | Min                       |                                  |
|                                  | 100kHz,0.1V<br>8mA DC BIAS | 0.5-1<br>MHz           | 1-125<br>MHz                | 1-40<br>MHz         | 40-100<br>MHz    | 1-100<br>MHz          | 1-100<br>MHz | 1mA,60s                   |                                  |
| WHDG18101 G                      | 350                        | -1.2                   | -0.2-0.002*f <sup>1.4</sup> | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | 0 to 70                          |
| WHDG18104 G                      | 350                        | -1.2                   | -0.2-0.002*f <sup>1.4</sup> | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | 0 to 70                          |
| WHDG18103 G                      | 350                        | -1.2                   | -0.2-0.002*f <sup>1.4</sup> | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | 0 to 70                          |
| WHDG18110 G                      | 350                        | -1.2                   | -0.2-0.002*f <sup>1.4</sup> | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | 0 to 70                          |

## **Mechanical**

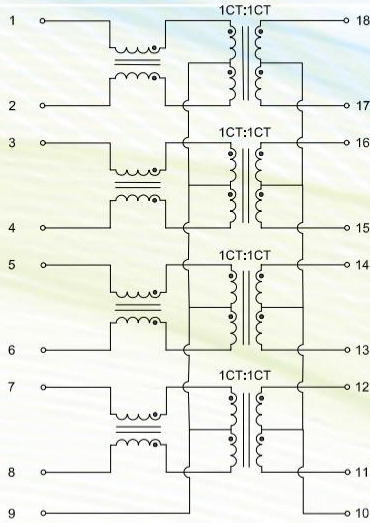


## **Schematics**

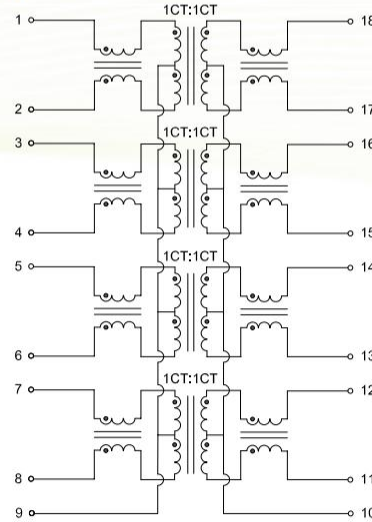
**WHDG18101 G**



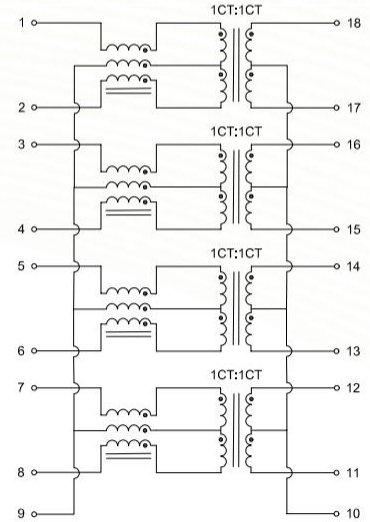
**WHDG18104 G**



**WHDG18103 G**



**WHDG18110 G**







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## NETWORK PRODUCT

LAN TRANSFORMER WHDG241XX G-Series

100/1000 Base-T Single Port Magnetic Modules DIP

### Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS

Requirements

### Electrical Performance Summary

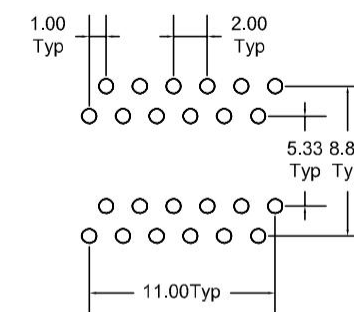
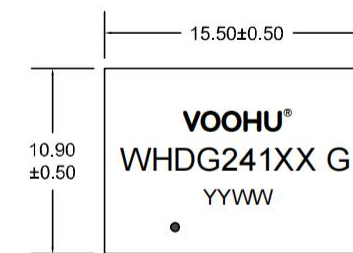
Designed For Ethernet 100/1000 Base-T, Full Single Port Applications

Compliant With IEEE 802.3 Standard For 100/1000 Base-T

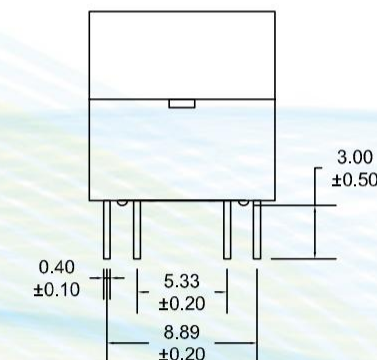
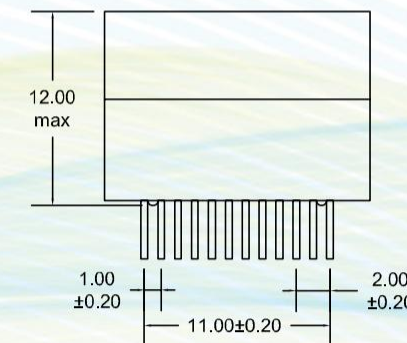
#### Electrical Specifications @ 25°C

| Part Number   | OCL<br>(μH)                 | Insertion Loss<br>(dB) |                             | Return Loss<br>(dB) |                  | Cross<br>Talk<br>(dB) | CMRR<br>(dB) | Isolation<br>Hipot<br>(V) | PoE<br>Rating | Operating<br>Temperature<br>(°C) |
|---------------|-----------------------------|------------------------|-----------------------------|---------------------|------------------|-----------------------|--------------|---------------------------|---------------|----------------------------------|
|               | Min                         | Max                    |                             | Min                 |                  | Min                   | Min          | Min                       |               |                                  |
|               | 100kHz, 0.1V<br>8mA DC BIAS | 0.5-1<br>MHz           | 1-125<br>MHz                | 1-40<br>MHz         | 40-100<br>MHz    | 1-100<br>MHz          | 1-100<br>MHz | 1mA, 60s                  |               |                                  |
| WHDG24101 G   | 350                         | -1.2                   | -0.2-0.002*f <sup>1.4</sup> | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | NON-PoE       | 0 to 70                          |
| WHDG24102 G   | 350                         | -1.2                   | -0.2-0.002*f <sup>1.4</sup> | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | PoE 15W       | 0 to 70                          |
| WHDG24102PT G | 350                         | -1.2                   | -0.2-0.002*f <sup>1.4</sup> | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | 4PPoE 90W     | 0 to 70                          |

### Mechanical

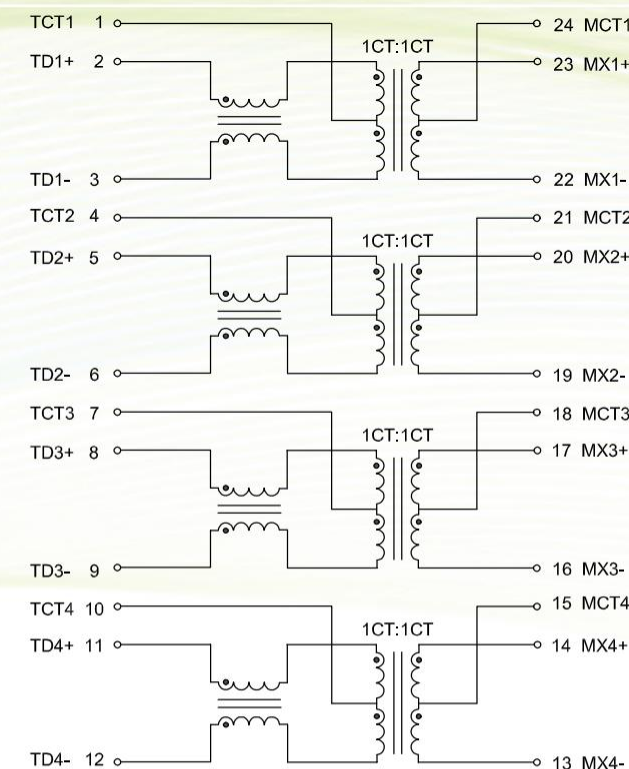


SUGGESTED PAD LAYOUT

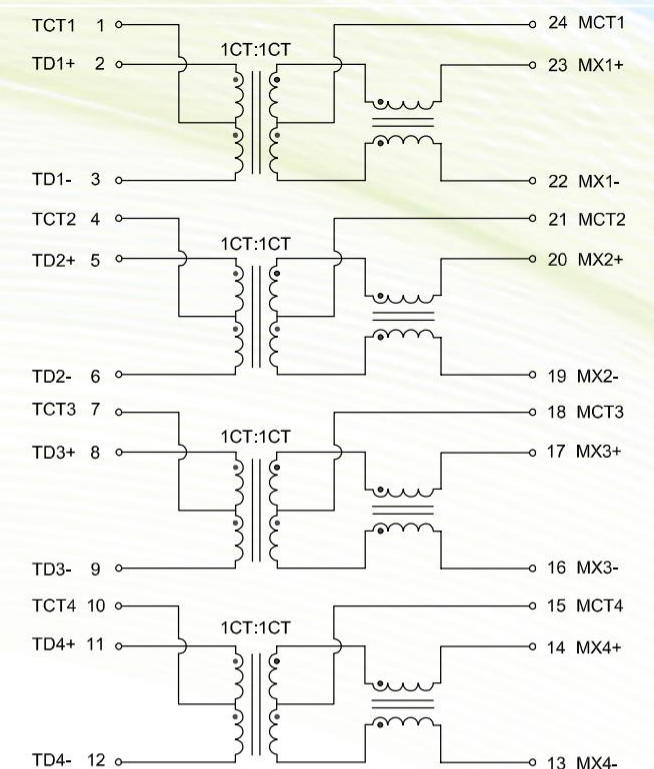


### Schematics

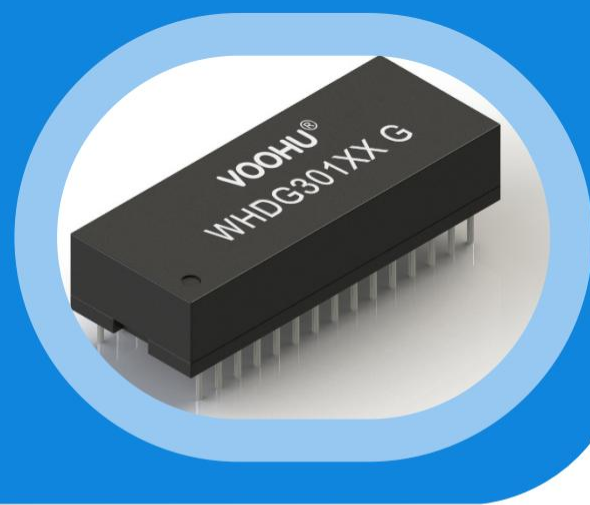
#### WHDG24101 G



#### WHDG24102 G/WHDG24102PT G







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## NETWORK PRODUCT

LAN TRANSFORMER WHDG301XX G-Series

10/100 Base-TX Triple Ports Magnetic Modules DIP

### Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements

### Electrical Performance Summary

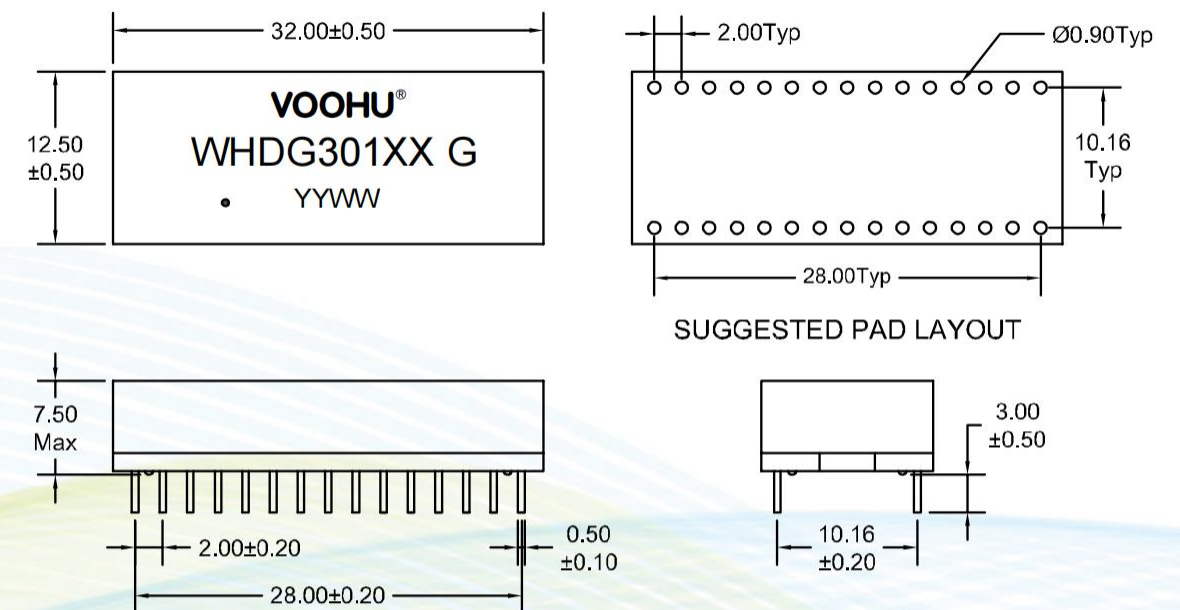
Designed For Ethernet 10/100 Base-TX, Full Triple Ports Applications

Compliant With IEEE 802.3 Standard For 10/100 Base-TX

#### Electrical Specifications @ 25°C

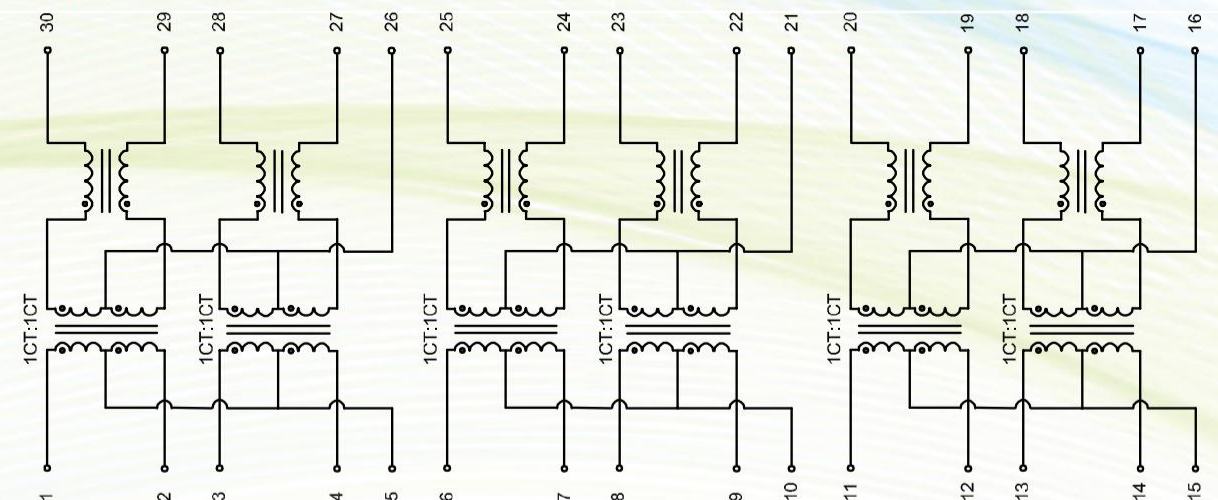
| Part Number | DCL (μH)                    | Insertion Loss (dB) | Return Loss (dB) |        |        |           | Cross Talk (dB) | CMRR (dB) | Isolation Hipot (V) | PoE Rating | Operating Temperature (°C) |
|-------------|-----------------------------|---------------------|------------------|--------|--------|-----------|-----------------|-----------|---------------------|------------|----------------------------|
|             | Min                         | Max                 | Min              |        |        |           | Min             | Min       | Min                 |            |                            |
|             | 100kHz, 0.1V<br>8mA DC BIAS | 1-100MHz            | 1-30 MHz         | 40 MHz | 50 MHz | 60-80 MHz | 1-100 MHz       | 1-100 MHz | 1mA, 60s            |            |                            |
| WHDG30102 G | 350                         | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |
| WHDG30101 G | 350                         | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |

### Mechanical

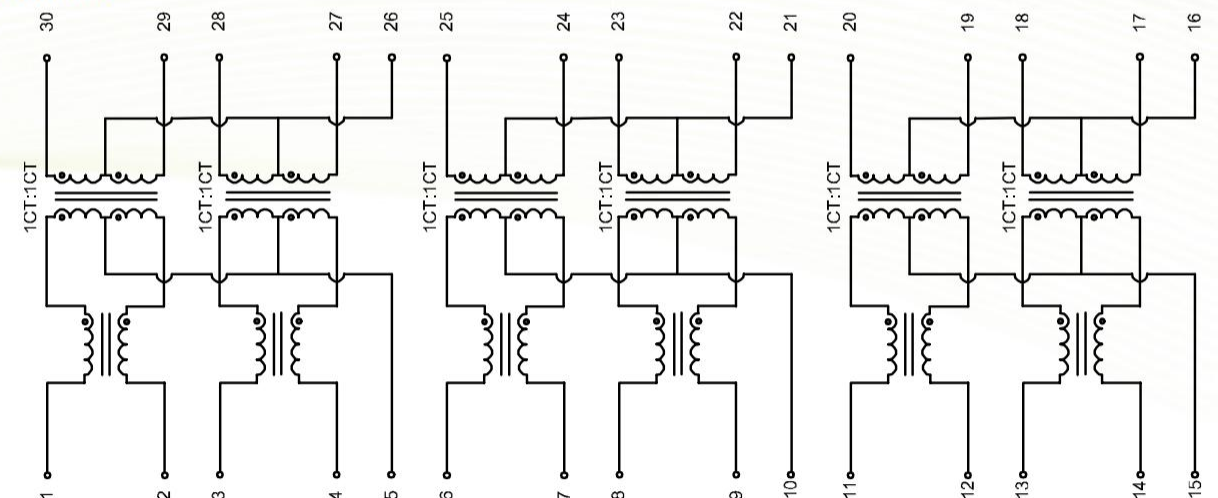


### Schematics

#### WHDG30102 G



#### WHDG30101 G







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# NETWORK PRODUCT

LAN TRANSFORMER WHDG302XX G-Series  
10/100 Base-TX Triple Ports Magnetic Modules DIP

## Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS

Requirements

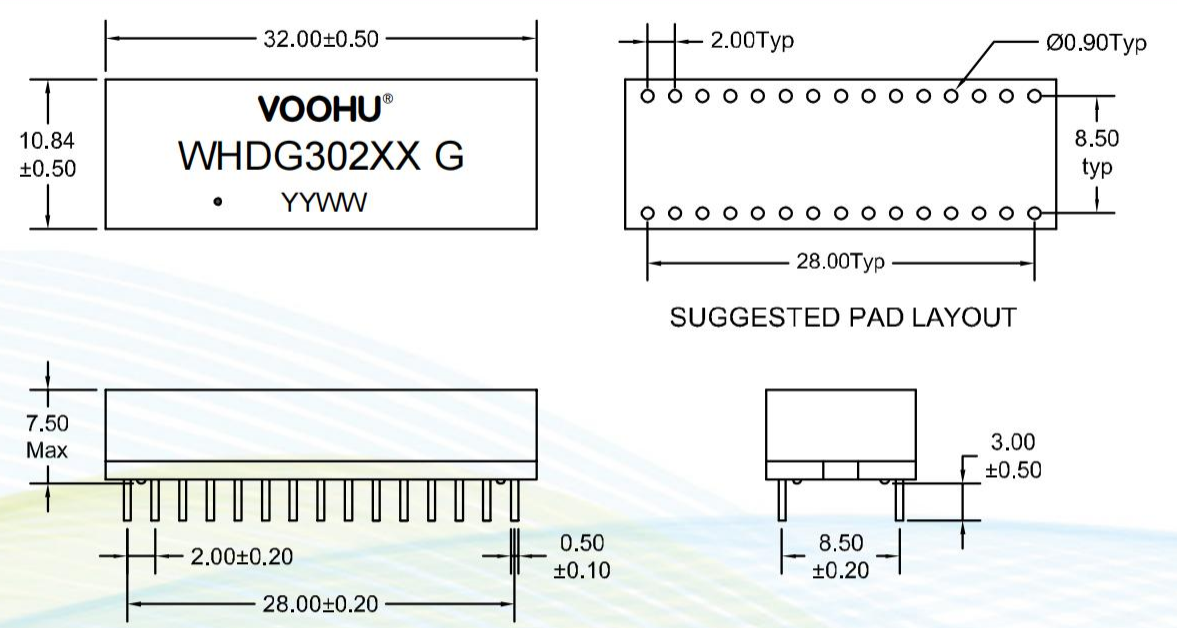
## Electrical Performance Summary

Designed For Ethernet 10/100 Base-TX, Full Triple Ports Applications

Compliant With IEEE 802.3 Standard For 10/100 Base-TX

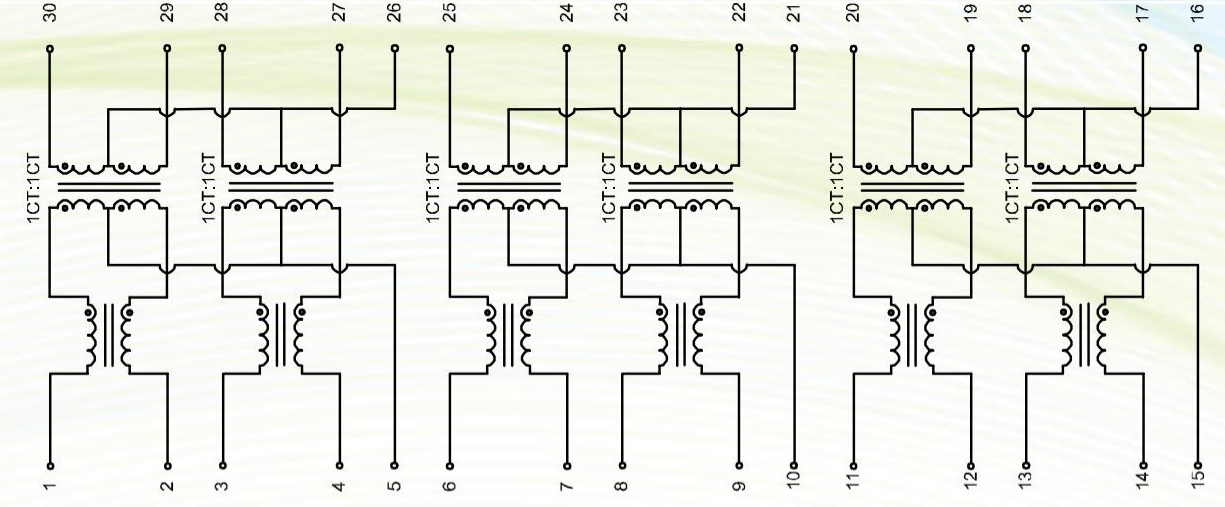
| Electrical Specifications @ 25°C |                          |                     |                  |        |        |           |                 |           |                     |            |                            |
|----------------------------------|--------------------------|---------------------|------------------|--------|--------|-----------|-----------------|-----------|---------------------|------------|----------------------------|
| Part Number                      | DCL (μH)                 | Insertion Loss (dB) | Return Loss (dB) |        |        |           | Cross Talk (dB) | CMRR (dB) | Isolation Hipot (V) | PoE Rating | Operating Temperature (°C) |
|                                  | Min                      | Max                 | Min              |        |        |           | Min             | Min       | Min                 |            |                            |
|                                  | 100kHz, 0.1V 8mA DC BIAS | 1-100MHz            | 1-30 MHz         | 40 MHz | 50 MHz | 60-80 MHz | 1-100 MHz       | 1-100 MHz | 1mA, 60s            |            |                            |
| WHDG30201 G                      | 350                      | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |

## Mechanical

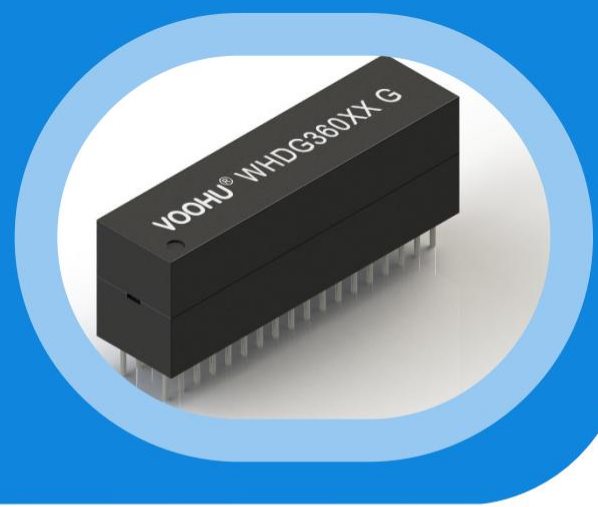


## Schematics

WHDG30201 G







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# NETWORK PRODUCT

## LAN TRANSFORMER WHDG360XX G-Series 100/1000 Base-T Dual Ports Magnetic Modules DIP

### Features And Benefits

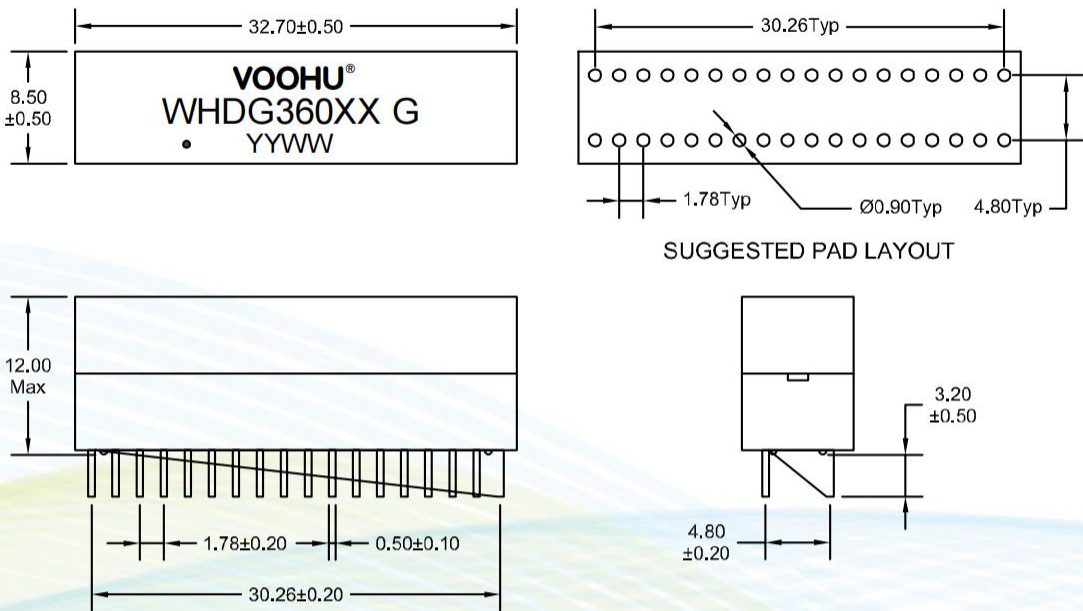
Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements

### Electrical Performance Summary

Designed For Ethernet 100/1000 Base-T, Full Dual Ports Applications  
Compliant With IEEE 802.3 Standard For 100/1000 Base-T

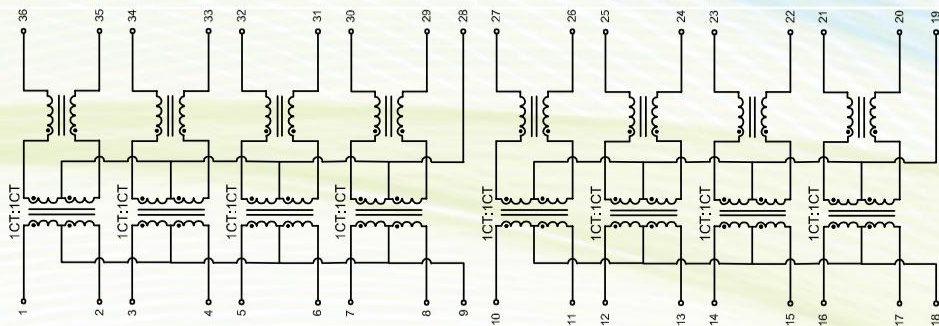
| Electrical Specifications @ 25°C |                            |                        |                  |                     |                  |                       |              |                           |               |                                  |
|----------------------------------|----------------------------|------------------------|------------------|---------------------|------------------|-----------------------|--------------|---------------------------|---------------|----------------------------------|
| Part Number                      | OCL<br>(μH)                | Insertion Loss<br>(dB) |                  | Return Loss<br>(dB) |                  | Cross<br>Talk<br>(dB) | CMRR<br>(dB) | Isolation<br>Hipot<br>(V) | PoE<br>Rating | Operating<br>Temperature<br>(°C) |
|                                  | Min                        | Max                    |                  | Min                 |                  | Min                   | Min          | Min                       |               |                                  |
|                                  | 100kHz,0.1V<br>8mA DC BIAS | 0.5-1<br>MHz           | 1-125<br>MHz     | 1-40<br>MHz         | 40-100<br>MHz    | 1-100<br>MHz          | 1-100<br>MHz | 1mA,60s                   |               |                                  |
| WHDG36001 G                      | 350                        | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | NON-PoE       | 0 to 70                          |
| WHDG36001T G                     | 350                        | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | NON-PoE       | -40 to 85                        |
| WHDG36002 G                      | 350                        | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | NON-PoE       | 0 to 70                          |
| WHDG36003 G                      | 350                        | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | NON-PoE       | 0 to 70                          |

### Mechanical

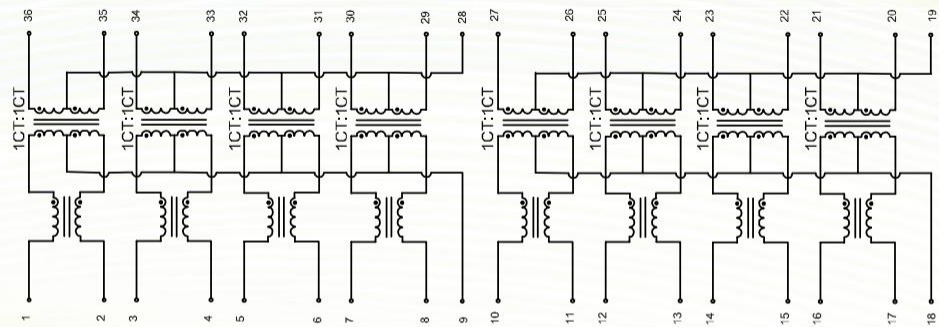


### Schematics

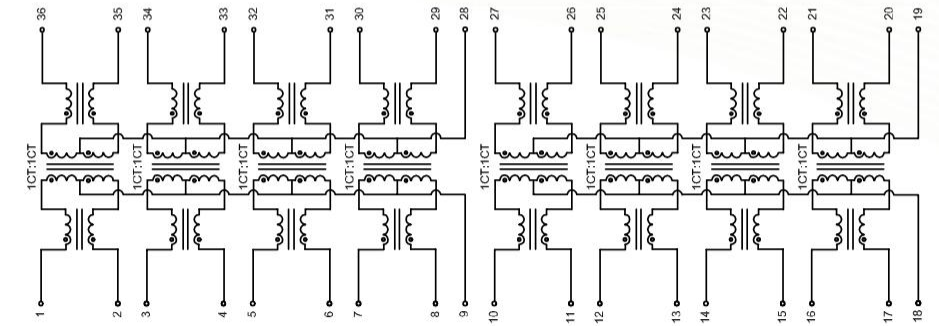
#### WHDG36001 G/WHDG36001T G



#### WHDG36002 G



#### WHDG36003 G







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# NETWORK PRODUCT

## LAN TRANSFORMER WHDG482XX G-Series

### 100/1000 Base-T Dual Ports Magnetic Modules DIP

#### Features And Benefits

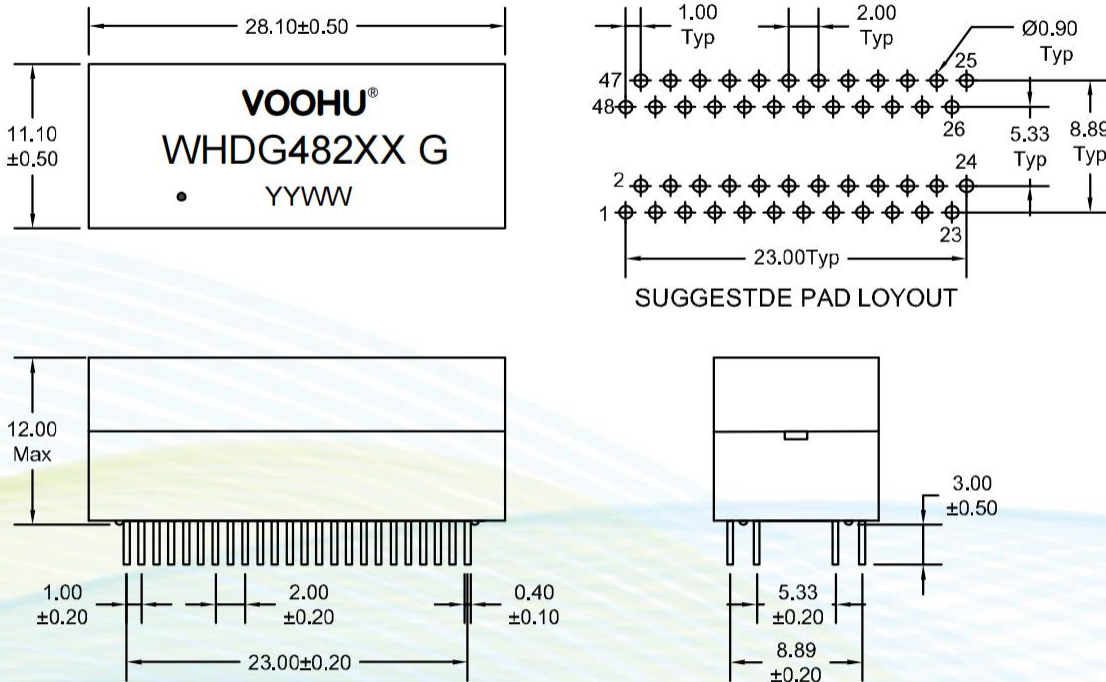
Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements

#### Electrical Performance Summary

Designed For Ethernet 100/1000 Base-T, Full Dual Ports Applications  
Compliant With IEEE 802.3 Standard For 100/1000 Base-T

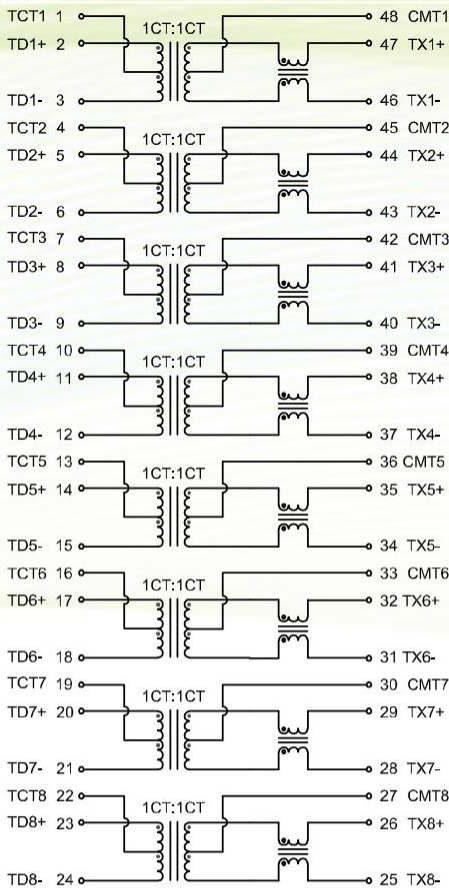
| Electrical Specifications @ 25°C |                            |                        |                             |                     |                  |                       |              |                           |                                  |
|----------------------------------|----------------------------|------------------------|-----------------------------|---------------------|------------------|-----------------------|--------------|---------------------------|----------------------------------|
| Part Number                      | OCL<br>(μH)                | Insertion Loss<br>(dB) |                             | Return Loss<br>(dB) |                  | Cross<br>Talk<br>(dB) | CMRR<br>(dB) | Isolation<br>Hipot<br>(V) | Operating<br>Temperature<br>(°C) |
|                                  | Min                        | Max                    |                             | Min                 |                  | Min                   | Min          | Min                       |                                  |
|                                  | 100kHz,0.1V<br>8mA DC BIAS | 0.5-1<br>MHz           | 1-125<br>MHz                | 1-40<br>MHz         | 40-100<br>MHz    | 1-100<br>MHz          | 1-100<br>MHz | 1mA,60s                   |                                  |
| WHDG48201-1 G                    | 350                        | -1.2                   | -0.2-0.002*f <sup>1.4</sup> | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | NON-PoE 0 to 70                  |
| WHDG48209 G                      | 350                        | -1.2                   | -0.2-0.002*f <sup>1.4</sup> | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | PoE 15W 0 to 70                  |
| WHDG48209P G                     | 350                        | -1.2                   | -0.2-0.002*f <sup>1.4</sup> | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | 4PPoE 60W -40 to 85              |
| WHDG48206-1 G                    | 350                        | -1.2                   | -0.2-0.002*f <sup>1.4</sup> | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | NON-PoE 0 to 70                  |

#### Mechanical

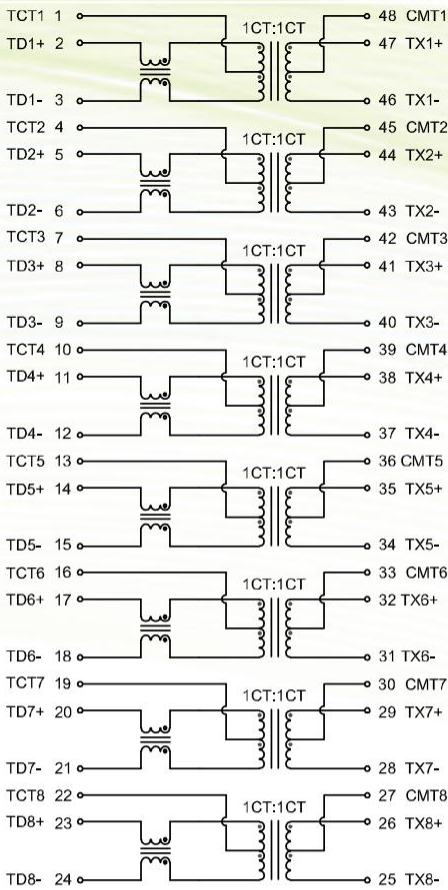


#### Schematics

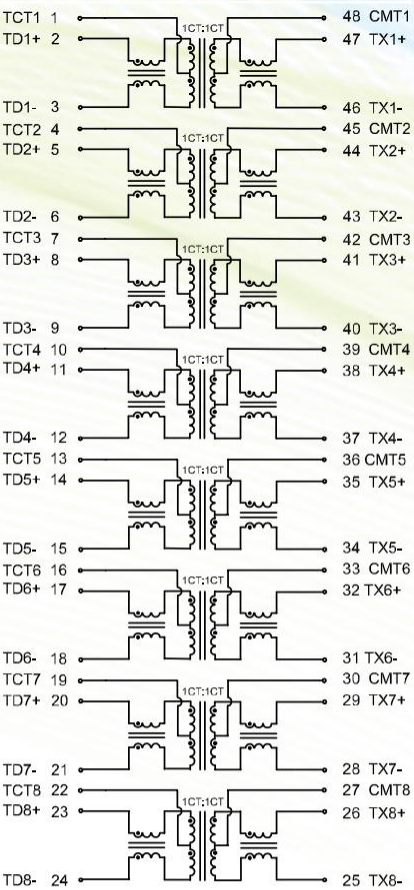
##### WHDG48201-1 G



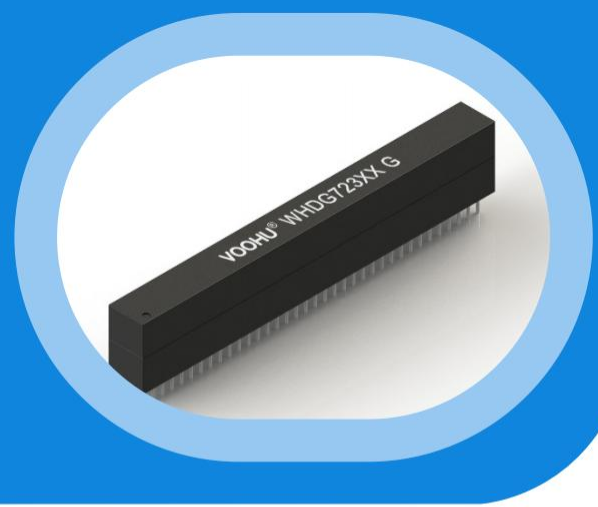
##### WHDG48209 G/WHDG48209P G



##### WHDG48206-1 G







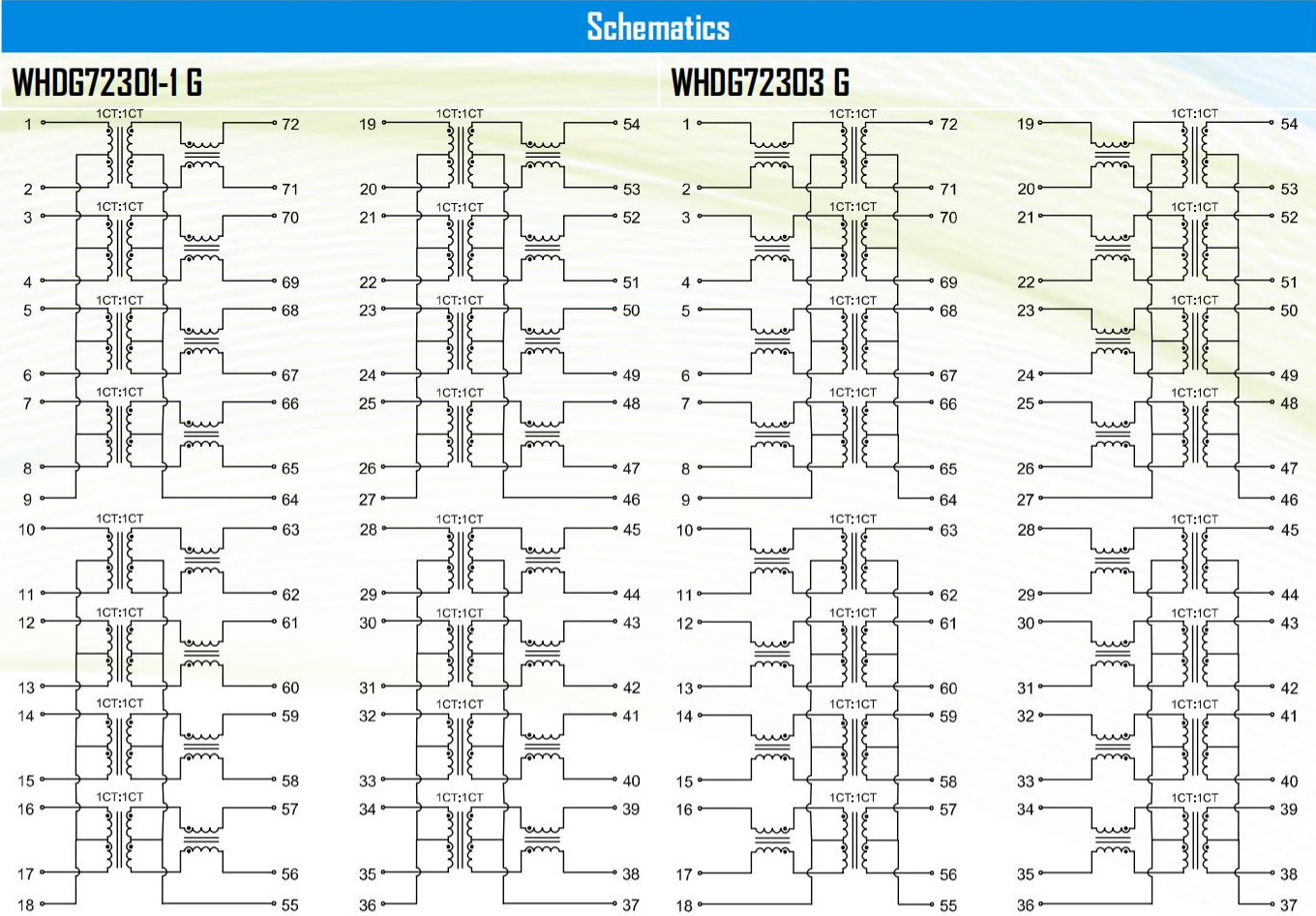
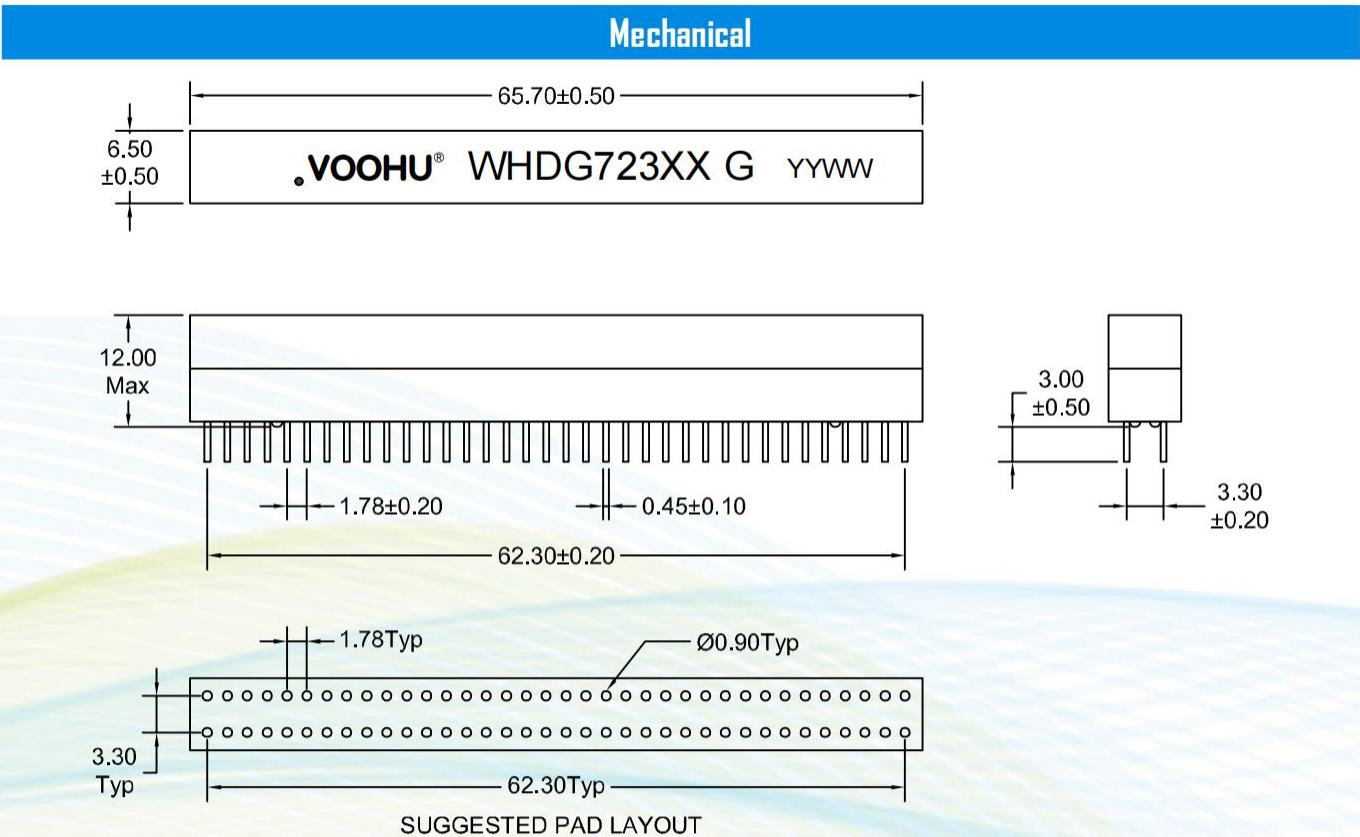
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**NETWORK PRODUCT**  
**LAN TRANSFORMER WHDG723XX G-Series**  
**100/1000 Base-T Quad Ports Magnetic Modules DIP**

**Features And Benefits**  
Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements  
**Electrical Performance Summary**  
Designed For Ethernet 100/1000 Base-T, Full Quad Ports Applications  
Compliant With IEEE 802.3 Standard For 100/1000 Base-T

| Electrical Specifications @ 25°C |                          |                     |                  |                  |                  |                 |           |                     |                            |
|----------------------------------|--------------------------|---------------------|------------------|------------------|------------------|-----------------|-----------|---------------------|----------------------------|
| Part Number                      | OCL (μH)                 | Insertion Loss (dB) |                  | Return Loss (dB) |                  | Cross Talk (dB) | CMRR (dB) | Isolation Hipot (V) | Operating Temperature (°C) |
|                                  | Min                      | Max                 |                  | Min              |                  | Min             | Min       | Min                 |                            |
|                                  | 100kHz, 0.1V 8mA DC BIAS | 0.5-1 MHz           | 1-125 MHz        | 1-40 MHz         | 40-100 MHz       | 1-100 MHz       | 1-100 MHz | 1mA, 60s            |                            |
| WHDG72301-I G                    | 350                      | -1.2                | -0.2-0.002*f^1.4 | -16              | -10+20*log(f/80) | -30             | -30       | 1500                | NON-PoE 0 to 70            |
| WHDG72303 G                      | 350                      | -1.2                | -0.2-0.002*f^1.4 | -16              | -10+20*log(f/80) | -30             | -30       | 1500                | NON-PoE 0 to 70            |







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## NETWORK PRODUCT

LAN TRANSFORMER WHDG72KXX G-Series

100/1000 Base-T Quad Ports Magnetic Modules DIP

### Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS

Requirements

### Electrical Performance Summary

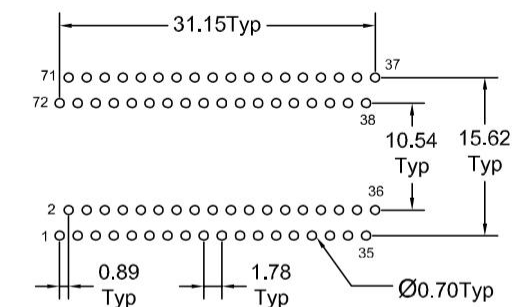
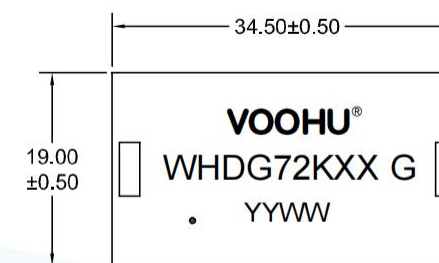
Designed For Ethernet 100/1000 Base-T, Full Quad Ports Applications

Compliant With IEEE 802.3 Standard For 100/1000 Base-T

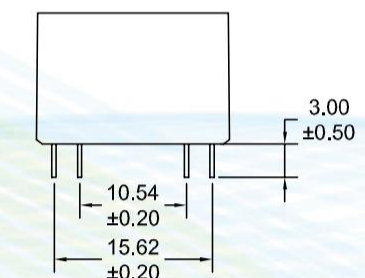
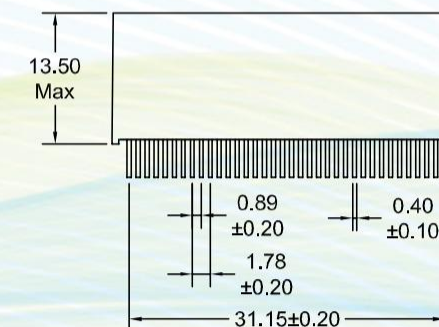
#### Electrical Specifications @ 25°C

| Part Number  | OCL<br>(μH)                | Insertion Loss<br>(dB) |                             | Return Loss<br>(dB) |               | Cross<br>Talk<br>(dB) | CMRR<br>(dB) | Isolation<br>Hipot<br>(V) | PoE<br>Rating | Operating<br>Temperature<br>(°C) |         |           |
|--------------|----------------------------|------------------------|-----------------------------|---------------------|---------------|-----------------------|--------------|---------------------------|---------------|----------------------------------|---------|-----------|
|              | Min                        | Max                    |                             | Min                 |               | Min                   | Min          | Min                       |               |                                  |         |           |
|              | 100kHz,0.1V<br>8mA DC BIAS | 0.5-1<br>MHz           | 1-125<br>MHz                | 1-40<br>MHz         | 40-100<br>MHz | 1-100<br>MHz          | 1-100<br>MHz | 1mA,60s                   |               |                                  |         |           |
| WHDG72K01 G  | 350                        | -1.2                   | -0.2-0.002*f <sup>1.4</sup> |                     | -16           | -10+20*log(f/80)      |              | -30                       | -30           | 1500                             | NON-PoE | 0 to 70   |
| WHDG72K01T G | 350                        | -1.2                   | -0.2-0.002*f <sup>1.4</sup> |                     | -16           | -10+20*log(f/80)      |              | -30                       | -30           | 1500                             | NON-PoE | -40 to 85 |
| WHDG72K06 G  | 350                        | -1.2                   | -0.2-0.002*f <sup>1.4</sup> |                     | -16           | -10+20*log(f/80)      |              | -30                       | -30           | 1500                             | NON-PoE | 0 to 70   |

### Mechanical

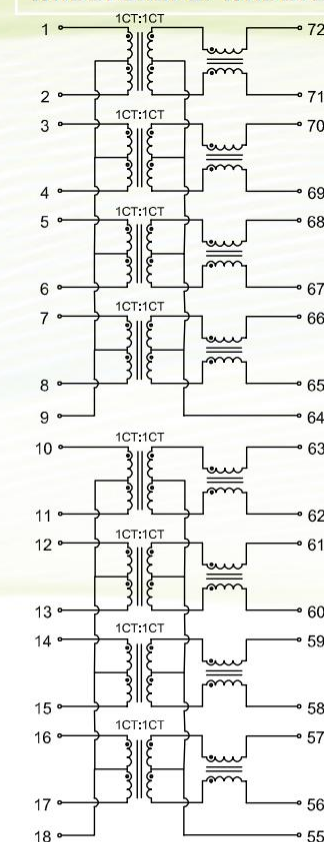


#### SUGGESTED PAD LAYOUT

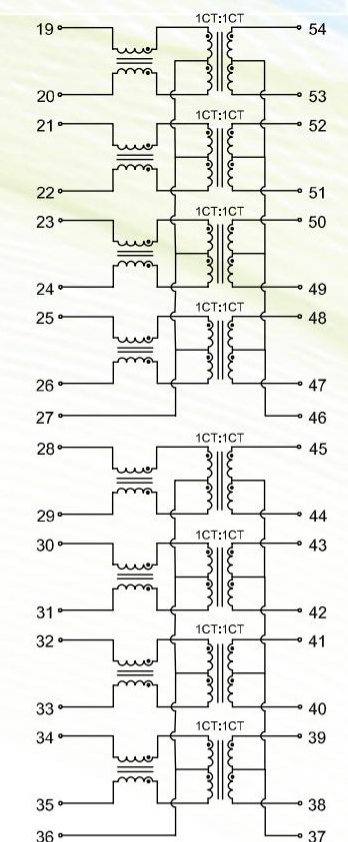
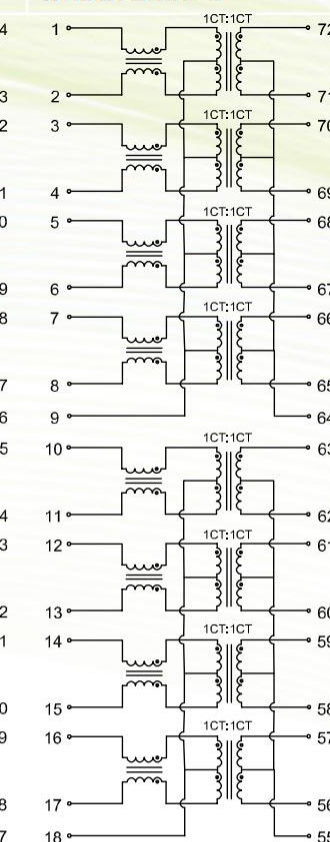


### Schematics

#### WHDG72K01 G/WHG72K01T G



#### WHDG72K06 G







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## NETWORK PRODUCT

LAN TRANSFORMER WHDG884XX G-Series

100/1000 Base-T Quad Ports Magnetic Modules DIP

### Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS

Requirements

### Electrical Performance Summary

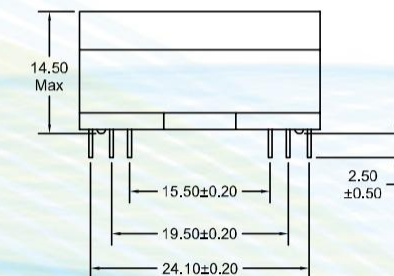
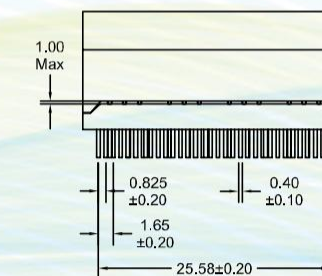
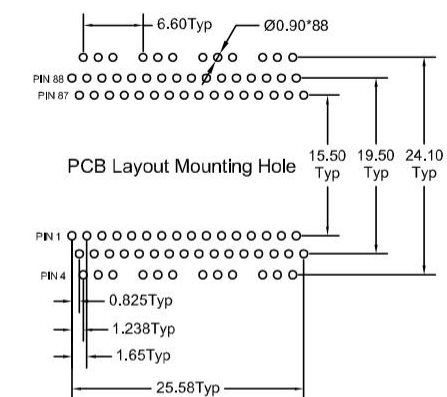
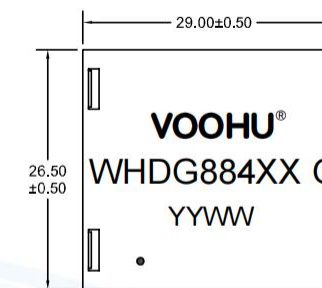
Designed For Ethernet 100/1000 Base-T, Full Quad Ports Applications

Compliant With IEEE 802.3 Standard For 100/1000 Base-T

#### Electrical Specifications @ 25°C

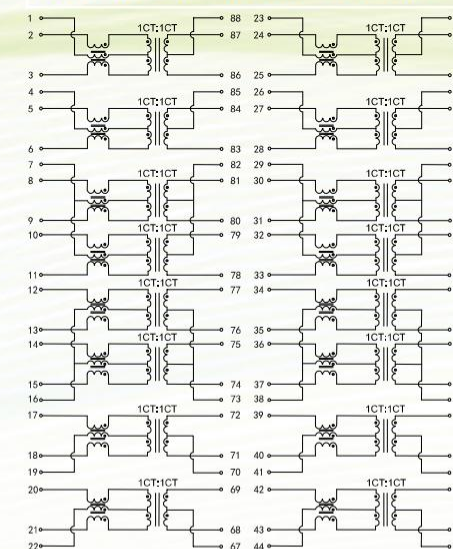
| Part Number  | OCL<br>(μH)       | Insertion Loss<br>(dB) |                             | Return Loss<br>(dB) |                  | Cross<br>Talk<br>(dB) | CMRR<br>(dB) | Isolation<br>Hipot<br>(V) | PoE<br>Rating | Operating<br>Temperature<br>(°C) |
|--------------|-------------------|------------------------|-----------------------------|---------------------|------------------|-----------------------|--------------|---------------------------|---------------|----------------------------------|
|              | Min               | Max                    |                             | Min                 |                  | Min                   | Min          | Min                       |               |                                  |
|              | 100kHz,0.1V       | 0.5-1<br>MHz           | 1-125<br>MHz                | 1-40<br>MHz         | 40-100<br>MHz    | 1-100<br>MHz          | 1-100<br>MHz | 1mA,60s                   |               |                                  |
| WHDG88402 G  | 350(8mA DC BIAS)  | -1.2                   | -0.2-0.002*f <sup>1.4</sup> | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | PoE 15W       | 0 to 70                          |
| WHDG88402P G | 350(8mA DC BIAS)  | -1.2                   | -0.2-0.002*f <sup>1.4</sup> | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | PoE 30W       | -40 to 85                        |
| WHDG88403 G  | 350(8mA DC BIAS)  | -1.2                   | -0.2-0.002*f <sup>1.4</sup> | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | NON-PoE       | 0 to 70                          |
| WHDG88409 G  | 350(8mA DC BIAS)  | -1.2                   | -0.2-0.002*f <sup>1.4</sup> | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | PoE 15W       | 0 to 70                          |
| WHDG88409P G | 350(14mA DC BIAS) | -1.2                   | -0.2-0.002*f <sup>1.4</sup> | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | PoE 30W       | -40 to 85                        |

### Mechanical

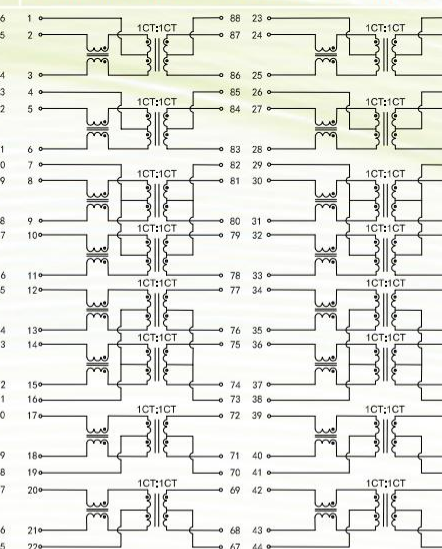


### Schematics

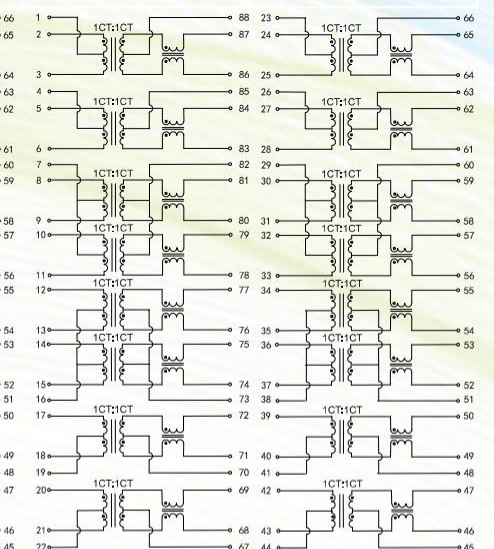
#### WHDG88402 G/WHDG88402P G



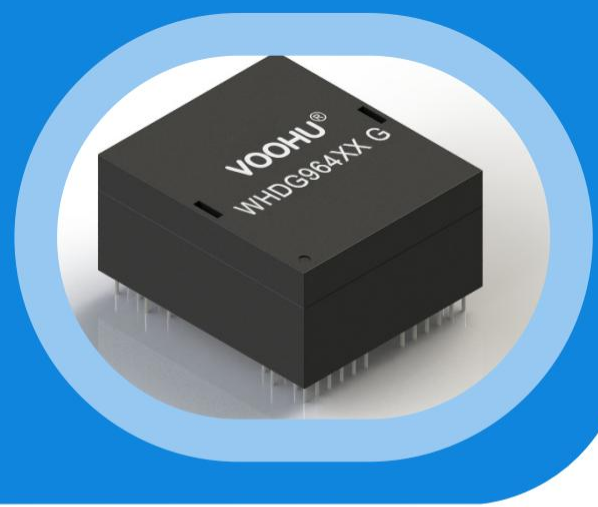
#### WHDG88409 G/WHDG88409P G



#### WHDG88403 G







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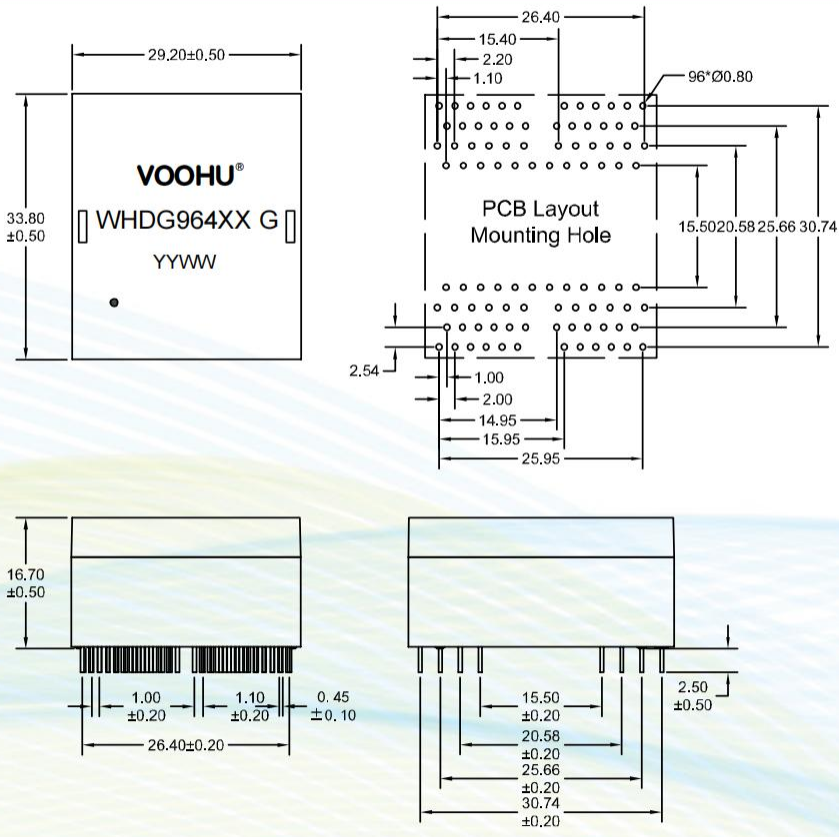


NETWORK PRODUCT  
LAN TRANSFORMER WHDG964XX G-Series  
100/1000 Base-T Quad Ports Magnetic Modules DIP

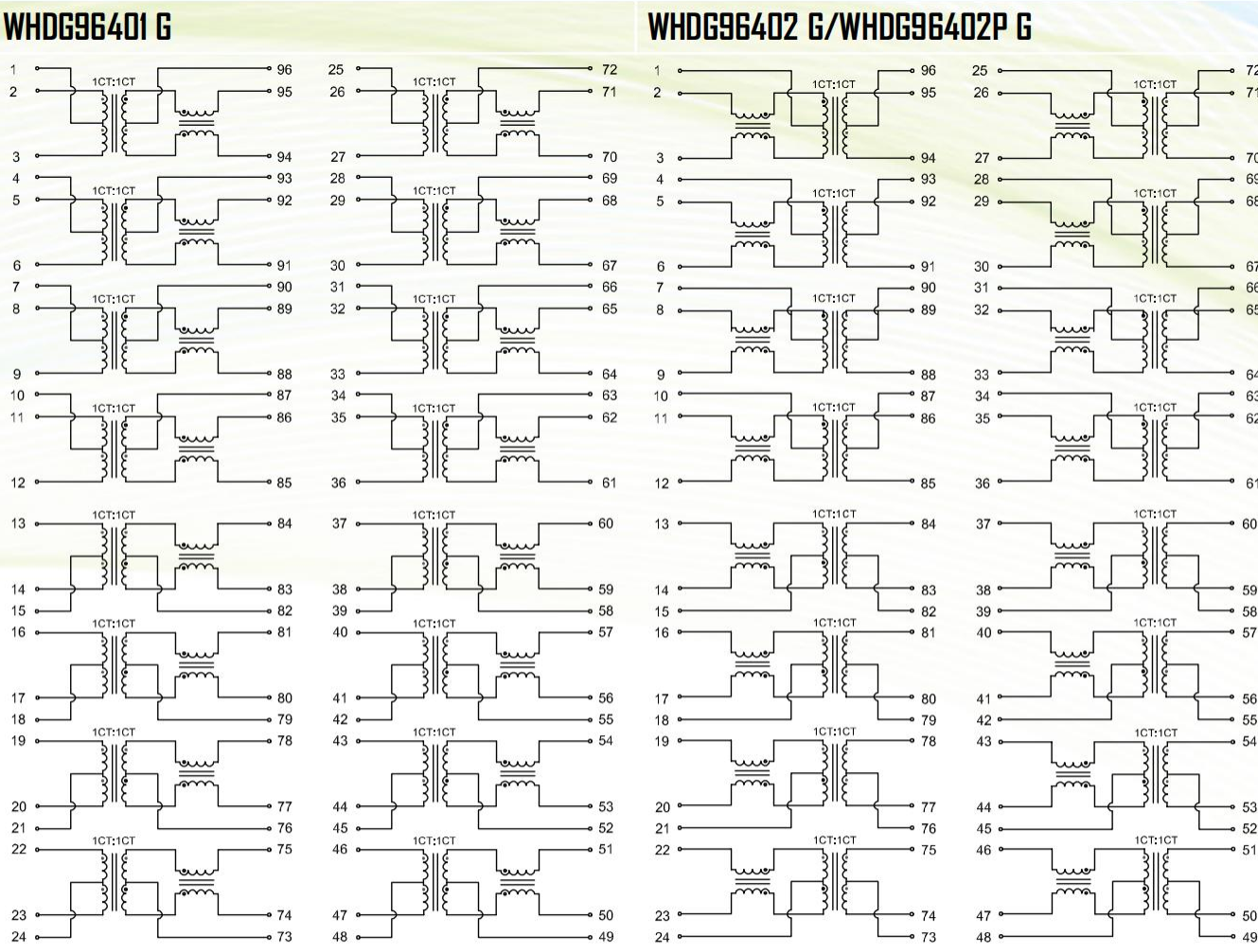
Features And Benefits  
Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements  
Electrical Performance Summary  
Designed For Ethernet 100/1000 Base-T, Full Quad Ports Applications  
Compliant With IEEE 802.3 Standard For 100/1000 Base-T

| Electrical Specifications @ 25°C |                   |                     |                  |                  |                  |                 |           |                     |            |                            |
|----------------------------------|-------------------|---------------------|------------------|------------------|------------------|-----------------|-----------|---------------------|------------|----------------------------|
| Part Number                      | OCL (μH)          | Insertion Loss (dB) |                  | Return Loss (dB) |                  | Cross Talk (dB) | CMRR (dB) | Isolation Hipot (V) | PoE Rating | Operating Temperature (°C) |
|                                  | Min               | Max                 |                  | Min              |                  | Min             | Min       | Min                 |            |                            |
|                                  | 100kHz, 0.1V      | 0.5-1 MHz           | 1-125 MHz        | 1-40 MHz         | 40-100 MHz       | 1-100 MHz       | 1-100 MHz | 1mA, 60s            |            |                            |
| WHDG96401 G                      | 350(8mA DC BIAS)  | -1.2                | -0.2-0.002*f^1.4 | -16              | -10+20*log(f/80) | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |
| WHDG96402 G                      | 350(8mA DC BIAS)  | -1.2                | -0.2-0.002*f^1.4 | -16              | -10+20*log(f/80) | -30             | -30       | 1500                | PoE 15W    | 0 to 70                    |
| WHDG96402P G                     | 350(14mA DC BIAS) | -1.2                | -0.2-0.002*f^1.4 | -16              | -10+20*log(f/80) | -30             | -30       | 1500                | 4PPoE 90W  | -40 to 85                  |

Mechanical



Schematics



The Latest Changes Without Notice, Or The Latest Changes And Information Please Contact With Us!  
The Product Data Only Shows The Basic Parameter Characteristics, He Detailed Application Requirements And Matters Needing Attention Should Be Confirmed To Us





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## NETWORK PRODUCT

LAN TRANSFORMER WHDG965XX G-Series

100/1000 Base-T Quad Ports Magnetic Modules DIP

### Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements

### Electrical Performance Summary

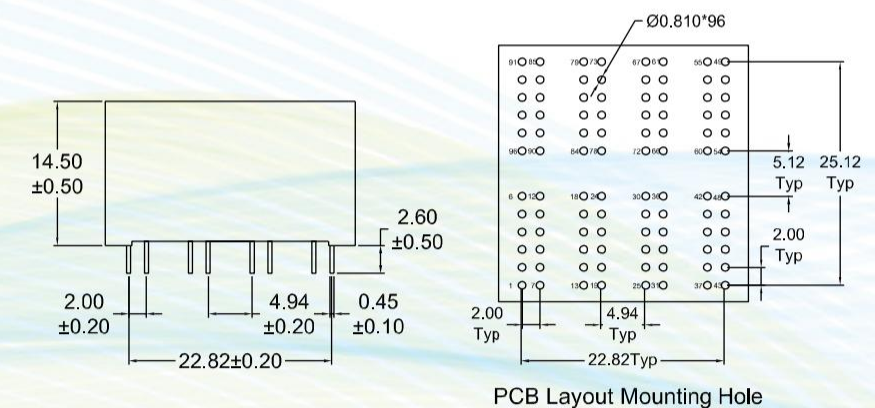
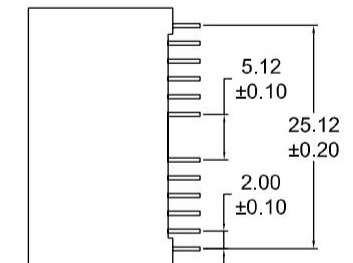
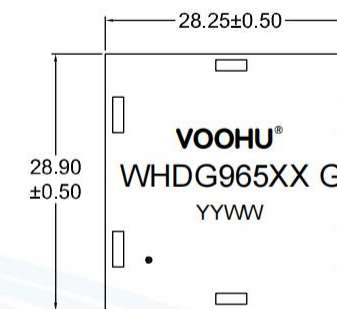
Designed For Ethernet 100/1000 Base-T, Full Quad Ports Applications

Compliant With IEEE 802.3 Standard For 100/1000 Base-T

#### Electrical Specifications @ 25°C

| Part Number   | OCL<br>(μH)       | Insertion Loss<br>(dB) |                  | Return Loss<br>(dB) |                  | Cross<br>Talk<br>(dB) | CMRR<br>(dB) | Isolation<br>Hipot<br>(V) | PoE<br>Rating | Operating<br>Temperature<br>(°C) |
|---------------|-------------------|------------------------|------------------|---------------------|------------------|-----------------------|--------------|---------------------------|---------------|----------------------------------|
|               | Min               | Max                    |                  | Min                 |                  | Min                   | Min          | Min                       |               |                                  |
|               | 100kHz,0.1V       | 0.5-1<br>MHz           | 1-125<br>MHz     | 1-40<br>MHz         | 40-100<br>MHz    | 1-100<br>MHz          | 1-100<br>MHz | 1mA,60s                   |               |                                  |
| WHDG96502 G   | 350(8mA DC BIAS)  | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | PoE 15W       | 0 to 70                          |
| WHDG96502PT G | 350(14mA DC BIAS) | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | 4PPoE 120W    | -40 to 85                        |
| WHDG96503 G   | 350(8mA DC BIAS)  | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | NON-PoE       | 0 to 70                          |
| WHDG96503PT G | 350(8mA DC BIAS)  | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | 4PPoE 90W     | -40 to 85                        |
| WHDG96504PT G | 350(21mA DC BIAS) | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | 4PPoE 120W    | -40 to 85                        |

### Mechanical

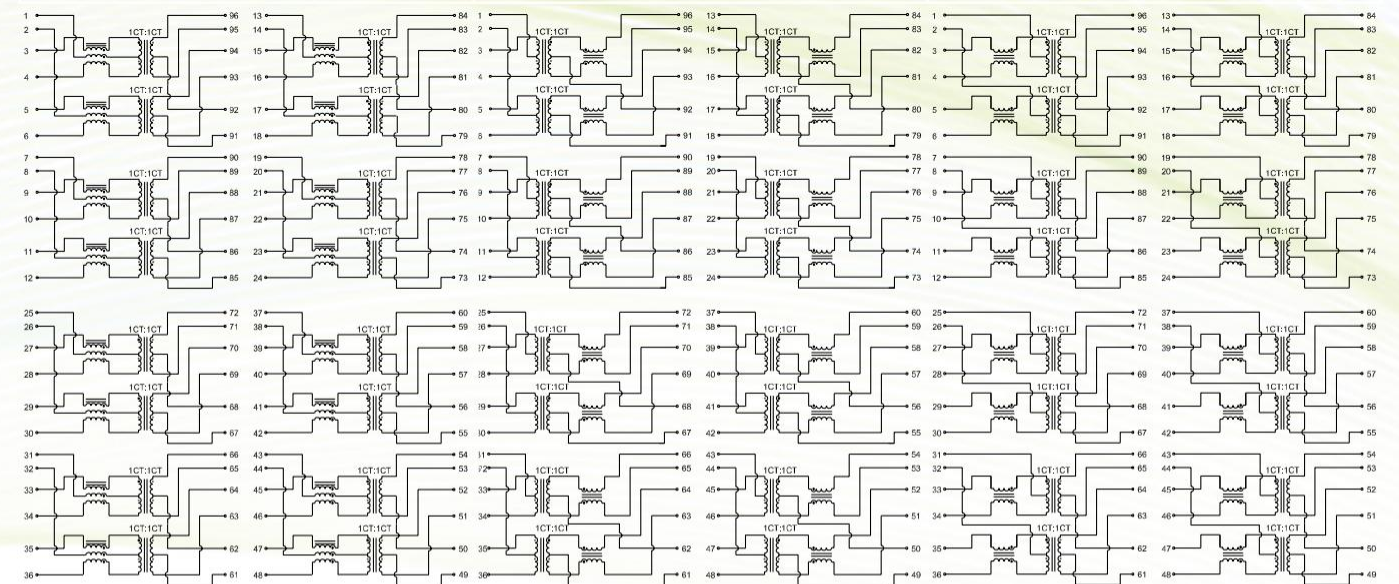


### Schematics

WHDG96502 G/WHDG96502PT

WHDG96503 G/WHDG96503PT G

WHDG96504PT G







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## NETWORK PRODUCT

LAN TRANSFORMER WHDQ964XX G-Series

2.5/5G Base-T Quad Ports Magnetic Modules DIP

### Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS

Requirements

### Electrical Performance Summary

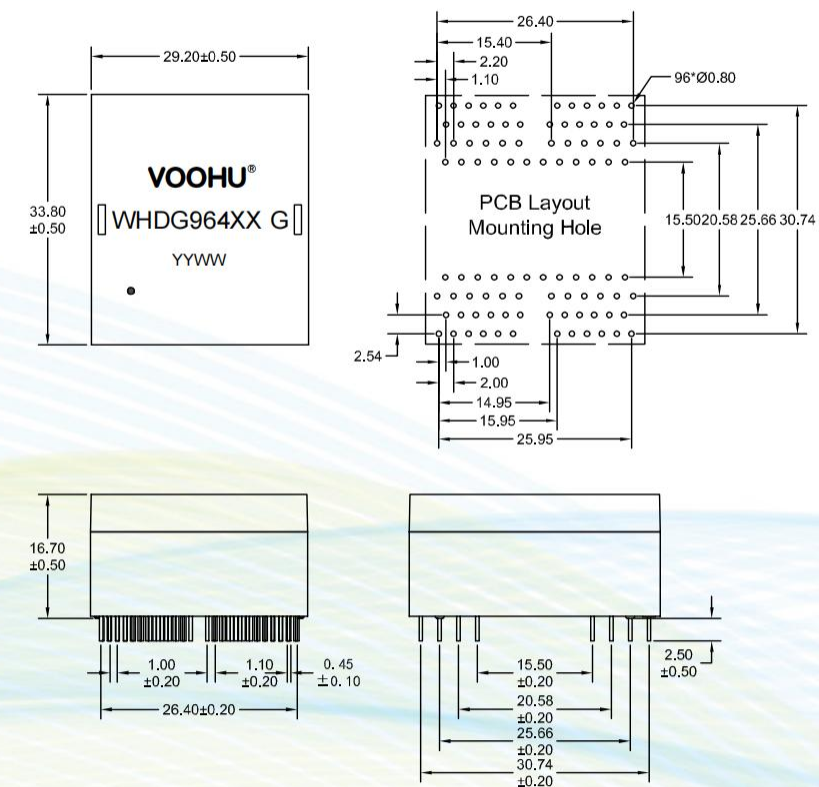
Designed For Ethernet 2.5/5G Base-T, Full Quad Ports Applications

Compliant With IEEE 802.3bz Standard For 2.5/5G Base-T

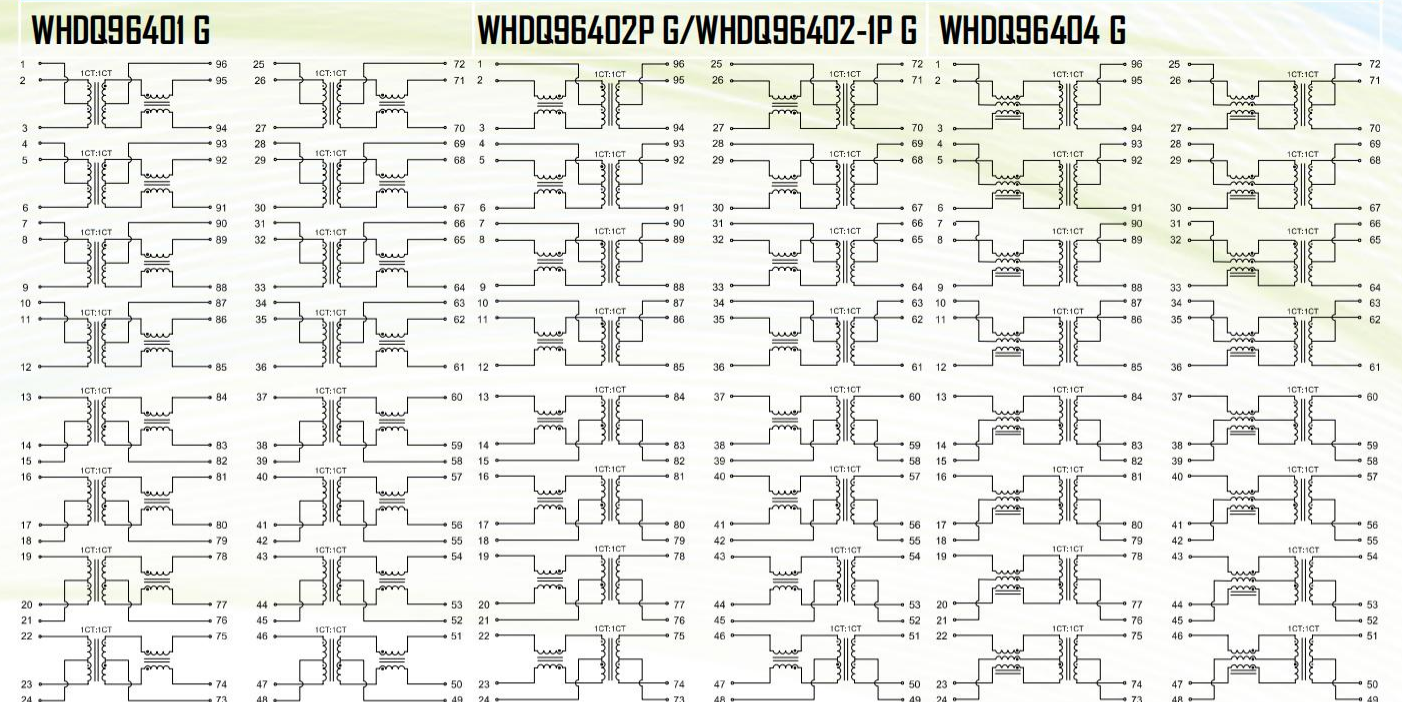
#### Electrical Specifications @ 25° C

| Part Number    | OCL<br>(μH)       | Insertion Loss<br>(dB) |                | Return Loss<br>(dB) |                 | Cross<br>Talk<br>(dB) | CMRR<br>(dB) | Isolation<br>Hipot<br>(V) | PoE<br>Rating |
|----------------|-------------------|------------------------|----------------|---------------------|-----------------|-----------------------|--------------|---------------------------|---------------|
|                | Min               | Max                    |                | Min                 |                 | Typ                   | Typ          | Min                       |               |
|                | 100KHz,0.1V       | 1-100<br>MHz           | 100-250<br>MHz | 1-40<br>MHz         | 40-250<br>MHz   | 1-250<br>MHz          | 1-250<br>MHz | 1mA,60s                   |               |
| WHDQ96401 G    | 200(8mA DC BIAS)  | -1.0                   | -2.0           | -16                 | -16+10log(f/40) | -30                   | -30          | 1500                      | NON-PoE       |
| WHDQ96402P G   | 200(8mA DC BIAS)  | -1.0                   | -2.0           | -16                 | -16+10log(f/40) | -30                   | -30          | 1500                      | PoE 15W       |
| WHDQ96402-IP G | 200(14mA DC BIAS) | -1.0                   | -2.0           | -16                 | -16+10log(f/40) | -30                   | -30          | 1500                      | 4PPoE 75W     |
| WHDQ96404 G    | 200(8mA DC BIAS)  | -1.0                   | -2.0           | -16                 | -16+10log(f/40) | -30                   | -30          | 1500                      | PoE 15W       |

### Mechanical



### Schematics







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## NETWORK PRODUCT

LAN TRANSFORMER WHS160XX G-Series

10/100 Base-TX Single Port Magnetic Modules SMD

### Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements

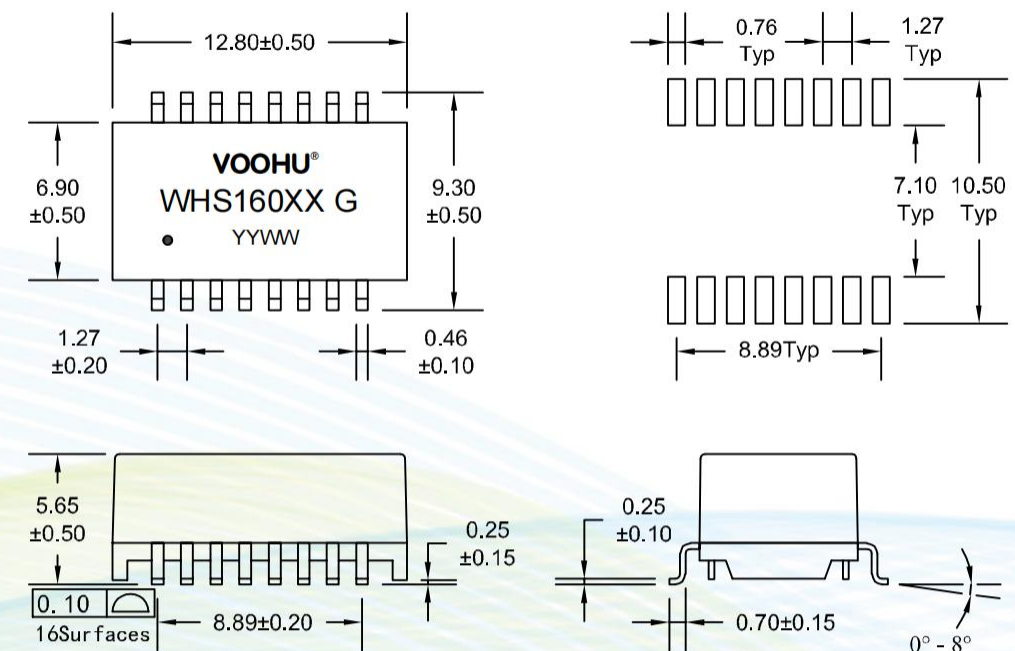
### Electrical Performance Summary

Designed For Ethernet 10/100 Base-TX, Full Single Port Applications  
Compliant With IEEE 802.3 Standard For 10/100 Base-TX

#### Electrical Specifications @ 25°C

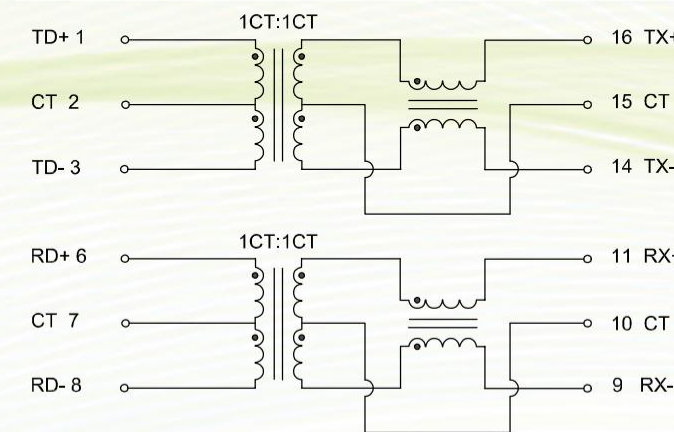
| Part Number  | OCL (μH)                 | Insertion Loss (dB) | Return Loss (dB) |        |        |           | Cross Talk (dB) | CMRR (dB) | Isolation Hipot (V) | PoE Rating | Operating Temperature (°C) |
|--------------|--------------------------|---------------------|------------------|--------|--------|-----------|-----------------|-----------|---------------------|------------|----------------------------|
|              | Min                      | Max                 | Min              |        |        |           | Min             | Min       | Min                 |            |                            |
|              | 100kHz, 0.1V 8mA DC BIAS | 1-100MHz            | 1-30 MHz         | 40 MHz | 50 MHz | 60-80 MHz | 1-100 MHz       | 1-100 MHz | 1mA, 60s            |            |                            |
| WHS16037 G   | 350                      | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |
| WHS16037T G  | 350                      | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | -40 to 85                  |
| WHS16002 G   | 350                      | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | PoE 15W    | 0 to 70                    |
| WHS160B1 G   | 350                      | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | PoE 15W    | 0 to 70                    |
| WHS160BIPT G | 350                      | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | PoE 30W    | -40 to 85                  |

### Mechanical

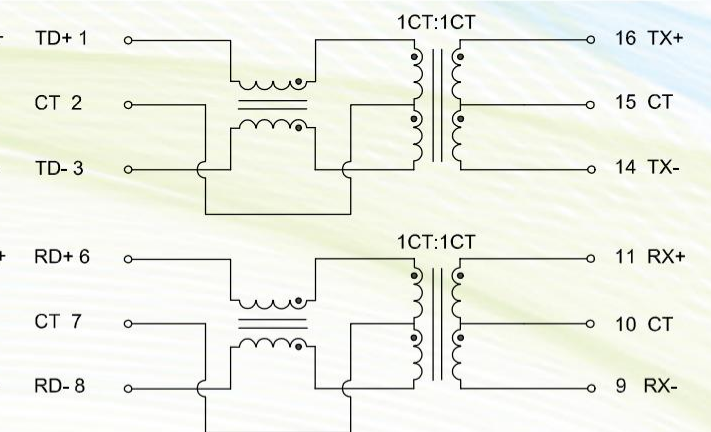


### Schematics

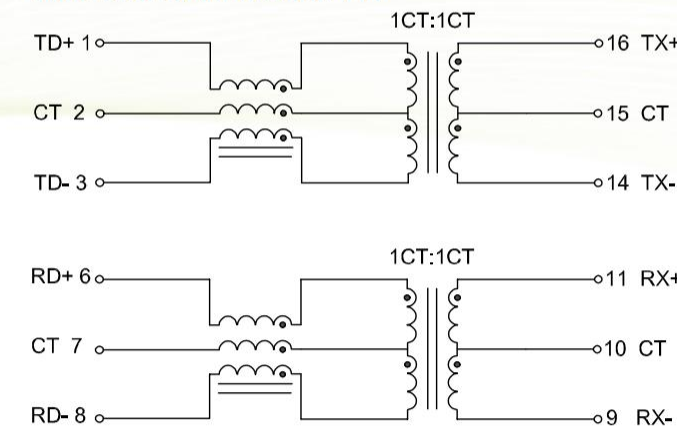
#### WHS16037 G/WHS16037T G



#### WHS16002 G



#### WHS160B1 G/WHS160BIPT G







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## NETWORK PRODUCT

LAN TRANSFORMER WHS161XX G-Series

10/100 Base-TX Single Port Magnetic Modules SMD

### Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements

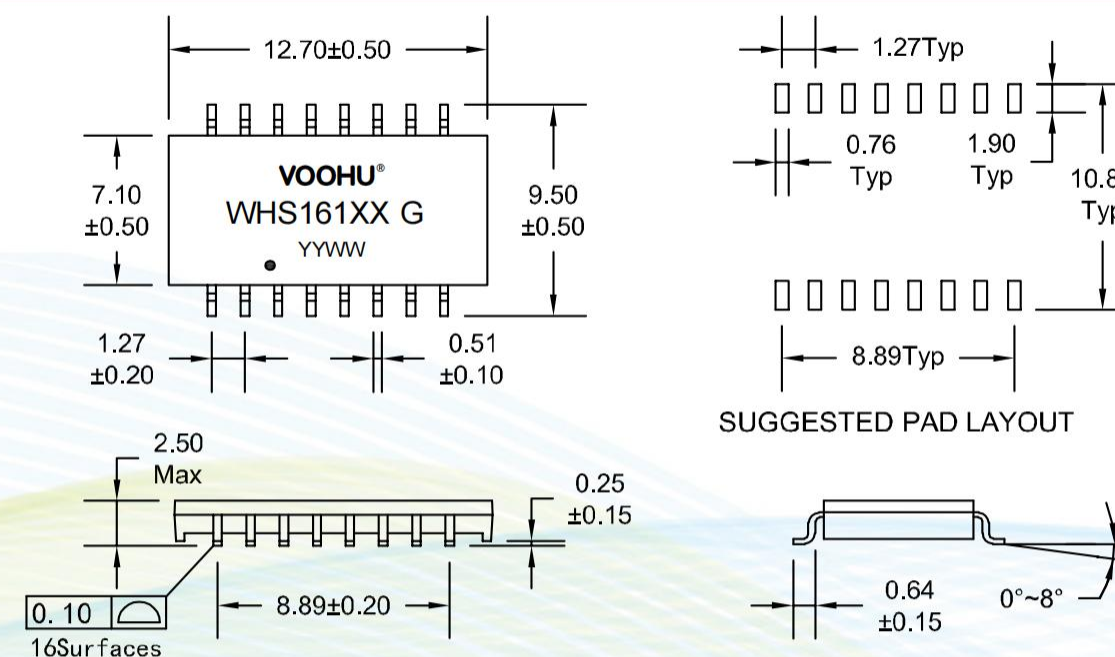
### Electrical Performance Summary

Designed For Ethernet 10/100 Base-TX, Full Single Port Applications  
Compliant With IEEE 802.3 Standard For 10/100 Base-TX

#### Electrical Specifications @ 25°C

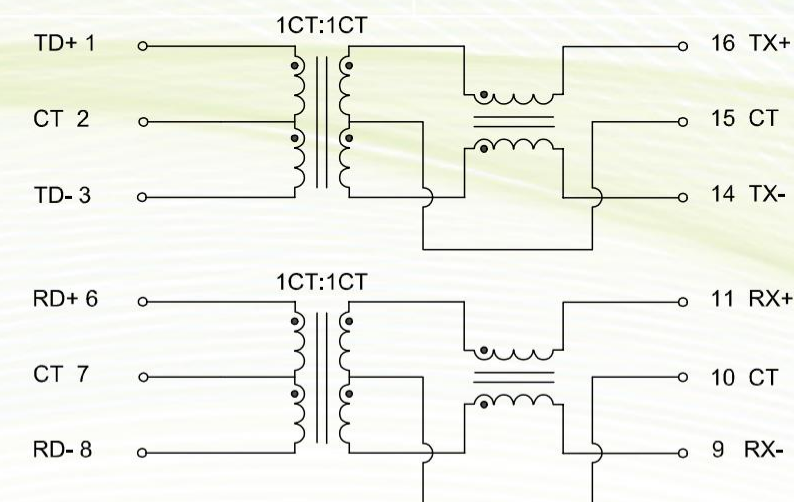
| Part Number | OCL (μH)     | Insertion Loss (dB) | Return Loss (dB) |        |        |           | Cross Talk (dB) | CMRR (dB) | Isolation Hipot (V) | PoE Rating | Operating Temperature (°C) |
|-------------|--------------|---------------------|------------------|--------|--------|-----------|-----------------|-----------|---------------------|------------|----------------------------|
|             | Min          | Max                 | Min              |        |        |           | Min             | Min       | Min                 |            |                            |
|             | 100kHz, 0.1V | 1-100MHz            | 1-30 MHz         | 40 MHz | 50 MHz | 60-80 MHz | 1-100 MHz       | 1-100 MHz | 1mA, 60s            |            |                            |
| WHS16116 G  | 350          | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |

### Mechanical



### Schematics

#### WHS16116 G







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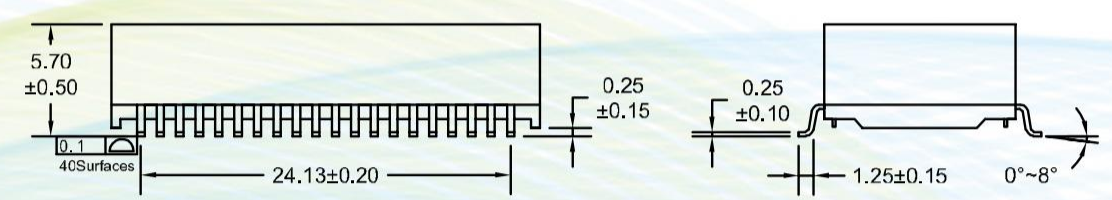
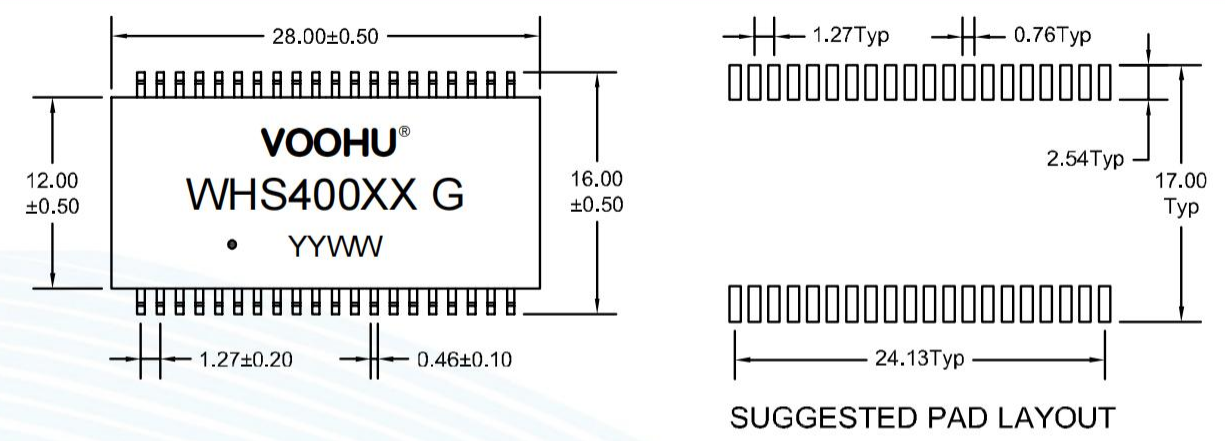


# **NETWORK PRODUCT** **LAN TRANSFORMER WHS400XX G-Series** **10/100 Base-TX Quad Ports Magnetic Modules SMD**

**Features And Benefits**  
 Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements  
**Electrical Performance Summary**  
 Designed For Ethernet 10/100 Base-TX, Full Quad Ports Applications  
 Compliant With IEEE 802.3 Standard For 10/100 Base-TX

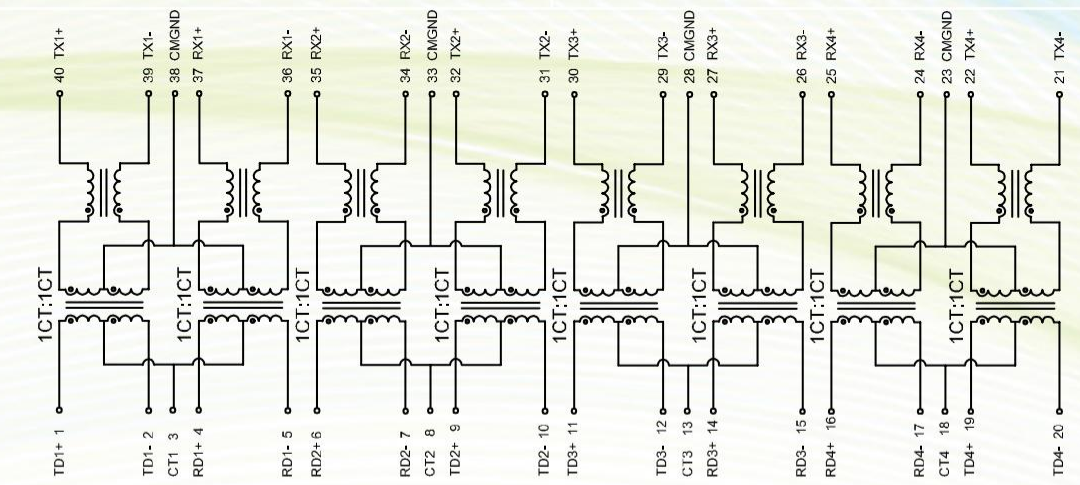
| Electrical Specifications @ 25°C |                            |                     |                  |        |        |           |                 |           |                     |            |                            |
|----------------------------------|----------------------------|---------------------|------------------|--------|--------|-----------|-----------------|-----------|---------------------|------------|----------------------------|
| Part Number                      | OCL (μH)                   | Insertion Loss (dB) | Return Loss (dB) |        |        |           | Cross Talk (dB) | CMRR (dB) | Isolation Hipot (V) | PoE Rating | Operating Temperature (°C) |
|                                  | Min                        | Max                 | Min              |        |        |           | Min             | Min       | Min                 |            |                            |
|                                  | 100kHz,0.1V<br>8mA DC BIAS | 1-100MHz            | 1-30 MHz         | 40 MHz | 50 MHz | 60-80 MHz | 1-100 MHz       | 1-100 MHz | 1mA,60s             |            |                            |
| WHS40005 G                       | 350                        | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |
| WHS40005T G                      | 350                        | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | -40 to 85                  |
| WHS40007 G                       | 350                        | -1.1                | -18              | -14.4  | -13.1  | -12       | -30             | -30       | 1500                | NON-PoE    | 0 to 70                    |

## **Mechanical**

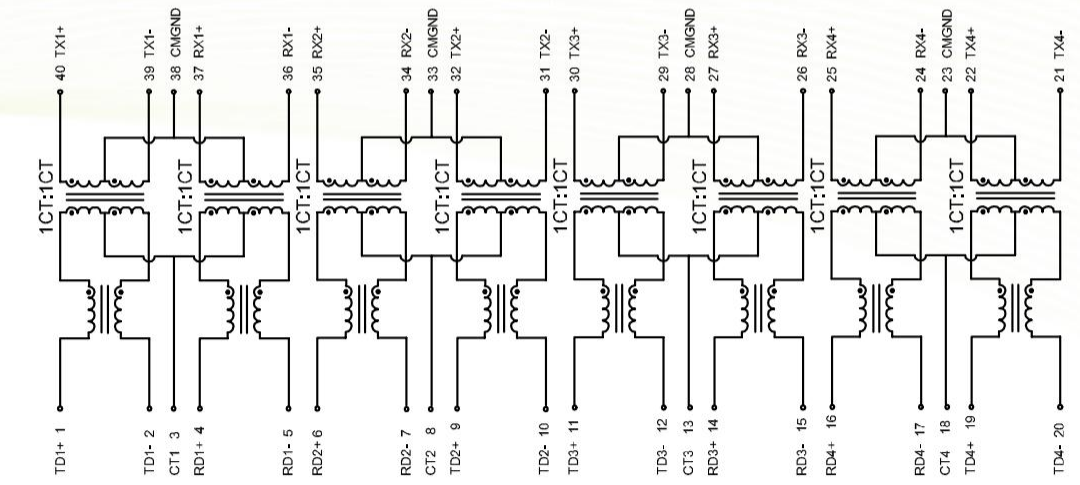


## **Schematics**

**WHS40005 G/WHS40005T G**



**WHS40007 G**







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## NETWORK PRODUCT

LAN TRANSFORMER WHSG24FXX G-Series

100/1000 Base-T Single Port Magnetic Modules SMD

### Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS

Requirements

### Electrical Performance Summary

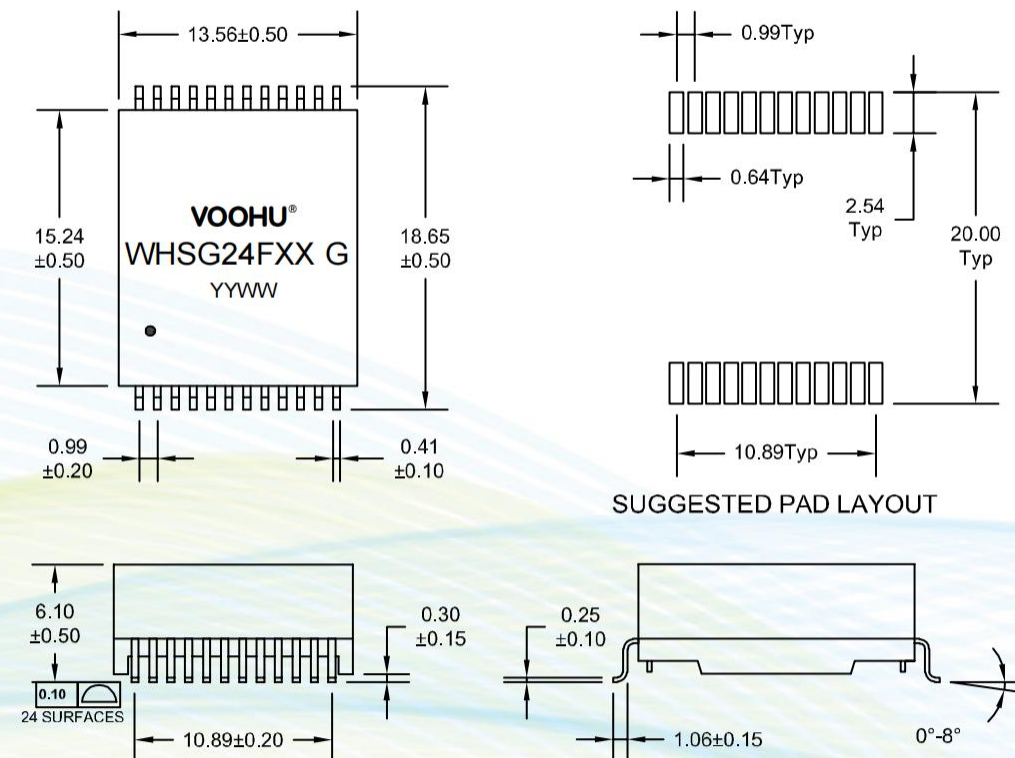
Designed For Ethernet 100/1000 Base-T, Full Single Port Applications

Compliant With IEEE 802.3 Standard For 100/1000 Base-T

#### Electrical Specifications @ 25°C

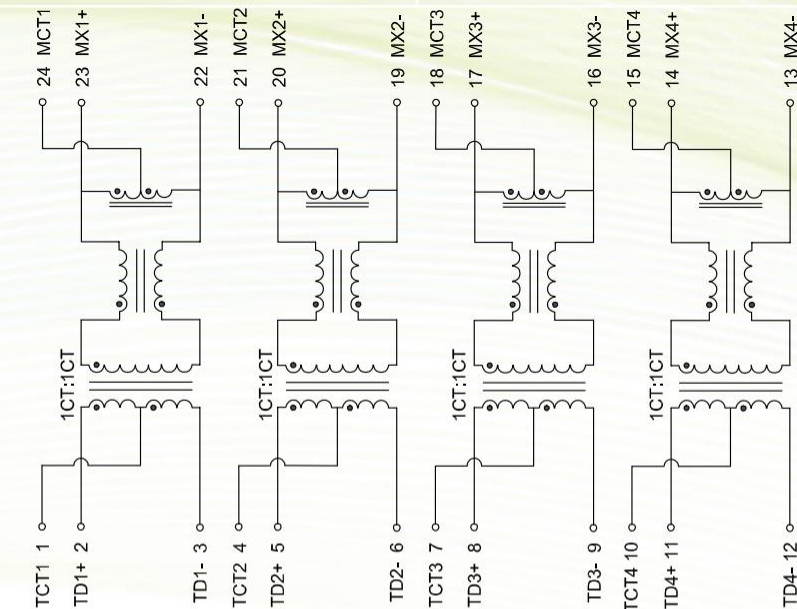
| Part Number   | OCL<br>(μH)                 | Insertion Loss<br>(dB) |                  | Return Loss<br>(dB) |                  | Cross Talk<br>(dB) | CMRR<br>(dB) | Isolation<br>Hipot<br>(V) | PoE<br>Rating | Operating<br>Temperature<br>(°C) |
|---------------|-----------------------------|------------------------|------------------|---------------------|------------------|--------------------|--------------|---------------------------|---------------|----------------------------------|
|               | Min                         | Max                    |                  | Min                 |                  | Min                | Min          | Min                       |               |                                  |
|               | 100kHz, 0.1V<br>8mA DC BIAS | 0.5-1<br>MHz           | 1-125<br>MHz     | 1-40<br>MHz         | 40-100<br>MHz    | 1-100<br>MHz       | 1-100<br>MHz | 1mA, 60s                  |               |                                  |
| WHSG24F01AT G | 350                         | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                | -30          | 1500                      | PoE 15W       | -40 to 85                        |

### Mechanical



### Schematics

#### WHSG24F01AT G







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## NETWORK PRODUCT

LAN TRANSFORMER WHSG24WXX G-Series

100/1000 Base-T Single Port Magnetic Modules SMD

### Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements

### Electrical Performance Summary

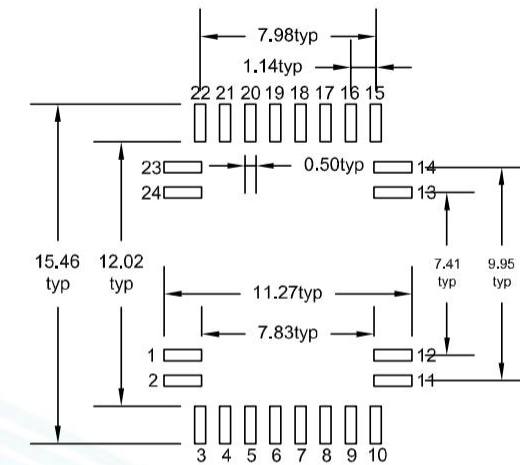
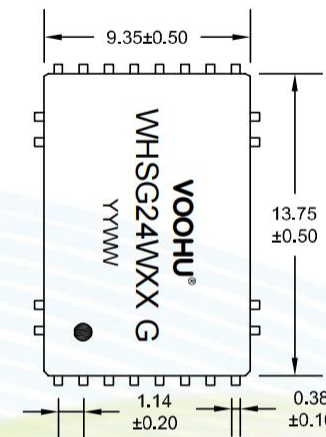
Designed For Ethernet 100/1000 Base-T, Full Single Port Applications

Compliant With IEEE 802.3 Standard For 100/1000 Base-T

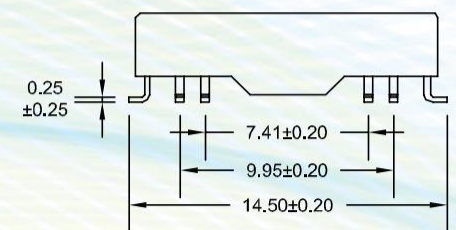
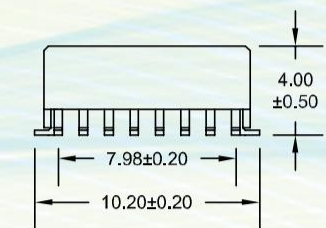
#### Electrical Specifications @ 25°C

| Part Number  | OCL<br>(μH)                | Insertion Loss<br>(dB) |                  | Return Loss<br>(dB) |                  | Cross<br>Talk<br>(dB) | CMRR<br>(dB) | Isolation<br>Hipot<br>(V) | PoE<br>Rating | Operating<br>Temperature<br>(°C) |
|--------------|----------------------------|------------------------|------------------|---------------------|------------------|-----------------------|--------------|---------------------------|---------------|----------------------------------|
|              | Min                        | Max                    |                  | Min                 |                  | Min                   | Min          | Min                       |               |                                  |
|              | 100kHz,0.1V<br>8mA DC BIAS | 0.5-1<br>MHz           | 1-125<br>MHz     | 1-40<br>MHz         | 40-100<br>MHz    | 1-100<br>MHz          | 1-100<br>MHz | 1mA,60s                   |               |                                  |
| WHSG24WDIT G | 350                        | -1.2                   | -0.2-0.002*f*1.4 | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | NON-PoE       | -40 to 85                        |
| WHSG24WD2T G | 350                        | -1.2                   | -0.2-0.002*f*1.4 | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | NON-PoE       | -40 to 85                        |

### Mechanical

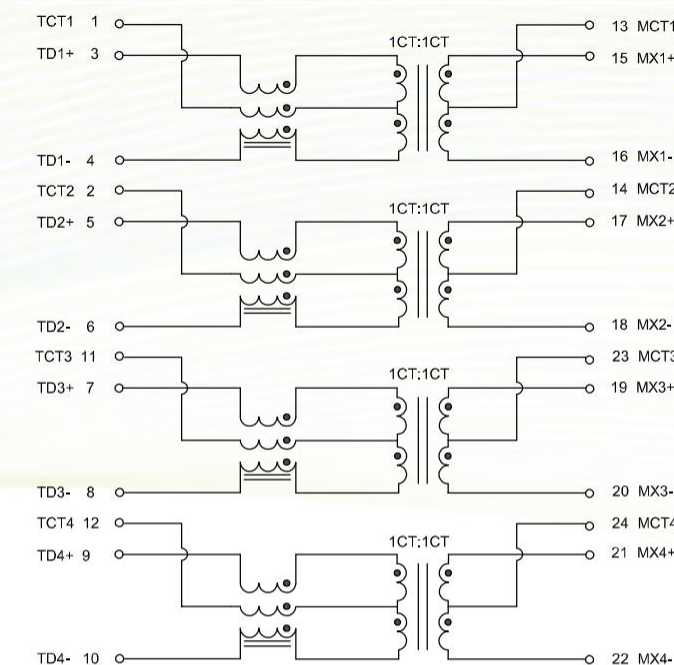


#### Suggested Pad Layout

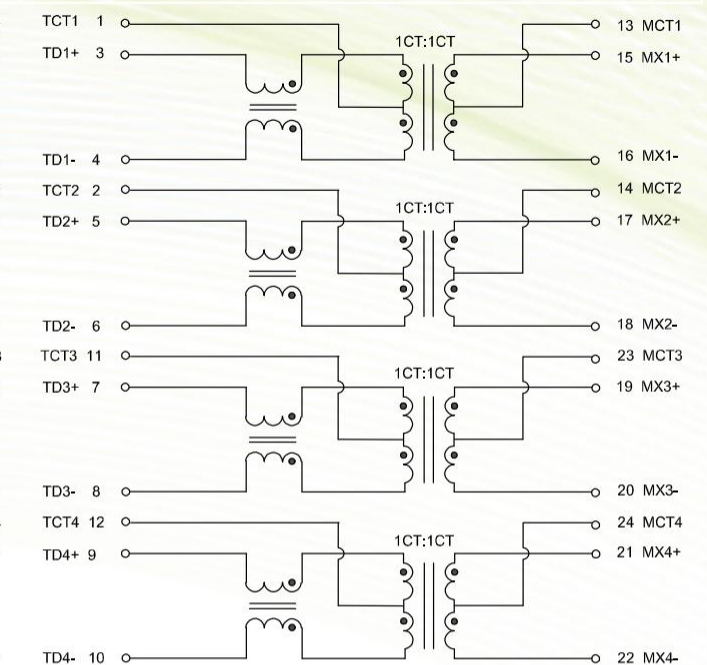


### Schematics

#### WHSG24WDIT G



#### WHSG24WD2T G







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# **NETWORK PRODUCT** **LAN TRANSFORMER WHSG24ZXX G-Series** **100/1000 Base-T Single Port Magnetic Modules SMD**

## **Features And Benefits**

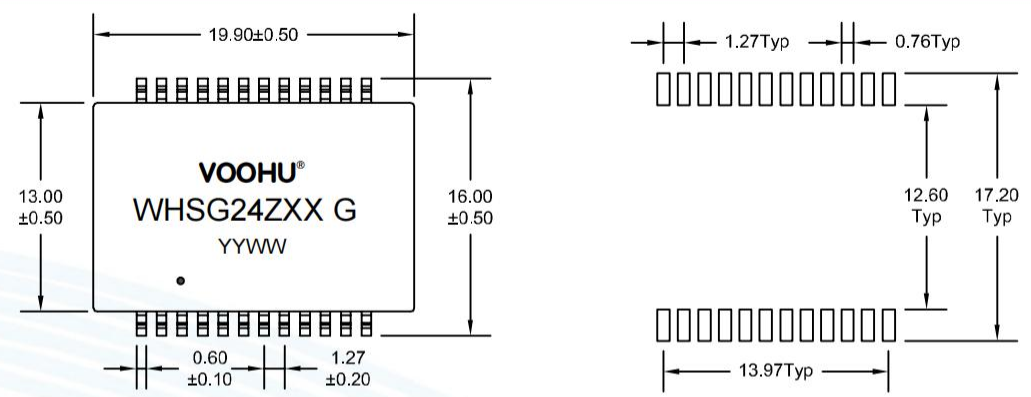
Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements

## **Electrical Performance Summary**

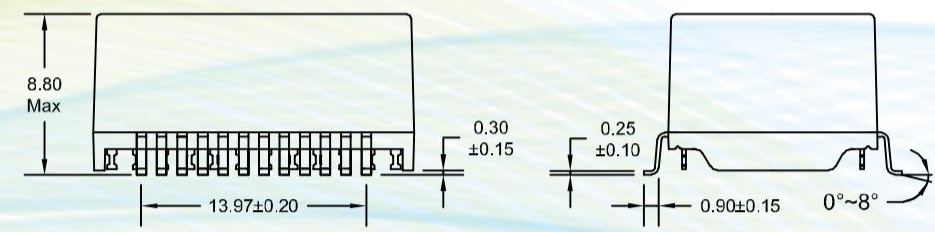
Designed For Ethernet 100/1000 Base-T, Full Single Port Applications  
 Compliant With IEEE 802.3 Standard For 100/1000 Base-T

| Electrical Specifications @ 25°C |                   |                     |                  |                  |                  |                 |           |                     |            |                            |
|----------------------------------|-------------------|---------------------|------------------|------------------|------------------|-----------------|-----------|---------------------|------------|----------------------------|
| Part Number                      | OCL (μH)          | Insertion Loss (dB) |                  | Return Loss (dB) |                  | Cross Talk (dB) | CMRR (dB) | Isolation Hipot (V) | PoE Rating | Operating Temperature (°C) |
|                                  | Min               | Max                 |                  | Min              |                  | Min             | Min       | Min                 |            |                            |
|                                  | 100kHz, 0.1V      | 0.5-1 MHz           | 1-125 MHz        | 1-40 MHz         | 40-100 MHz       | 1-100 MHz       | 1-100 MHz | 1mA, 60s            |            |                            |
| WHSG24ZDIPT G                    | 180(35mA DC BIAS) | -1.2                | -0.2-0.002*f^1.4 | -16              | -10+20*log(f/80) | -30             | -30       | 1500                | 4PPoE 200W | -40 to 85                  |

## **Mechanical**

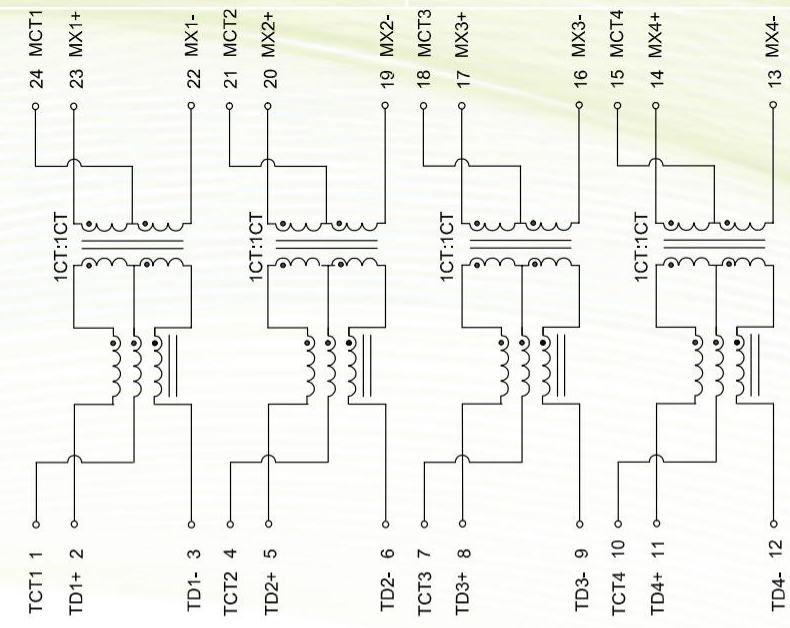


Suggested PAD Layout



## **Schematics**

### **WHSG24ZDIPT G**







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# NETWORK PRODUCT

LAN TRANSFORMER WHSG240XX G-Series  
100/1000 Base-T Single Port Magnetic Modules SMD

## Features And Benefits

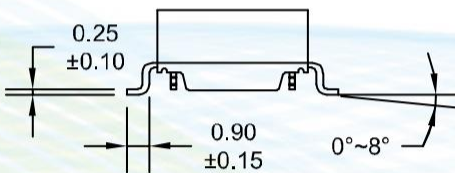
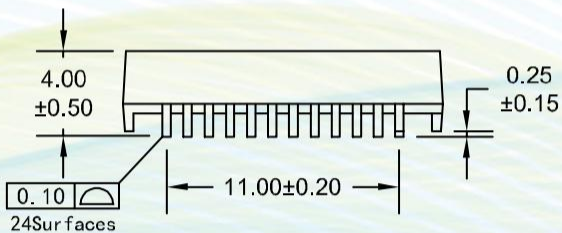
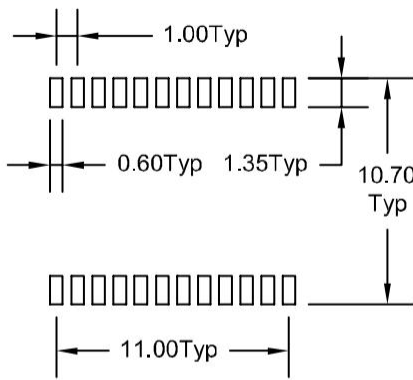
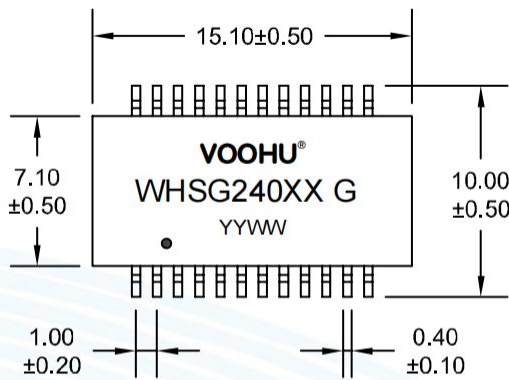
Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements

## Electrical Performance Summary

Designed For Ethernet 100/1000 Base-T, Full Single Port Applications  
Compliant With IEEE 802.3 Standard For 100/1000 Base-T

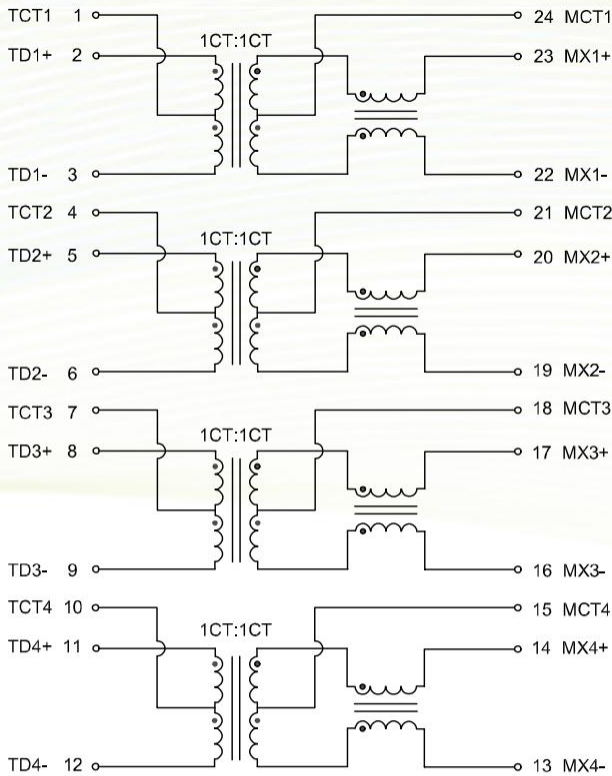
| Electrical Specifications @ 25°C |                            |                     |                  |                  |                  |                 |              |                     |                            |
|----------------------------------|----------------------------|---------------------|------------------|------------------|------------------|-----------------|--------------|---------------------|----------------------------|
| Part Number                      | OCL (μH)                   | Insertion Loss (dB) |                  | Return Loss (dB) |                  | Cross talk (dB) | CMRR (dB)    | Isolation Hipot (V) | Operating Temperature (°C) |
|                                  | Min                        | Max                 |                  | Min              |                  | Min             | Min          | Min                 |                            |
|                                  | 100kHz,0.1V<br>8mA DC BIAS | 0.5-1<br>MHz        | 1-125<br>MHz     | 1-40<br>MHz      | 40-100<br>MHz    | 1-100<br>MHz    | 1-100<br>MHz | 1mA,60s             |                            |
| WHSG24002 G                      | 350                        | -1.2                | -0.2-0.002*f^1.4 | -16              | -10+20*log(f/80) | -30             | -30          | 1500                | NON-PoE 0 to 70            |
| WHSG24002T G                     | 350                        | -1.2                | -0.2-0.002*f^1.4 | -16              | -10+20*log(f/80) | -30             | -30          | 1500                | NON-PoE -40 to 85          |
| WHSG24015 G                      | 350                        | -1.2                | -0.2-0.002*f^1.4 | -16              | -10+20*log(f/80) | -30             | -30          | 1500                | PoE 15W 0 to 70            |

## Mechanical

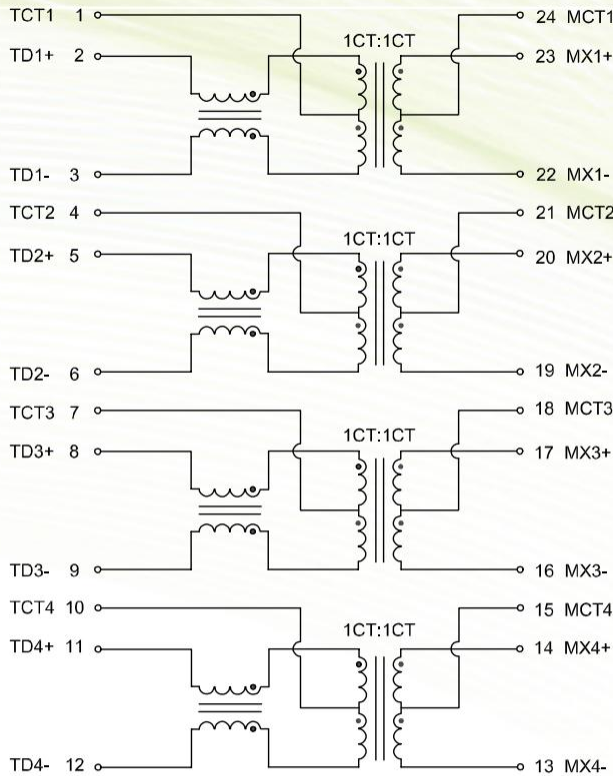


## Schematics

### WHSG24002 G/WHSG24002T G



### WHSG24015 G







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## NETWORK PRODUCT

LAN TRANSFORMER WHSG243XX G-Series

100/1000 Base-T Single Port Magnetic Modules SMD

### Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements

### Electrical Performance Summary

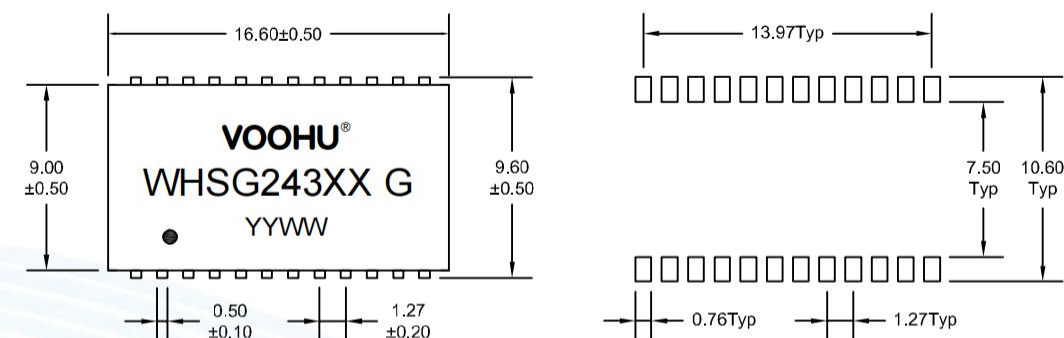
Designed For Ethernet 100/1000 Base-T, Full Single Port Applications

Compliant With IEEE 802.3 Standard For 100/1000 Base-T

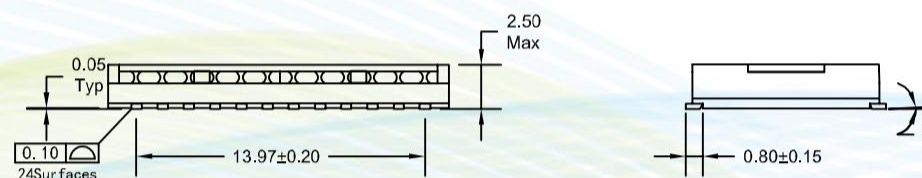
#### Electrical Specifications @ 25°C

| Part Number | DCL<br>(μH)  | Insertion Loss<br>(dB) |                  | Return Loss<br>(dB) |                  | Cross talk<br>(dB) | CMRR<br>(dB) | Isolation<br>Hipot<br>(V) | PoE<br>Rating | Operating<br>Temperature<br>(°C) |
|-------------|--------------|------------------------|------------------|---------------------|------------------|--------------------|--------------|---------------------------|---------------|----------------------------------|
|             | Min          | Max                    |                  | Min                 |                  | Min                | Min          | Min                       |               |                                  |
|             | 100kHz, 0.1V | 0.5-1<br>MHz           | 1-125<br>MHz     | 1-40<br>MHz         | 40-100<br>MHz    | 1-100<br>MHz       | 1-100<br>MHz | 1mA, 60s                  |               |                                  |
| WHSG24301 G | 350          | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                | -30          | 1500                      | NON-PoE       | 0 to 70                          |
| WHSG24303 G | 350          | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                | -30          | 1500                      | NON-PoE       | 0 to 70                          |

### Mechanical

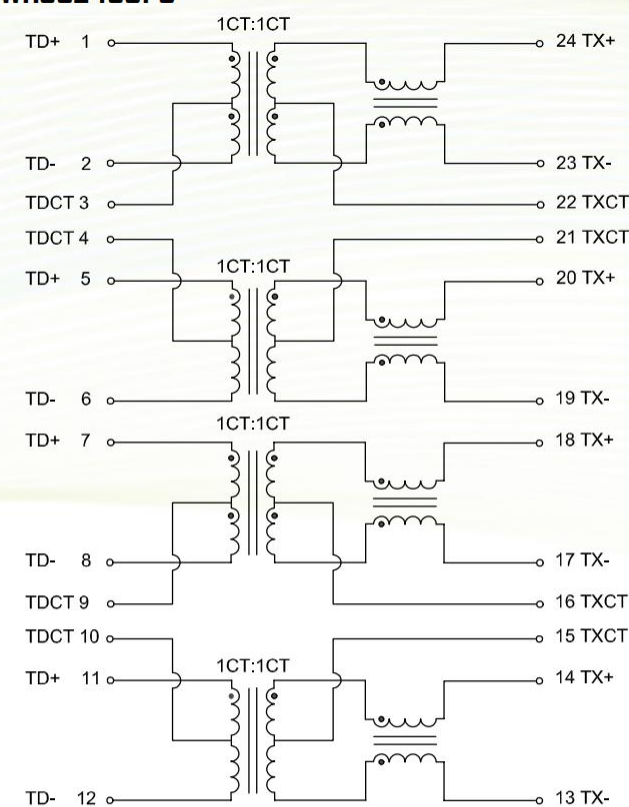


#### SUGGESTED PAD LAYOUT

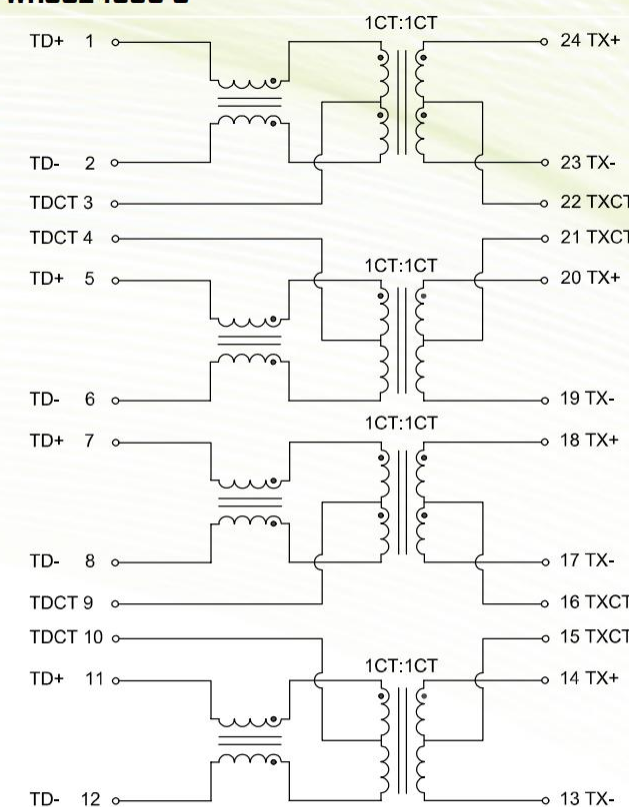


### Schematics

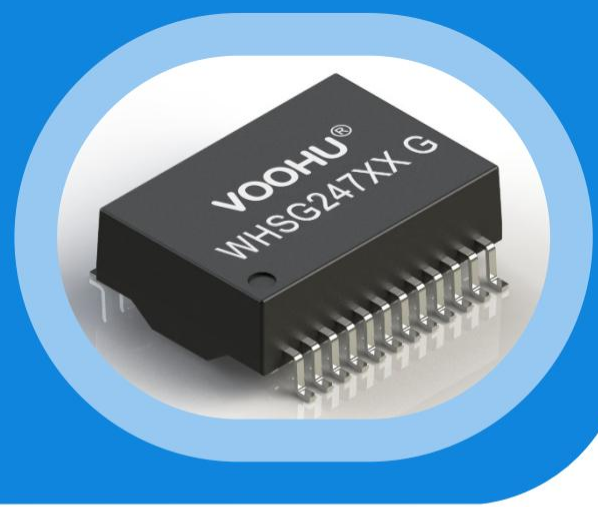
#### WHSG24301 G



#### WHSG24303 G







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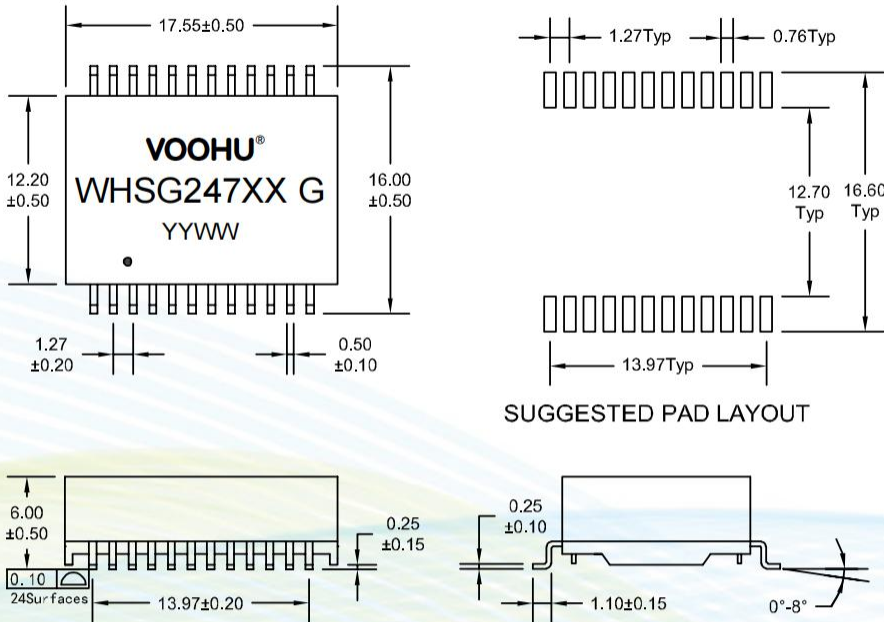


**NETWORK PRODUCT**  
**LAN TRANSFORMER WHSG247XX G-Series**  
**100/1000 Base-T Single Port Magnetic Modules SMD**

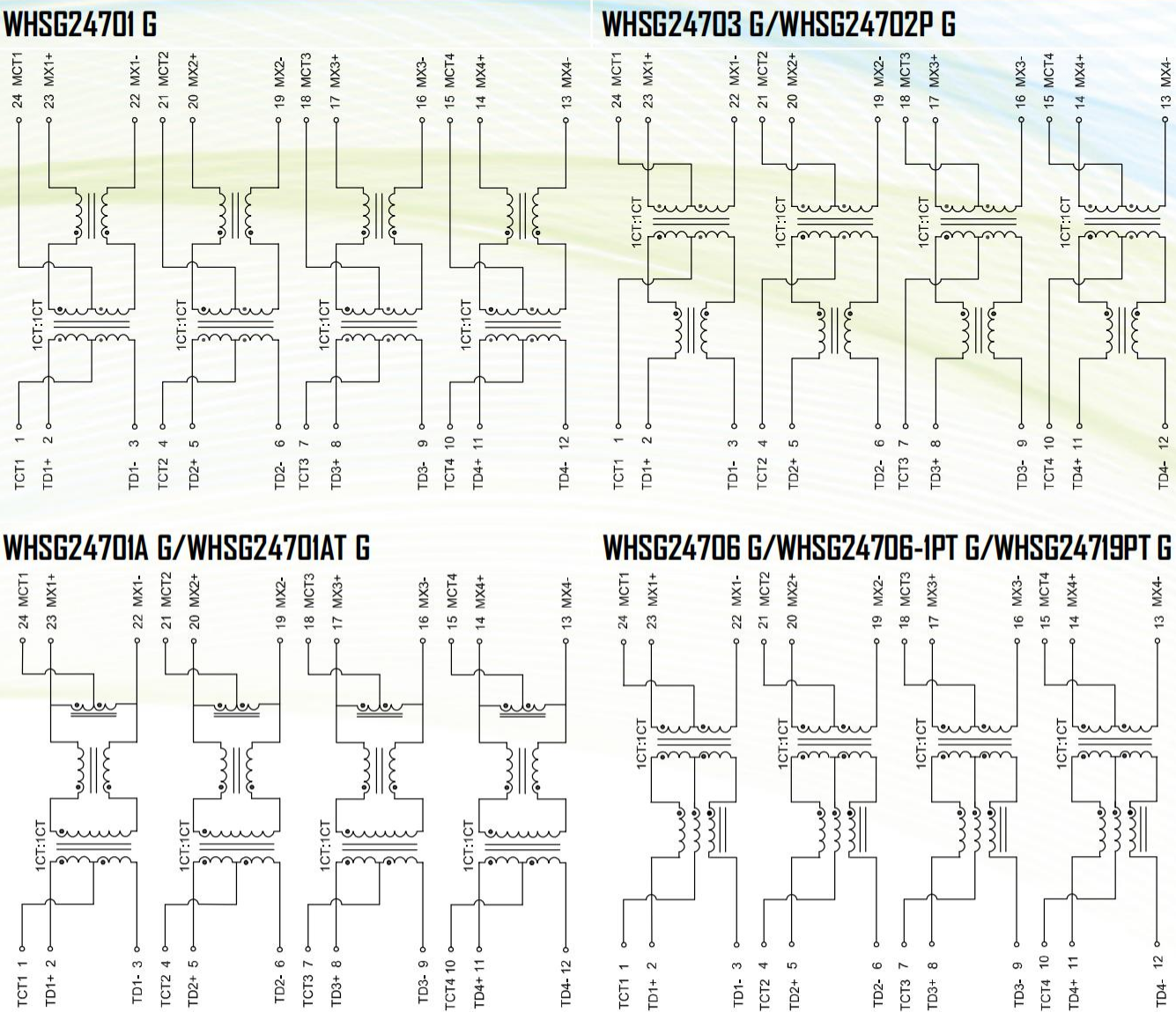
**Features And Benefits**  
Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements  
**Electrical Performance Summary**  
Designed For Ethernet 100/1000 Base-T, Full Single Port Applications  
Compliant With IEEE 802.3 Standard For 100/1000 Base-T

| Electrical Specifications @ 25°C |                   |                     |                  |                  |                  |                 |           |                     |                            |
|----------------------------------|-------------------|---------------------|------------------|------------------|------------------|-----------------|-----------|---------------------|----------------------------|
| Part Number                      | OCL (μH)          | Insertion Loss (dB) |                  | Return Loss (dB) |                  | Cross Talk (dB) | CMRR (dB) | Isolation Hipot (V) | Operating Temperature (°C) |
|                                  | Min               | Max                 |                  | Min              |                  | Min             | Min       | Min                 |                            |
|                                  | 100kHz,0.1V       | 0.5-1 MHz           | 1-125 MHz        | 1-40 MHz         | 40-100 MHz       | 1-100 MHz       | 1-100 MHz | 1mA,60s             |                            |
| WHSG24701 G                      | 350(8mA DC BIAS)  | -1.2                | -0.2-0.002*f^1.4 | -16              | -10+20*log(f/80) | -30             | -30       | 1500                | NON-PoE 0 to 70            |
| WHSG24703 G                      | 350(8mA DC BIAS)  | -1.2                | -0.2-0.002*f^1.4 | -16              | -10+20*log(f/80) | -30             | -30       | 1500                | PoE 15W 0 to 70            |
| WHSG24702P G                     | 350(14mA DC BIAS) | -1.2                | -0.2-0.002*f^1.4 | -16              | -10+20*log(f/80) | -30             | -30       | 1500                | 4PPoE 90W -40 to 85        |
| WHSG24701A G                     | 350(8mA DC BIAS)  | -1.2                | -0.2-0.002*f^1.4 | -16              | -10+20*log(f/80) | -30             | -30       | 1500                | PoE 15W 0 to 70            |
| WHSG24701AT G                    | 350(8mA DC BIAS)  | -1.2                | -0.2-0.002*f^1.4 | -16              | -10+20*log(f/80) | -30             | -30       | 1500                | PoE 15W -40 to 85          |
| WHSG24706 G                      | 350(8mA DC BIAS)  | -1.2                | -0.2-0.002*f^1.4 | -16              | -10+20*log(f/80) | -30             | -30       | 1500                | PoE 15W 0 to 70            |
| WHSG24706-IPT G                  | 350(14mA DC BIAS) | -1.2                | -0.2-0.002*f^1.4 | -16              | -10+20*log(f/80) | -30             | -30       | 1500                | 4PPoE 90W -40 to 85        |
| WHSG24719PT G                    | 350(8mA DC BIAS)  | -1.2                | -0.2-0.002*f^1.4 | -16              | -10+20*log(f/80) | -30             | -30       | 1500                | 4PPoE 90W -40 to 85        |

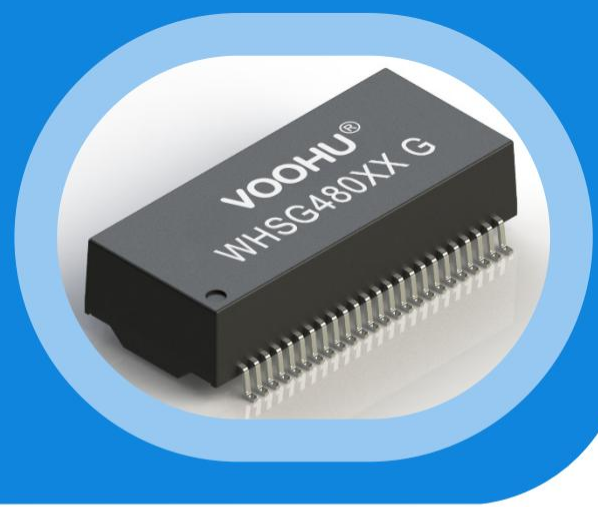
**Mechanical**



**Schematics**







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NETWORK PRODUCT

LAN TRANSFORMER WHSG480XX G-Series  
100/1000 Base-T Dual Ports Magnetic Modules SMD

Features And Benefits

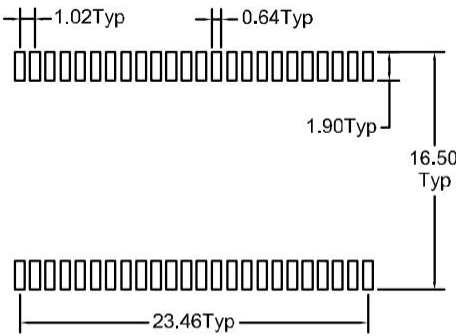
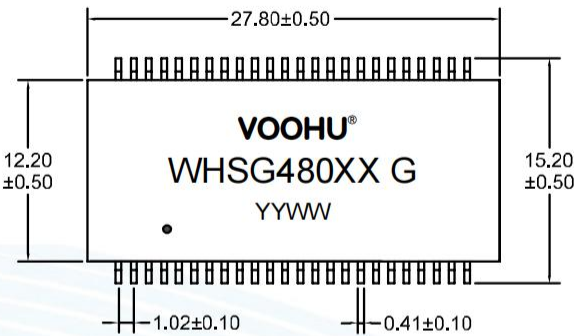
Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements

Electrical Performance Summary

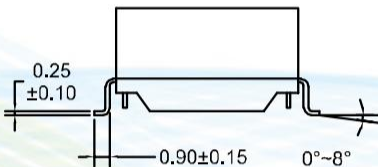
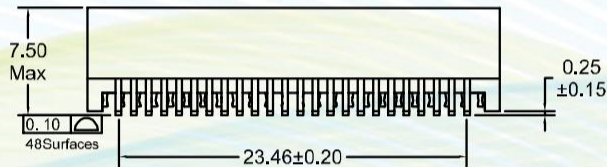
Designed For Ethernet 100/1000 Base-T, Full Dual Ports Applications  
Compliant With IEEE 802.3 Standard For 100/1000 Base-T

| Electrical Specifications @ 25°C |                   |                        |                  |                     |                  |                       |                  |                           |                                  |
|----------------------------------|-------------------|------------------------|------------------|---------------------|------------------|-----------------------|------------------|---------------------------|----------------------------------|
| Part Number                      | OCL<br>(μH)       | Insertion Loss<br>(dB) |                  | Return Loss<br>(dB) |                  | Cross<br>Talk<br>(dB) | CMR<br>R<br>(dB) | Isolation<br>Hipot<br>(V) | Operating<br>Temperature<br>(°C) |
|                                  | Min               | Max                    |                  | Min                 |                  | Min                   | Min              | Min                       |                                  |
|                                  |                   | 100kHz,0.1V            | 0.5-1<br>MHz     | 1-125<br>MHz        | 1-40<br>MHz      | 40-100<br>MHz         | 1-100<br>MHz     | 1-100<br>MHz<br>1mA,60s   |                                  |
| WHSG4800I G                      | 350(8mA DC BIAS)  | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30              | 1500                      | NON-PoE 0 to 70                  |
| WHSG4800IT G                     | 350(8mA DC BIAS)  | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30              | 1500                      | NON-PoE -40 to 85                |
| WHSG48002 G                      | 350(8mA DC BIAS)  | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30              | 1500                      | PoE 15W 0 to 70                  |
| WHSG48002P G                     | 350(14mA DC BIAS) | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30              | 1500                      | 4PPoE 90W -40 to 85              |
| WHSG4800IAT G                    | 350(8mA DC BIAS)  | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30              | 1500                      | PoE 15W -40 to 85                |
| WHSG48008 G                      | 350(8mA DC BIAS)  | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30              | 1500                      | PoE 15W 0 to 70                  |
| WHSG48008-3P G                   | 350(14mA DC BIAS) | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30              | 1500                      | 4PPoE 90W -40 to 85              |

Mechanical

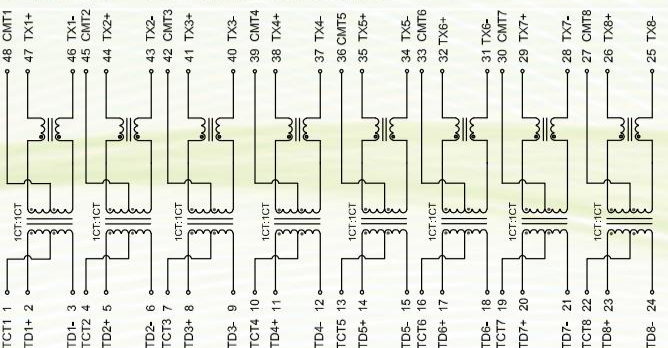


SUGGESTED PAD LAYOUT

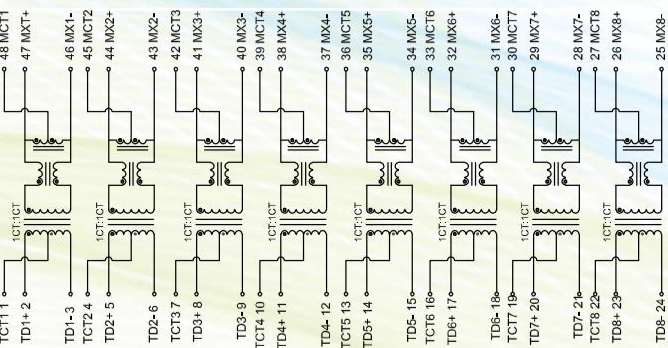


Schematics

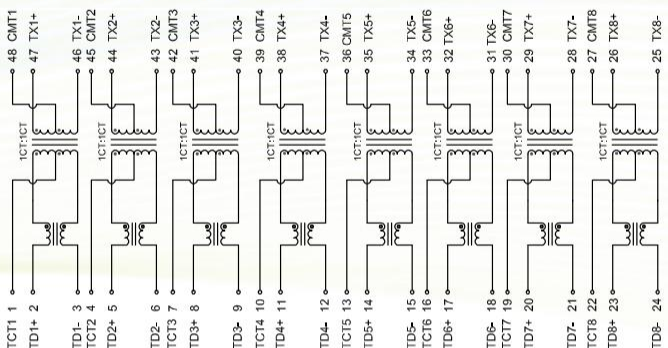
WHSG4800I G/WHSG4800IT G



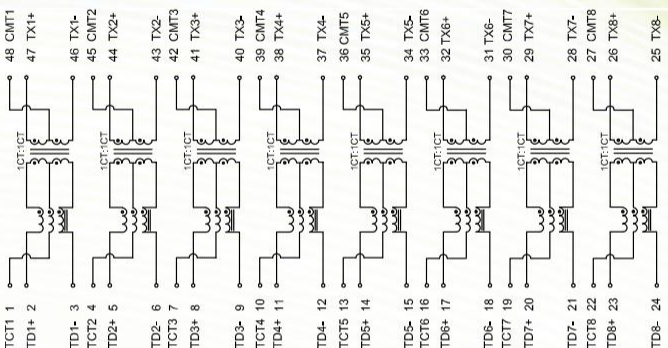
WHSG4800IAT G



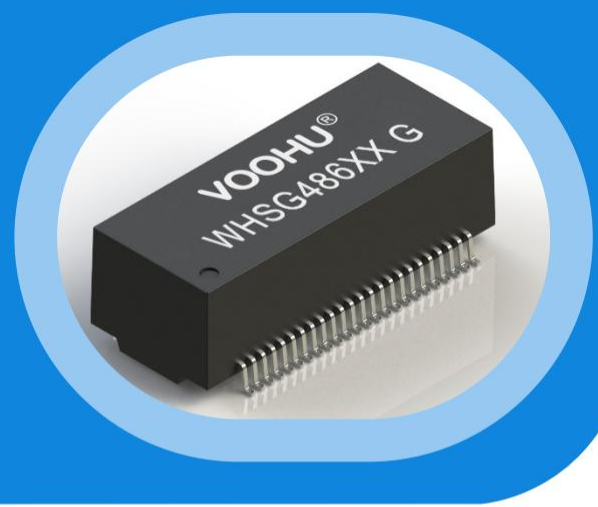
WHSG48002 G/WHSG48002P G



WHSG48008 G/WHSG48008-3P G







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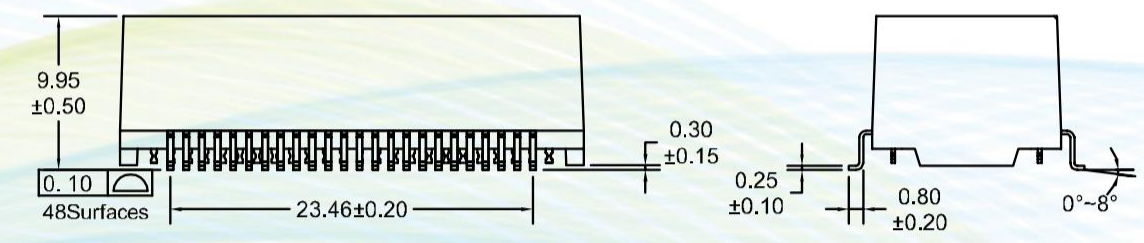
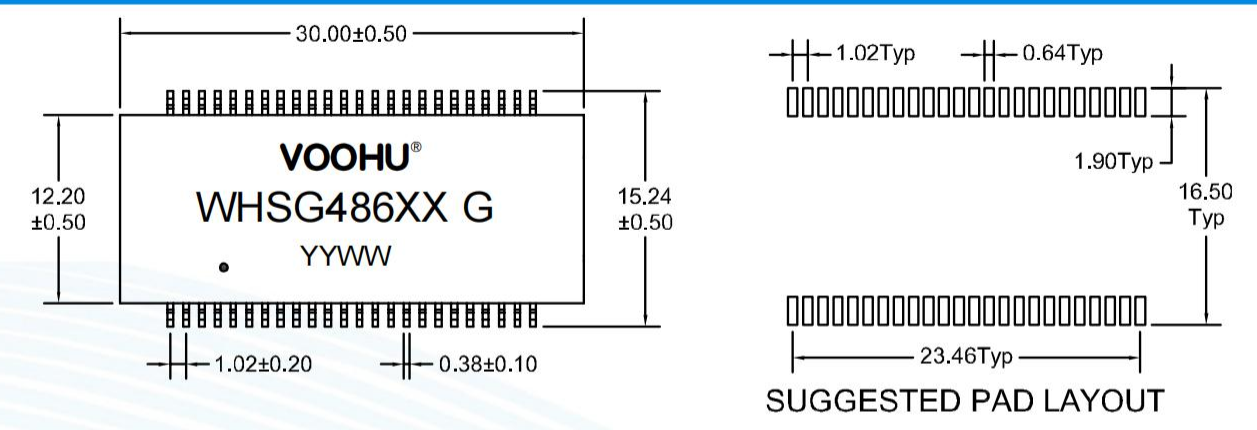


# **NETWORK PRODUCT** **LAN TRANSFORMER WHSG486XX G-Series** **100/1000 Base-T Dual Ports Magnetic Modules SMD**

**Features And Benefits**  
 Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements  
**Electrical Performance Summary**  
 Designed For Ethernet 100/1000 Base-T, Full Dual Ports Applications  
 Compliant With IEEE 802.3 Standard For 100/1000 Base-T

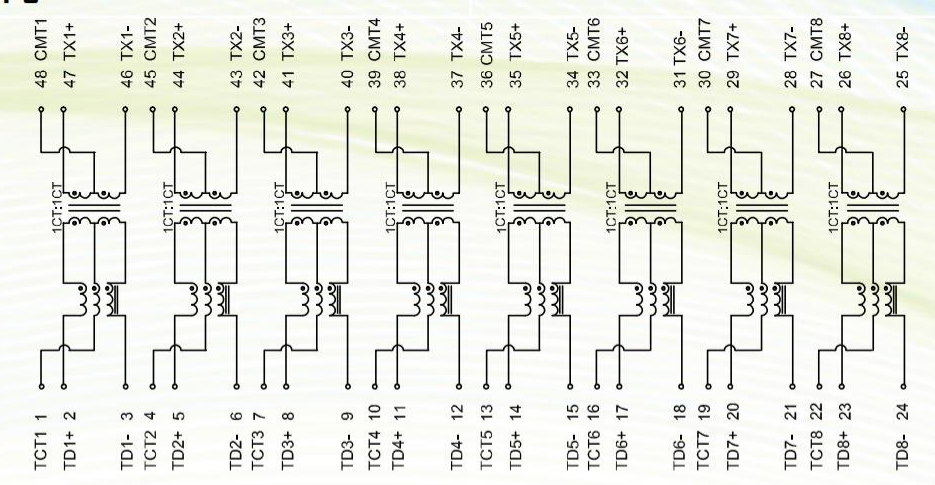
| Electrical Specifications @ 25°C |                   |                     |                  |                  |                  |                 |           |                     |                            |
|----------------------------------|-------------------|---------------------|------------------|------------------|------------------|-----------------|-----------|---------------------|----------------------------|
| Part Number                      | DCL (μH)          | Insertion Loss (dB) |                  | Return Loss (dB) |                  | Cross Talk (dB) | CMRR (dB) | Isolation Hipot (V) | Operating Temperature (°C) |
|                                  | Min               | Max                 |                  | Min              |                  | Min             | Min       | Min                 |                            |
|                                  | 100kHz, 0.1V      | 0.5-1 MHz           | 1-125 MHz        | 1-40 MHz         | 40-100 MHz       | 1-100 MHz       | 1-100 MHz | 1mA, 60s            |                            |
| WHSG48601-2PT G                  | 350(21mA DC BIAS) | -1.2                | -0.2-0.002*f^1.4 | -16              | -10+20*log(f/80) | -30             | -30       | 1500                | 4PPoE 90W -40 to 85        |
| WHSG48603PT G                    | 350(21mA DC BIAS) | -1.2                | -0.2-0.002*f^1.4 | -16              | -10+20*log(f/80) | -30             | -30       | 1500                | 4PPoE 90W -40 to 85        |

## **Mechanical**

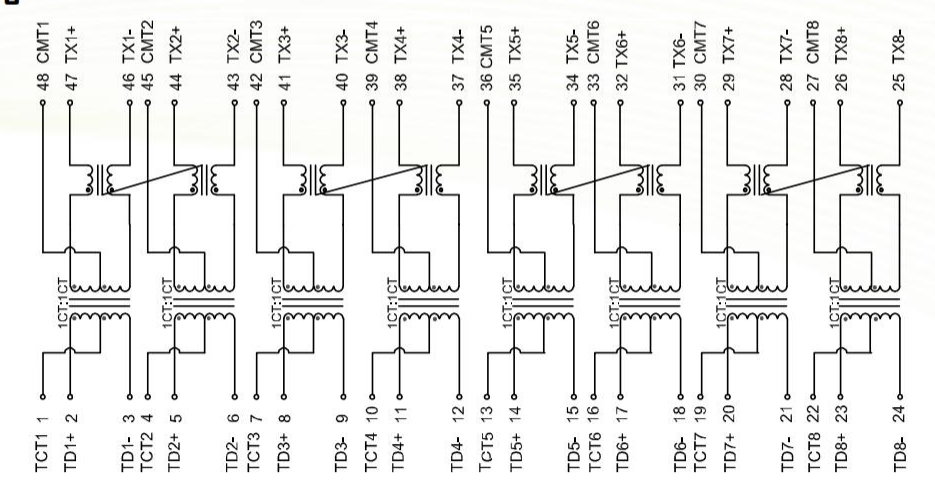


## **Schematics**

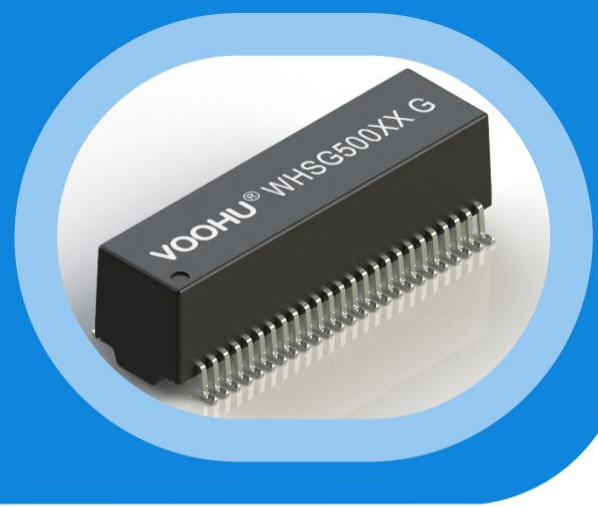
**WHSG48601-2PT G**



**WHSG48603PT G**







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NETWORK PRODUCT  
LAN TRANSFORMER WHSG500XX G-Series  
100/1000 Base-T Dual Ports Magnetic Modules SMD

Features And Benefits

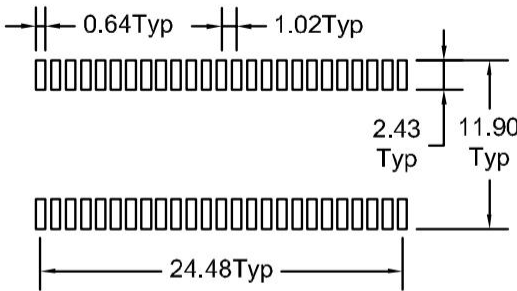
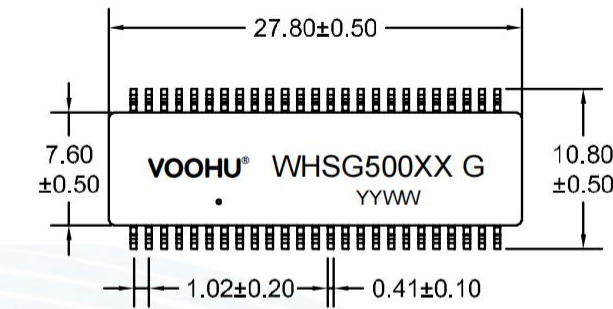
Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements

Electrical Performance Summary

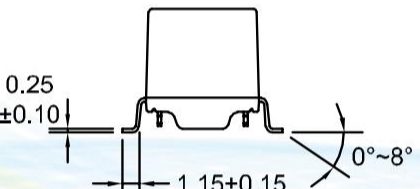
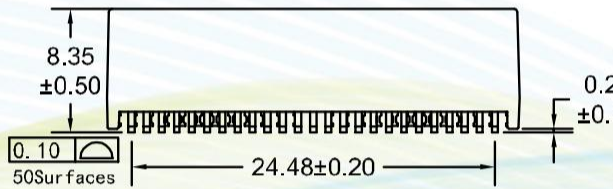
Designed For Ethernet 100/1000 Base-T, Full Dual Ports Applications  
Compliant With IEEE 802.3 Standard For 100/1000 Base-T

| Electrical Specifications @ 25°C |                   |                        |                  |                     |                  |                       |              |                           |               |                                  |
|----------------------------------|-------------------|------------------------|------------------|---------------------|------------------|-----------------------|--------------|---------------------------|---------------|----------------------------------|
| Part Number                      | OCL<br>(μH)       | Insertion Loss<br>(dB) |                  | Return Loss<br>(dB) |                  | Cross<br>Talk<br>(dB) | CMRR<br>(dB) | Isolation<br>Hipot<br>(V) | PoE<br>Rating | Operating<br>Temperature<br>(°C) |
|                                  | Min               | Max                    |                  | Min                 |                  | Min                   | Min          | Min                       |               |                                  |
|                                  | 100kHz,0.1V       | 0.5-1<br>MHz           | 1-125<br>MHz     | 1-40<br>MHz         | 40-100<br>MHz    | 1-100<br>MHz          | 1-100<br>MHz | 1mA,60s                   |               |                                  |
| WHSG50002-I G                    | 350(8mA DC BIAS)  | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | NON-PoE       | 0 to 70                          |
| WHSG50010T G                     | 350(21mA DC BIAS) | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | PoE 15W       | -40 to 85                        |
| WHSG50010P G                     | 350(8mA DC BIAS)  | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | PoE 15W       | 0 to 70                          |
| WHSG50011 G                      | 350(8mA DC BIAS)  | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | PoE 15W       | 0 to 70                          |
| WHSG50011P G                     | 350(14mA DC BIAS) | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20*log(f/80) | -30                   | -30          | 1500                      | 4PPoE 90W     | -40 to 85                        |

Mechanical

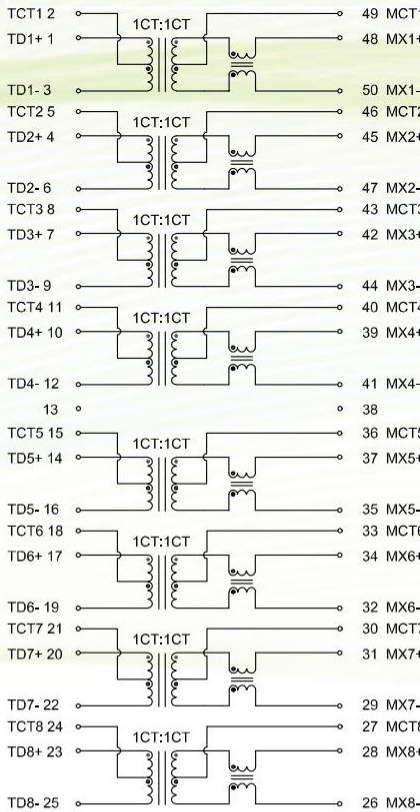


SUGGESTED PAD LAYOUT

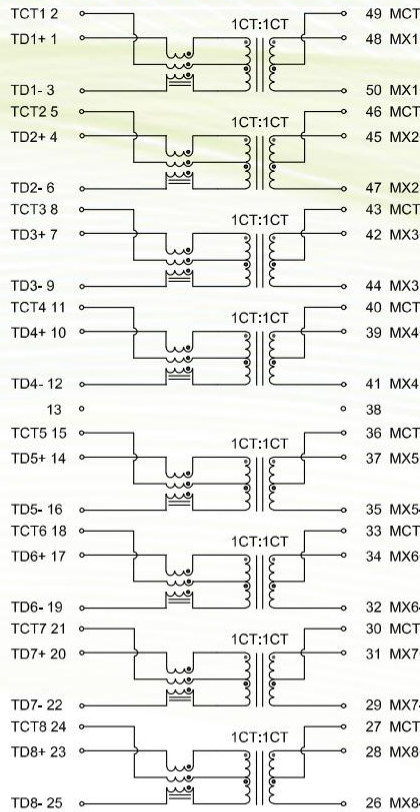


Schematics

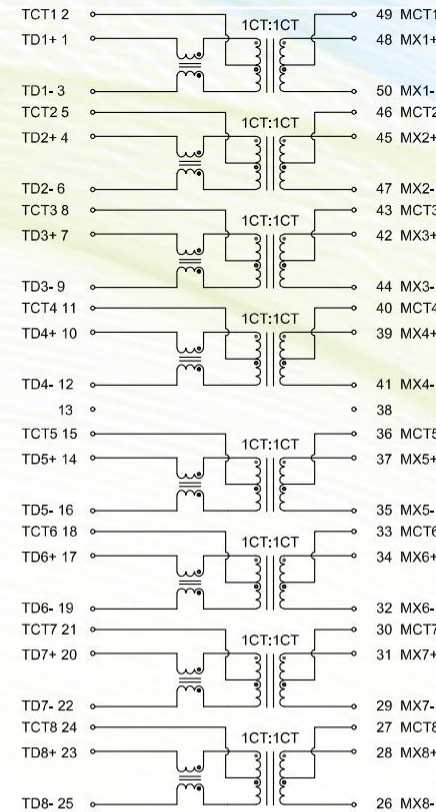
WHSG50002-I G



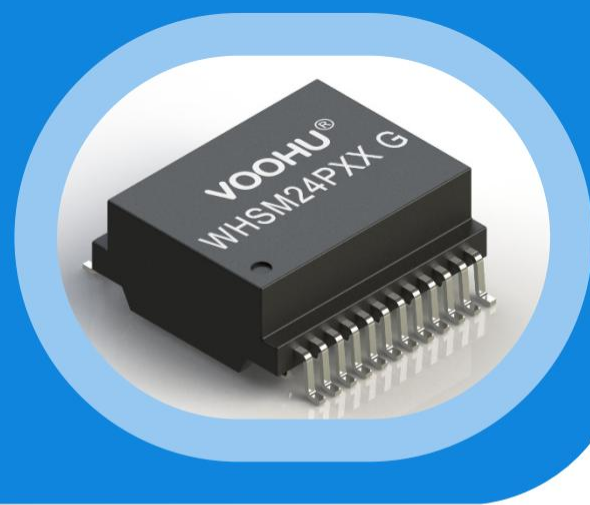
WHSG50010T G/WHSG50010P G



WHSG50011 G/WHSG50011P G







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## NETWORK PRODUCT

LAN TRANSFORMER WHSM24PXX G-Series

10G Base-T Single Port Magnetic Modules SMD

### Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS

Requirements

### Electrical Performance Summary

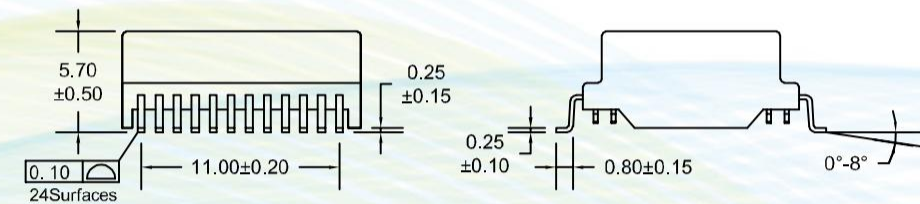
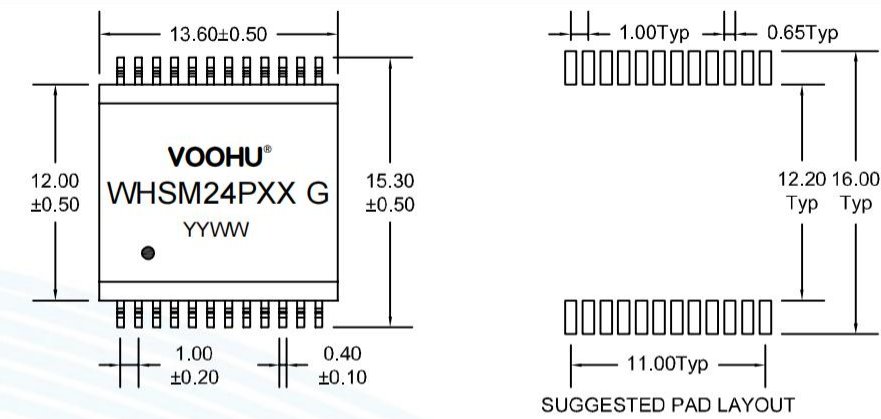
Designed For Ethernet 10G Base-T, Full Single Port Applications

Compliant With IEEE 802.3an Standard For 10G Base-T

#### Electrical Specifications @ 25° C

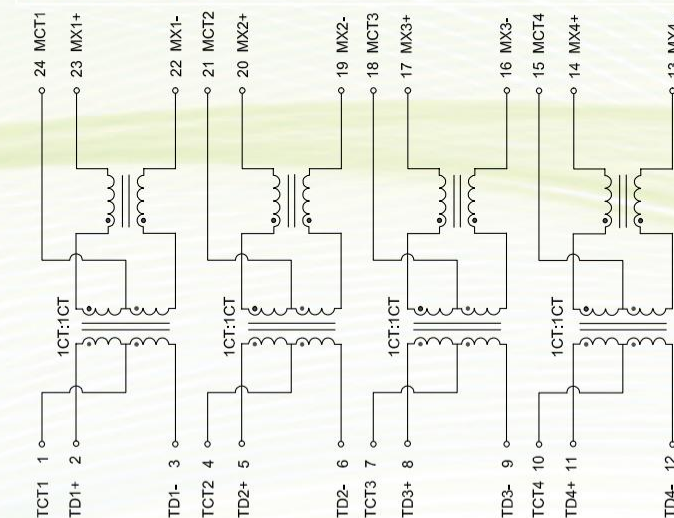
| Part Number    | OCL<br>(μH)       | Insertion Loss<br>(dB) |                | Return Loss<br>(dB) |                  | Cross<br>Talk<br>(dB) | CMRR<br>(dB) | Isolation<br>Hipot<br>(V) | PoE<br>Rating |
|----------------|-------------------|------------------------|----------------|---------------------|------------------|-----------------------|--------------|---------------------------|---------------|
|                | Min               | Max                    |                | Min                 |                  | Typ                   | Typ          | Min                       |               |
|                | 100KHz,0.1V       | 1-400<br>MHz           | 400-500<br>MHz | 1-40<br>MHz         | 40-500<br>MHz    | 1-500<br>MHz          | 1-500<br>MHz | 1mA,60s                   |               |
| WHSM24P01 G    | 120               | -2.0                   | -3.0           | -19                 | -19+10*LOG(f/40) | -25                   | -25          | 1500                      | NON-PoE       |
| WHSM24P02 G    | 120               | -2.0                   | -3.0           | -19                 | -19+10*LOG(f/40) | -25                   | -25          | 1500                      | NON-PoE       |
| WHSM24P02-IP G | 120(14mA DC BIAS) | -2.0                   | -3.0           | -19                 | -19+10*LOG(f/40) | -25                   | -25          | 1500                      | 4PPoE 75W     |
| WHSM24P03P G   | 120(8mA DC BIAS)  | -2.0                   | -3.0           | -19                 | -19+10*LOG(f/40) | -25                   | -25          | 1500                      | PoE 15W       |
| WHSM24P03-2P G | 120(21mA DC BIAS) | -2.0                   | -3.0           | -19                 | -19+10*LOG(f/40) | -25                   | -25          | 1500                      | 4PPoE 120W    |
| WHSM24P05P G   | 120(8mA DC BIAS)  | -2.0                   | -3.0           | -19                 | -19+10*LOG(f/40) | -25                   | -25          | 1500                      | PoE 15W       |

### Mechanical

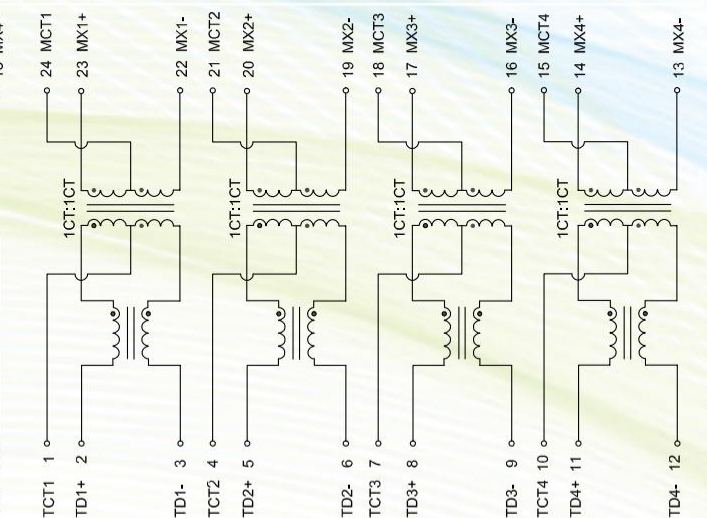


### Schematics

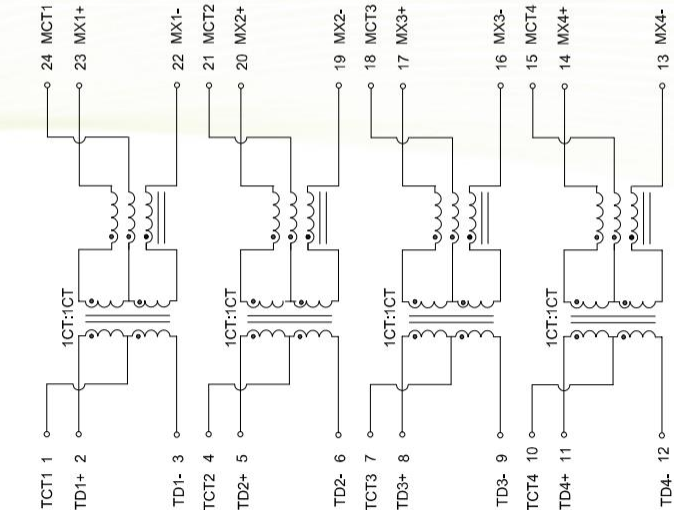
#### WHSM24P01 G



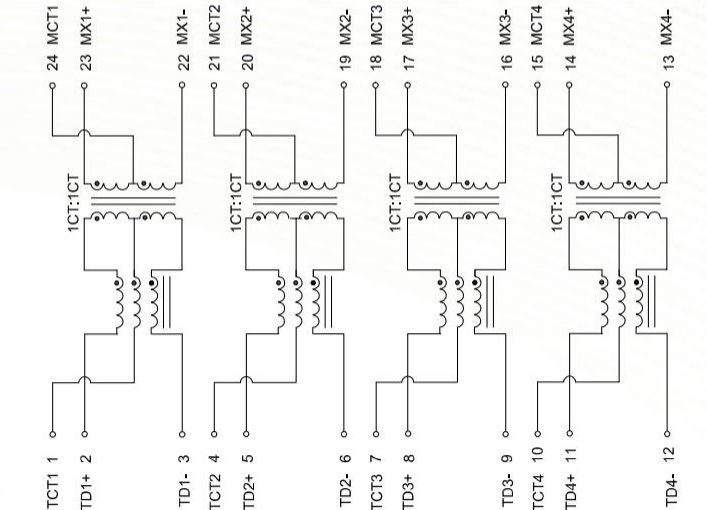
#### WHSM24P05P G



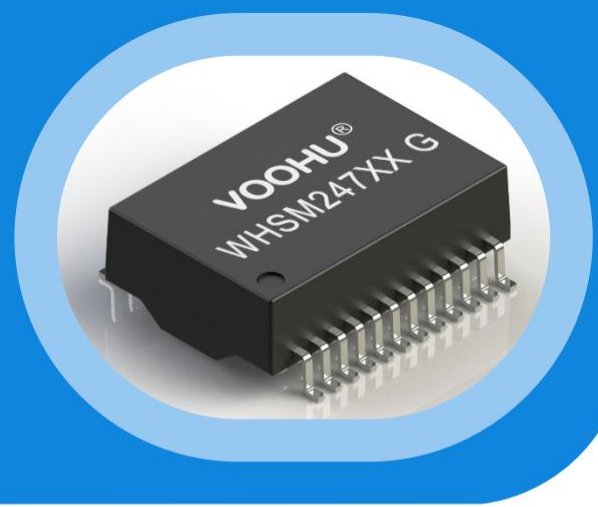
#### WHSM24P02 G/WHSM24P02-IP G



#### WHSM24P03P G/WHSM24P03-2P G







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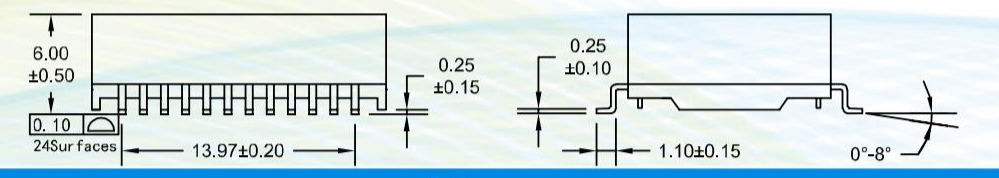
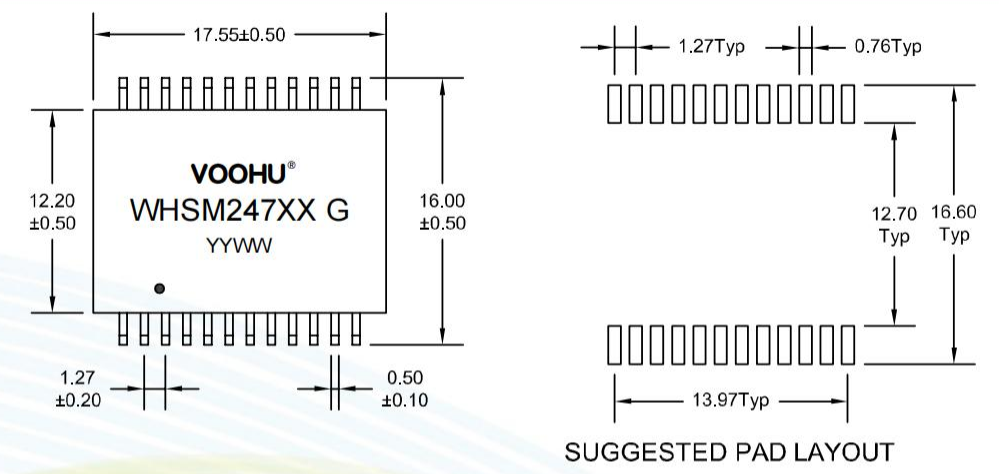


# **NETWORK PRODUCT** **LAN TRANSFORMER WHSM247XX G-Series** **10G Base-T Single Port Magnetic Modules SMD**

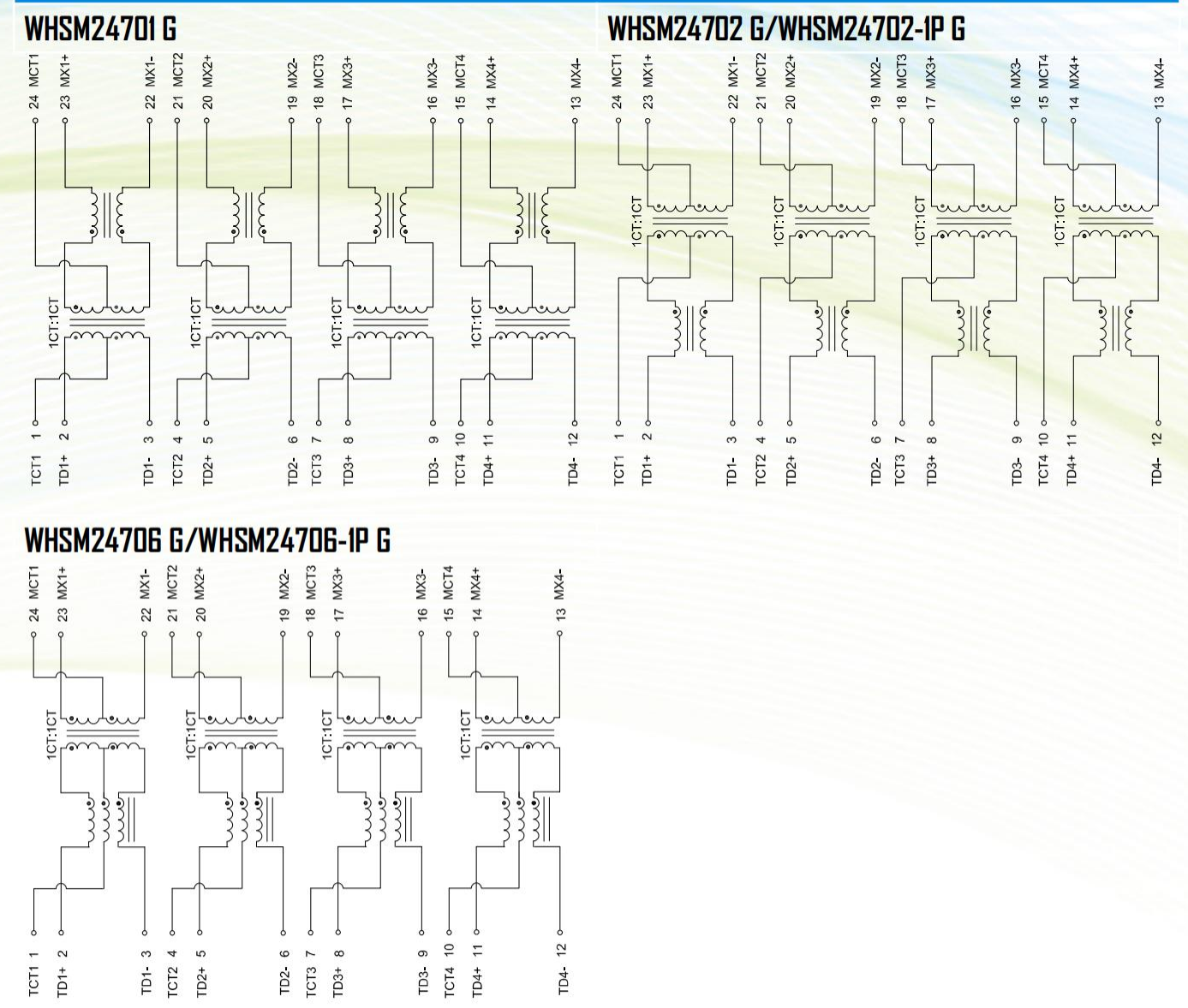
**Features And Benefits**  
Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements  
**Electrical Performance Summary**  
Designed For Ethernet 10G Base-T, Full Single Port Applications  
Compliant With IEEE 802.3an Standard For 10G Base-T

| Electrical Specifications @ 25° C |                   |                     |             |                  |                  |                 |           |                     |            |
|-----------------------------------|-------------------|---------------------|-------------|------------------|------------------|-----------------|-----------|---------------------|------------|
| Part Number                       | OCL (μH)          | Insertion Loss (dB) |             | Return Loss (dB) |                  | Cross Talk (dB) | CMRR (dB) | Isolation Hipot (V) | PoE Rating |
|                                   | Min               | Max                 |             | Min              |                  | Typ             | Typ       | Min                 |            |
|                                   | 100KHz,0.1V       | 1-400 MHz           | 400-500 MHz | 1-40 MHz         | 40-500 MHz       | 1-500 MHz       | 1-500 MHz | 1mA,60s             |            |
| WHSM24701 G                       | 120               | -2.0                | -3.0        | -19              | -19+10*LOG(f/40) | -25             | -25       | 1500                | NON-PoE    |
| WHSM24702 G                       | 120               | -2.0                | -3.0        | -19              | -19+10*LOG(f/40) | -25             | -25       | 1500                | PoE 15W    |
| WHSM24702-IP G                    | 120(14mA DC BIAS) | -2.0                | -3.0        | -19              | -19+10*LOG(f/40) | -25             | -25       | 1500                | 4PPoE 75W  |
| WHSM24706 G                       | 120               | -2.0                | -3.0        | -19              | -19+10*LOG(f/40) | -25             | -25       | 1500                | PoE 15W    |
| WHSM24706-IP G                    | 120(14mA DC BIAS) | -2.0                | -3.0        | -19              | -19+10*LOG(f/40) | -25             | -25       | 1500                | 4PPoE 75W  |

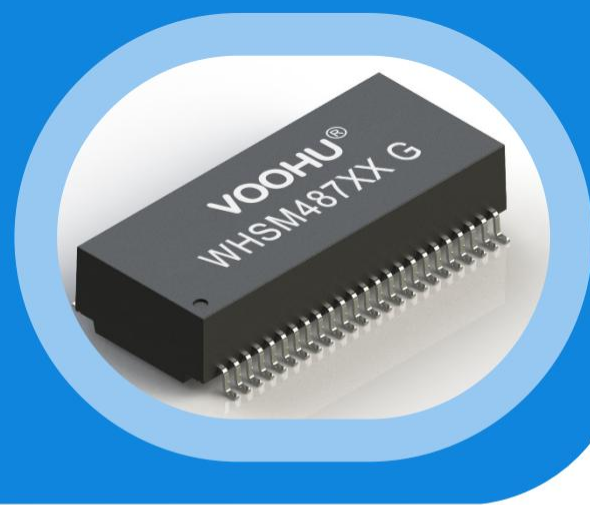
## **Mechanical**



## **Schematics**







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## NETWORK PRODUCT

LAN TRANSFORMER WHSM487XX G-Series

10G Base-T Dual Ports Magnetic Modules SMD

### Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS

Requirements

### Electrical Performance Summary

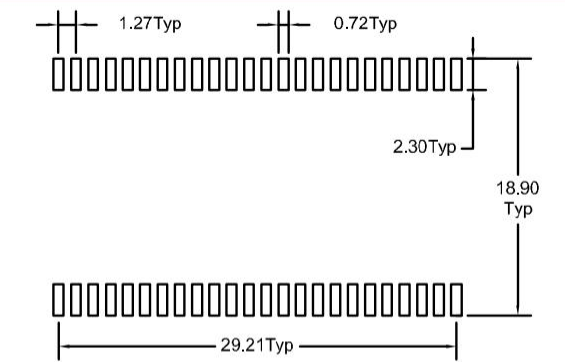
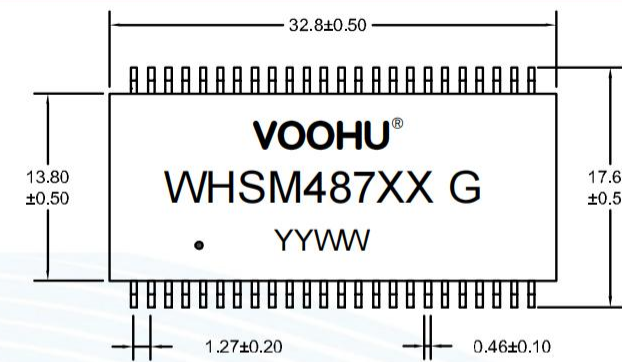
Designed For Ethernet 10G Base-T, Full Dual Ports Applications

Compliant With IEEE 802.3an Standard For 10G Base-T

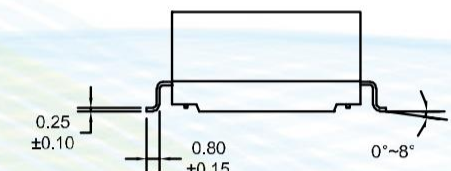
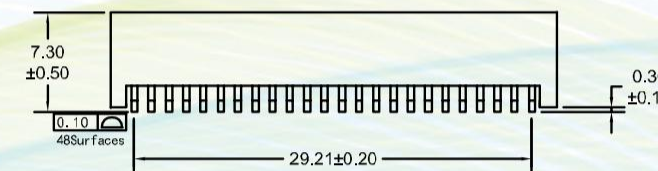
#### Electrical Specifications @ 25° C

| Part Number    | OCL<br>(μH)       | Insertion Loss<br>(dB) |                | Return Loss<br>(dB) |                  | Cross<br>Talk<br>(dB) | CMRR<br>(dB) | Isolation<br>Hipot<br>(V) | PoE<br>Rating |
|----------------|-------------------|------------------------|----------------|---------------------|------------------|-----------------------|--------------|---------------------------|---------------|
|                | Min               | Max                    |                | Min                 |                  | Typ                   | Typ          | Min                       |               |
|                | 100KHz,0.1V       | 1-400<br>MHz           | 400-500<br>MHz | 1-40<br>MHz         | 40-500<br>MHz    | 1-500<br>MHz          | 1-500<br>MHz | 1mA,60s                   |               |
| WHSM48701 G    | 120               | -2.0                   | -3.0           | -19                 | -19+10*LOG(f/40) | -25                   | -25          | 1500                      | NON-PoE       |
| WHSM48702 G    | 120               | -2.0                   | -3.0           | -19                 | -19+10*LOG(f/40) | -25                   | -25          | 1500                      | PoE 15W       |
| WHSM48702-2P G | 120(21mA DC BIAS) | -2.0                   | -3.0           | -19                 | -19+10*LOG(f/40) | -25                   | -25          | 1500                      | 4PPoE 120W    |

### Mechanical

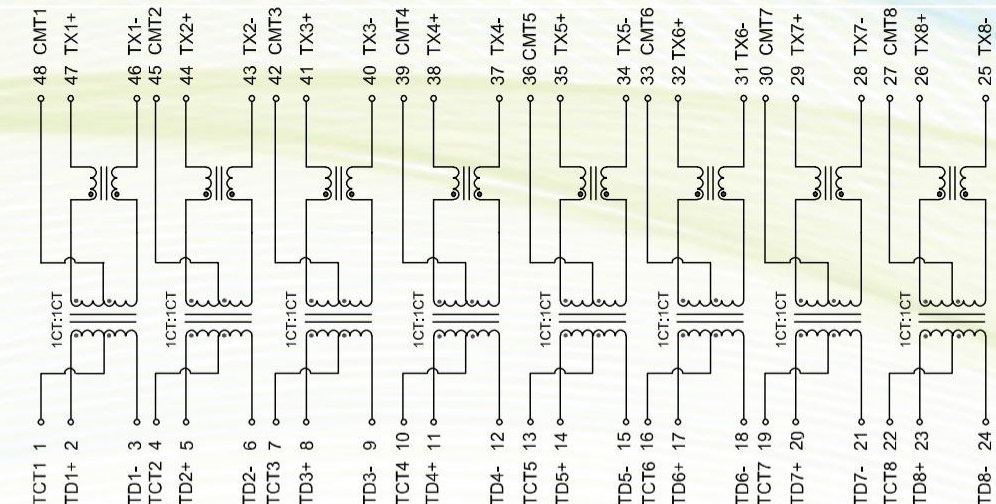


### SUGGESTED PAD LAYOUT

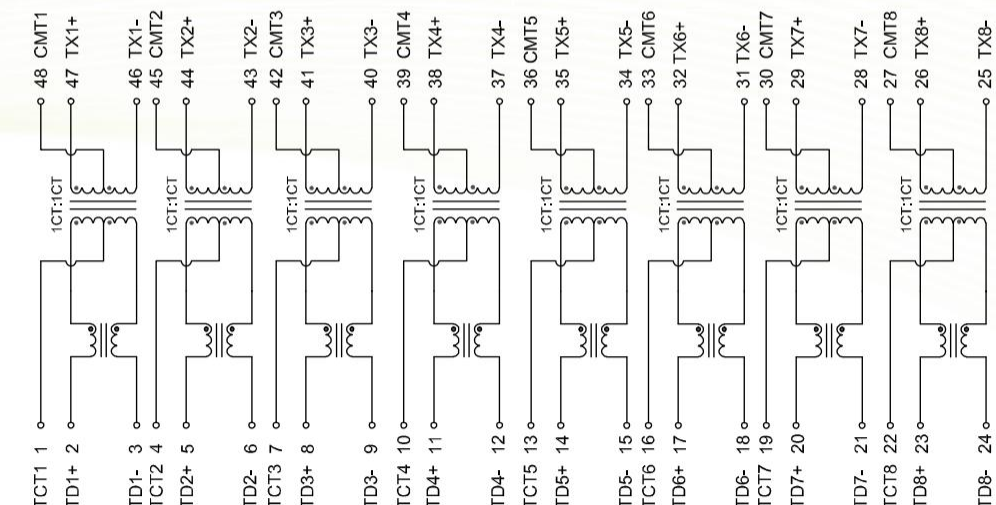


### Schematics

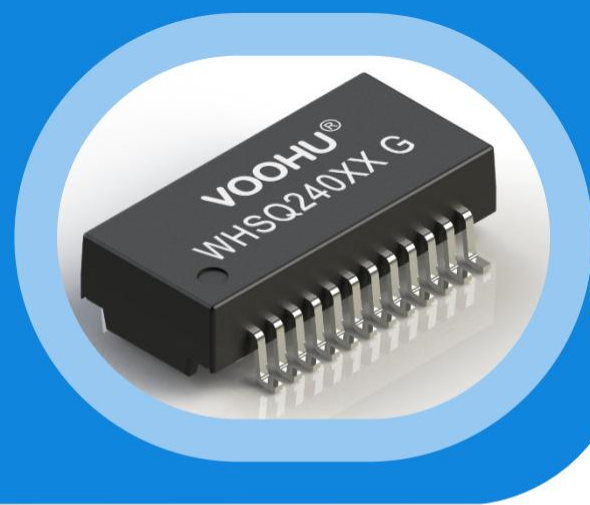
#### WHSM48701 G



#### WHSM48702 G/WHSM48702-2P G







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## NETWORK PRODUCT

LAN TRANSFORMER WHSQ240XX G-Series

2.5/5G Base-T Single Port Magnetic Modules SMD

### Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS

Requirements

### Electrical Performance Summary

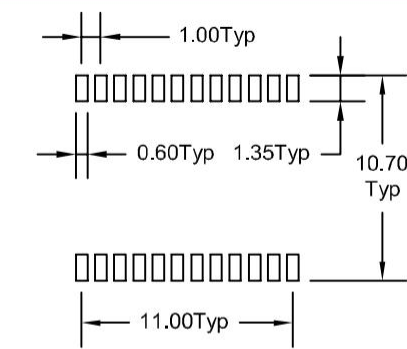
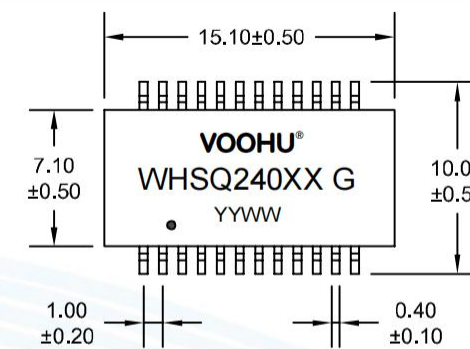
Designed For Ethernet 2.5/5G Base-T, Full Single Port Applications

Compliant With IEEE 802.3bz Standard For 2.5/5G Base-T

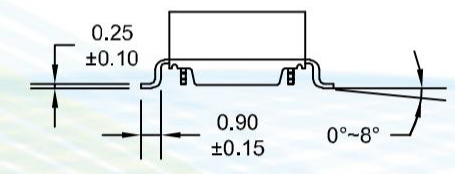
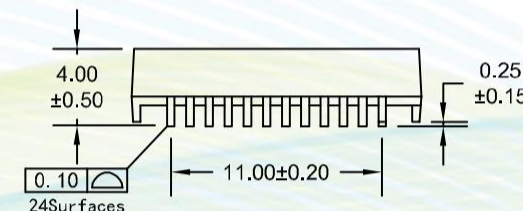
#### Electrical Specifications @ 25° C

| Part Number    | OCL<br>( $\mu$ H) | Insertion Loss<br>(dB) |                | Return Loss<br>(dB) |                 | Cross<br>Talk<br>(dB) | CMRR<br>(dB) | Isolation<br>Hipot<br>(V) | PoE<br>Rating |
|----------------|-------------------|------------------------|----------------|---------------------|-----------------|-----------------------|--------------|---------------------------|---------------|
|                | Min               | Max                    |                | Min                 |                 | Typ                   | Typ          | Min                       |               |
|                | 100KHz, 0.1V      | 1-100<br>MHz           | 100-250<br>MHz | 1-40<br>MHz         | 40-250<br>MHz   | 1-250<br>MHz          | 1-250<br>MHz | 1mA, 60s                  |               |
| WHSQ24002 G    | 200               | -1.0                   | -2.0           | -16                 | -16+10log(f/40) | -30                   | -30          | 1500                      | NON-PoE       |
| WHSQ24015 G    | 200               | -1.0                   | -2.0           | -16                 | -16+10log(f/40) | -30                   | -30          | 1500                      | PoE 15W       |
| WHSQ24015-1P G | 200(8mA DC BIAS)  | -1.0                   | -2.0           | -16                 | -16+10log(f/40) | -30                   | -30          | 1500                      | PoE 30W       |

### Mechanical

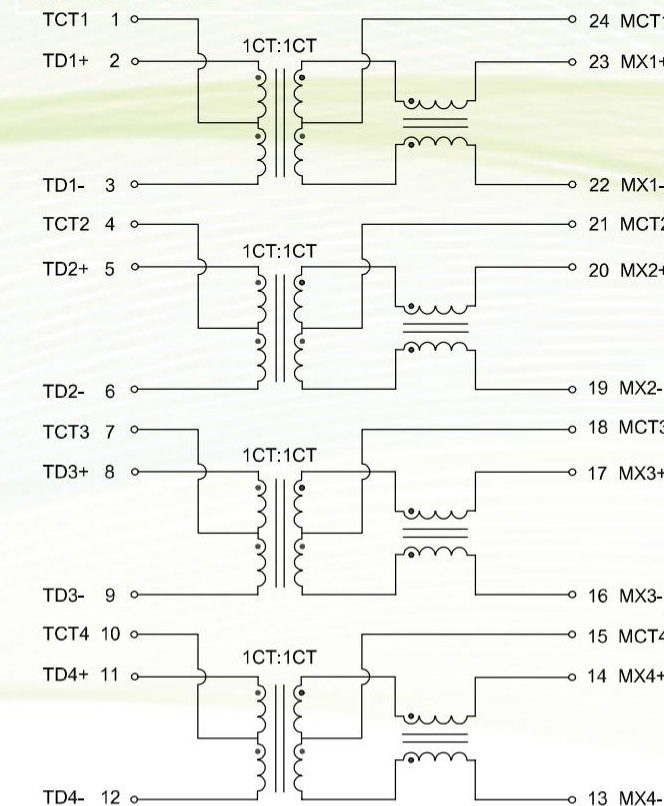


SUGGESTED PAD LAYOUT

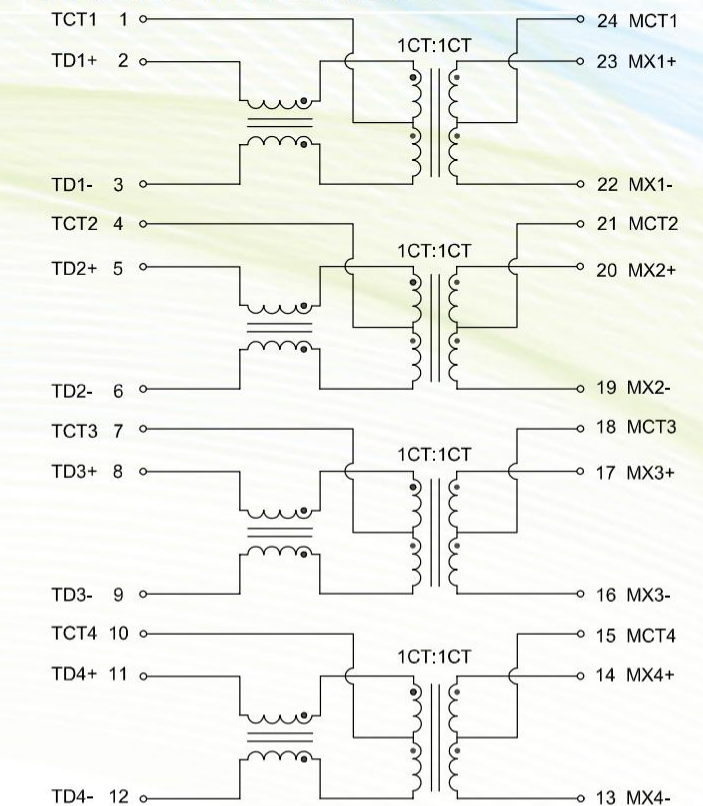


### Schematics

#### WHSQ24002 G



#### WHSQ24015 G/WHSQ24015-1P G







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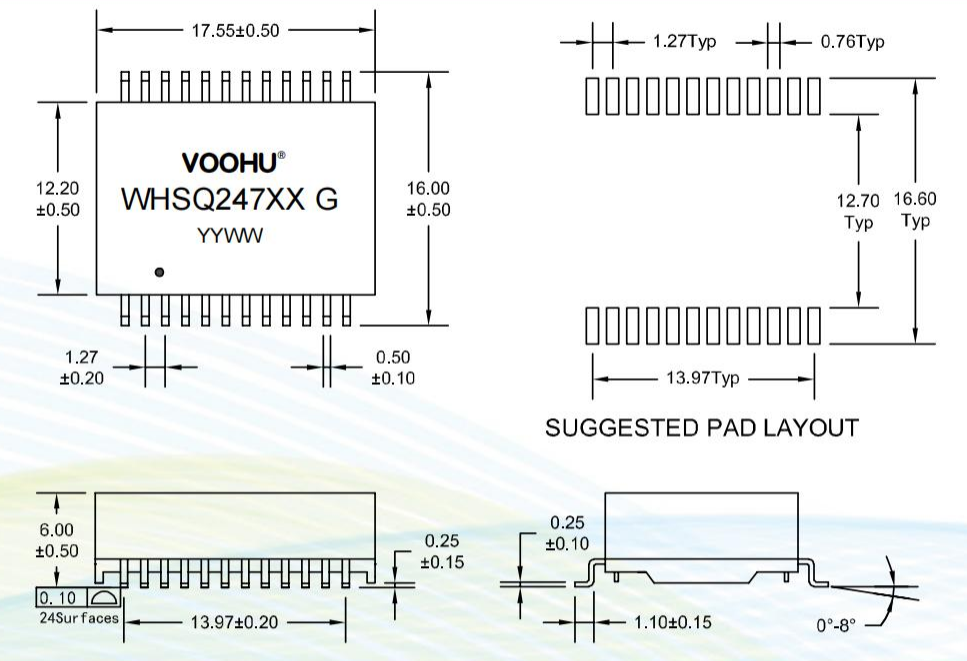
# NETWORK PRODUCT LAN TRANSFORMER WHSQ247XX G-Series 2.5/5G Base-T Single Port Magnetic Modules SMD

**Features And Benefits**  
Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements

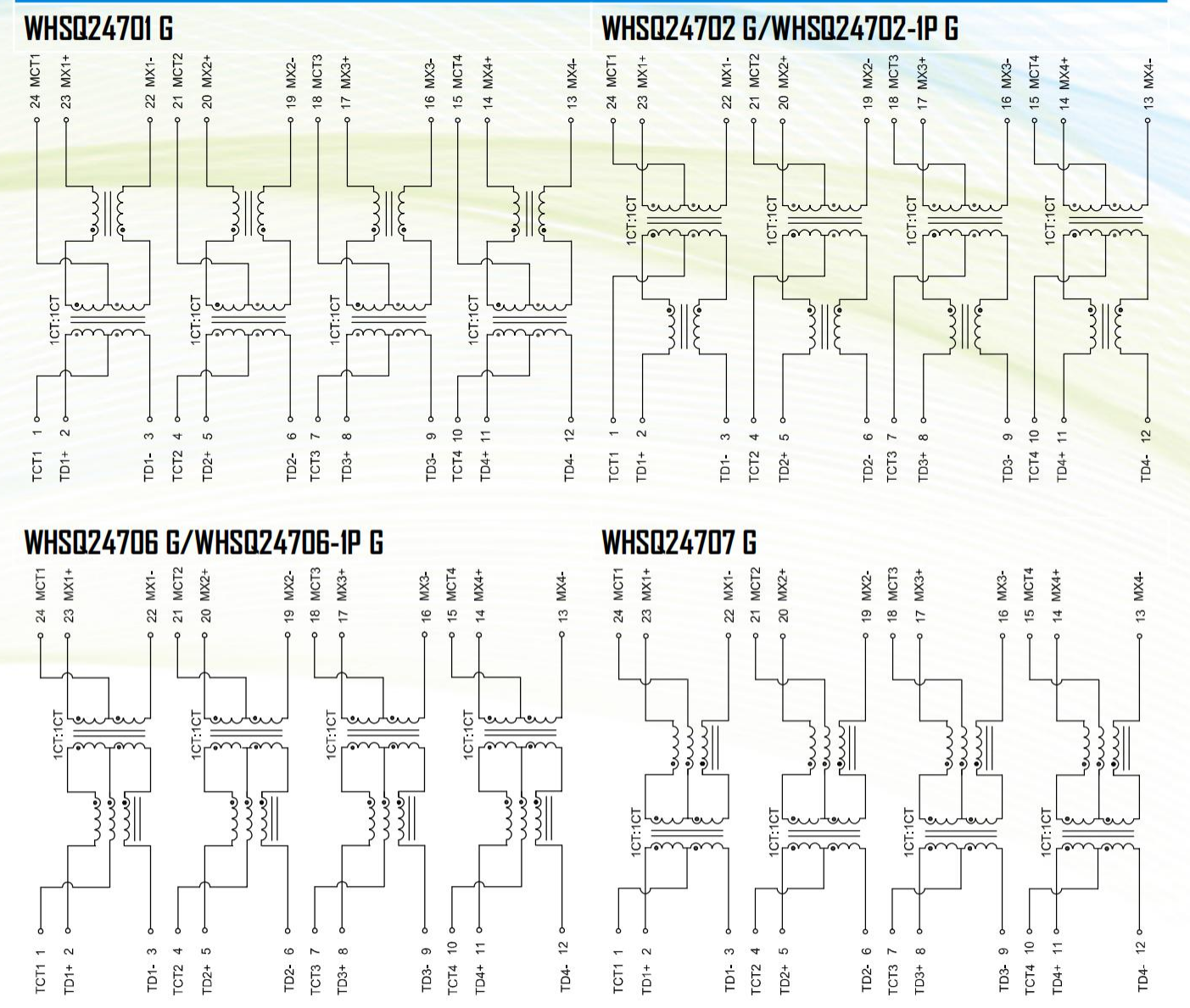
**Electrical Performance Summary**  
Designed For Ethernet 2.5/5G Base-T, Full Single Port Applications  
Compliant With IEEE 802.3bz Standard For 2.5/5G Base-T

| Electrical Specifications @ 25° C |                   |                     |             |                  |                 |                 |           |                     |            |
|-----------------------------------|-------------------|---------------------|-------------|------------------|-----------------|-----------------|-----------|---------------------|------------|
| Part Number                       | OCL (μH)          | Insertion Loss (dB) |             | Return Loss (dB) |                 | Cross Talk (dB) | CMRR (dB) | Isolation Hipot (V) | PoE Rating |
|                                   | Min               | Max                 |             | Min              |                 | Typ             | Typ       | Min                 |            |
|                                   | 100KHz,0.1V       | 1-100 MHz           | 100-250 MHz | 1-40 MHz         | 40-250 MHz      | 1-250 MHz       | 1-250 MHz | 1mA,60s             |            |
| WHSQ24701 G                       | 200(8mA DC BIAS)  | -1.0                | -2.0        | -16              | -16+10log(f/40) | -30             | -30       | 1500                | NON-PoE    |
| WHSQ24702 G                       | 200(8mA DC BIAS)  | -1.0                | -2.0        | -16              | -16+10log(f/40) | -30             | -30       | 1500                | PoE 15W    |
| WHSQ24702-IP G                    | 200(14mA DC BIAS) | -1.0                | -2.0        | -16              | -16+10log(f/40) | -30             | -30       | 1500                | 4PPoE 75W  |
| WHSQ24706 G                       | 200(8mA DC BIAS)  | -1.0                | -2.0        | -16              | -16+10log(f/40) | -30             | -30       | 1500                | PoE 15W    |
| WHSQ24706-IP G                    | 200(14mA DC BIAS) | -1.0                | -2.0        | -16              | -16+10log(f/40) | -30             | -30       | 1500                | 4PPoE 75W  |
| WHSQ24707 G                       | 200(8mA DC BIAS)  | -1.0                | -2.0        | -16              | -16+10log(f/40) | -30             | -30       | 1500                | PoE 15W    |

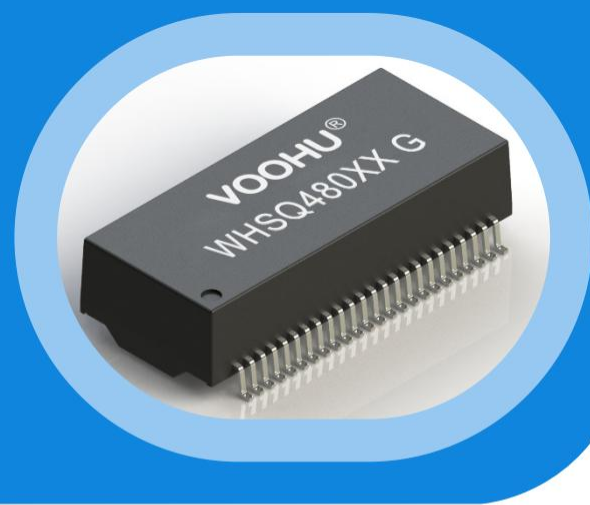
## Mechanical



## Schematics







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# NETWORK PRODUCT

LAN TRANSFORMER WHSQ480XX G-Series

2.5/5G Base-T Dual Ports Magnetic Modules SMD

## Features And Benefits

Cable Interface For Isolation And Low Common Mode Emissions Compliant With RoHS Requirements

## Electrical Performance Summary

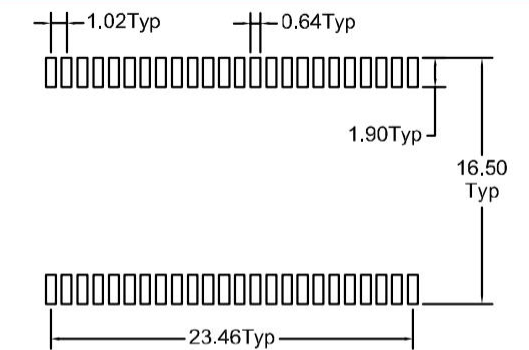
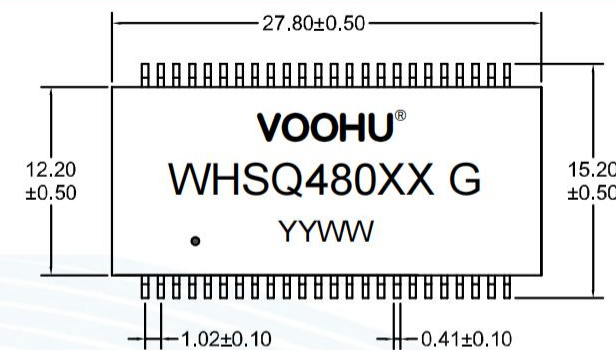
Designed For Ethernet 2.5/5G Base-T, Full Dual Ports Applications

Compliant With IEEE 802.3bz Standard For 2.5/5G Base-T

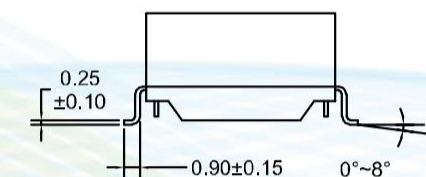
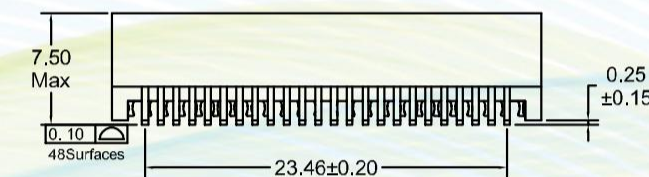
### Electrical Specifications @ 25° C

| Part Number    | OCL<br>(μH)       | Insertion Loss<br>(dB) |                | Return Loss<br>(dB) |                 | Cross<br>Talk<br>(dB) | CMRR<br>(dB) | Isolation<br>Hipot<br>(V) | PoE<br>Rating |
|----------------|-------------------|------------------------|----------------|---------------------|-----------------|-----------------------|--------------|---------------------------|---------------|
|                | Min               | Max                    |                | Min                 |                 | Typ                   | Typ          | Min                       |               |
|                | 100KHz,0.1V       | 1-100<br>MHz           | 100-250<br>MHz | 1-40<br>MHz         | 40-250<br>MHz   | 1-250<br>MHz          | 1-250<br>MHz | 1mA,60s                   |               |
| WHSQ48001 G    | 200(8mA DC BIAS)  | -1.0                   | -2.0           | -16                 | -16+10log(f/40) | -30                   | -30          | 1500                      | NON-PoE       |
| WHSQ48004 G    | 200(8mA DC BIAS)  | -1.0                   | -2.0           | -16                 | -16+10log(f/40) | -30                   | -30          | 1500                      | PoE 15W       |
| WHSQ48004-IP G | 200(14mA DC BIAS) | -1.0                   | -2.0           | -16                 | -16+10log(f/40) | -30                   | -30          | 1500                      | 4PPoE 75W     |
| WHSQ48002 G    | 200(8mA DC BIAS)  | -1.0                   | -2.0           | -16                 | -16+10log(f/40) | -30                   | -30          | 1500                      | PoE 15W       |
| WHSQ48002-IP G | 200(14mA DC BIAS) | -1.0                   | -2.0           | -16                 | -16+10log(f/40) | -30                   | -30          | 1500                      | 4PPoE 75W     |
| WHSQ48003 G    | 200(8mA DC BIAS)  | -1.0                   | -2.0           | -16                 | -16+10log(f/40) | -30                   | -30          | 1500                      | PoE 15W       |

## Mechanical

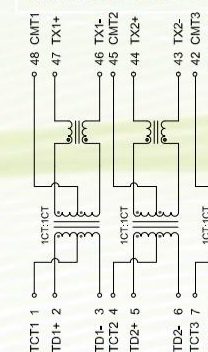


### SUGGESTED PAD LAYOUT

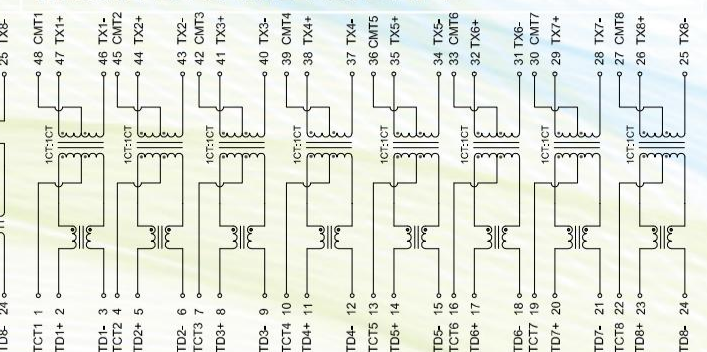


## Schematics

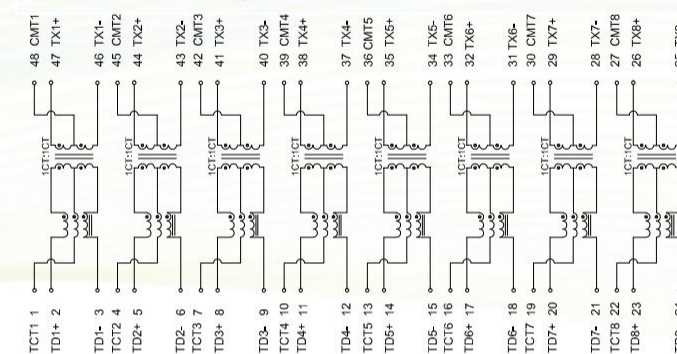
### WHSQ48001 G



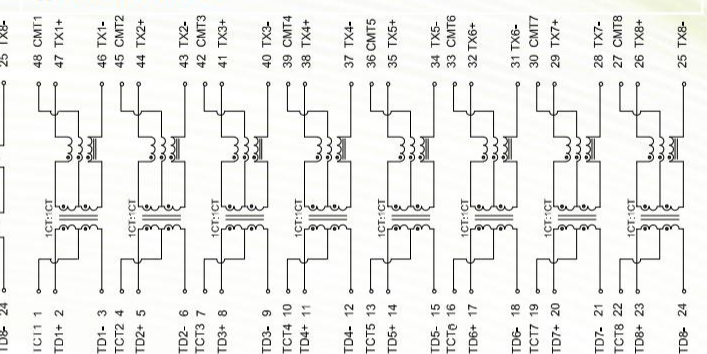
### WHSQ48004 G/WHSQ48004-IP G



### WHSQ48002 G/WHSQ48002-IP G



### WHSQ48003 G







**VOOHU 沃虎**

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## NETWORK PRODUCT

### RF Balun Transformer

VOOHU 为其客户开发了广泛的射频产品选择。我们紧跟当前 IC 供应商的要求，同时我们知道如何有效地减少您的设计尺寸和成本。我们提供各种射频应用的产品，包括了电缆调制解调器，智能零售柜，流媒体后视镜，对讲和对讲机应用。我们提供高质量的定向耦合器和分路/合成磁性器件，以满足您最苛刻的网络应用。所有射频耦合器和分离器符合RoHS规范，可用于大批量生产。

VOOHU Has Developed A Wide Selection Of RF Products For Its Customers. We Keep Pace With Current IC Vendor Requirements And We Know What It Takes To Effectively Reduce Your Design Size And Costs. We Supply Products For A Variety Of RF Applications Including Cable Modem, Intelligent Retail Cabinet, Streaming Media Rearview Mirror, Talkback And Walkie-Talkie Applications. We Offers A High-Quality Line Of Directional Coupler And Splitter/Combiner Components To Meet Your Most Demanding Network Applications. All RF Couplers And Splitters Meet RoHS Specifications And Are Available For High-Volume Production.

#### Features And Benefits

- Multi Band Filter & Modules
- Diplexers/Triplexers
- High Rejection, Low Loss
- Excellent Return Loss
- Compliant to Docsis & MoCA
- Transmission Line Baluns & Splitters
- Isolation Matching Baluns

#### Applications

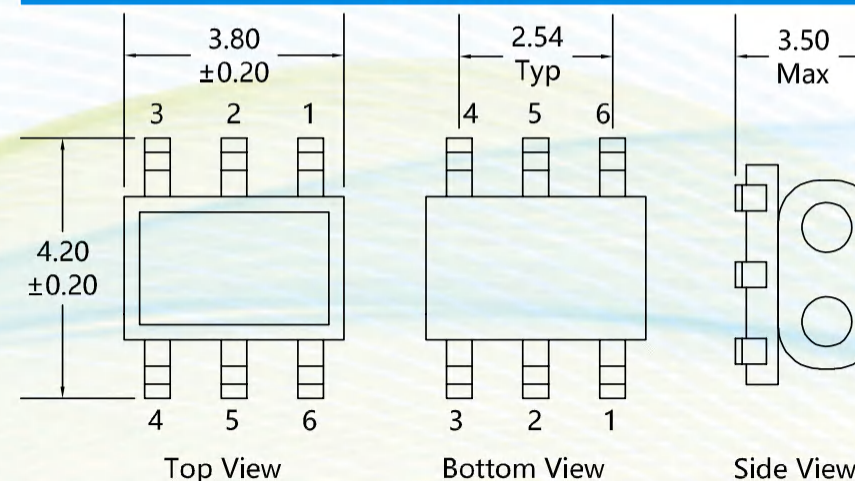
- Cable Modem
- Intelligent Retail Cabinet
- Streaming Media Rearview Mirror
- Talkback
- Satellite Distribution
- Walkie-Talkie
- CATV Amplifier Module

#### Electrical Specifications @ 25°C

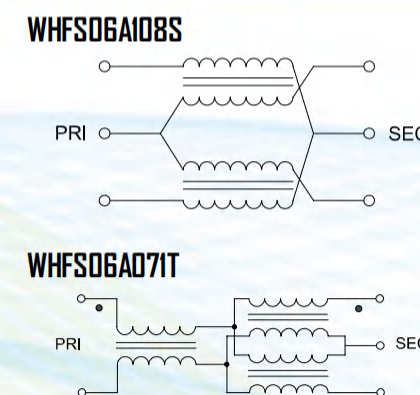
| Part Number | Frequency | Out1 Loss (dB) | Out2 Loss (dB) | Input Return Loss (dB) | Output1 Return Loss (dB) | Output2 Return Loss (dB) | Isolation (dB) | Z <sub>0</sub> (Ω) |
|-------------|-----------|----------------|----------------|------------------------|--------------------------|--------------------------|----------------|--------------------|
|             | MHz       | Max            | Max            | Min                    | Min                      | Min                      | Min            |                    |
| WHFS06A108S | 5-1250    | 1.5            | 1.5            | 22.0                   | 0.2                      | 2.0                      | 16.0           | 75                 |

| Part Number | Frequency | Insertion Loss (dB) | Input Return Loss (dB) | Amplitude (dB) | Phase (°) | Ratio   | Z <sub>0</sub> (Ω) |
|-------------|-----------|---------------------|------------------------|----------------|-----------|---------|--------------------|
|             | MHz       | Max                 | Min                    | Typ            | Typ       | PRI:SEC |                    |
| WHFS06A071T | 5-1250    | 3.5                 | 16.0                   | 0.5            | 8.0       | 1:2     | 75                 |

#### Mechanical



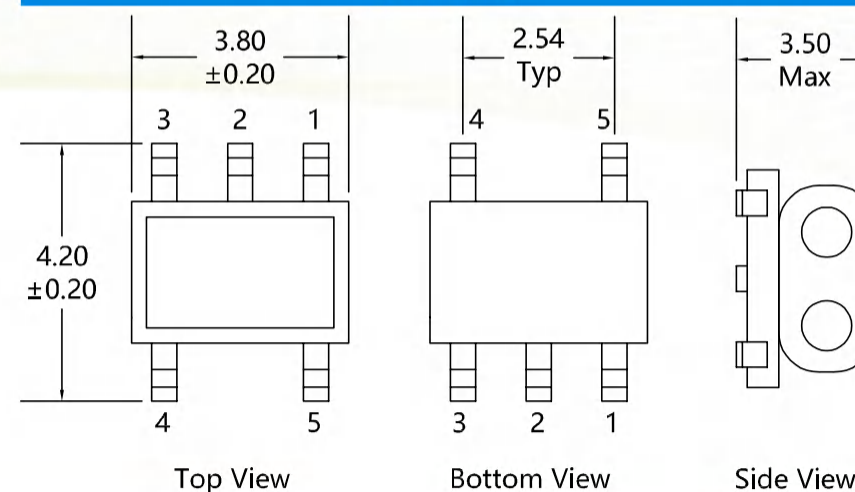
#### Schematics



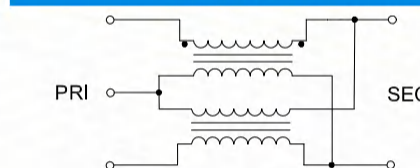
#### Electrical Specifications @ 25°C

| Part Number | Frequency | Insertion Loss (dB) | Coupling (dB) | Input Return Loss (dB) | Output Return Loss (dB) | Coupling Return Loss (dB) | Isolation (dB) | Z <sub>0</sub> (Ω) |
|-------------|-----------|---------------------|---------------|------------------------|-------------------------|---------------------------|----------------|--------------------|
|             | MHz       | Max                 | Typ           | Min                    | Min                     | Min                       | Min            |                    |
| WHFS068067C | 5-1020    | 1.2                 | 17.3          | 16.0                   | 16.0                    | 18.0                      | 20.0           | 75                 |
| WHFS068068C | 5-1250    | 3.0                 | 6.8           | 13.0                   | 16.0                    | 14.0                      | 16.0           | 75                 |
| WHFS068069C | 5-1250    | 1.5                 | 12.0          | 16.0                   | 16.0                    | 16.0                      | 18.0           | 75                 |
| WHFS06806AC | 5-1250    | 1.2                 | 17.0          | 19.0                   | 20.0                    | 20.0                      | 25.0           | 75                 |
| WHFS06806BC | 5-1250    | 1.0                 | 19.8          | 18.0                   | 18.0                    | 18.0                      | 25.0           | 75                 |
| WHFS06806CC | 5-1500    | 1.0                 | 18.0          | 20.0                   | 20.0                    | 20.0                      | 25.0           | 75                 |

#### Mechanical

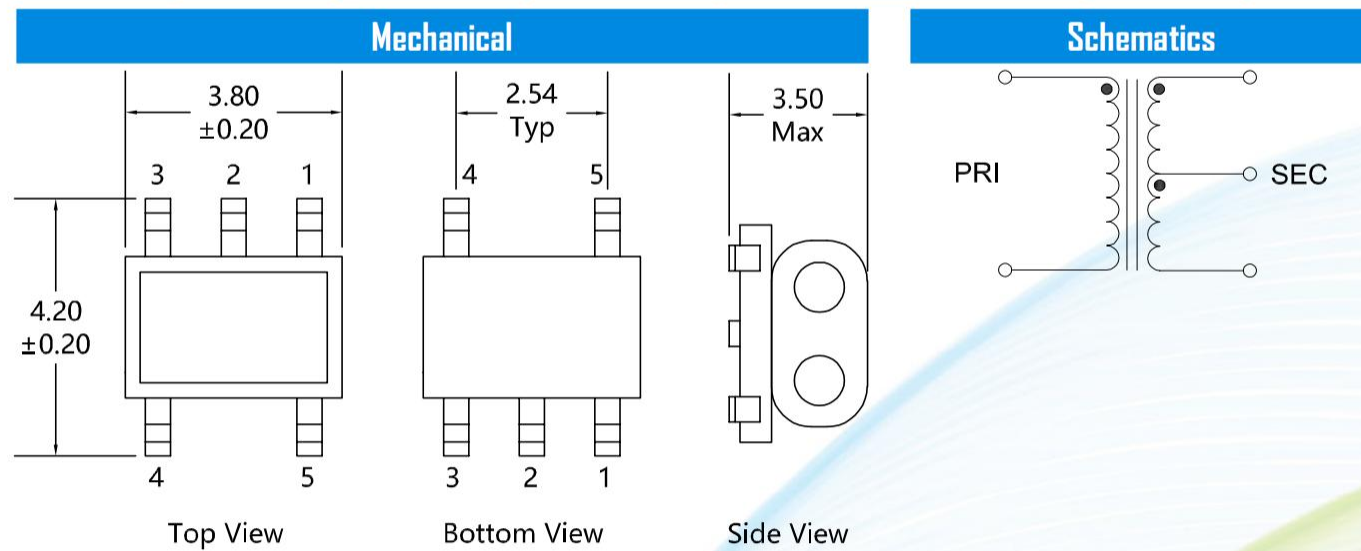


#### Schematics

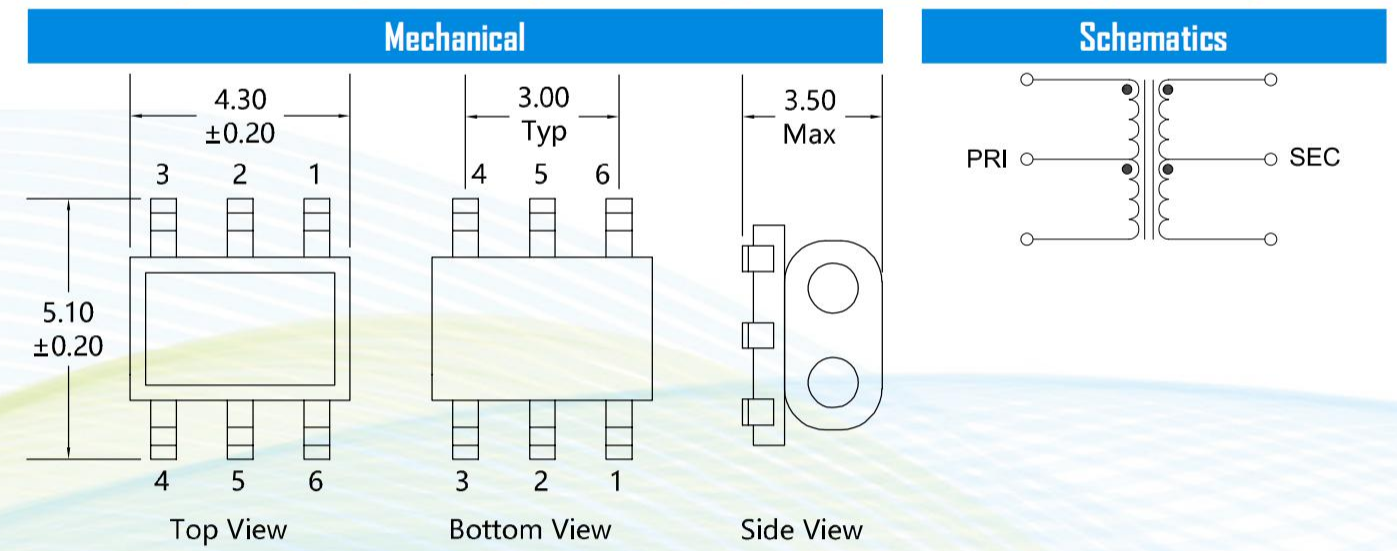




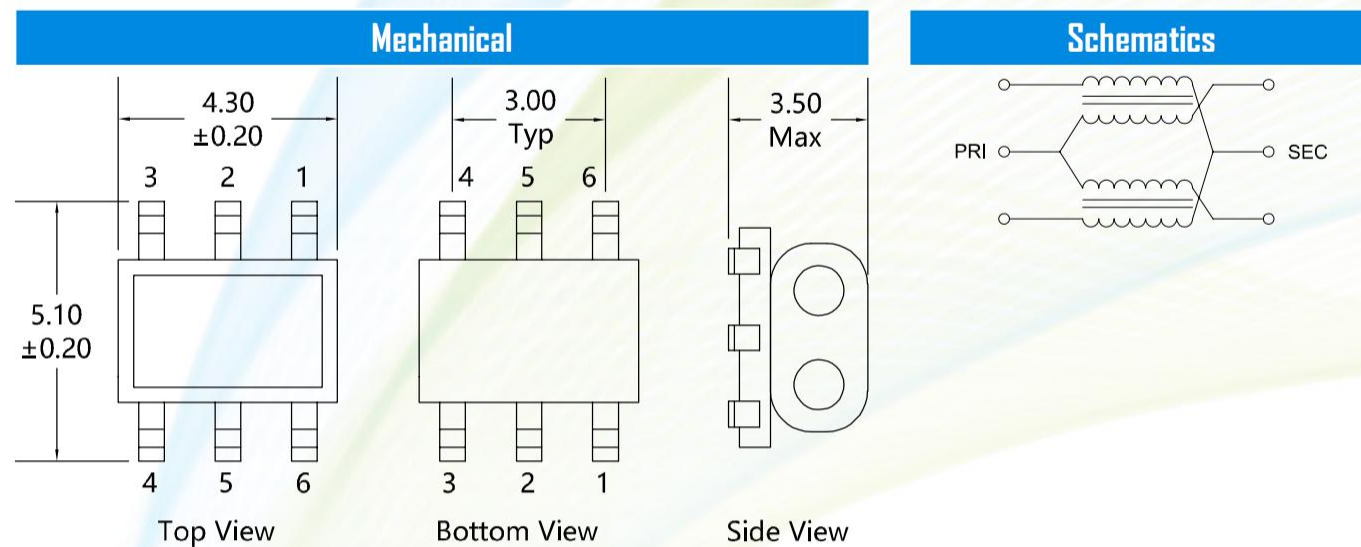
| Electrical Specifications @ 25°C |           |                     |                        |                |           |         |        |
|----------------------------------|-----------|---------------------|------------------------|----------------|-----------|---------|--------|
| Part Number                      | Frequency | Insertion Loss (dB) | Input Return Loss (dB) | Amplitude (dB) | Phase (°) | Ratio   | Zo (Ω) |
|                                  | MHz       | Max                 | Min                    | Typ            | Typ       | PRI:SEC |        |
| WHFS06804T                       | 1-350     | 2.0                 | 8.0                    | 0.3            | 2.0       | 1:4     | 50     |



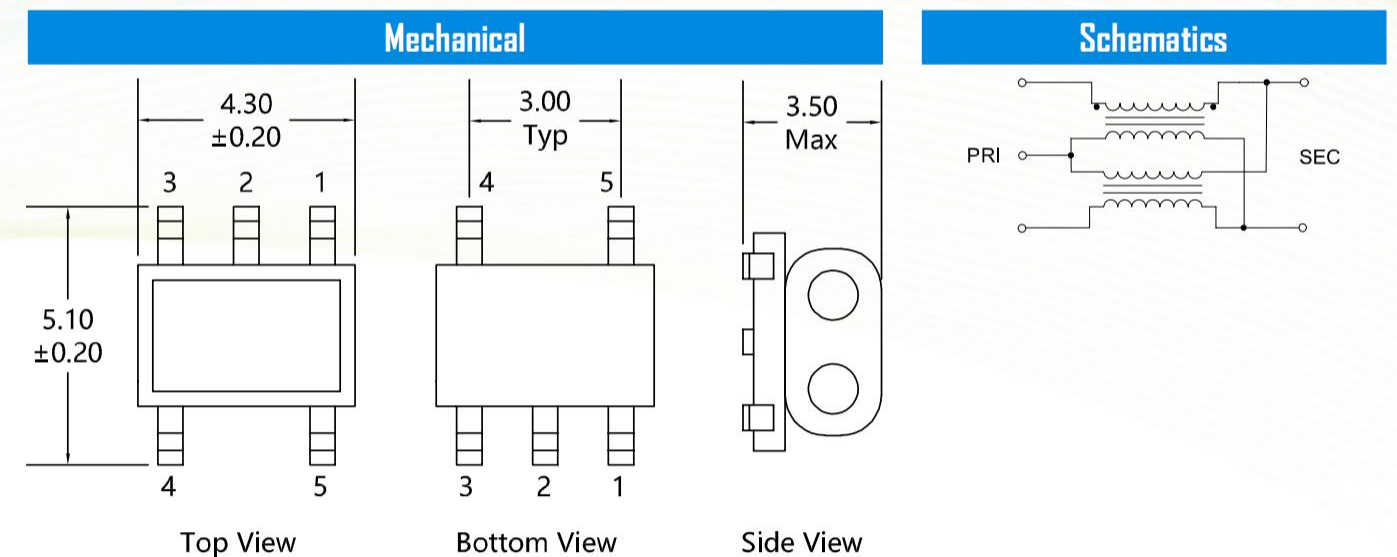
| Electrical Specifications @ 25°C |           |                     |                        |                |           |         |        |
|----------------------------------|-----------|---------------------|------------------------|----------------|-----------|---------|--------|
| Part Number                      | Frequency | Insertion Loss (dB) | Input Return Loss (dB) | Amplitude (dB) | Phase (°) | Ratio   | Zo (Ω) |
|                                  | MHz       | Max                 | Min                    | Typ            | Typ       | PRI:SEC |        |
| WHFS063082T                      | 0.3-800   | 3.5                 | 5.0                    | 0.5            | 10.0      | 1:4     | 50     |



| Electrical Specifications @ 25°C |           |                |                |                        |                          |                          |                |        |
|----------------------------------|-----------|----------------|----------------|------------------------|--------------------------|--------------------------|----------------|--------|
| Part Number                      | Frequency | Out1 Loss (dB) | Out2 Loss (dB) | Input Return Loss (dB) | Output1 Return Loss (dB) | Output2 Return Loss (dB) | Isolation (dB) | Zo (Ω) |
|                                  | MHz       | Max            | Max            | Min                    | Min                      | Min                      | Min            |        |
| WHFS063109S                      | 5-1600    | 1.4            | 1.2            | 11.0                   | 14.0                     | 16.0                     | 12.0           | 75     |

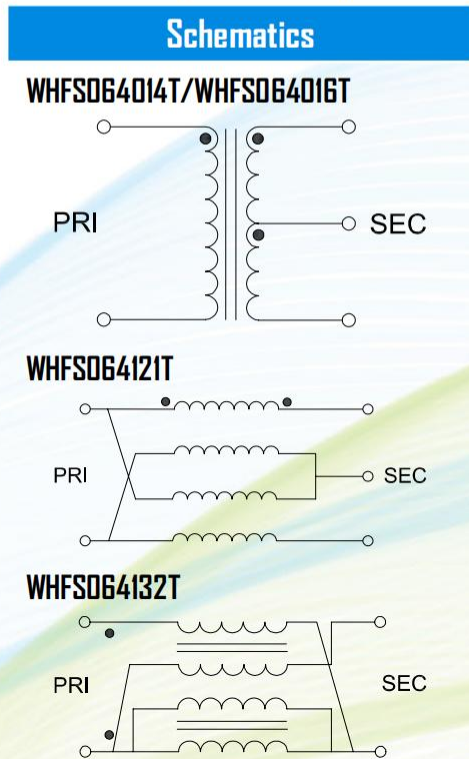
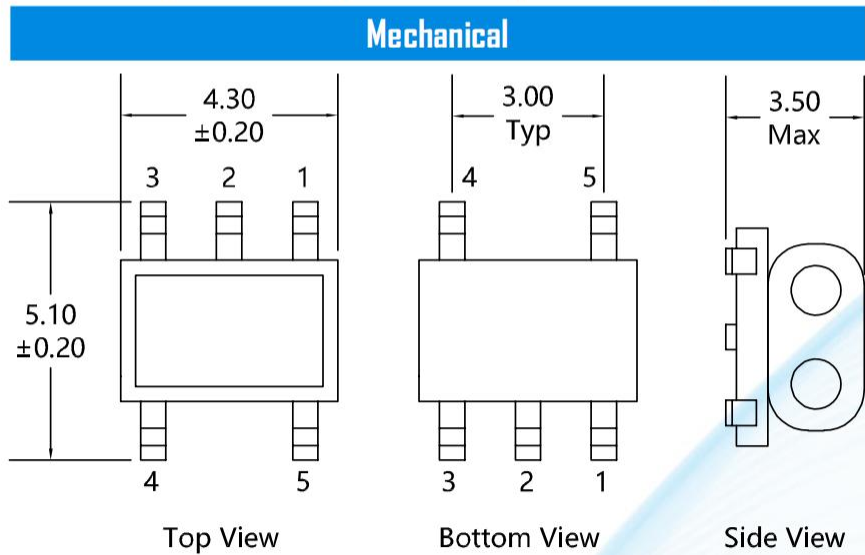


| Electrical Specifications @ 25°C |           |                     |               |                        |                         |                           |                |        |
|----------------------------------|-----------|---------------------|---------------|------------------------|-------------------------|---------------------------|----------------|--------|
| Part Number                      | Frequency | Insertion Loss (dB) | Coupling (dB) | Input Return Loss (dB) | Output Return Loss (dB) | Coupling Return Loss (dB) | Isolation (dB) | Zo (Ω) |
|                                  | MHz       | Max                 | Typ           | Min                    | Min                     | Min                       | Min            |        |
| WHFS064063C                      | 5-1000    | 1.5                 | 15.0          | 16.0                   | 16.0                    | 16.0                      | 20.0           | 75     |
| WHFS064064C                      | 5-1000    | 1.3                 | 16.0          | 18.0                   | 18.0                    | 18.0                      | 20.0           | 75     |
| WHFS064065C                      | 5-1200    | 1.5                 | 17.3          | 16.0                   | 16.0                    | 16.0                      | 16.0           | 75     |
| WHFS064066C                      | 5-1250    | 2.5                 | 8.3           | 16.0                   | 16.0                    | 16.0                      | 16.0           | 75     |

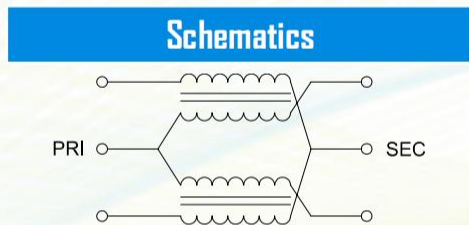
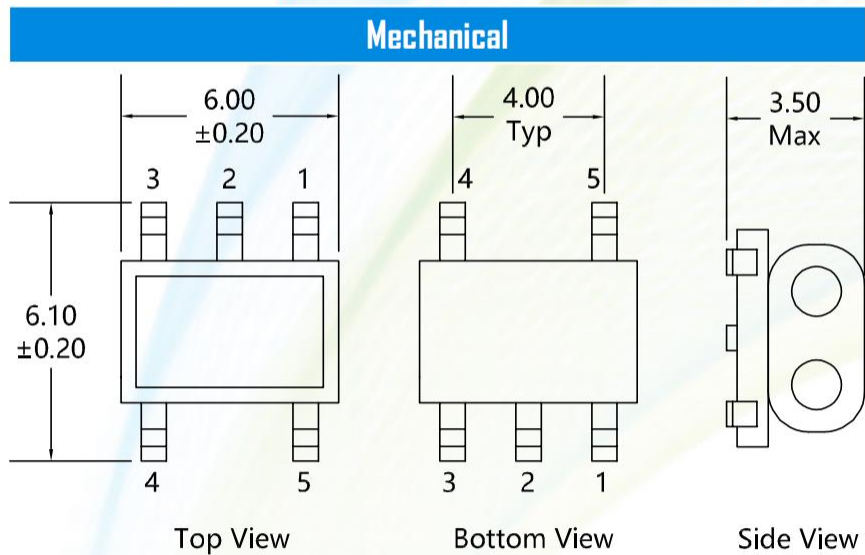




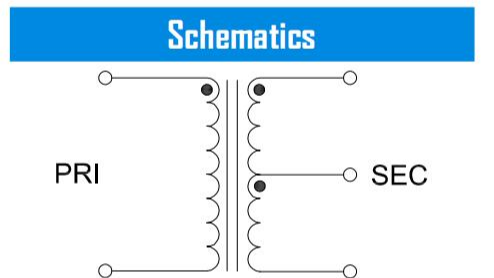
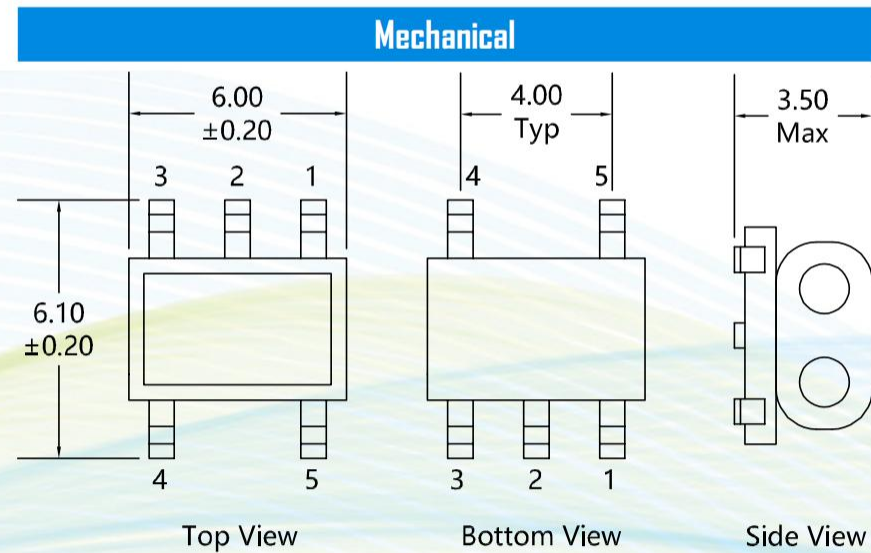
| Electrical Specifications @ 25°C |           |                     |                        |                |           |         |        |
|----------------------------------|-----------|---------------------|------------------------|----------------|-----------|---------|--------|
| Part Number                      | Frequency | Insertion Loss (dB) | Input Return Loss (dB) | Amplitude (dB) | Phase (°) | Ratio   | Zo (Ω) |
|                                  | MHz       | Max                 | Min                    | Typ            | Typ       | PRI:SEC |        |
| WHFS064014T                      | 8-750     | 3.0                 | 10.0                   | 0.5            | 10.0      | 1:4     | 50     |
| WHFS064016T                      | 5-200     | 1.5                 | 10.0                   | 0.5            | 5.0       | 1:1     | 75     |
| WHFS064121T                      | 5-1250    | 2.0                 | 10.0                   | 0.2            | 6.0       | 1:4     | 50     |
| WHFS064132T                      | 5-1250    | 2.0                 | 10.0                   | 0.2            | 6.0       | 1:1     | 75     |



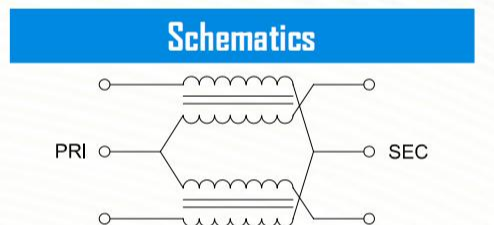
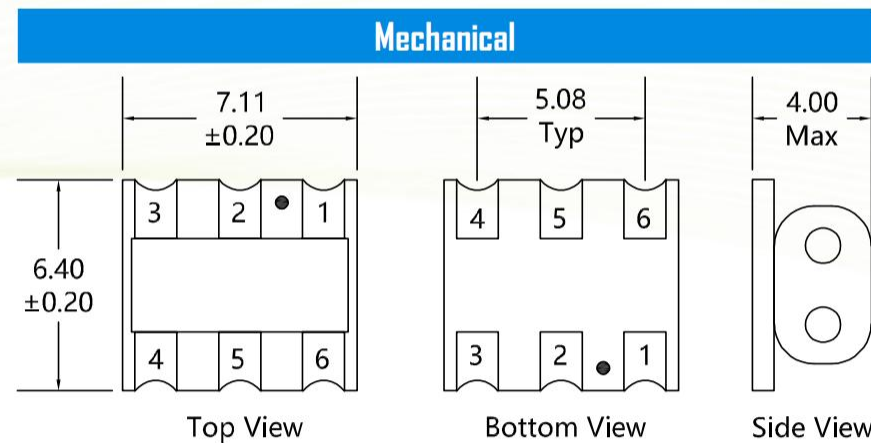
| Electrical Specifications @ 25°C |           |                |                |                        |                          |                          |                |        |
|----------------------------------|-----------|----------------|----------------|------------------------|--------------------------|--------------------------|----------------|--------|
| Part Number                      | Frequency | Out1 Loss (dB) | Out2 Loss (dB) | Input Return Loss (dB) | Output1 Return Loss (dB) | Output2 Return Loss (dB) | Isolation (dB) | Zo (Ω) |
|                                  | MHz       | Max            | Max            | Min                    | Min                      | Min                      | Min            |        |
| WHFS06510AS                      | 5-1000    | 2.5            | 3.0            | 15.0                   | 20.0                     | 25.0                     | 12.0           | 75     |



| Electrical Specifications @ 25°C |           |                     |                        |                |           |         |        |
|----------------------------------|-----------|---------------------|------------------------|----------------|-----------|---------|--------|
| Part Number                      | Frequency | Insertion Loss (dB) | Input Return Loss (dB) | Amplitude (dB) | Phase (°) | Ratio   | Zo (Ω) |
|                                  | MHz       | Max                 | Min                    | Typ            | Typ       | PRI:SEC |        |
| WHFS065011T                      | 5-100     | 2.0                 | 4.0                    | 0.1            | 3.0       | 2:1     | 75     |
| WHFS068013C                      | 5-200     | 3.0                 | 3.0                    | 0.6            | 1.2       | 4:1     | 75     |



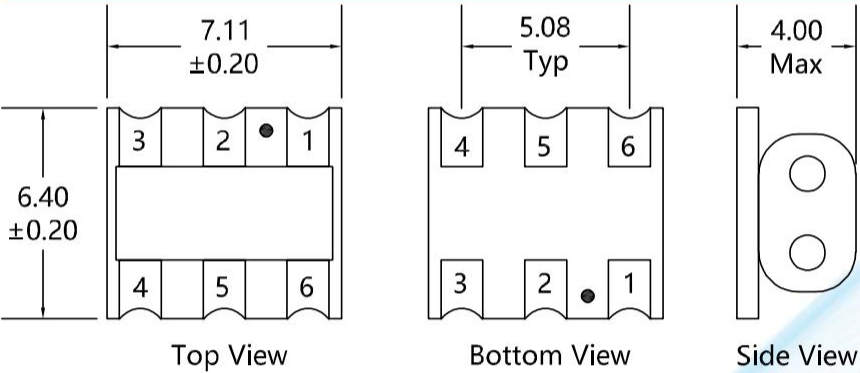
| Electrical Specifications @ 25°C |           |                |                |                        |                          |                          |                |        |
|----------------------------------|-----------|----------------|----------------|------------------------|--------------------------|--------------------------|----------------|--------|
| Part Number                      | Frequency | Out1 Loss (dB) | Out2 Loss (dB) | Input Return Loss (dB) | Output1 Return Loss (dB) | Output2 Return Loss (dB) | Isolation (dB) | Zo (Ω) |
|                                  | MHz       | Max            | Max            | Min                    | Min                      | Min                      | Min            |        |
| WHFS166101S                      | 5-1250    | 1.5            | 1.5            | 16.0                   | 0.2                      | 2.0                      | 16.0           | 75     |
| WHFS166102S                      | 1-250     | 0.5            | 0.5            | 22.0                   | 0.2                      | 2.0                      | 20.0           | 75     |
| WHFS166103S                      | 5-1250    | 1.5            | 1.5            | 16.0                   | 0.2                      | 2.0                      | 16.0           | 75     |
| WHFS166104S                      | 5-1250    | 2.0            | 1.5            | 10.0                   | 10.0                     | 10.0                     | 16.0           | 75     |
| WHFS166105S                      | 5-1250    | 1.2            | 1.5            | 16.0                   | 0.2                      | 4.0                      | 16.0           | 75     |
| WHFS166106S                      | 5-1000    | 1.4            | 1.2            | 11.0                   | 14.0                     | 16.0                     | 12.0           | 75     |
| WHFS166107S                      | 5-1250    | 1.5            | 2.1            | 16.0                   | 0.2                      | 4.0                      | 16.0           | 75     |



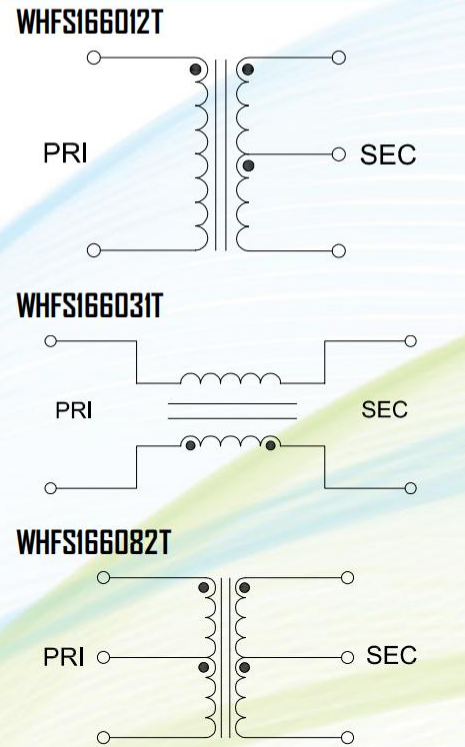


| Electrical Specifications @ 25°C |           |                     |                        |                |           |         |        |
|----------------------------------|-----------|---------------------|------------------------|----------------|-----------|---------|--------|
| Part Number                      | Frequency | Insertion Loss (dB) | Input Return Loss (dB) | Amplitude (dB) | Phase (°) | Ratio   | Zo (Ω) |
|                                  | MHz       | Max                 | Min                    | Typ            | Typ       | PRI:SEC |        |
| WHFS166012T                      | 0.3-125   | 2.5                 | 6.0                    | 0.2            | 5.0       | 1:1     | 50     |
| WHFS166031T                      | 20-1200   | 2.0                 | 8.0                    | 0.5            | 4.0       | 1:1     | 50     |
| WHFS166082T                      | 0.3-125   | 1.0                 | 10.0                   | 0.2            | 9.1       | 1:4     | 50     |

Mechanical

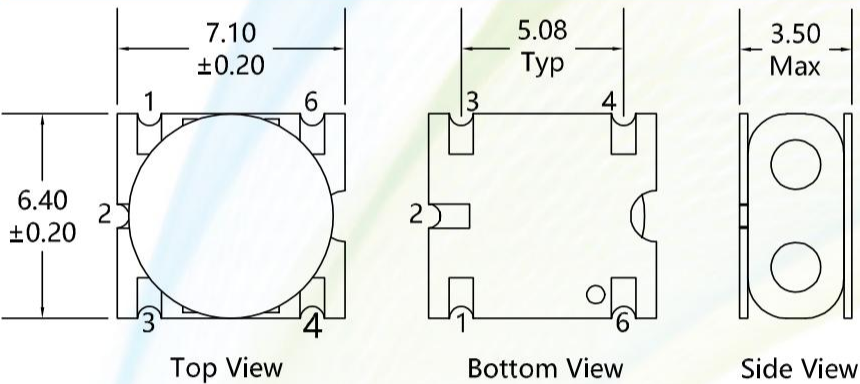


Schematics

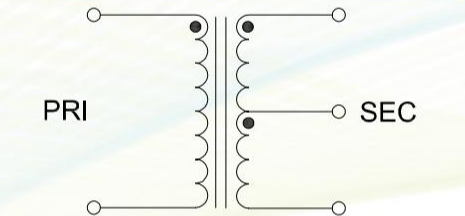


| Electrical Specifications @ 25°C |           |                     |                        |                |           |         |        |
|----------------------------------|-----------|---------------------|------------------------|----------------|-----------|---------|--------|
| Part Number                      | Frequency | Insertion Loss (dB) | Input Return Loss (dB) | Amplitude (dB) | Phase (°) | Ratio   | Zo (Ω) |
|                                  | MHz       | Max                 | Min                    | Typ            | Typ       | PRI:SEC |        |
| WHFS167011T                      | 5-300     | 1.5                 | 10.0                   | 0.2            | 2.0       | 1:2     | 75     |

Mechanical

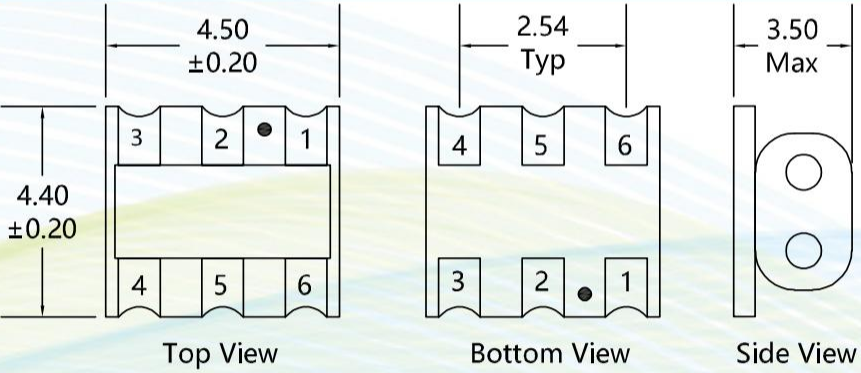


Schematics

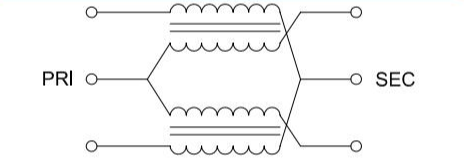


| Electrical Specifications @ 25°C |           |                |                |                        |                          |                          |                |        |
|----------------------------------|-----------|----------------|----------------|------------------------|--------------------------|--------------------------|----------------|--------|
| Part Number                      | Frequency | Out1 Loss (dB) | Out2 Loss (dB) | Input Return Loss (dB) | Output1 Return Loss (dB) | Output2 Return Loss (dB) | Isolation (dB) | Zo (Ω) |
|                                  | MHz       | Max            | Max            | Min                    | Min                      | Min                      | Min            |        |
| WHFS16810BS                      | 5-2400    | 2.5            | 4.0            | 22.0                   | 11.0                     | 9.0                      | 12.0           | 75     |
| WHFS16810CS                      | 5-1600    | 1.4            | 1.2            | 11.0                   | 14.0                     | 16.0                     | 12.0           | 75     |

Mechanical

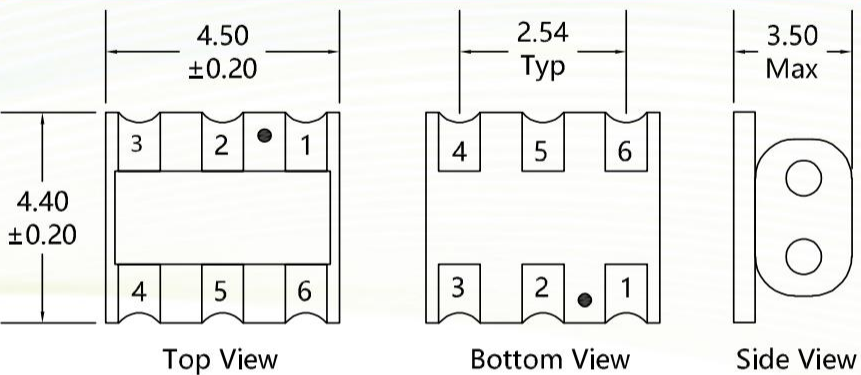


Schematics

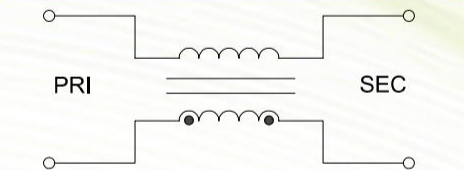


| Electrical Specifications @ 25°C |           |                     |                        |                |           |         |        |
|----------------------------------|-----------|---------------------|------------------------|----------------|-----------|---------|--------|
| Part Number                      | Frequency | Insertion Loss (dB) | Input Return Loss (dB) | Amplitude (dB) | Phase (°) | Ratio   | Zo (Ω) |
|                                  | MHz       | Max                 | Min                    | Typ            | Typ       | PRI:SEC |        |
| WHFS168031T                      | 5-1250    | 3.5                 | 13.0                   | 2.0            | 12.0      | 1:1     | 50     |

Mechanical



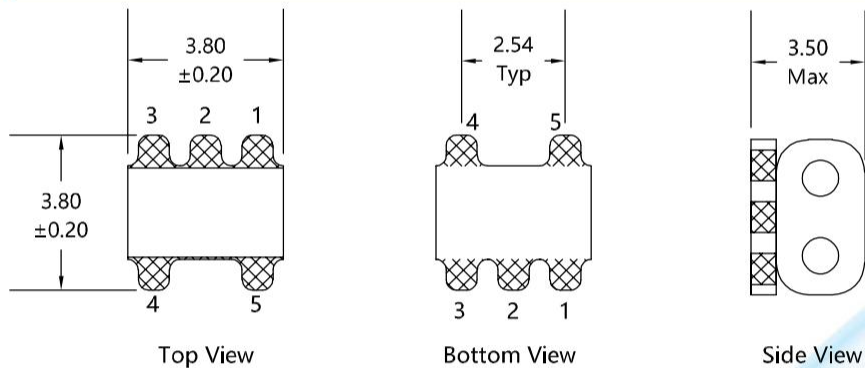
Schematics



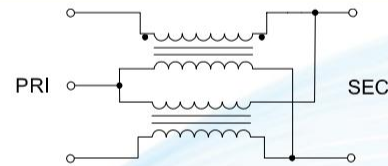


| Electrical Specifications @ 25°C |           |                     |               |                        |                         |                           |                |                    |
|----------------------------------|-----------|---------------------|---------------|------------------------|-------------------------|---------------------------|----------------|--------------------|
| Part Number                      | Frequency | Insertion Loss (dB) | Coupling (dB) | Input Return Loss (dB) | Output Return Loss (dB) | Coupling Return Loss (dB) | Isolation (dB) | Z <sub>0</sub> (Ω) |
|                                  | MHz       | Max                 | Typ           | Min                    | Min                     | Min                       | Min            |                    |
| WHFS36106DC                      | 5-1250    | 1.7                 | 10.0          | 18.0                   | 20.0                    | 18.0                      | 18.0           | 75                 |

#### Mechanical

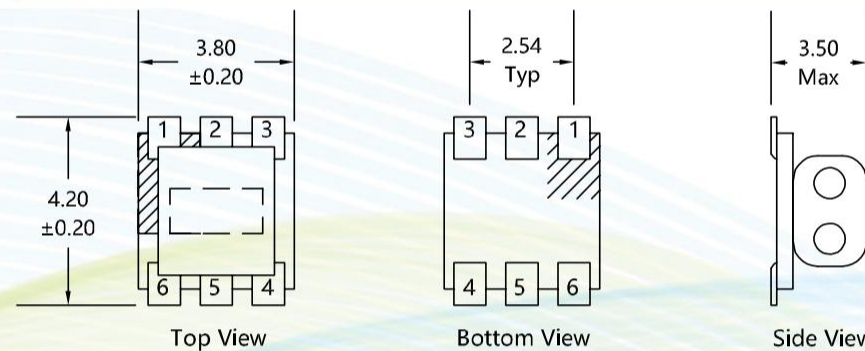


#### Schematics

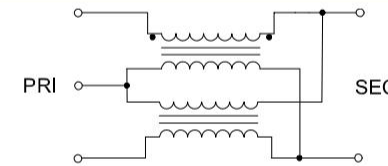


| Electrical Specifications @ 25°C |           |                     |               |                        |                         |                           |                |                    |
|----------------------------------|-----------|---------------------|---------------|------------------------|-------------------------|---------------------------|----------------|--------------------|
| Part Number                      | Frequency | Insertion Loss (dB) | Coupling (dB) | Input Return Loss (dB) | Output Return Loss (dB) | Coupling Return Loss (dB) | Isolation (dB) | Z <sub>0</sub> (Ω) |
|                                  | MHz       | Max                 | Typ           | Min                    | Min                     | Min                       | Min            |                    |
| WHFS36506EC                      | 5-2250    | 2.0                 | 16.5          | 11.0                   | 12.0                    | 10.0                      | 22.0           | 75                 |

#### Mechanical

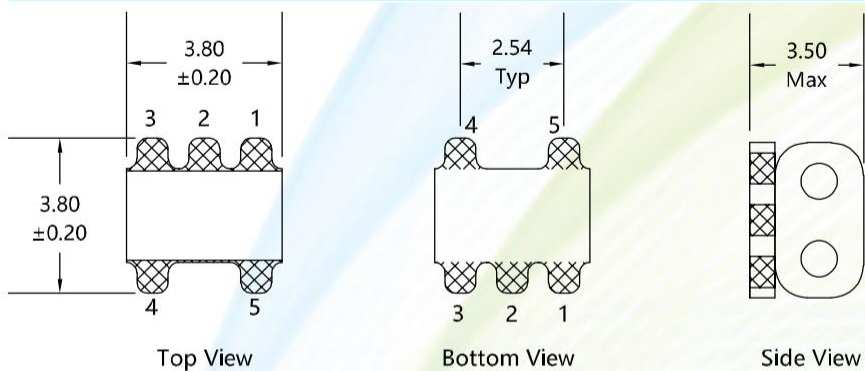


#### Schematics

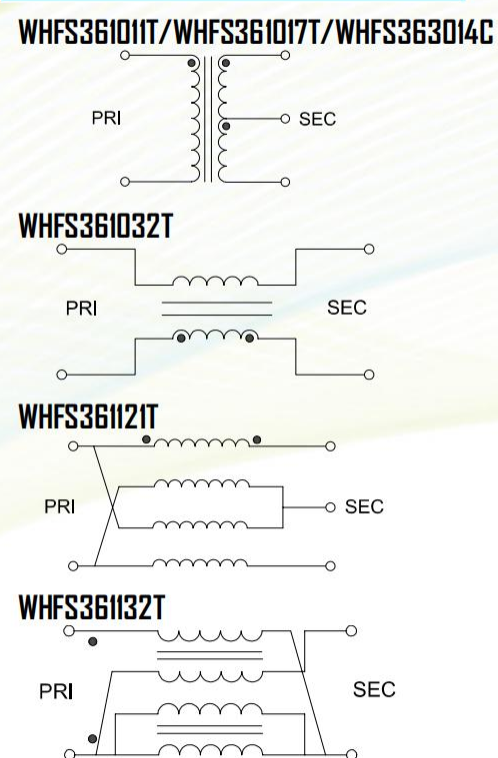


| Electrical Specifications @ 25°C |           |                     |                        |                |           |         |                    |
|----------------------------------|-----------|---------------------|------------------------|----------------|-----------|---------|--------------------|
| Part Number                      | Frequency | Insertion Loss (dB) | Input Return Loss (dB) | Amplitude (dB) | Phase (°) | Ratio   | Z <sub>0</sub> (Ω) |
|                                  | MHz       | Max                 | Min                    | Typ            | Typ       | PRI:SEC |                    |
| WHFS36101IT                      | 0.3-500   | 2.5                 | 10.0                   | 0.5            | 5.0       | 1:2     | 50                 |
| WHFS361017T                      | 5-130     | 1.8                 | 13.0                   | 0.2            | 0.5       | 1:9     | 50                 |
| WHFS361032T                      | 3-3000    | 3.5                 | 13.0                   | 2.0            | 12.0      | 1:1     | 75                 |
| WHFS361121T                      | 10-1900   | 3.5                 | 5.0                    | 0.2            | 10.0      | 1:4     | 50                 |
| WHFS361132T                      | 30-1250   | 1.5                 | 10.0                   | 0.2            | 5.0       | 1:1     | 75                 |
| WHFS363014C                      | 2-800     | 3.0                 | 13.0                   | 0.5            | 5.0       | 1:4     | 50                 |

#### Mechanical

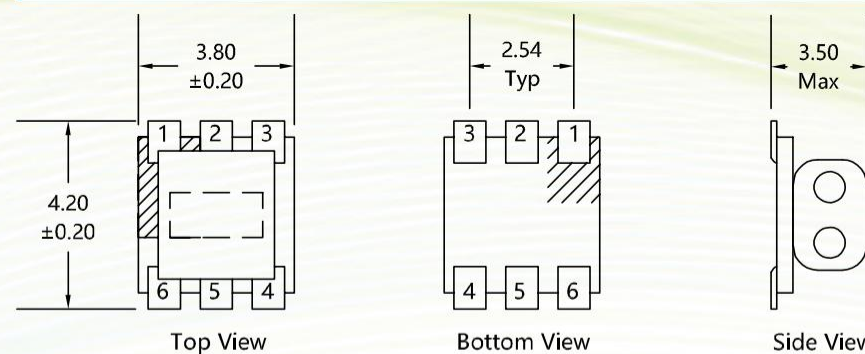


#### Schematics

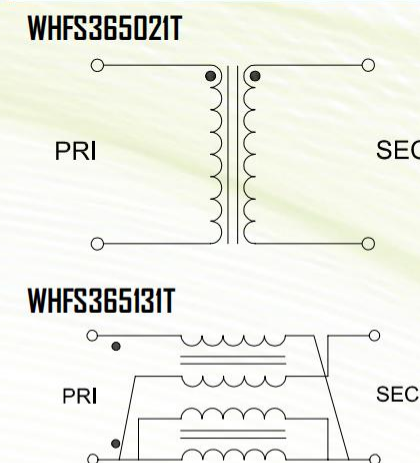


| Electrical Specifications @ 25°C |           |                     |                        |                |           |         |                    |
|----------------------------------|-----------|---------------------|------------------------|----------------|-----------|---------|--------------------|
| Part Number                      | Frequency | Insertion Loss (dB) | Input Return Loss (dB) | Amplitude (dB) | Phase (°) | Ratio   | Z <sub>0</sub> (Ω) |
|                                  | MHz       | Max                 | Min                    | Typ            | Typ       | PRI:SEC |                    |
| WHFS365021T                      | 1.5-500   | 2.0                 | 12.0                   | 0.5            | 5.0       | 1:1     | 50                 |
| WHFS365131T                      | 10-4000   | 4.5                 | 8.0                    | 1.0            | 8.0       | 1:1     | 50                 |

#### Mechanical



#### Schematics







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## NETWORK PRODUCT

### G.FAST TRANSFORMERS

我们的G.FAST系列变压器是工程师为快速传输寻找最可靠的功能隔离变压器的首选。这些紧凑的变压器提供优良的纵向平衡和总谐波失真性能。G.FAST变压器是建立在一个非常小的平台上，低漏电感小于 $0.4\mu\text{H}$ 。G.Fast是国际电联最新批准的超宽带DSL标准，适用于短于500米的本地环路，预计可向消费者住宅提供高达1Gbps的带宽。

Our Line Of G.Fast Transformers Are The Preferred Choice Of Engineers Seeking The Most Reliable, Functional Isolation Transformers For G.Fast Transmission. These Compact Transformers Deliver Excellent Longitudinal Balance And Total Harmonic Distortion Performance. The G.Fast Transformers Are Built On A Very Small Platform Of With A Low Leakage Inductance Of Less Than  $0.4\mu\text{H}$ . G.Fast Is The Newly Approved Ultra-broadband DSL Standard From The ITU For Local Loops Shorter Than 500 Meters And Is Expected To Deliver Up To 1 Gbps To Consumer Residences, ITU-T G.9701.

#### Features And Benefits

- Support All Major PHY Manufacturers
- EN60950-1 Functional Isolation Compliant
- RoHS-6 Compliant SMD Product
- Highly Compact Platform
- Low Leakage Inductance
- Available in Tape & Reel

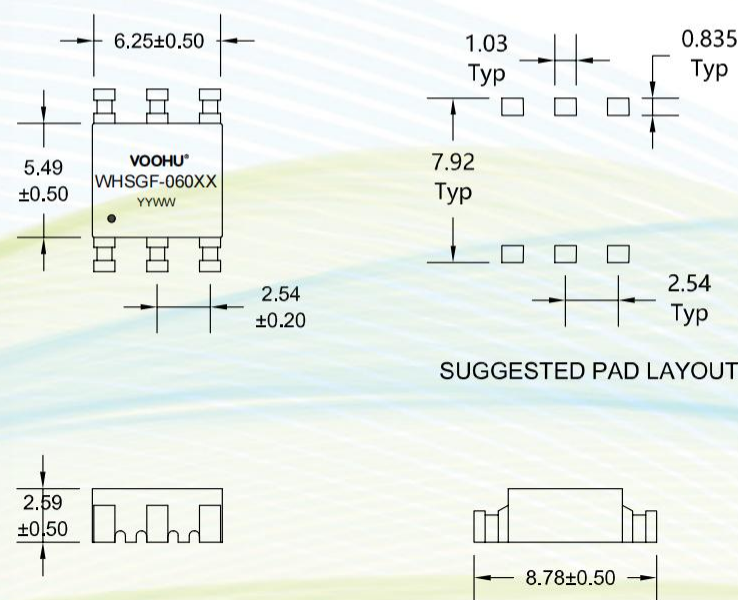
#### Applications

- Fiber To The Desktop (FTTD)
- Fiber To The Building (FTTB)
- Very-High-Bit-Rate
- Digital Subscriber Loop (VDSL)

#### Electrical Specifications @ 25°C

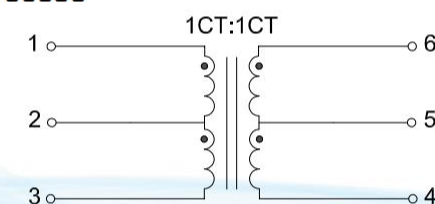
| Part Number  | OCL (MH)     |         | DCR ( $\Omega$ ) |         | Isolation Hipot (V) | Turns Ratio | Operating Temperature (°C) |
|--------------|--------------|---------|------------------|---------|---------------------|-------------|----------------------------|
|              | Condition    | 1-3 Min | PRI Max          | SEC Max | 1mA, 60s            |             |                            |
| WHS GF-06000 | 100kHz, 10mV | 40      | 0.132            | 0.142   | 1500                | 1:1         | -40 to 85                  |
| WHS GF-06010 | 100kHz, 10mV | 75      | 0.190            | 0.190   | 1500                | 1.2:1       | -40 to 85                  |
| WHS GF-06021 | 10kHz, 100mV | 96      | 0.202            | 0.235   | 1500                | 1:1.25      | -40 to 85                  |

#### Mechanical

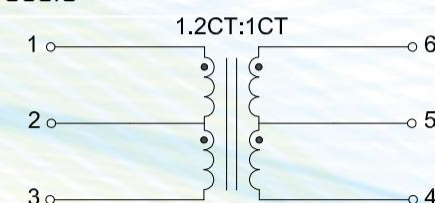


#### Schematics

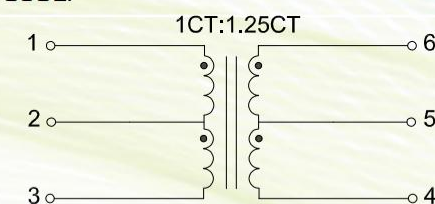
##### WHS GF-06000



##### WHS GF-06010



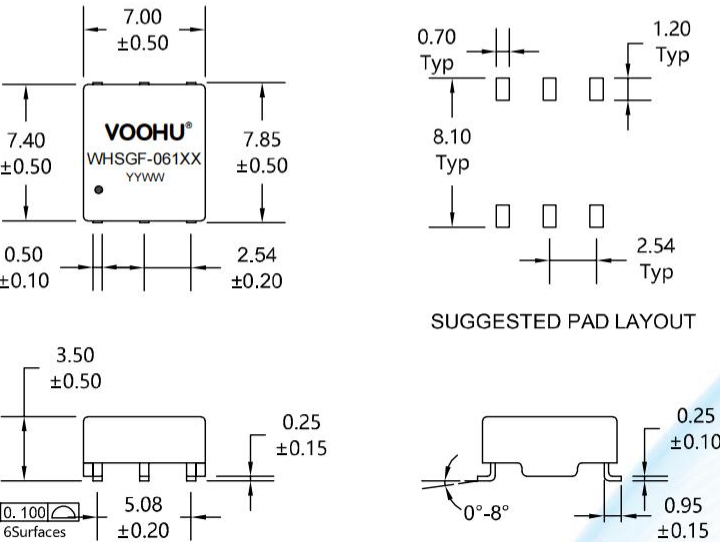
##### WHS GF-06021



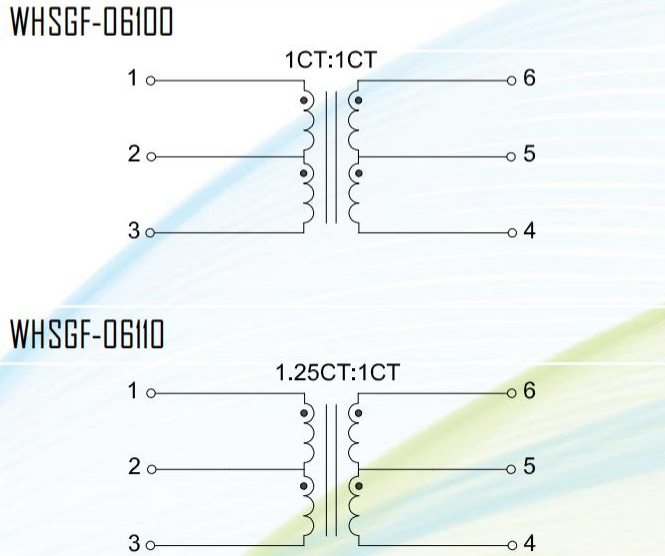


| Electrical Specifications @ 25°C |             |         |       |                     |                     |             |                            |
|----------------------------------|-------------|---------|-------|---------------------|---------------------|-------------|----------------------------|
| Part Number                      | DCL (MH)    | DCR (Ω) |       | Insertion Loss (dB) | Isolation Hipot (V) | Turns Ratio | Operating Temperature (°C) |
|                                  | 100kHz,10mV | Max     | Max   | Max                 | Min                 |             |                            |
|                                  | 1-3 Min     | PRI     | SEC   | 1-250MHz            | 1mA,60s             |             |                            |
| WHSGF-06100                      | 86          | 0.20    | 0.20  | -1.0                | 1500                | 1:1         | -40 to 85                  |
| WHSGF-06110                      | 135         | 0.25    | 0.182 | -1.5                | 1500                | 1.25:1      | -40 to 85                  |

Mechanical

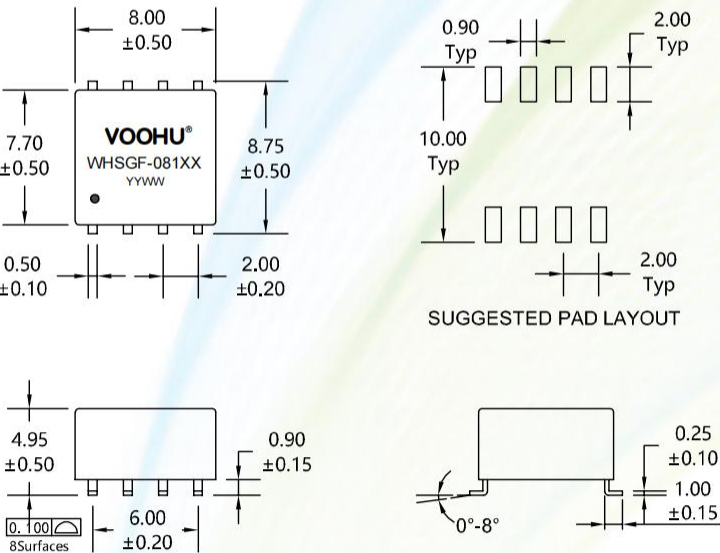


Schematics

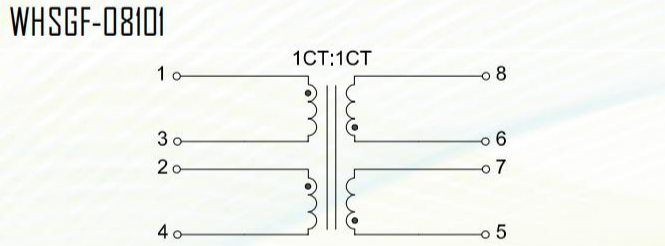


| Electrical Specifications @ 25°C |              |                     |                  |                     |             |                            |
|----------------------------------|--------------|---------------------|------------------|---------------------|-------------|----------------------------|
| Part Number                      | DCL (MH)     | Insertion Loss (dB) | Return Loss (dB) | Isolation Hipot (V) | Turns Ratio | Operating Temperature (°C) |
|                                  | 100kHz,0.1V  | Max                 | Min              | Min                 |             |                            |
|                                  | 5-8,short6-7 | 2-424MHz            | 2-424MHz         | 1mA,60s             | 15.7kHz,1V  |                            |
| WHSGF-08101                      | 65-250       | -2.3                | -6.0             | 1500                | 1:1         | -40 to 85                  |

Mechanical

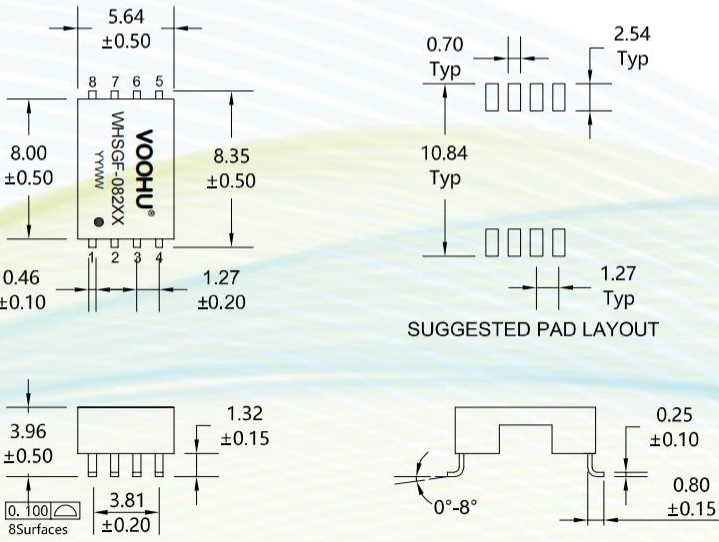


Schematics

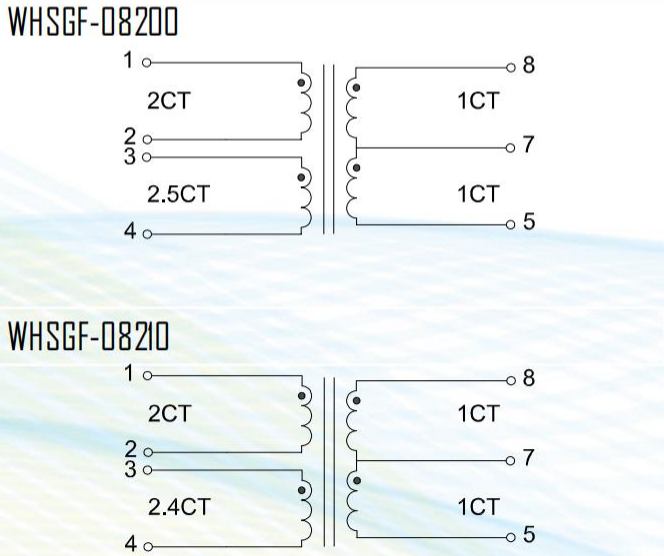


| Electrical Specifications @ 25°C |             |          |     |         |       |       |                     |                     |             |                            |
|----------------------------------|-------------|----------|-----|---------|-------|-------|---------------------|---------------------|-------------|----------------------------|
| Part Number                      | Condition   | DCL (MH) |     | DCR (Ω) |       |       | Insertion Loss (dB) | Isolation Hipot (V) | Turns Ratio | Operating Temperature (°C) |
|                                  |             | Min      |     | Max     |       |       | Max                 | Min                 |             |                            |
|                                  |             | 1-2      | 3-4 | 1-2     | 3-4   | 5-8   | 1-100MHz            | 1mA,60s             |             |                            |
| WHSGF-08200                      | 10kHz,100mV | 47       | 74  | 0.10    | 0.105 | 0.094 | -1.25               | 1500                | 2:2.5:1:1   | -40 to 85                  |
| WHSGF-08210                      | 100kHz,10mV | 60       | 86  | 0.169   | 0.20  | 0.228 | -1.0                | 1500                | 2:2.4:1:1   | -40 to 85                  |

Mechanical



Schematics







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## NETWORK PRODUCT

### CHIP LAN

新的片式网络变压器完全突破了传统的设计模式，开发团队的灵感来自于SMD共模电感器的设计。为了使新型片式网络变压器的大规模生产成为可能，VOOHU采用了自动缠绕铁芯再焊接到端银的方法。VOOHU为客户提供分离式新型网络变压器单元或集成模块，以取代传统的脉冲变压器。

The New Chip Pulse Transformer Completely Breaks Through The Traditional Design Pattern, And The Development Team Was Inspired By The Design Of SMD Common Mode Inductors. To Make Large-scale Production Of Chip Pulse Transformers Possible, VOOHU USES The Method Of Automatically Winding The Iron Core And Then Connecting It To The Plate Plate Core. VOOHU Provides Customers With Discrete Chip Pulse Transformer is Or Integrated Modules To Replace Traditional Pulse Transformers

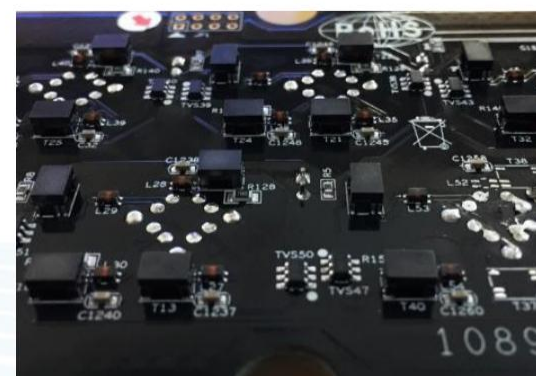
### Features And Benefits

- Compliant With Ethernet 10/100/1000 Base-T
- Compliant With Ethernet 2.5/5G and 10G Base-T
- 100 % Automatic Production
- Improved Return Loss And Crosstalk Properties
- Super Small Size
- Operating Temperature: -40 °C Up To +105 °C

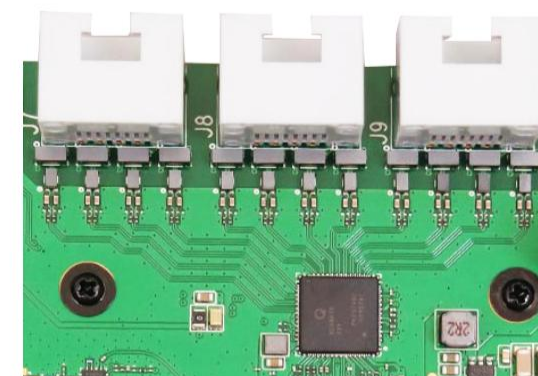
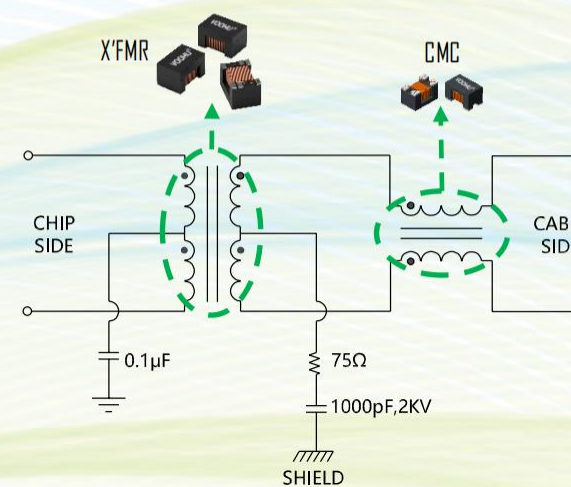
### Applications

- Ethernet Connector Module
- Router
- G.Fast
- PON

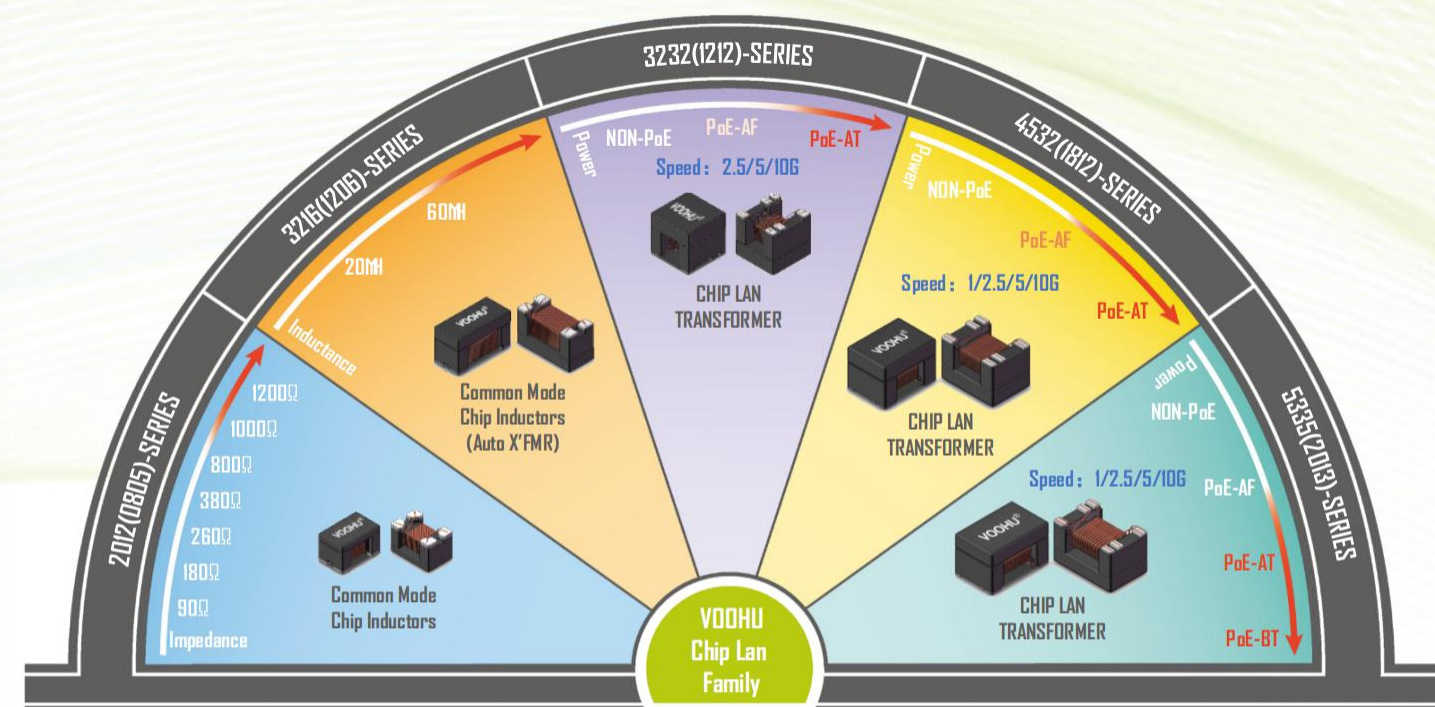
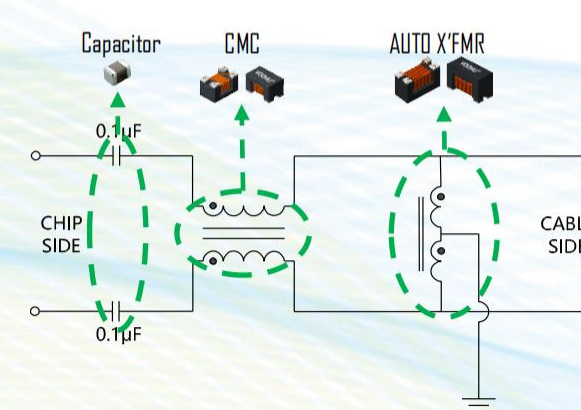
## Product Application And Principle



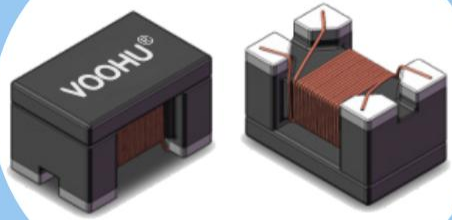
Inductive Chip LAN on Board



Capacitive Chip LAN on Board







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## NETWORK PRODUCT

### COMMON MODE CHIP INDUCTORS

#### 2012(0805)-SERIES

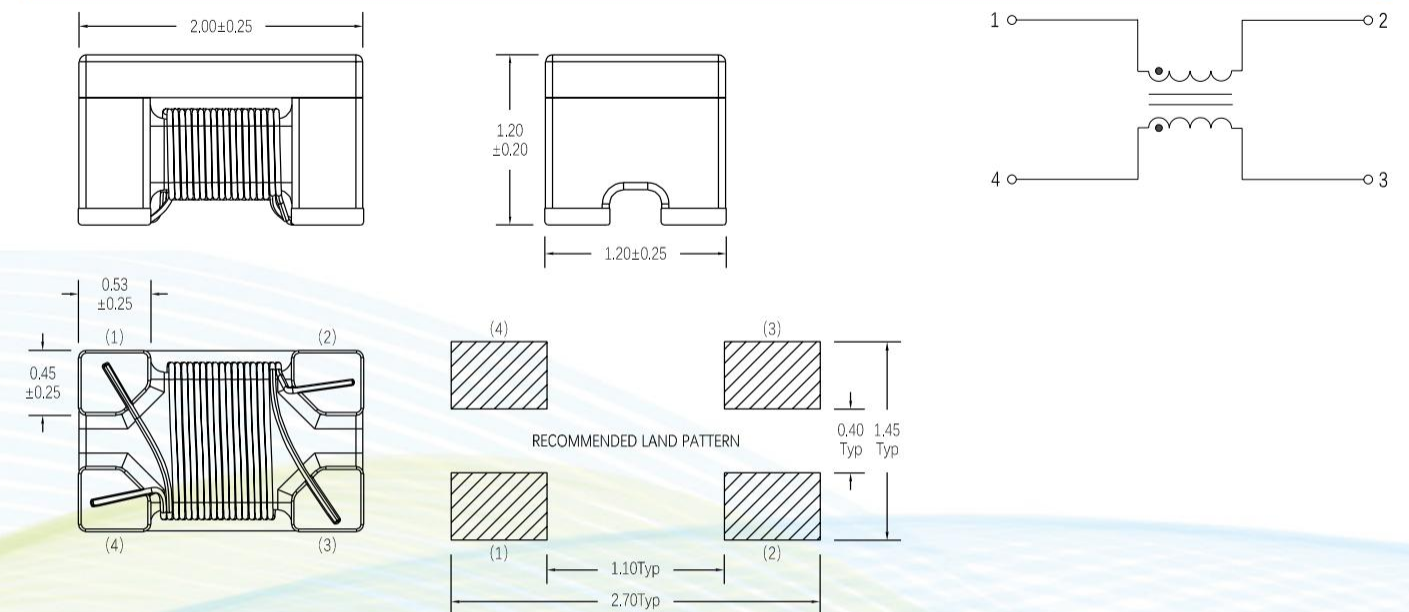
#### Features And Benefits

- Large Range of Common Mode Impedance to Fit With Signal And Noise Level
- Suppression of Common Mode Noise Without Attenuating The Signal
- High-Quality Product That Uses Auto Winding
- Available in 2012(0805) Size
- RoHS Compliant

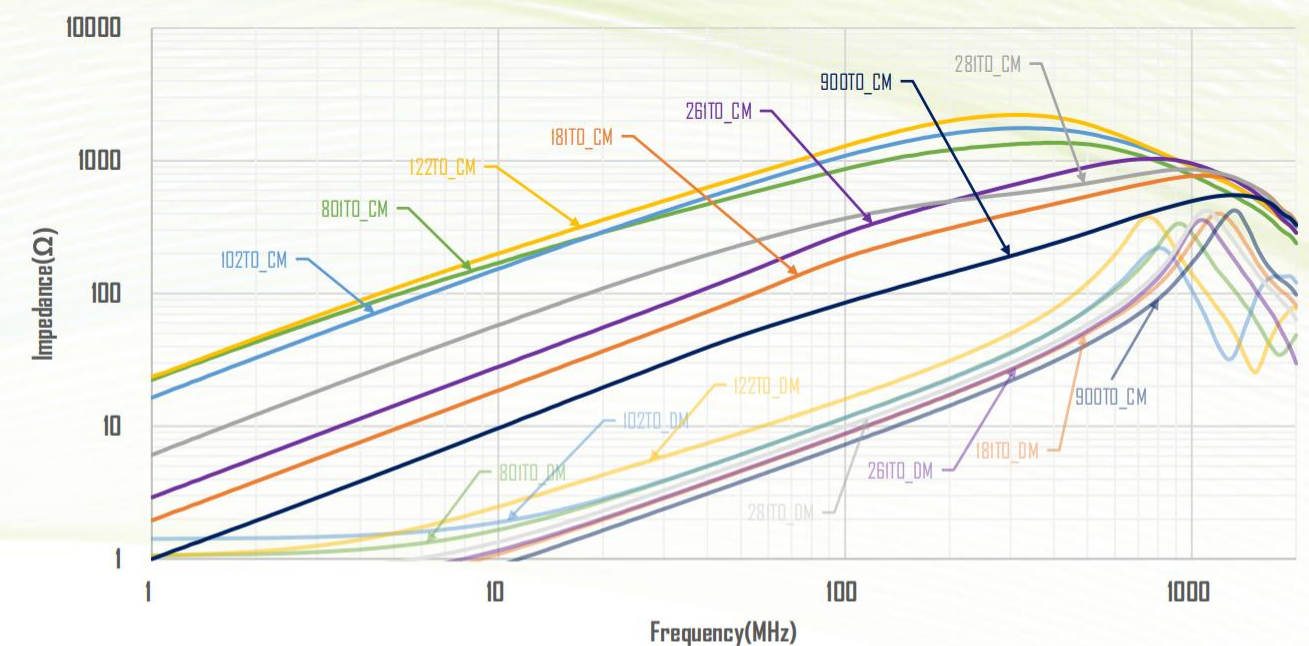
#### Electrical Specifications @ 25°C

| Part Number      | Common Mode Impedance 100MHz (Ω Typ) | DC Resistance (Ω MAX) | Rated Voltage (Vdc) | Rated Current (mA MAX) | Withstanding Voltage (Vdc) | Insulation Resistance (MΩ MIN) |
|------------------|--------------------------------------|-----------------------|---------------------|------------------------|----------------------------|--------------------------------|
| WHLC-2012A-900TO | 90                                   | 0.35                  | 50                  | 300                    | 125                        | 10                             |
| WHLC-2012A-181TO | 180                                  | 0.35                  | 50                  | 300                    | 125                        | 10                             |
| WHLC-2012A-261TO | 260                                  | 0.40                  | 50                  | 300                    | 125                        | 10                             |
| WHLC-2012A-381TO | 380                                  | 0.45                  | 50                  | 300                    | 125                        | 10                             |
| WHLC-2012A-801TO | 800                                  | 0.88                  | 50                  | 300                    | 125                        | 10                             |
| WHLC-2012A-102TO | 1000                                 | 1.30                  | 50                  | 300                    | 125                        | 10                             |
| WHLC-2012A-122TO | 1200                                 | 1.50                  | 50                  | 300                    | 125                        | 10                             |

#### Mechanical & Schematics



#### Impedance VS. Frequency

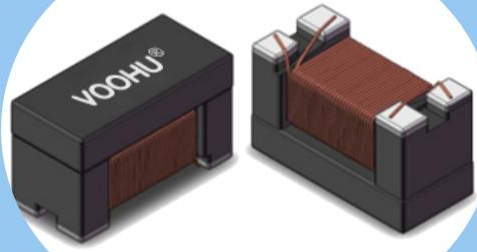


#### Measurement Equipment

Product No. \_\_\_\_\_ Manufacturer \_\_\_\_\_  
E4991A \_\_\_\_\_ Keysight Technologies \_\_\_\_\_

\*Equivalent Measurement Equipment May Be Used.





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## NETWORK PRODUCT

### COMMON MODE CHIP INDUCTORS

### 3216(1206)-SERIES

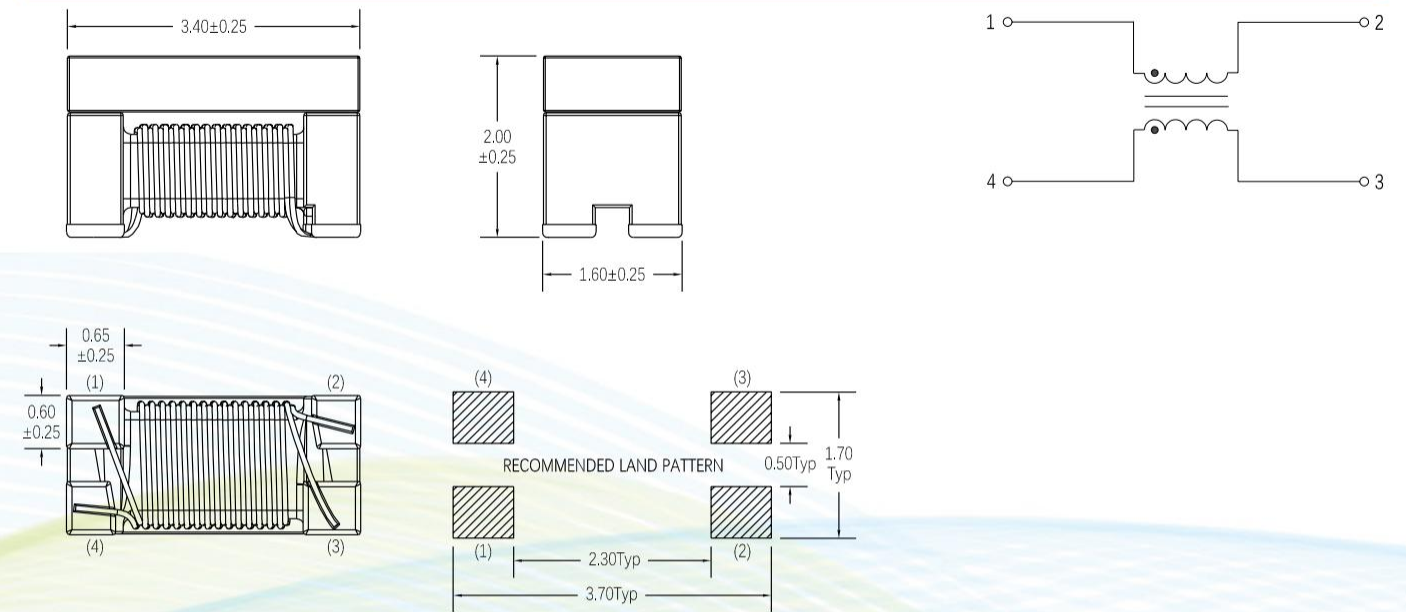
#### Features And Benefits

- Large Range of Common Mode Impedance to Fit With Signal And Noise Level
- Suppression of Common Mode Noise Without Attenuating The Signal
- High-Quality Product That Uses Auto Winding
- Available in 3216(1206) Size
- RoHS Compliant

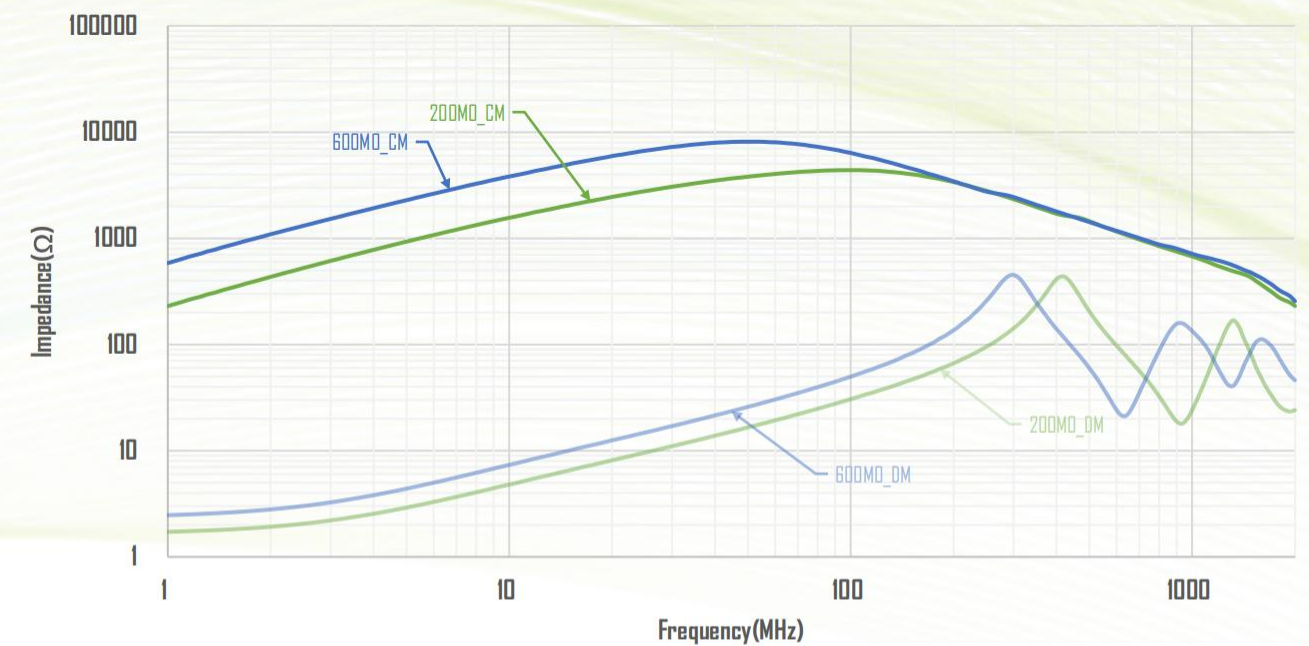
#### Electrical Specifications @ 25°C

| Part Number      | Inductance<br>100KHz/0.1V<br>(μH)Min | DC Resistance<br>(Ω)Max | Rated<br>Current<br>(mA) | Rated Volt<br>(VDC) | Withstand Volt<br>(VDC)<br>Max | Insulation<br>Resistance<br>(MΩ Min) |
|------------------|--------------------------------------|-------------------------|--------------------------|---------------------|--------------------------------|--------------------------------------|
| WHLC-3216A-200MO | 20                                   | 1.00                    | 200                      | 50                  | 125                            | 10                                   |
| WHLC-3216A-600MO | 60                                   | 1.70                    | 200                      | 50                  | 125                            | 10                                   |

#### Mechanical & Schematics



#### Impedance VS. Frequency

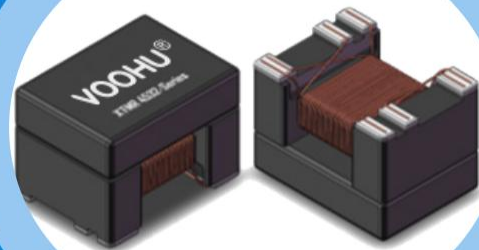


#### Measurement Equipment

| Product No. | Manufacturer          |
|-------------|-----------------------|
| E4991A      | Keysight Technologies |

\*Equivalent Measurement Equipment May Be Used.





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## NETWORK PRODUCT

### CHIP LAN TRANSFORMER

### 4532(1812)-SERIES

#### Features And Benefits

- Compliant With Ethernet 1/2.5/5/10GBase-T
- 100 % Automatic Production
- Improved Return Loss And Cross Talk Properties
- Super Small Size
- Available in 4532(1812) Size
- RoHS Compliant

10GBase-T Series Electrical Specifications @ 25° C

| Part Number       | Speed | OCL<br>(μH)   | DCR<br>(Ω) | Insertion Loss<br>(dB) |                  | Return Loss<br>(dB) |                 | Operating<br>Temperature<br>(°C) | PoE<br>Rating | Hi-Pot<br>(Vrms) |
|-------------------|-------|---------------|------------|------------------------|------------------|---------------------|-----------------|----------------------------------|---------------|------------------|
|                   |       | Min           | Max        | Max                    |                  | Min                 |                 |                                  |               |                  |
|                   |       | 100KHz,0.1V   |            | 0.5-1<br>MHz           | 1-125<br>MHz     | 1-40<br>MHz         | 40-100<br>MHz   |                                  |               |                  |
| WHLT-4532B-20IMGN | 1G    | 200@8mA DC    | 3.00       | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20log(f/80) | -40 to 85                        | NON-PoE       | 1200             |
| WHLT-4532B-20IMGF | 1G    | 200@10.5mA DC | 3.00       | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20log(f/80) | -40 to 85                        | PoE-AF        | 1200             |
| WHLT-4532B-35IMGN | 1G    | 350@8mA DC    | 6.00       | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20log(f/80) | -40 to 85                        | NON-PoE       | 1200             |
| WHLT-4532B-35IMGF | 1G    | 350@10.5mA DC | 6.00       | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20log(f/80) | -40 to 85                        | PoE-AF        | 1200             |
| WHLT-4532B-18IMGT | 1G    | 180@15mA DC   | 6.00       | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20log(f/80) | -40 to 85                        | PoE-AT        | 1200             |

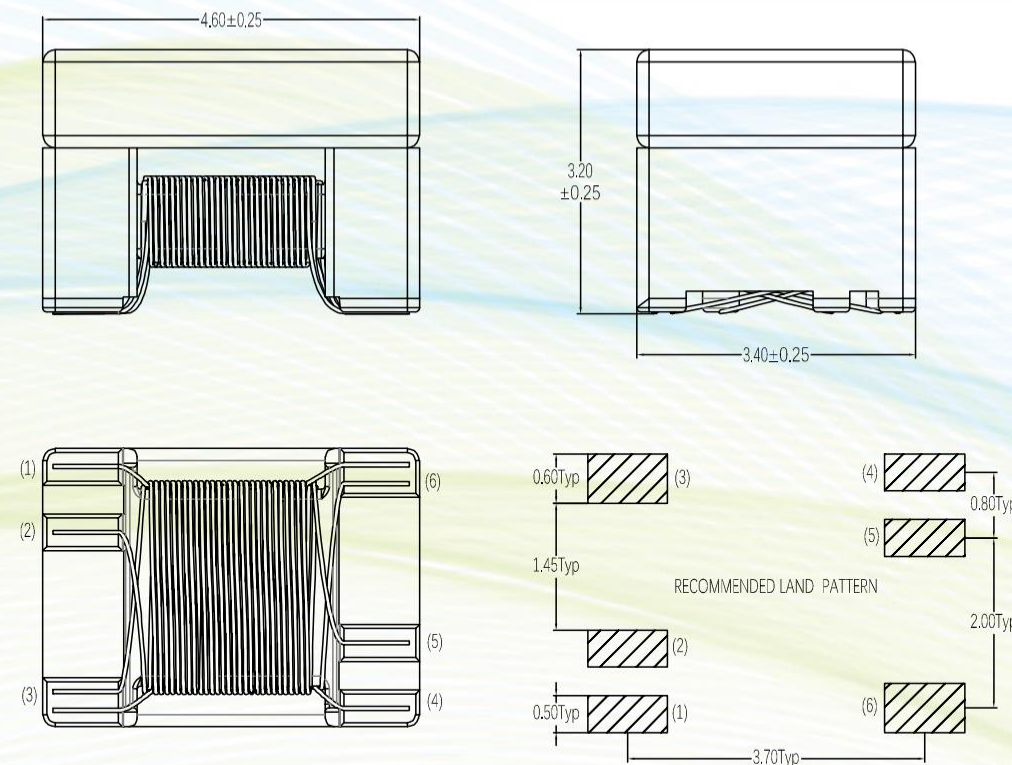
2.5/5GBase-T Series Electrical Specifications @ 25° C

| Part Number       | Speed  | OCL<br>(μH)   | DCR<br>(Ω) | Insertion Loss<br>(dB) |              | Return Loss<br>(dB) |                 | Operating<br>Temperature<br>(°C) | PoE<br>Rating | Hi-Pot<br>(Vrms) |
|-------------------|--------|---------------|------------|------------------------|--------------|---------------------|-----------------|----------------------------------|---------------|------------------|
|                   |        | Min           | Max        | Max                    |              | Min                 |                 |                                  |               |                  |
|                   |        | 100KHz,0.1V   |            | 1-100<br>MHz           | 1-250<br>MHz | 1-40<br>MHz         | 40-250<br>MHz   |                                  |               |                  |
| WHLT-4532B-20IMQN | 2.5/5G | 200@8mA DC    | 3.00       | -1.0                   | -2.0         | -16                 | -16+10log(f/40) | -40 to 85                        | NON-PoE       | 1200             |
| WHLT-4532B-20IMQF | 2.5/5G | 200@10.5mA DC | 3.00       | -1.0                   | -2.0         | -16                 | -16+10log(f/40) | -40 to 85                        | PoE-AF        | 1200             |
| WHLT-4532B-18IMQT | 2.5/5G | 180@15mA DC   | 3.00       | -1.0                   | -2.0         | -16                 | -16+10log(f/40) | -40 to 85                        | PoE-AT        | 1200             |

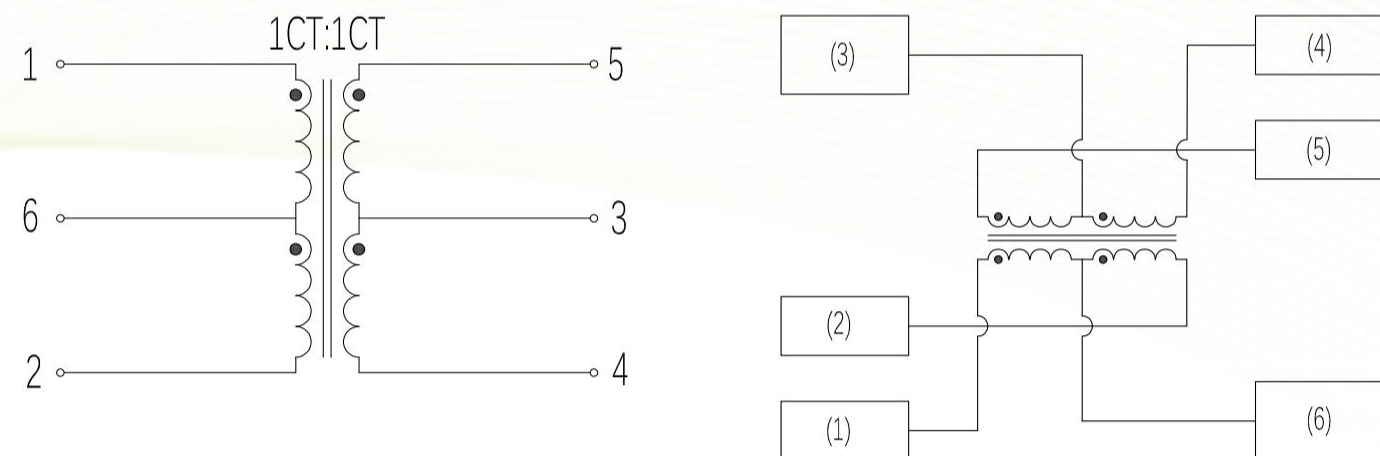
10GBase-T Series Electrical Specifications @ 25° C

| Part Number       | Speed | OCL<br>(μH)   | DCR<br>(Ω) | Insertion Loss<br>(dB) |                    |                    |                    | Return Loss<br>(dB) |                    |                    |                    |                    | Operating<br>Temperature<br>(°C) | PoE<br>Rating | Hi-Pot<br>(Vrms) |
|-------------------|-------|---------------|------------|------------------------|--------------------|--------------------|--------------------|---------------------|--------------------|--------------------|--------------------|--------------------|----------------------------------|---------------|------------------|
|                   |       | Min           | Max        | Max                    |                    |                    |                    | Min                 |                    |                    |                    |                    |                                  |               |                  |
|                   |       | 100KHz,0.1V   |            | 1-<br>200<br>MHz       | 200-<br>300<br>MHz | 300-<br>400<br>MHz | 400-<br>500<br>MHz | 1-<br>100<br>MHz    | 100-<br>200<br>MHz | 200-<br>300<br>MHz | 300-<br>400<br>MHz | 400-<br>500<br>MHz |                                  |               |                  |
| WHLT-4532B-12IMMN | 10G   | 120@8mA DC    | 2.00       | -1.2                   | -1.5               | -2.0               | -3.0               | -18                 | -16                | -12                | -10                | -8                 | -40 to 85                        | NON-PoE       | 1200             |
| WHLT-4532B-12IMMF | 10G   | 120@10.5mA DC | 2.00       | -1.2                   | -1.5               | -2.0               | -3.0               | -18                 | -16                | -12                | -10                | -8                 | -40 to 85                        | PoE-AF        | 1200             |
| WHLT-4532B-12IMMT | 10G   | 120@15mA DC   | 2.00       | -1.2                   | -1.5               | -2.0               | -3.0               | -18                 | -16                | -12                | -10                | -8                 | -40 to 85                        | PoE-AT        | 1200             |

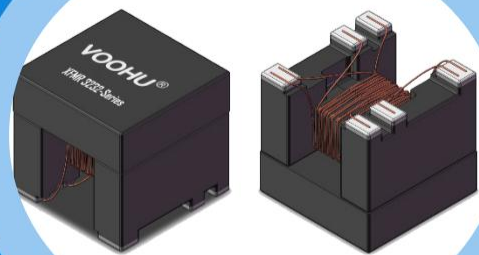
#### Mechanical



#### Schematics & Application







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## NETWORK PRODUCT

### CHIP LAN TRANSFORMER 3232(1212)-SERIES

#### Features And Benefits

- Compliant With Ethernet 2.5/5/10GBase-T
- 100 % Automatic Production
- Improved Return Loss And Cross Talk Properties
- Super Small Size
- Available in 3232(1212) Size
- RoHS Compliant

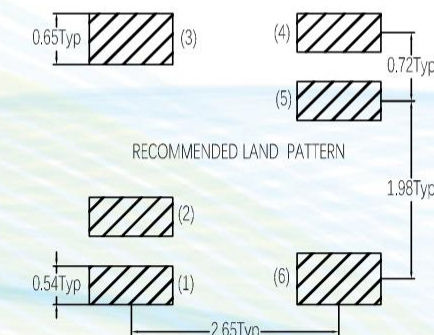
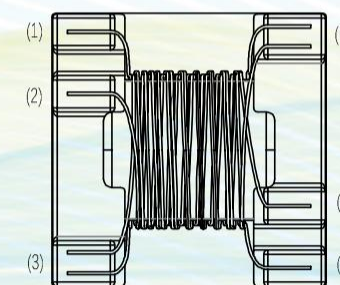
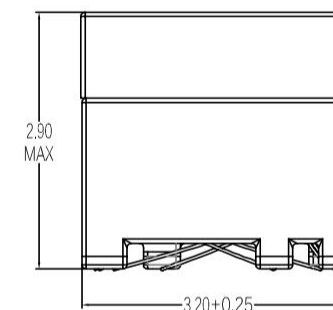
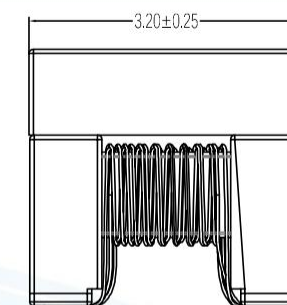
**2.5/5GBase-T Series Electrical Specifications @ 25° C**

| Part Number       | Speed  | OCL<br>( $\mu$ H) | DCR<br>( $\Omega$ ) | Insertion Loss<br>(dB) |              | Return Loss<br>(dB) |                 | Operating<br>Temperature<br>( $^{\circ}$ C) | PoE<br>Rating | Hi-Pot<br>(Vrms) |
|-------------------|--------|-------------------|---------------------|------------------------|--------------|---------------------|-----------------|---------------------------------------------|---------------|------------------|
|                   |        | Min               | Max                 | Max                    |              | Min                 |                 |                                             |               |                  |
|                   |        | 100KHz,0.1V       |                     | 1-100<br>MHz           | 1-250<br>MHz | 1-40<br>MHz         | 40-100<br>MHz   |                                             |               |                  |
| WHLT-3232A-121MQN | 2.5/5G | 120@8mA DC        | 4.50                | -1.0                   | -2.0         | -16                 | -16+10log(f/40) | -40 to 85                                   | NON-PoE       | 1200             |
| WHLT-3232A-121MQF | 2.5/5G | 120@10.5mA DC     | 4.50                | -1.0                   | -2.0         | -16                 | -16+10log(f/40) | -40 to 85                                   | PoE-AF        | 1200             |

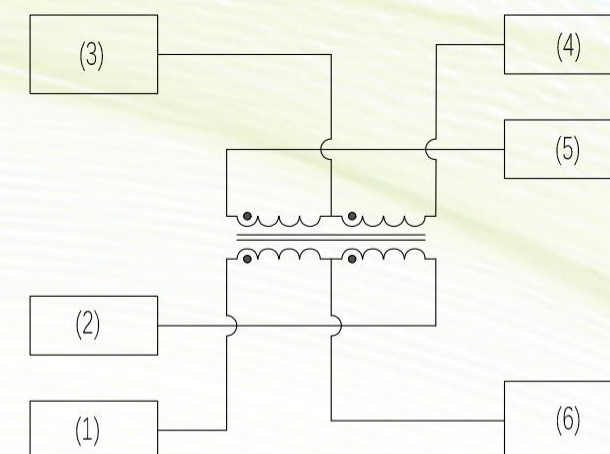
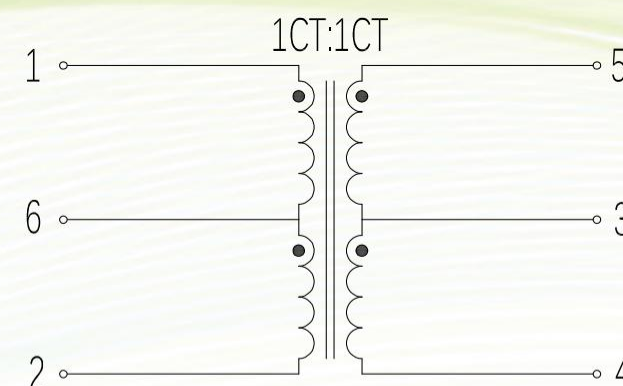
**10GBase-T Series Electrical Specifications @ 25° C**

| Part Number       | Speed | OCL<br>( $\mu$ H) | DCR<br>( $\Omega$ ) | Insertion Loss<br>(dB) |                    |                        |                    | Return Loss<br>(dB) |                    |                    |                        | Operating<br>Temperature<br>( $^{\circ}$ C) | PoE<br>Rating | Hi-Pot<br>(Vrms) |                    |
|-------------------|-------|-------------------|---------------------|------------------------|--------------------|------------------------|--------------------|---------------------|--------------------|--------------------|------------------------|---------------------------------------------|---------------|------------------|--------------------|
|                   |       | Min               | Max                 | Max                    |                    |                        |                    | Min                 |                    |                    |                        |                                             |               |                  |                    |
|                   |       | 100KHz,0.1V       |                     | 1-<br>200<br>MHz       | 200-<br>300<br>MHz | 300-400-<br>400<br>MHz | 400-<br>500<br>MHz | 1-<br>100-<br>MHz   | 100-<br>200<br>MHz | 200-<br>300<br>MHz | 300-400-<br>400<br>MHz |                                             |               |                  | 400-<br>500<br>MHz |
| WHLT-3232A-121MMN | 10G   | 120@8mA DC        | 4.50                | -1.2                   | -1.5               | -2.0                   | -3.0               | -18                 | -16                | -12                | -10                    | -8                                          | -40 to 85     | NON-PoE          | 1200               |
| WHLT-3232A-121MMF | 10G   | 120@10.5mA DC     | 4.50                | -1.2                   | -1.5               | -2.0                   | -3.0               | -18                 | -16                | -12                | -10                    | -8                                          | -40 to 85     | PoE-AF           | 1200               |
| WHLT-3232A-121MMT | 10G   | 120@15mA DC       | 4.50                | -1.2                   | -1.5               | -2.0                   | -3.0               | -18                 | -16                | -12                | -10                    | -8                                          | -40 to 85     | PoE-AT           | 1200               |

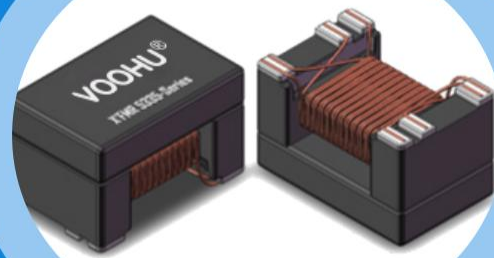
#### Mechanical



#### Schematics & Application







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## NETWORK PRODUCT

### CHIP LAN TRANSFORMER

### 5335(2013)-SERIES

#### Features And Benefits

- Compliant With Ethernet 1/2.5/5/10GBase-T
- 100 % Automatic Production
- Improved Return Loss And Cross Talk Properties
- Super Small Size
- Available in 5335(2013) Size
- RoHS Compliant

#### 1GBase-T Series Electrical Specifications @ 25° C

| Part Number       | Speed | OCL<br>(μH) | DCR<br>(Ω) | Insertion Loss<br>(dB) |                  | Return Loss<br>(dB) |                 | Operating<br>Temperature<br>(°C) | PoE<br>Rating | Hi-Pot<br>(Vrms) |
|-------------------|-------|-------------|------------|------------------------|------------------|---------------------|-----------------|----------------------------------|---------------|------------------|
|                   |       | Min         | Max        | Max                    |                  | Min                 |                 |                                  |               |                  |
|                   |       | 100KHz,0.1V |            | 0.5-1<br>MHz           | 1-125<br>MHz     | 1-40<br>MHz         | 40-100<br>MHz   |                                  |               |                  |
| WHLT-5335A-20IMGB | 1G    | 200@21mA DC | 3.00       | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20log(f/80) | -40 to 85                        | PoE-BT        | 1200             |
| WHLT-5335A-25IMGB | 1G    | 250@21mA DC | 3.00       | -1.2                   | -0.2-0.002*f^1.4 | -16                 | -10+20log(f/80) | -40 to 85                        | PoE-BT        | 1200             |

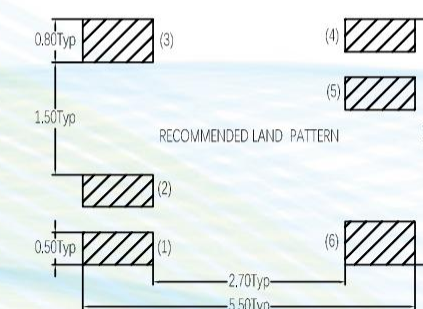
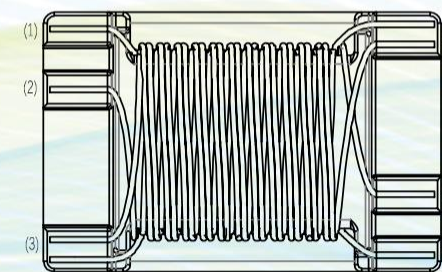
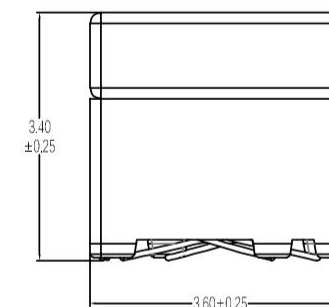
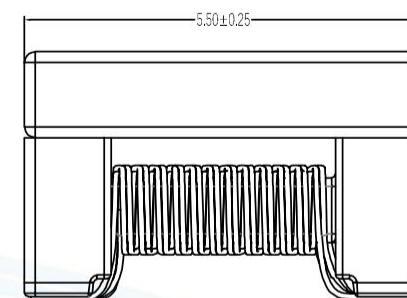
#### 2.5/5GBase-T Series Electrical Specifications @ 25° C

| Part Number        | Speed  | OCL<br>(μH) | DCR<br>(Ω) | Insertion Loss<br>(dB) |              | Return Loss<br>(dB) |                 | Operating<br>Temperature<br>(°C) | PoE<br>Rating | Hi-Pot<br>(Vrms) |
|--------------------|--------|-------------|------------|------------------------|--------------|---------------------|-----------------|----------------------------------|---------------|------------------|
|                    |        | Min         | Max        | Max                    |              | Min                 |                 |                                  |               |                  |
|                    |        | 100KHz,0.1V |            | 1-100<br>MHz           | 1-250<br>MHz | 1-40<br>MHz         | 40-100<br>MHz   |                                  |               |                  |
| WHLT--5335A-18IMQB | 2.5/5G | 180@21mA DC | 4.50       | -1.0                   | -2.0         | -16                 | -16+10log(f/40) | -40 to 85                        | PoE-BT        | 1200             |

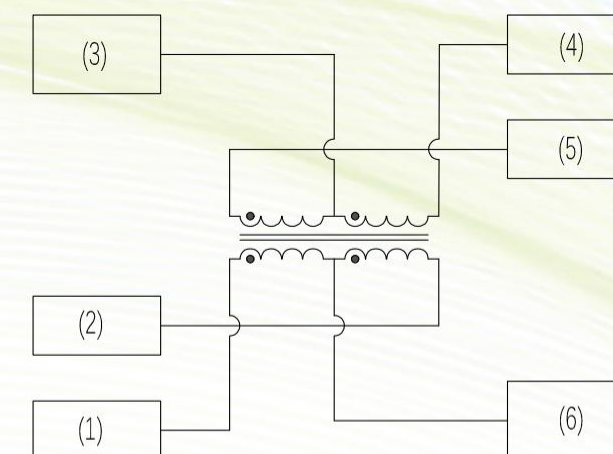
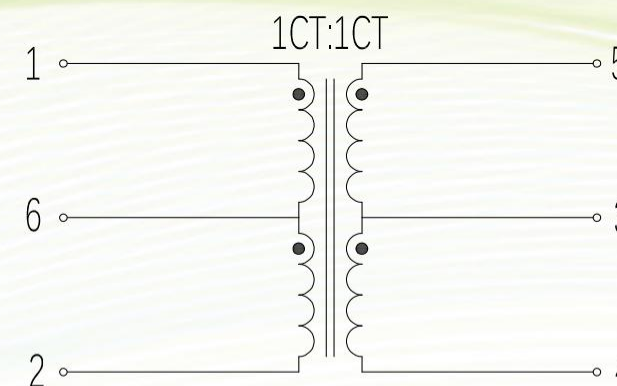
#### 10GBase-T Series Electrical Specifications @ 25° C

| Part Number       | Speed | OCL<br>(μH) | DCR<br>(Ω) | Insertion Loss<br>(dB) |                    |                    |                    | Return Loss<br>(dB) |                    |                    |                    |                    | Operating<br>Temperature<br>(°C) | PoE<br>Rating | Hi-Pot<br>(Vrms) |
|-------------------|-------|-------------|------------|------------------------|--------------------|--------------------|--------------------|---------------------|--------------------|--------------------|--------------------|--------------------|----------------------------------|---------------|------------------|
|                   |       | Min         | Max        | Max                    |                    |                    |                    | Min                 |                    |                    |                    |                    |                                  |               |                  |
|                   |       | 100KHz,0.1V |            | 1-<br>200<br>MHz       | 200-<br>300<br>MHz | 300-<br>400<br>MHz | 400-<br>500<br>MHz | 1-<br>100<br>MHz    | 100-<br>200<br>MHz | 200-<br>300<br>MHz | 300-<br>400<br>MHz | 400-<br>500<br>MHz |                                  |               |                  |
| WHLT-5335A-12IMMB | 10G   | 120@21mA DC | 1.00       | -1.2                   | -1.5               | -2.0               | -3.0               | -18                 | -16                | -12                | -10                | -8                 | -40 to 85                        | PoE-BT        | 1200             |

#### Mechanical



#### Schematics & Application





VOOHU 已设计和制造电源磁性元件超过12年。 我们拥有丰富的产品和制造创新历史，多样化的专利组合和先进的自动化装配和测试，这使我们能够快速生产出具有成本效益、高质量、高可靠性的产品。我们提供一个完整的电源磁性器件系列选型目录，其中包括了功率电感，功率变压器，隔离变压器，电流互感器，共模电感；除了我们广泛的产品目录外，我们还设计和制造定制和应用特定的磁性解决方案

VOOHU Electronics Power PBU Has Been Designing And Manufacturing Power Magnetic Components For More Than 50yrs. We Have A Rich History Of Product And Manufacturing Innovation, A Diverse Patent Portfolio And World Class Automated Assembly And Test Which Allows Us To Ramp Quickly And Produce Cost-effective, High-Quality, Robust And Reliable Components. We Offer A Complete Line Of Catalog Power Magnetics For Switch Mode Power Applications Including Power Inductors, Power Transformers, Isolation Transformers, Current Sense Magnetics And Common Mode Chokes In Addition To Our Extensive Catalog Line We Also Design And Manufacture Custom And Application Specific Magnetic Solutions.



### 汽车 AUTOMOTIVE

- 车载充电-On Board Charger(OBC)
- 直流/直流转换-DC/DC Conversion
- 变频器-Small Cell Base Station
- 牵引马达-Traction Motor
- 照明控制-Lighting Control
- 摄影机及安全系统-Camera And Security Systems



### 工业 INDUSTRIAL

- 自动化-Automation
- 过程控制-Process Control
- 机器人-Robotic
- 安全显示-Security Display
- 智能电网-Smart Grid
- 防爆系统-Explosion Protection System

### 新能源 NEW ENERGY

- 太阳能-Solar Power
- 风力-Wind Power
- 计量和存储-Metering & Storage
- 荷载控制-Load Control
- 安全系统-Security System
- 电池管理-Battery Management
- 智能电网-Smart Grid



### 信息处理 COMPUTING

- 服务器-Server
- 工作站-Work Station
- 数据存储-Data Storage
- 显示卡-Graphics Card
- 硬盘驱动器-Hard Drive
- 计算机-Computer

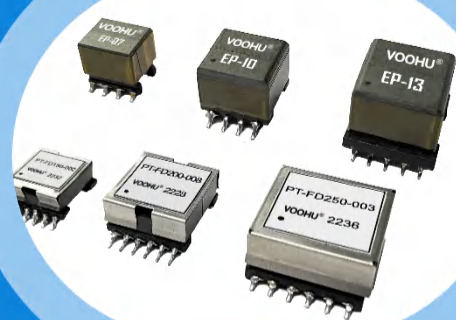


### 网络通讯 COMMUNICATION

- 基站-Base Station
- 接入点-Access Point
- 网关-Gateway
- 交换机-Switch
- 路由器-Router







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## POWER PRODUCT

### POWER OVER ETHERNET TRANSFORMER

目前越来越多的设备均具备局域网连接功能，以方便通信连接。最简单的解决方案是通过LAN网线（以太网供电）为设备进行供电，这样就无需使用单独的电源装置。现有的系统大多采用符合IEEE 802.3af (PoE)和IEEE 802.3at (PoE+) 标准要求的双股端口输出，输出功率分别为15W和30W。VOOHU的变压器经过专门设计，采用符合PoE和PoE+标准的输出，可为设备提供高功率输出。新系列变压器的典型应用场合包括视频和POS系统，以及照明控制器、火警系统或门禁系统等楼宇管理系统。

An Increasing Number Of Devices Offer LAN Connectivity For Communication Purposes. The Obvious Solution Therefore Is To Power Them Via The LAN Cable As Well (Power Over Ethernet), So That No Separate Power Supplies Are Necessary. Existing Systems With Two Pairs Of Cables Compliant With IEEE 802.3af (PoE) And IEEE 802.3at (PoE+) Are Designed For Outputs Of 15W And 30W, Respectively. The PoE And PoE+ Standard, Which Is Designed For Four Pairs Of Cables, Has Been Developed In Order To Supply Devices With A Higher Power Demand. The New VOOHU Transformers Are Designed Specifically For This Application Segment. Typical Applications Are Video And POS Systems, But Also Include Systems Such As Lighting Controllers, Fire Alarm Systems Or Access Systems That Are Used In Building Management.

#### Features And Benefits

- Core Material Ferrite
- Typical Topology : Flyback Converters
- Perfect Solution For PoE Applications
- High Efficiency; Excellent DCR; Very Low Leakage Inductance
- Turn Ratios Adopted To Different Output Voltages
- Installation :SMD

#### Applications

- PoE Applications
- Point-Of-Sale System
- Security And Protection
- Fire-Alarm System
- Door Control System
- Lighting Controller

### TSEPXX Series Electrical Specifications

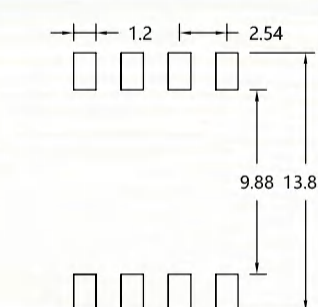
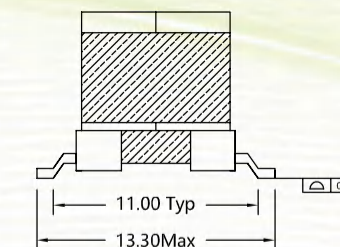
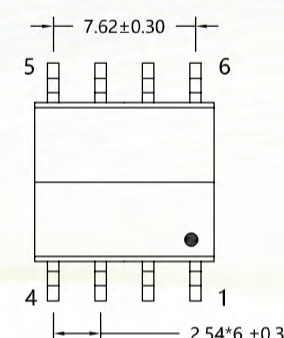
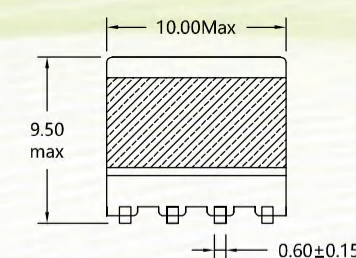
| Part Number     | MECH. Drawing | Input(V) | Power (W) | Inductance $\pm 10\%$ ( $\mu$ H) | DCR Max (m $\Omega$ ) |      |      | Leakage Inductance Max ( $\mu$ H) | Turns Ratio |       |      | Output (V/A) |
|-----------------|---------------|----------|-----------|----------------------------------|-----------------------|------|------|-----------------------------------|-------------|-------|------|--------------|
|                 |               |          |           |                                  | Pri.                  | Sec. | Aux. |                                   | Pri.        | Sec.  | Aux. |              |
| WHTSEP7S-MI374  | A Type        | 36 ~ 72  | 3         | 310                              | 1020                  | 66   | 2010 | 4.8                               | 1.000       | 0.19  | 0.70 | 3.3/0.91     |
| WHTSEP7S-MI375  | A Type        | 36 ~ 72  | 3         | 310                              | 1020                  | 118  | 2010 | 4.5                               | 1.000       | 0.28  | 0.70 | 5/0.6        |
| WHTSEP7S-MI376  | A Type        | 36 ~ 72  | 3         | 310                              | 1020                  | 700  | 2010 | 4.25                              | 1.000       | 0.70  | 0.70 | 12/0.25      |
| WHTSEPIOS-MI377 | B Type        | 36 ~ 72  | 7.3       | 155                              | 414                   | 36   | 822  | 4.00                              | 1.000       | 0.19  | 0.66 | 3.3/2.12     |
| WHTSEPIOS-MI378 | B Type        | 36 ~ 72  | 7.24      | 155                              | 414                   | 60   | 822  | 3.60                              | 1.000       | 0.26  | 0.60 | 5.0/1.4      |
| WHTSEPIOS-MI379 | B Type        | 36 ~ 72  | 7.4       | 155                              | 414                   | 343  | 822  | 3.25                              | 1.000       | 0.667 | 0.60 | 12/0.6       |
| WHTSEPIOS-MI380 | B Type        | 36 ~ 72  | 9.9       | 40                               | 98                    | 62   | /    | 0.70                              | 1.000       | 0.3   | /    | 3.3/3        |
| WHTSEPIOS-MI381 | B Type        | 36 ~ 72  | 10.0      | 40                               | 98                    | 85   | /    | 1.00                              | 1.000       | 0.4   | /    | 5/2          |
| WHTSEPIOS-MI381 | B Type        | 36 ~ 72  | 10.0      | 40                               | 98                    | 156  | /    | 0.70                              | 1.000       | 1.000 | /    | 12/0.83      |

#### NOTES:

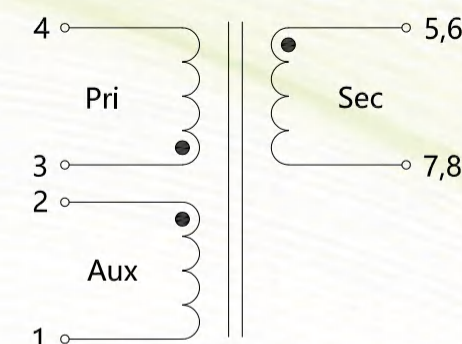
- All Test Data Is Referenced To 25°C Ambient
- Inductance Measured At 100kHz 0.1V
- Output Is For The Secondary. Output Of The Aux Winding Is 12V, 30mA.
- Leakage Inductance Is For The Primary And Is Measured With The Secondary Winding Shorted.

### WHTSEPXX Series Mechanical & Schematics

#### A Type

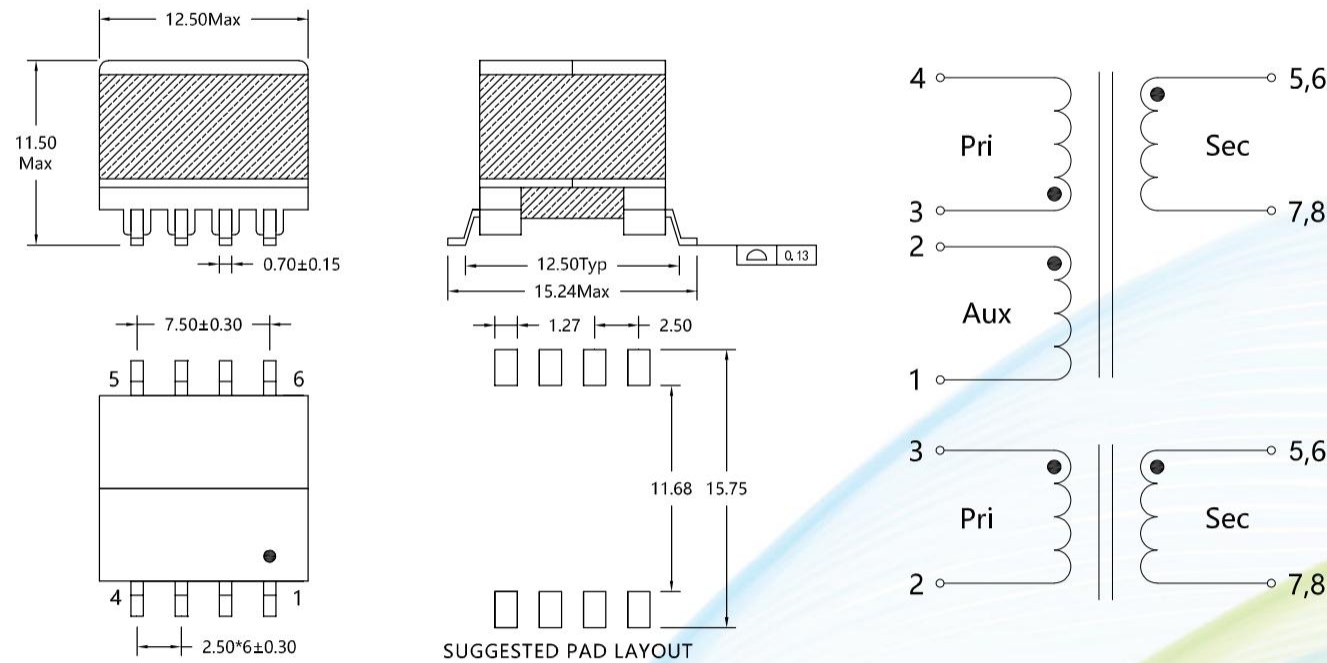


SUGGESTED PAD LAYOUT





### B Type



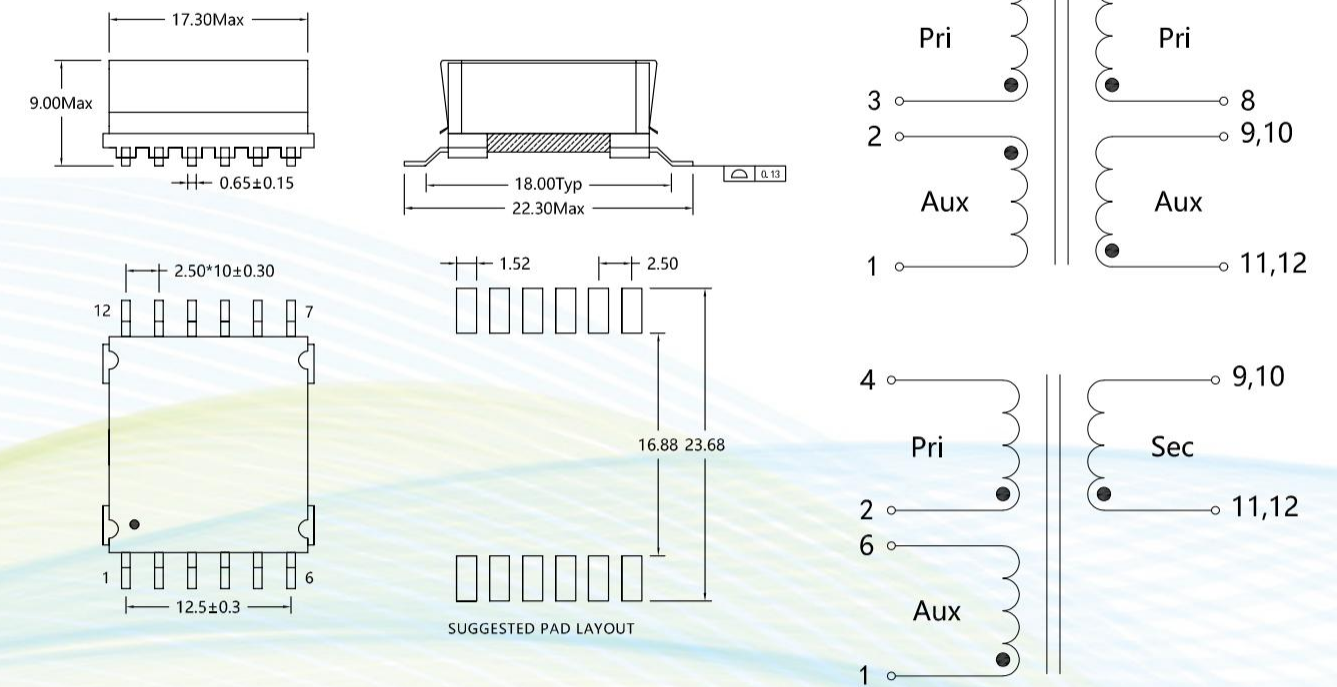
### WHTSEFDXX Series Electrical Specifications

| Part Number       | MECH. Drawing | Input(V) | Power (W) | Inductance ±10%(μH) | DCR Max (mΩ) |      |      | Leakage Inductance Max (μH) | Turns Ratio |       |       | Output (V/A) |
|-------------------|---------------|----------|-----------|---------------------|--------------|------|------|-----------------------------|-------------|-------|-------|--------------|
|                   |               |          |           |                     | Pri.         | Sec. | Aux. |                             | Pri.        | Sec.  | Aux.  |              |
| WHTSEFD15S-MI393  | A Type        | 36-57V   | 10        | 167                 | 735          | 23   | 985  | 2.5                         | 1.00        | 0.154 | 0.5   | 3.3/3.0      |
| WHTSEFD15S-MI394  | A Type        | 36-57V   | 10        | 150                 | 520          | 28   | 880  | 1.9                         | 1.00        | 0.25  | 0.44  | 5/2.0        |
| WHTSEFD15S-MI395  | A Type        | 36-57V   | 10        | 167                 | 760          | 103  | 1100 | 1.8                         | 1.00        | 0.5   | 0.5   | 12/0.83      |
| WHTSEFD15S-MI396  | A Type        | 36-72V   | 13        | 94                  | 210          | 10   | 453  | 3.9                         | 1.00        | 0.12  | 0.47  | 5/2.6        |
| WHTSEFD15S-MI397  | A Type        | 36-72V   | 23        | 40                  | 130          | 9    | 165  | 1.9                         | 1.00        | 0.15  | 0.35  | 5/2.6        |
| WHTSEFD15S-MI398  | A Type        | 36-72V   | 24        | 35                  | 95           | 17   | 150  | 0.6                         | 1.00        | 0.35  | 0.35  | 12/2.0       |
| WHTSEFD20S-MI399  | B Type        | 36-57V   | 25        | 70                  | 70           | 6    | 310  | 1.0                         | 1.00        | 0.182 | 0.4   | 5/5.0        |
| WHTSEFD20S-MI400  | B Type        | 36-72V   | 35.1      | 42                  | 70           | 4    | 220  | 3.0                         | 1.00        | 0.09  | 0.33  | 3.9/9.0      |
| WHTSEFD20S-MI401  | B Type        | 36-72V   | 30        | 42                  | 69           | 5    | 225  | 1.6                         | 1.00        | 0.143 | 0.333 | 5.0/6.0      |
| WHTSEFD20S-MI402  | B Type        | 36-72V   | 30        | 42                  | 61           | 15   | 195  | 1.0                         | 1.00        | 0.333 | 0.333 | 12/2.5       |
| WHTSEFD 20S-MI403 | B Type        | 36-72V   | 29.5      | 42                  | 60           | 37   | 195  | 0.5                         | 1.00        | 0.556 | 0.333 | 19.5/1.5     |
| WHTSEFD20S-MI404  | B Type        | 36-72V   | 30        | 42                  | 60           | 55   | 195  | 0.5                         | 1.00        | 0.667 | 0.333 | 24/1.25      |

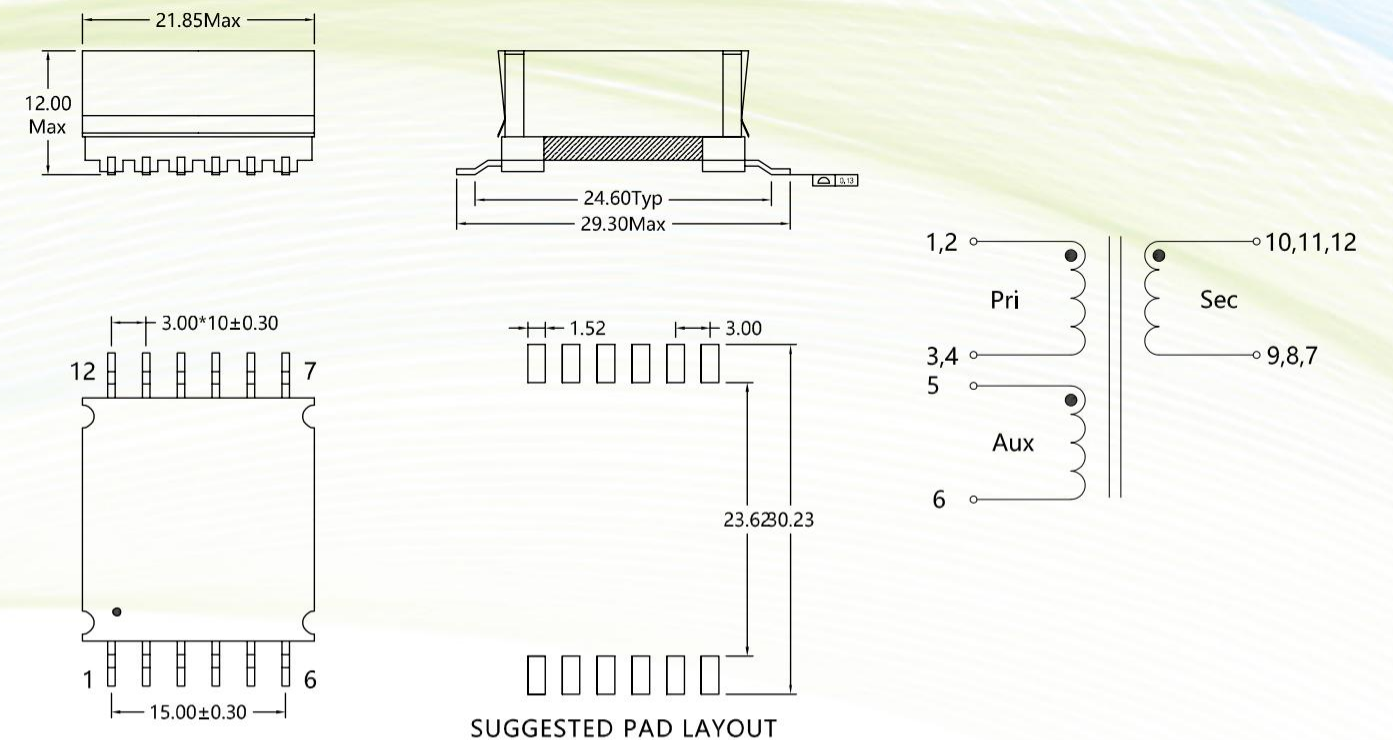
#### NOTES:

- All Test Data Is Referenced To 25°C Ambient
- Inductance Measured At 100kHz, 0.1V
- Output Is For The Secondary. Output Of The Aux Winding Is 12V, 30mA.
- Leakage Inductance Is For The Primary And Is Measured With The Secondary Winding Shorted.

### A Type



### B Type







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# POWER TRANSFORMER

## PLANAR TRANSFORMER

平面变压器是一种采用低轮廓磁芯扁平绕组的高频电力变压器。它具有非常高的功率密度，良好的一致性和良好的热性能。新兴的趋势增加了该产品作为嵌入式成本节约技术的流行程度，尽管与平面解决方案相关的价格溢价。VOOHU 的平面变压器包含多层 PCB 型、铜箔型和多种绕组组合型，涵盖各种电源应用。如 DC/DC, AC/DC 等。另外我们还可以定制各种形式和应用的平面变压器，为我们的客户提供最合适的解决方案和产品。

The Planar Transformer Is A Kind Of High Frequency Power Transformer With A Low Profile Magnetic Core And Flat Winding. It Has Very High Power Density, Good Consistency And Good Thermal Properties. Emerging Trends Have Increased The Popularity Of This Product As An Embedded Cost Saving Technique Despite The Price Premium Associated With A Planar Solution. VOOHU Electronics Planar Transformer Contains Multilayer PCB Type, Copper Foil Type And A Variety Of Winding Combination Type, Covering All Kinds Of Power Supply Application. Such As DC/DC, AC/DC Etc. VOOHU Also Can Customizes Various Forms And Applications Of Planar Transformers To Provide Our Customers With The Most Suitable Solutions And Products.

### Features And Benefits

- Multilayer PCB For Transformer Winding
- High Consistency And Efficiency
- Low Profile, High Reliability
- Winding Structure : PCB Up To 24 Layers
- Typical Efficiency : 95% ~ 99%
- Typical Topology : Forward/Flyback/ Full Bridge/Half Bridge

### Applications

- High Current AC-DC Converter
- High Current DC-DC Converter
- Base Stations
- Automotive Applications
- Battery Powered Devices

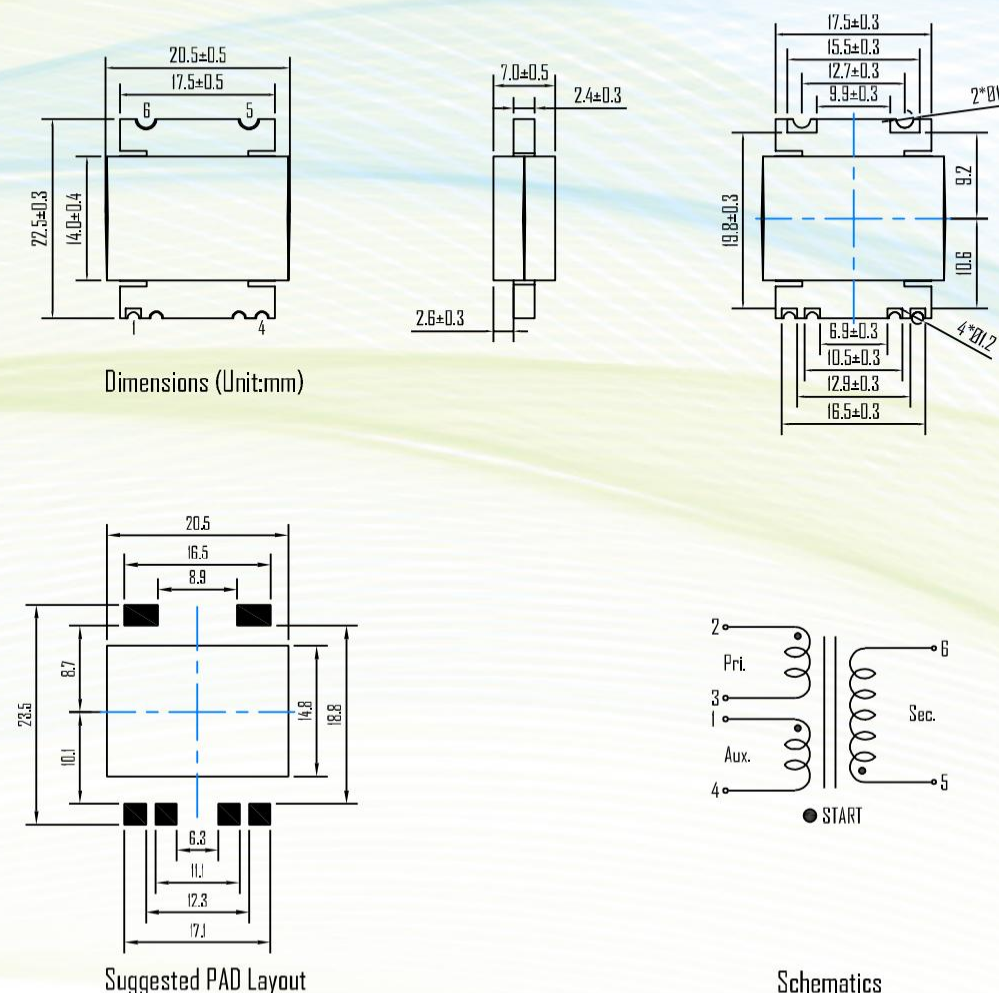
## WHSPER20SX Series Electrical Specifications

| Part Number | Power (W) | Inductance $\pm 10\%$ ( $\mu\text{H}$ ) | DCR Max ( $\text{m}\Omega$ ) |       |        | Leakage Inductance Max ( $\mu\text{H}$ ) | Turns Ratio |       |       | Isat (A) | Output     |
|-------------|-----------|-----------------------------------------|------------------------------|-------|--------|------------------------------------------|-------------|-------|-------|----------|------------|
|             |           |                                         | Pri.                         | Sec.  | Aux.   |                                          | Pri.        | Sec.  | Aux.  |          |            |
| WHSPER20S6  | 71        | 18                                      | 35.00                        | 1.60  | 220.00 | 0.5                                      | 1.000       | 0.166 | 0.666 | 6.3      | 3.3V/21.0A |
| WHSPER20S7  | 71        | 18                                      | 40.00                        | 2.50  | 220.00 | 0.5                                      | 1.000       | 0.250 | 0.500 | 6.3      | 5.0V/14.0A |
| WHSPER20S8  | 71        | 18                                      | 40.00                        | 8.00  | 220.00 | 0.5                                      | 1.000       | 0.500 | 0.500 | 6.6      | 12.0V/5.9A |
| WHSPER20S9  | 71        | 18                                      | 40.00                        | 28.00 | 220.00 | 0.5                                      | 1.000       | 1.000 | 0.500 | 6.6      | 24.0V/2.9A |

### NOTES:

- DC Current At 25 °C That Causes An Inductance Drop Of <15% From Its Value Without Current
- Output Is For The Secondary. Output Of The Aux Winding Is 12V/30mA

## WHSPER20SX Series Mechanical & Schematics





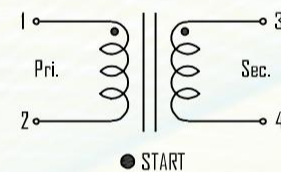
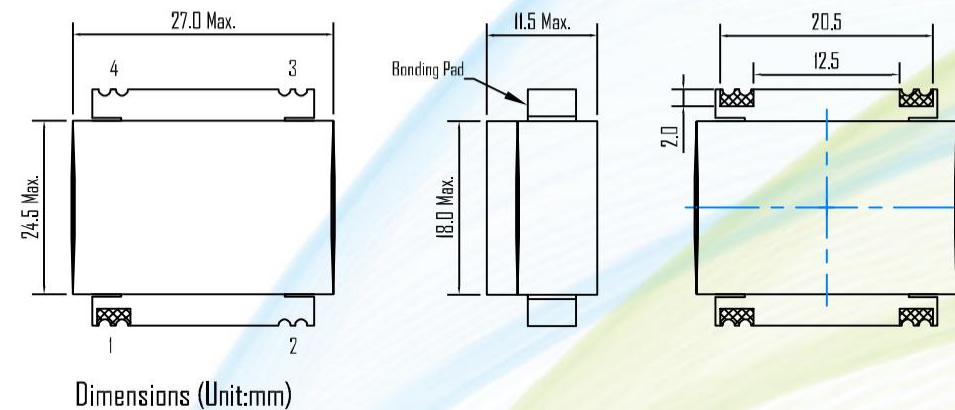
### WHSPER25SDXA Series Electrical Specifications

| Part Number  | Topology    | Turns Ratio<br>Pri:Sec | Pri<br>Inductance<br>( $\mu$ H) | LK<br>Inductance<br>Max ( $\mu$ H) | DCR Max ( $m\Omega$ ) |      | HI-Pot   |
|--------------|-------------|------------------------|---------------------------------|------------------------------------|-----------------------|------|----------|
|              |             |                        |                                 |                                    | Pri.                  | Sec. |          |
| WHSPER25SD1A | Full bridge | 4:1                    | 85 $\pm$ 25%                    | 0.05                               | 3.8                   | 0.3  | 1000Vrms |
| WHSPER25SD2A | Full bridge | 4:2                    | 85 $\pm$ 25%                    | 0.05                               | 3.8                   | 1.2  | 1000Vrms |
| WHSPER25SD3A | Full bridge | 4:3                    | 85 $\pm$ 25%                    | 0.05                               | 3.8                   | 2.5  | 1000Vrms |
| WHSPER25SD4A | Full bridge | 4:4                    | 85 $\pm$ 25%                    | 0.05                               | 3.8                   | 3.8  | 1000Vrms |
| WHSPER25SD5A | Full bridge | 4:5                    | 85 $\pm$ 25%                    | 0.05                               | 3.8                   | 7.2  | 1000Vrms |
| WHSPER25SD6A | Full bridge | 5:1                    | 133 $\pm$ 25%                   | 0.05                               | 7.2                   | 0.3  | 1000Vrms |
| WHSPER25SD7A | Full bridge | 5:2                    | 133 $\pm$ 25%                   | 0.05                               | 7.2                   | 1.2  | 1000Vrms |

#### NOTES:

- All Test Data Is Referenced To 25°C Ambient
- Inductance Measured At 100kHz,0.1V

### WHSPER25SDXA Series Mechanical & Schematics



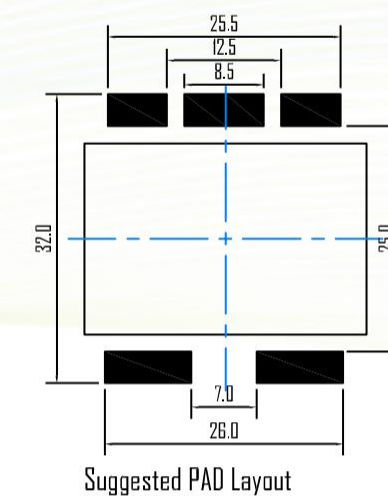
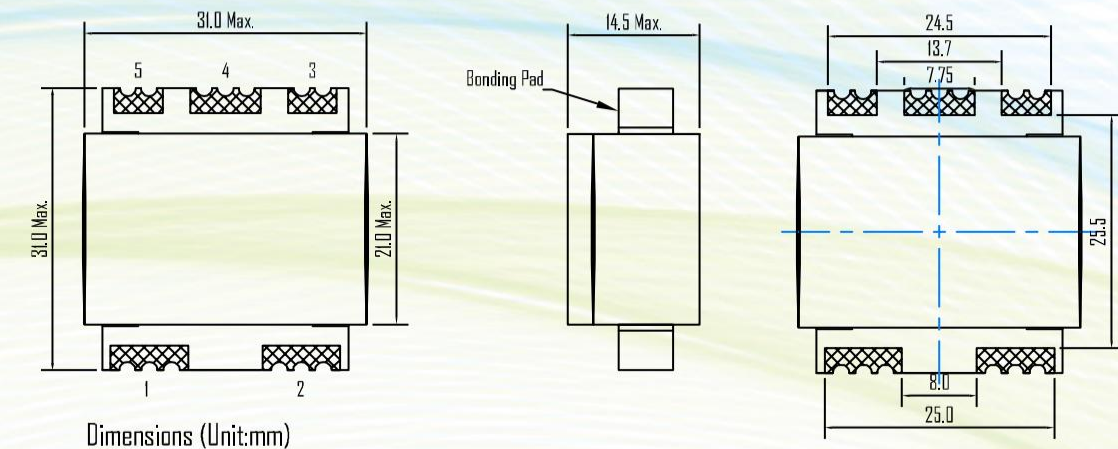
### WHSPER30SDXA Series Electrical Specifications

| Part Number  | Topology    | Turns Ratio<br>Pri:Sec | Pri<br>Inductance<br>( $\mu$ H) | LK<br>Inductance<br>Max ( $\mu$ H) | DCR Max ( $m\Omega$ ) |      | HI-Pot   |
|--------------|-------------|------------------------|---------------------------------|------------------------------------|-----------------------|------|----------|
|              |             |                        |                                 |                                    | Pri.                  | Sec. |          |
| WHSPER30SD1A | Full bridge | 4:2                    | 96 $\pm$ 25%                    | 0.05                               | 3.5                   | 1.0  | 1500Vrms |
| WHSPER30SD2A | Full bridge | 4:4                    | 96 $\pm$ 25%                    | 0.05                               | 3.5                   | 3.5  | 1500Vrms |
| WHSPER30SD3A | Full bridge | 4:6                    | 96 $\pm$ 25%                    | 0.05                               | 3.5                   | 5.5  | 1500Vrms |
| WHSPER30SD4A | Full bridge | 5:2                    | 150 $\pm$ 25%                   | 0.05                               | 4.5                   | 1.0  | 1500Vrms |
| WHSPER30SD5A | Full bridge | 5:4                    | 150 $\pm$ 25%                   | 0.05                               | 4.5                   | 3.5  | 1500Vrms |
| WHSPER30SD6A | Full bridge | 5:6                    | 150 $\pm$ 25%                   | 0.05                               | 4.5                   | 5.5  | 1500Vrms |

#### NOTES:

- All Test Data Is Referenced To 25°C Ambient
- Inductance Measured At 100kHz,0.1V

### WHSPER30SDXA Series Mechanical & Schematics





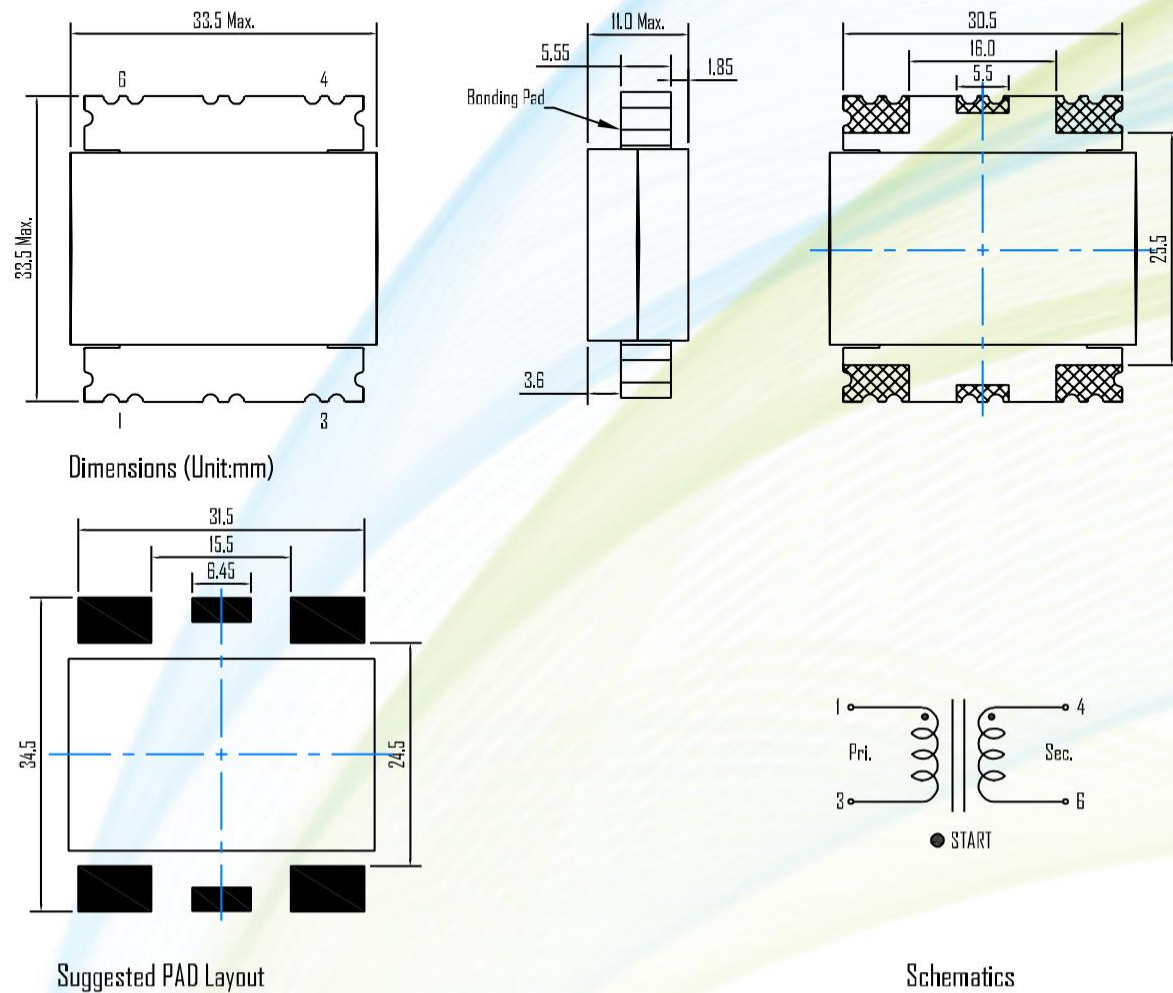
## WHSPER32SDXA Series Electrical Specifications

| Part Number  | Topology    | Turns Ratio<br>Pri:Sec | Pri<br>Inductance<br>( $\mu$ H) | LK<br>Inductance<br>Max ( $\mu$ H) | DCR Max ( $m\Omega$ ) |      | HI-Pot   |
|--------------|-------------|------------------------|---------------------------------|------------------------------------|-----------------------|------|----------|
|              |             |                        |                                 |                                    | Pri.                  | Sec. |          |
| WHSPER32SD1A | Full bridge | 3:1                    | $48 \pm 25\%$                   | 0.05                               | 2.5                   | 0.3  | 1500Vrms |
| WHSPER32SD2A | Full bridge | 3:2                    | $48 \pm 25\%$                   | 0.05                               | 2.5                   | 0.6  | 1500Vrms |
| WHSPER32SD3A | Full bridge | 3:5                    | $48 \pm 25\%$                   | 0.05                               | 2.5                   | 5.5  | 1500Vrms |
| WHSPER32SD4A | Full bridge | 4:4                    | $85 \pm 25\%$                   | 0.05                               | 3.5                   | 3.5  | 1500Vrms |
| WHSPER32SD5A | Full bridge | 4:6                    | $85 \pm 25\%$                   | 0.08                               | 3.5                   | 5.5  | 1500Vrms |
| WHSPER32SD6A | Full bridge | 5:2                    | $132 \pm 25\%$                  | 0.08                               | 4.5                   | 0.6  | 1500Vrms |
| WHSPER32SD7A | Full bridge | 5:4                    | $132 \pm 25\%$                  | 0.08                               | 4.5                   | 2.5  | 1500Vrms |

### NOTES:

- All Test Data Is Referenced To 25°C Ambient
- Inductance Measured At 100kHz, 0.1V

## WHSPER32SDXA Series Mechanical & Schematics



**VOOHU 沃虎**

—— 连接世界 · 通信未来 ——



## POWER INDUCTOR HIGH CURRENT FLAT WIRE INDUCTOR

VOOHU的矩形扁平线圈电感器包括多种平台尺寸, 通过使用低损耗铁芯材料最大化电感器的效率, 最小化交流损耗, 也消除热老化。使用扁平线圈可以降低制造成本, 同时保持低DCR和小占地面积。我们的产品设计和制造符合IATF16949管理体系, 其可靠性通过AEC-Q200标准认证。广泛应用于各种电源拓扑中的输出和储能扼流圈, 包括负载点电源(POL)转换器, DC-DC转换器, 大电流开关模式电源, 光伏系统和汽车应用中的逆变器。

VOOHU Electronics Rectangular Flat Coil Inductors Include A Variety Of Platform Sizes, Maximizing The Efficiency Of The Inductor By Using A Low-loss Iron Core Material, Minimizing AC Losses And Also Eliminating Thermal Aging. Using Flat Coils Can Reduce Manufacturing Costs While Maintaining Low DCR And Small Footprint. Our Products Are Designed And Manufactured To Meet The IATF16949 Management System, And Their Reliability Is Certified By The AEC-Q200 Standard. Widely Used As Output And Energy-storage Choke Coils In A Variety Of Power Topologies, Including Load Point Power (POL) Converters, DC-DC Converters, High Current Switching Mode Power Supplies, Inverters In Photovoltaic Systems, And Automotive Applications.

### Features And Benefits

- Flat wire Helical winding To Achieve Compact Size
- Ferrite Core To Minimize AC Loss
- Easily Customized
- AEC-Q200 Qualified
- Larger Terminations For Lower DCR And Stronger Solder Joint

### Applications

- High Current DC-DC Converter
- POL Converter
- Photovoltaic Inverter
- Automotive Applications
- High Current Switch Mode Power Supply



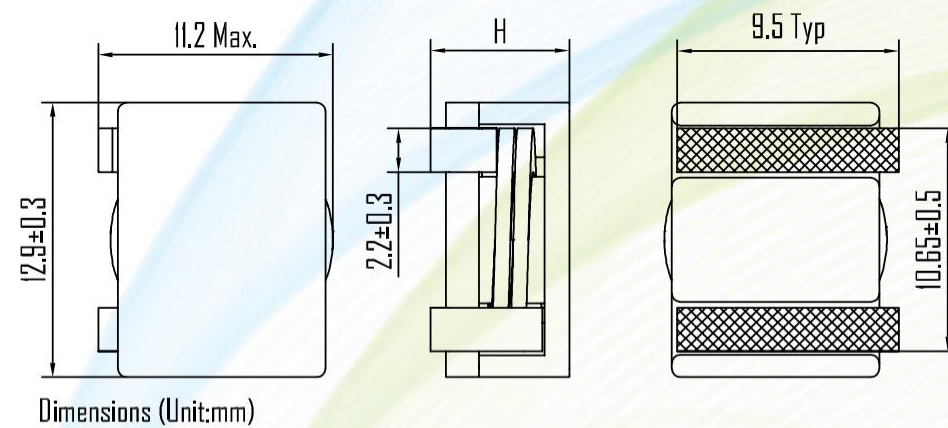
### WHFPR130X Series Electrical Specifications

| Part Number    | Height (mm) | Inductance ( $\mu\text{H}\pm 20\%$ ) | DCR(m $\Omega$ ) Max @25°C | DCR(m $\Omega$ ) Typ @25°C | Isat (A) | Irms (A) |
|----------------|-------------|--------------------------------------|----------------------------|----------------------------|----------|----------|
| WHFPR1305-R50M | 5.00        | 0.50                                 | 0.73                       | 0.67                       | 30.00    | 17.60    |
| WHFPR1306-R95M | 6.00        | 0.95                                 | 1.19                       | 1.08                       | 23.00    | 15.40    |
| WHFPR1305-IR1M | 5.00        | 1.10                                 | 1.85                       | 1.69                       | 20.00    | 6.90     |
| WHFPR1306-IR5M | 6.00        | 1.50                                 | 1.66                       | 1.51                       | 19.00    | 12.90    |
| WHFPR1305-2R2M | 5.00        | 2.20                                 | 3.31                       | 3.02                       | 16.50    | 7.00     |
| WHFPR1306-2R4M | 6.00        | 2.40                                 | 3.04                       | 2.77                       | 16.50    | 8.40     |
| WHFPR1305-3R0M | 5.00        | 3.00                                 | 3.31                       | 3.02                       | 12.00    | 7.00     |
| WHFPR1306-4R0M | 6.00        | 4.00                                 | 5.19                       | 4.74                       | 13.00    | 5.40     |

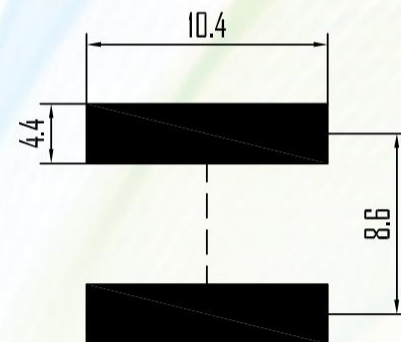
#### NOTES:

- Inductance At Isat Causes An Inductance Drop Of <30% From Its Value Without Current
- All Test Data Is Referenced To 25°C Ambient
- Inductance Test Condition: 100kHz 0.1V
- Maximum Part Temperature: +155°C

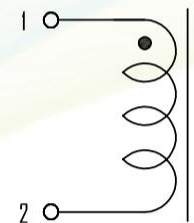
### WHFPR130X Series Mechanical & Schematics



Dimensions (Unit:mm)



Suggested PAD Layout



Schematics

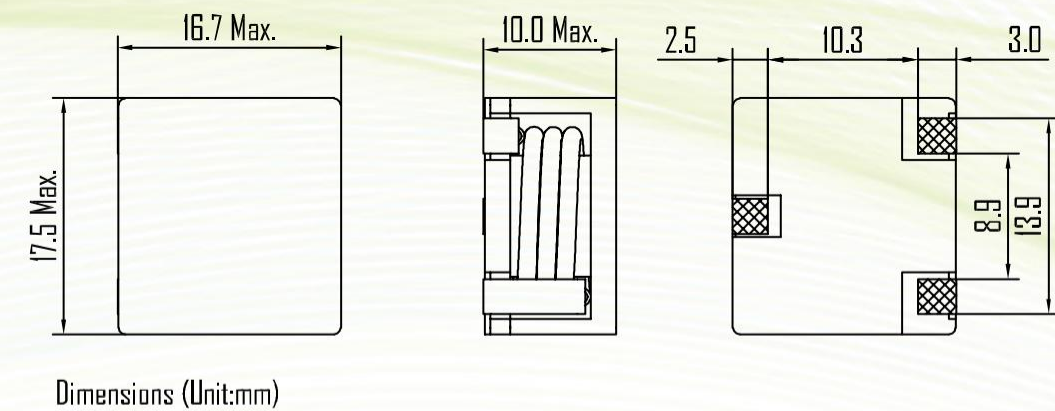
### WHFPR171X Series Electrical Specifications

| Part Number    | Height (mm) | Inductance ( $\mu\text{H}\pm 20\%$ ) | DCR(m $\Omega$ ) Max @25°C | DCR(m $\Omega$ ) Typ @25°C | Isat (A) | Irms (A) |
|----------------|-------------|--------------------------------------|----------------------------|----------------------------|----------|----------|
| WHFPR1710-R47M | 9.00        | 0.47                                 | 0.44                       | 0.40                       | 80.00    | 52.50    |
| WHFPR1710-R68M | 9.00        | 0.68                                 | 0.63                       | 0.57                       | 80.00    | 45.00    |
| WHFPR1710-1R0M | 10.00       | 1.00                                 | 0.87                       | 0.79                       | 55.00    | 33.00    |
| WHFPR1710-1R5M | 10.00       | 1.50                                 | 0.87                       | 0.79                       | 39.00    | 30.30    |
| WHFPR1710-2R2M | 10.00       | 2.20                                 | 0.87                       | 0.79                       | 26.00    | 22.00    |
| WHFPR1710-3R3M | 10.00       | 3.30                                 | 1.39                       | 1.27                       | 25.00    | 18.00    |
| WHFPR1710-4R7M | 10.00       | 4.70                                 | 2.74                       | 2.51                       | 26.00    | 13.00    |
| WHFPR1710-5R3M | 10.00       | 5.30                                 | 3.86                       | 3.52                       | 25.00    | 11.00    |
| WHFPR1710-6R0M | 10.00       | 6.00                                 | 3.86                       | 3.52                       | 23.50    | 11.00    |
| WHFPR1710-6R8M | 10.00       | 6.80                                 | 4.83                       | 4.41                       | 25.00    | 10.00    |
| WHFPR1710-100M | 10.00       | 10.00                                | 6.01                       | 5.49                       | 19.00    | 7.90     |
| WHFPR1710-150M | 10.00       | 15.00                                | 7.49                       | 6.84                       | 14.00    | 6.50     |
| WHFPR1710-180M | 10.00       | 18.00                                | 9.39                       | 8.58                       | 13.00    | 5.30     |

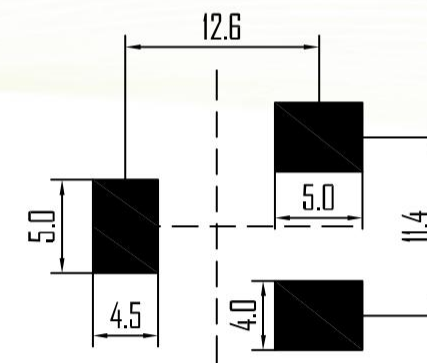
#### NOTES:

- Inductance At Isat Causes An Inductance Drop Of <30% From Its Value Without Current
- All Test Data Is Referenced To 25°C Ambient
- Inductance Test Condition: 100kHz 0.1V
- Maximum Part Temperature: +155°C

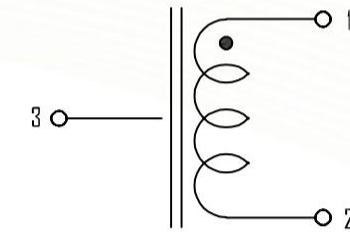
### WHFPR171X Series Mechanical & Schematics



Dimensions (Unit:mm)



Suggested PAD Layout



Schematics



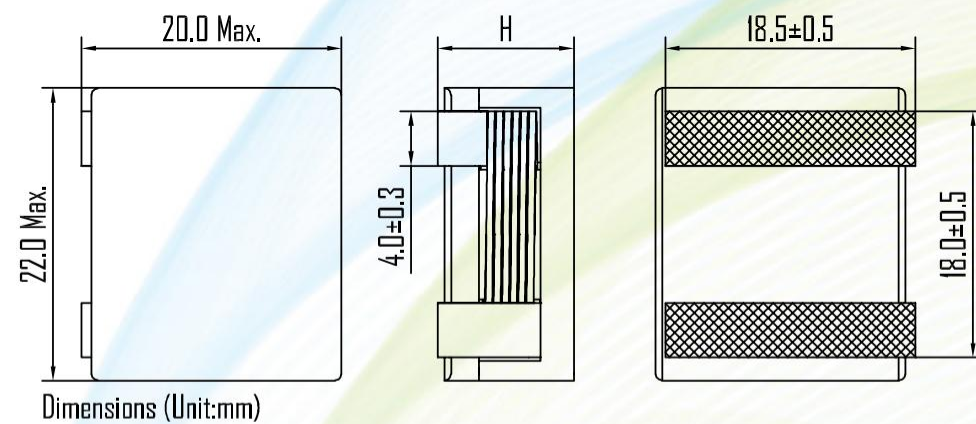
### WHFPR221X Series Electrical Specifications

| Part Number    | Height (mm) | Inductance ( $\mu\text{H} \pm 20\%$ ) | DCR(m $\Omega$ ) Max @25°C | DCR(m $\Omega$ ) Typ @25°C | Isat (A) | Irms (A) |
|----------------|-------------|---------------------------------------|----------------------------|----------------------------|----------|----------|
| WHFPR221I-1R0M | 11.25       | 1.00                                  | 0.33                       | 0.30                       | 50.00    | 42.00    |
| WHFPR221I-1R5M | 11.85       | 1.50                                  | 0.55                       | 0.50                       | 50.00    | 33.80    |
| WHFPR221I-2R2M | 12.05       | 2.20                                  | 0.84                       | 0.77                       | 43.00    | 28.60    |
| WHFPR221I-3R3M | 11.20       | 3.30                                  | 1.43                       | 1.31                       | 37.00    | 19.20    |
| WHFPR221I-4R7M | 11.20       | 4.70                                  | 1.43                       | 1.31                       | 25.00    | 19.20    |
| WHFPR221I-6R8M | 10.55       | 6.80                                  | 1.64                       | 1.50                       | 19.00    | 15.40    |
| WHFPR221I-100M | 10.75       | 10.00                                 | 3.61                       | 3.30                       | 18.50    | 10.00    |
| WHFPR221I-120M | 13.43       | 12.00                                 | 5.40                       | 4.93                       | 24.00    | 10.60    |
| WHFPR221I-150M | 11.18       | 15.00                                 | 4.98                       | 4.55                       | 15.50    | 9.00     |
| WHFPR221I-300M | 10.38       | 30.00                                 | 14.23                      | 13.00                      | 12.50    | 5.00     |
| WHFPR221I-350M | 10.38       | 35.00                                 | 14.23                      | 13.00                      | 10.50    | 5.00     |

#### NOTES:

- Inductance At Isat Causes An Inductance Drop Of <30% From Its Value Without Current
- All Test Data Is Referenced To 25°C Ambient
- Inductance Test Condition: 100kHz 0.1V
- Maximum Part Temperature: +155°C

### WHFPR221X Series Mechanical & Schematics



Suggested PAD Layout

Schematics

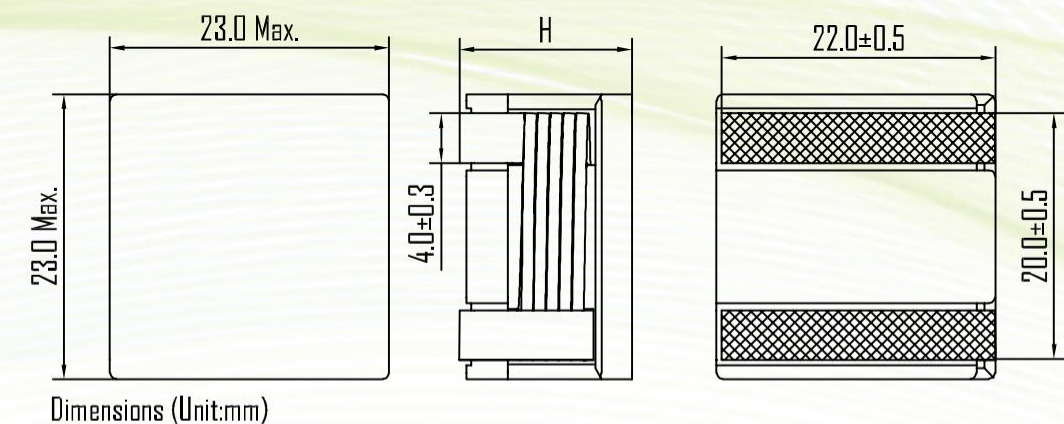
### WHFPR231X Series Electrical Specifications

| Part Number    | Height (mm) | Inductance ( $\mu\text{H} \pm 20\%$ ) | DCR(m $\Omega$ ) Max @25°C | DCR(m $\Omega$ ) Typ @25°C | Isat (A) | Irms (A) |
|----------------|-------------|---------------------------------------|----------------------------|----------------------------|----------|----------|
| WHFPR2314-1R0M | 14.00       | 1.00                                  | 0.49                       | 0.44                       | 112.00   | 105.00   |
| WHFPR2314-1R5M | 13.50       | 1.50                                  | 0.52                       | 0.47                       | 75.00    | 57.60    |
| WHFPR2314-2R2M | 13.30       | 2.20                                  | 0.83                       | 0.76                       | 68.00    | 41.60    |
| WHFPR2314-3R3M | 13.20       | 3.30                                  | 1.22                       | 1.11                       | 55.00    | 30.80    |
| WHFPR2315-3R3M | 14.30       | 3.30                                  | 1.45                       | 1.33                       | 68.00    | 35.20    |
| WHFPR2314-4R7M | 10.40       | 4.70                                  | 1.92                       | 1.75                       | 40.00    | 16.80    |
| WHFPR2314-6R0M | 13.50       | 6.00                                  | 2.18                       | 1.99                       | 43.00    | 25.50    |
| WHFPR2314-6R8M | 13.50       | 6.80                                  | 2.18                       | 1.99                       | 37.00    | 25.50    |
| WHFPR2314-6R8M | 15.50       | 6.60                                  | 2.11                       | 1.93                       | 45.00    | 32.00    |
| WHFPR2313-6R8M | 14.00       | 6.80                                  | 3.02                       | 2.76                       | 44.00    | 21.00    |
| WHFPR2314-8R8M | 14.00       | 8.80                                  | 2.48                       | 2.26                       | 29.00    | 22.50    |
| WHFPR2314-100M | 14.00       | 10.00                                 | 3.02                       | 2.76                       | 30.00    | 19.60    |

#### NOTES:

- Inductance At Isat Causes An Inductance Drop Of <30% From Its Value Without Current
- All Test Data Is Referenced To 25°C Ambient
- Inductance Test Condition: 100kHz 0.1V
- Maximum Part Temperature: +155°C

### WHFPR231X Series Mechanical & Schematics



Suggested PAD Layout

Schematics



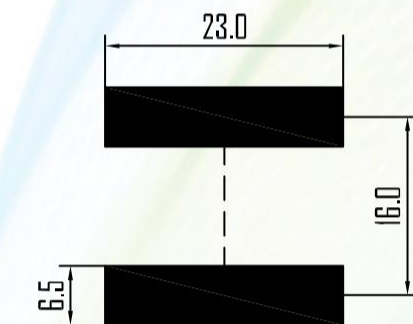
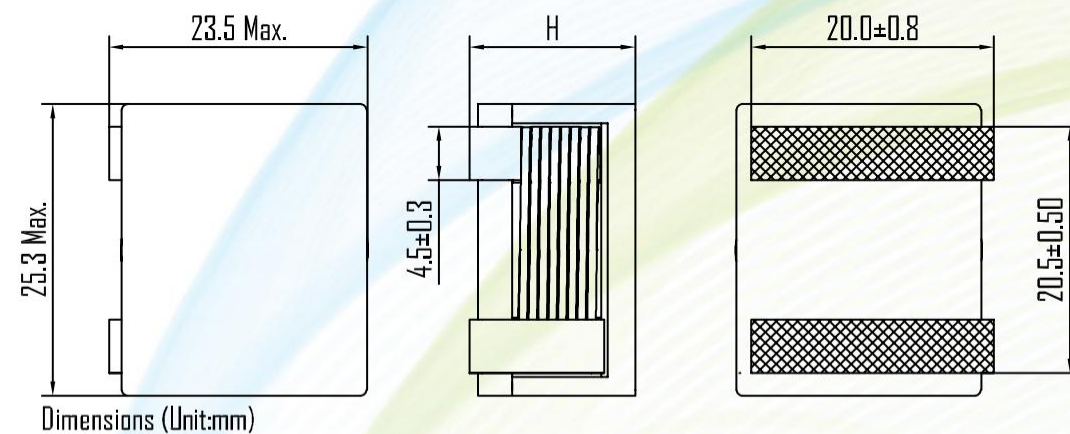
### WHFPR25IX Series Electrical Specifications

| Part Number    | Height (mm) | Inductance ( $\mu\text{H} \pm 20\%$ ) | DCR(m $\Omega$ ) Max @25°C | DCR(m $\Omega$ ) Typ @25°C | Isat (A) | Irms (A) |
|----------------|-------------|---------------------------------------|----------------------------|----------------------------|----------|----------|
| WHFPR25I2-2R0M | 11.90       | 2.00                                  | 0.74                       | 0.68                       | 51.00    | 31.50    |
| WHFPR25I2-2R3M | 12.70       | 2.30                                  | 0.62                       | 0.56                       | 44.00    | 35.10    |
| WHFPR25I2-2R9M | 10.70       | 2.90                                  | 1.06                       | 0.97                       | 34.00    | 18.90    |
| WHFPR25I1-4R4M | 11.40       | 4.40                                  | 1.39                       | 1.27                       | 30.00    | 18.90    |
| WHFPR25I1-6R1M | 12.10       | 6.10                                  | 1.72                       | 1.57                       | 28.00    | 18.90    |
| WHFPR25I2-7R9M | 12.45       | 7.90                                  | 2.21                       | 2.02                       | 26.00    | 16.10    |
| WHFPR25I4-100M | 13.50       | 10.00                                 | 2.39                       | 2.18                       | 24.00    | 18.90    |
| WHFPR25I3-100M | 12.30       | 10.00                                 | 3.12                       | 2.85                       | 24.00    | 12.40    |
| WHFPR25I3-120M | 12.40       | 12.00                                 | 3.80                       | 3.47                       | 22.00    | 11.30    |
| WHFPR25I3-150M | 12.70       | 15.00                                 | 2.78                       | 2.54                       | 15.50    | 14.90    |
| WHFPR25I4-200M | 14.90       | 20.00                                 | 3.05                       | 2.78                       | 15.00    | 14.20    |

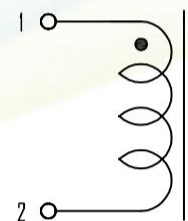
#### NOTES:

- Inductance At Isat Causes An Inductance Drop Of <30% From Its Value Without Current
- All Test Data Is Referenced To 25°C Ambient
- Inductance Test Condition: 100kHz 0.1V
- Maximum Part Temperature: +155°C

### WHFPR25IX Series Mechanical & Schematics



Suggested PAD Layout



Schematics

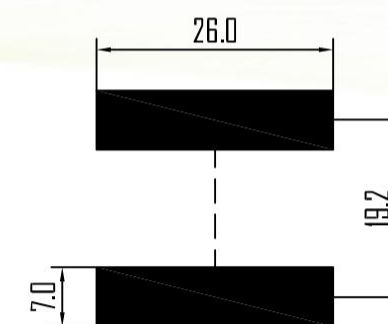
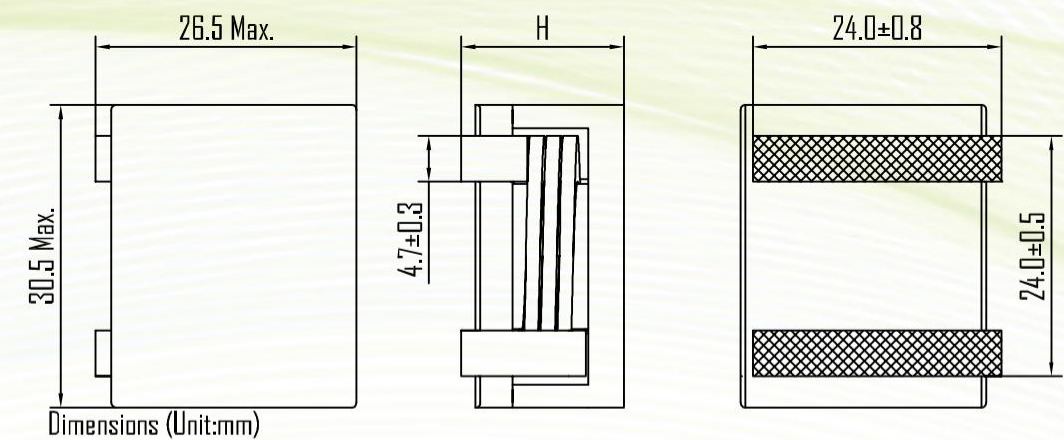
### WHFPR30IX Series Electrical Specifications

| Part Number    | Height (mm) | Inductance ( $\mu\text{H} \pm 20\%$ ) | DCR(m $\Omega$ ) Max @25°C | DCR(m $\Omega$ ) Typ @25°C | Isat (A) | Irms (A) |
|----------------|-------------|---------------------------------------|----------------------------|----------------------------|----------|----------|
| WHFPR30I7-3R3M | 15.70       | 3.30                                  | 0.51                       | 0.46                       | 44.00    | 34.40    |
| WHFPR30I7-4R7M | 15.60       | 4.70                                  | 0.81                       | 0.74                       | 43.00    | 31.50    |
| WHFPR30I7-6R8M | 15.60       | 6.80                                  | 0.81                       | 0.74                       | 29.00    | 25.20    |
| WHFPR30I7-8R8M | 15.60       | 8.80                                  | 1.17                       | 1.07                       | 28.00    | 24.30    |
| WHFPR30I7-100M | 15.60       | 10.00                                 | 1.17                       | 1.07                       | 24.00    | 21.60    |
| WHFPR30I7-120M | 15.50       | 12.00                                 | 1.68                       | 1.53                       | 24.00    | 20.30    |
| WHFPR30I7-140M | 15.50       | 14.00                                 | 1.68                       | 1.53                       | 20.00    | 18.00    |
| WHFPR30I7-180M | 15.50       | 18.00                                 | 2.17                       | 1.98                       | 18.00    | 16.20    |
| WHFPR30I7-220M | 15.30       | 22.00                                 | 2.17                       | 1.98                       | 15.00    | 16.20    |
| WHFPR30I7-250M | 14.20       | 25.00                                 | 3.18                       | 2.90                       | 15.00    | 12.60    |
| WHFPR30I7-280M | 14.90       | 28.00                                 | 3.56                       | 3.25                       | 15.00    | 12.60    |
| WHFPR30I7-300M | 14.40       | 30.00                                 | 4.61                       | 4.33                       | 16.00    | 13.50    |

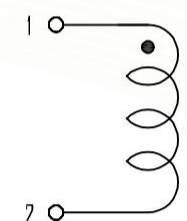
#### NOTES:

- Inductance At Isat Causes An Inductance Drop Of <30% From Its Value Without Current
- All Test Data Is Referenced To 25°C Ambient
- Inductance Test Condition: 100kHz 0.1V
- Maximum Part Temperature: +155°C

### WHFPR30IX Series Mechanical & Schematics



Suggested PAD Layout



Schematics



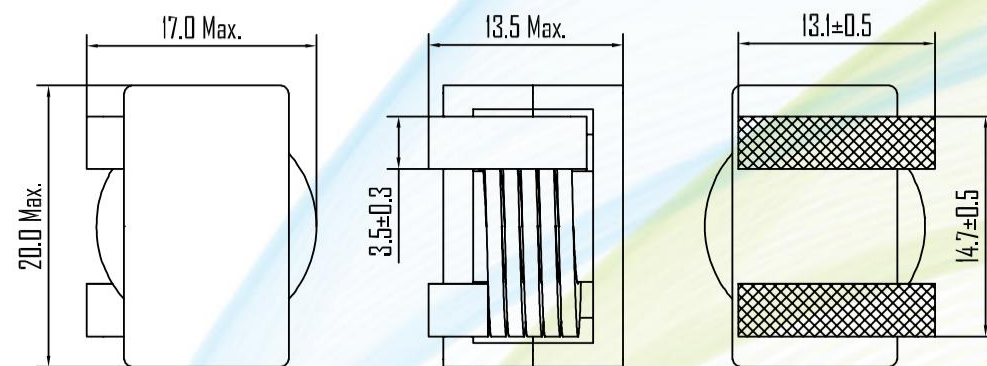
### WHPAR19IX Series Electrical Specifications

| Part Number    | Inductance<br>( $\mu\text{H} \pm 20\%$ ) | DCR(m $\Omega$ )<br>Max @25°C | DCR(m $\Omega$ )<br>Typ @25°C | Isat<br>(A) | Irms<br>(A) |
|----------------|------------------------------------------|-------------------------------|-------------------------------|-------------|-------------|
| WHPAR1911-3R3M | 3.30                                     | 1.80                          | 1.20                          | 49.00       | 38.50       |
| WHPAR1911-4R4M | 4.40                                     | 2.20                          | 1.60                          | 42.00       | 34.50       |
| WHPAR1911-5R8M | 5.80                                     | 2.40                          | 2.00                          | 36.00       | 30.50       |
| WHPAR1911-7R0M | 7.00                                     | 3.00                          | 2.60                          | 32.00       | 26.50       |
| WHPAR1911-9R0M | 9.00                                     | 3.60                          | 3.10                          | 29.00       | 25.00       |
| WHPAR1911-110M | 11.00                                    | 4.30                          | 3.60                          | 26.00       | 23.00       |
| WHPAR1911-130M | 13.00                                    | 5.20                          | 4.30                          | 24.00       | 21.00       |

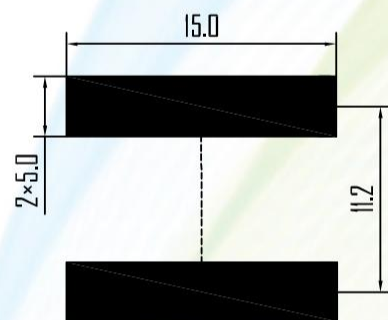
#### NOTES:

- Inductance At Isat Causes An Inductance Drop Of <30% From Its Value Without Current
- All Test Data Is Referenced To 25°C Ambient
- Inductance Test Condition: 100kHz 0.1V
- Maximum Part Temperature: +155°C

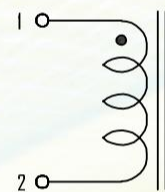
### WHPAR19IX Series Mechanical & Schematics



Dimensions (Unit:mm)



Suggested PAD Layout



Schematics

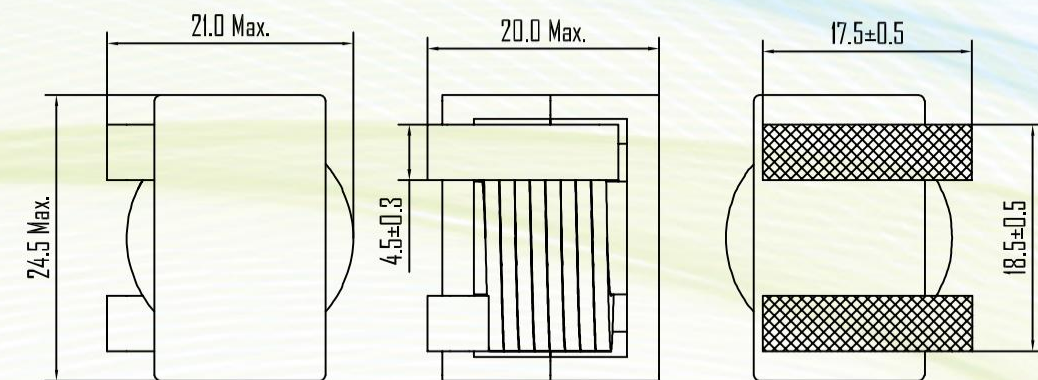
### WHPAR232X Series Electrical Specifications

| Part Number    | Inductance<br>( $\mu\text{H} \pm 20\%$ ) | DCR(m $\Omega$ )<br>Max @25°C | DCR(m $\Omega$ )<br>Typ @25°C | Isat<br>(A) | Irms<br>(A) |
|----------------|------------------------------------------|-------------------------------|-------------------------------|-------------|-------------|
| WHPAR2320-6R6M | 6.60                                     | 1.95                          | 1.29                          | 51.00       | 48.60       |
| WHPAR2320-8R3M | 8.30                                     | 2.05                          | 1.58                          | 45.00       | 44.50       |
| WHPAR2320-100M | 10.00                                    | 2.89                          | 1.93                          | 40.00       | 40.50       |
| WHPAR2320-120M | 12.00                                    | 3.10                          | 2.35                          | 36.00       | 36.50       |
| WHPAR2320-150M | 15.00                                    | 3.50                          | 2.71                          | 33.00       | 34.40       |
| WHPAR2320-170M | 17.00                                    | 4.04                          | 3.11                          | 33.00       | 32.40       |
| WHPAR2320-210M | 21.00                                    | 4.60                          | 3.60                          | 33.00       | 28.30       |

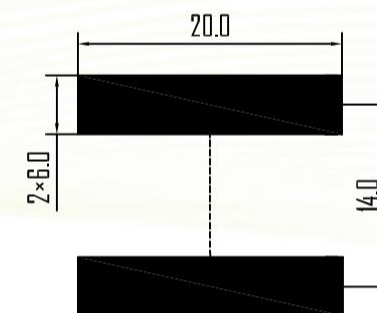
#### NOTES:

- Inductance At Isat Causes An Inductance Drop Of <30% From Its Value Without Current
- All Test Data Is Referenced To 25°C Ambient
- Inductance Test Condition: 100kHz 0.1V
- Maximum Part Temperature: +155°C

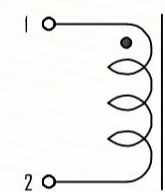
### WHPAR232X Series Mechanical & Schematics



Dimensions (Unit:mm)



Suggested PAD Layout



Schematics



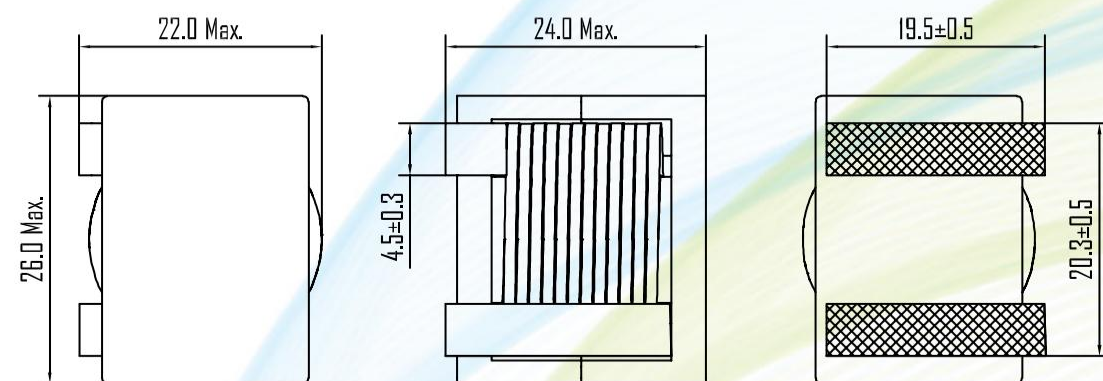
### WHPAR252X Series Electrical Specifications

| Part Number    | Inductance<br>( $\mu\text{H} \pm 20\%$ ) | DCR(m $\Omega$ )<br>Max @25°C | DCR(m $\Omega$ )<br>Typ @25°C | Isat<br>(A) | Irms<br>(A) |
|----------------|------------------------------------------|-------------------------------|-------------------------------|-------------|-------------|
| WHPAR2524-120M | 12.00                                    | 1.60                          | 1.30                          | 58.00       | 55.00       |
| WHPAR2524-150M | 15.00                                    | 2.17                          | 1.70                          | 52.00       | 48.00       |
| WHPAR2524-180M | 18.00                                    | 2.60                          | 2.00                          | 47.00       | 43.00       |
| WHPAR2524-210M | 21.00                                    | 3.10                          | 2.40                          | 44.00       | 40.00       |
| WHPAR2524-250M | 25.00                                    | 3.70                          | 2.80                          | 40.00       | 36.00       |
| WHPAR2524-280M | 28.00                                    | 3.90                          | 3.20                          | 37.00       | 36.00       |
| WHPAR2524-330M | 33.00                                    | 4.70                          | 3.60                          | 35.00       | 32.00       |
| WHPAR2524-380M | 38.00                                    | 5.00                          | 4.10                          | 33.00       | 28.50       |
| WHPAR2524-420M | 42.00                                    | 5.80                          | 4.80                          | 30.00       | 26.00       |

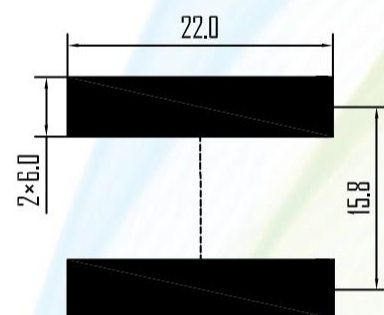
#### NOTES:

- Inductance At Isat Causes An Inductance Drop Of <30% From Its Value Without Current
- All Test Data Is Referenced To 25°C Ambient
- Inductance Test Condition: 100kHz 0.1V
- Maximum Part Temperature: +155°C

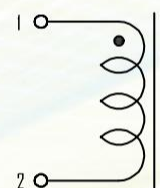
### WHPAR252X Series Mechanical & Schematics



Dimensions (Unit:mm)



Suggested PAD Layout



Schematics

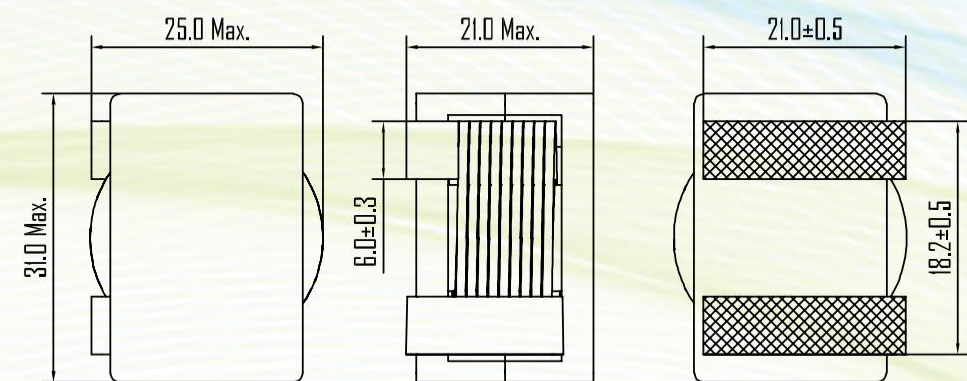
### WHPAR302X Series Electrical Specifications

| Part Number    | Inductance<br>( $\mu\text{H} \pm 20\%$ ) | DCR(m $\Omega$ )<br>Max @25°C | DCR(m $\Omega$ )<br>Typ @25°C | Isat<br>(A) | Irms<br>(A) |
|----------------|------------------------------------------|-------------------------------|-------------------------------|-------------|-------------|
| WHPAR3021-5R5M | 5.50                                     | 1.20                          | 0.80                          | 82.00       | 72.00       |
| WHPAR3021-7R5M | 7.50                                     | 1.50                          | 1.00                          | 72.00       | 62.50       |
| WHPAR3021-9R5M | 9.50                                     | 1.70                          | 1.30                          | 61.00       | 57.50       |
| WHPAR3021-120M | 12.00                                    | 2.20                          | 1.70                          | 54.00       | 50.10       |
| WHPAR3021-150M | 15.00                                    | 2.50                          | 1.90                          | 48.00       | 48.00       |
| WHPAR3021-180M | 18.00                                    | 3.00                          | 2.30                          | 44.00       | 43.00       |
| WHPAR3021-220M | 22.00                                    | 3.64                          | 2.80                          | 40.00       | 38.00       |
| WHPAR3021-250M | 25.00                                    | 4.03                          | 3.10                          | 37.00       | 38.00       |
| WHPAR3021-300M | 30.00                                    | 4.50                          | 3.50                          | 34.00       | 36.00       |

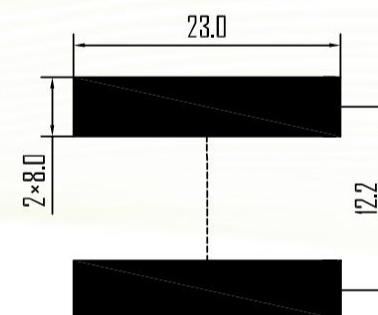
#### NOTES:

- Inductance At Isat Causes An Inductance Drop Of <30% From Its Value Without Current
- All Test Data Is Referenced To 25°C Ambient
- Inductance Test Condition: 100kHz 0.1V
- Maximum Part Temperature: +155°C

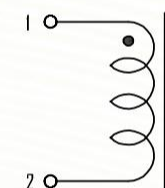
### WHPAR302X Series Mechanical & Schematics



Dimensions (Unit:mm)



Suggested PAD Layout



Schematics



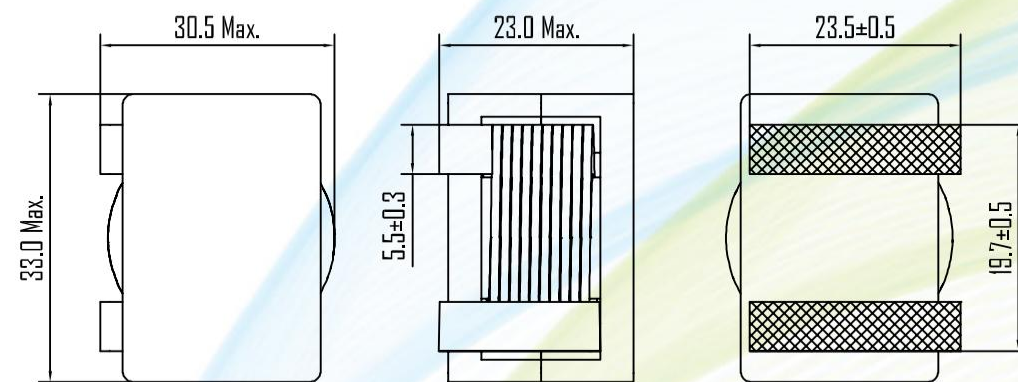
## WHPAR322X Series Electrical Specifications

| Part Number    | Inductance<br>( $\mu\text{H} \pm 20\%$ ) | DCR(m $\Omega$ )<br>Max @25°C | DCR(m $\Omega$ )<br>Typ @25°C | Isat<br>(A) | Irms<br>(A) |
|----------------|------------------------------------------|-------------------------------|-------------------------------|-------------|-------------|
| WHPAR3223-140M | 14.00                                    | 2.20                          | 1.65                          | 58.00       | 53.00       |
| WHPAR3223-180M | 18.00                                    | 2.80                          | 2.16                          | 52.00       | 44.00       |
| WHPAR3223-210M | 21.00                                    | 3.10                          | 2.40                          | 47.00       | 44.00       |
| WHPAR3223-250M | 25.00                                    | 3.80                          | 2.90                          | 43.00       | 35.00       |
| WHPAR3223-290M | 29.00                                    | 4.55                          | 3.50                          | 40.00       | 35.00       |

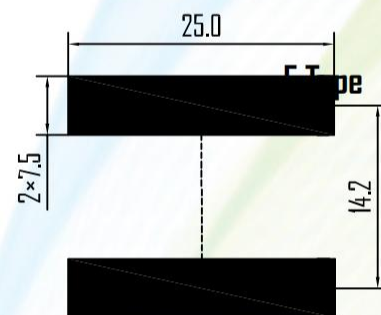
### NOTES:

- Inductance At Isat Causes An Inductance Drop Of <30% From Its Value Without Current
- All Test Data Is Referenced To 25°C Ambient
- Inductance Test Condition: 100kHz 0.1V
- Maximum Part Temperature: +155°C

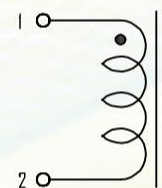
## WHPAR322X Series Mechanical & Schematics



Dimensions (Unit:mm)



Suggested PAD Layout



Schematics

## POWER PRODUCT HIGH CURRENT FLAT WIRE CM CHOKE

共模扼流圈，顾名思义，是设计来衰减和过滤电气系统中的共模噪声。共模扼流圈的关键参数是额定电流(以确保部件在应用中不会过热)，阻抗与频率(以确保它被优化以衰减所需的频率)，隔离电压(以确保它满足线路和中性相位之间的板级要求)和安全隔离(以确保它满足终端应用的安全要求)。重要的是要记住，共模扼流圈在应用程序中不能饱和(在正常使用下)，因为它们的设计是为了确保线路和返回电流是平衡的。

Common Mode Choke, As The Name Implies, Are Designed To Attenuate And Filter Common Mode Noise Within An Electric System. The Key Parameters For A Common Mode Choke Are The Current Rating (To Ensure The Part Does Not Overheat Within The Application), The Impedance Versus Frequency (To Ensure It Is Optimized To Attenuate The Desired Frequencies), The Isolation Voltage (To Ensure It Meets Board Level Requirements Between The Line And Neutral Phases) And Safety Isolation (To Ensure It Meets The Safety Requirements Of The End-application). It Is Important To Remember That Common Mode Chokes Cannot Saturate In The Application (Under Normal Use) As They Are Designed To Ensure That The Line And Return Currents Are Balanced.

### Features And Benefits

- Very Low DC Resistance
- High Rated Current
- Excellent Impedance Characteristics
- Flat Wire Winding And E-type Ferrite Core
- High  $\mu$ i Ferrite Core Material Magnetic Shield Construction Provide Good EMI

### Applications

- High Current AC-DC Converters
- High Current DC-DC Converters
- Battery Powered Devices
- Solar Converters
- Base Stations



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### WHHCMC2217 Series Electrical Specifications

| Part Number     | Inductance<br>1-2/4-3<br>( $\mu\text{H} \pm 30\%$ ) | DCR<br>1-2/4-3<br>( $\text{m}\Omega$ , Max.) | I <sub>rat</sub><br>(A) | Turn Ratio<br>1-2 : 4-3<br>( $\pm 5\%$ ) | Hi-pot<br>Coil-Coil |
|-----------------|-----------------------------------------------------|----------------------------------------------|-------------------------|------------------------------------------|---------------------|
| WHHCMC2217-881N | 880                                                 | 4.20                                         | 10.80                   | 1:1                                      | 2000V/DC            |
| WHHCMC2217-671N | 670                                                 | 3.20                                         | 12.96                   | 1:1                                      | 2000V/DC            |
| WHHCMC2217-501N | 496                                                 | 2.30                                         | 15.12                   | 1:1                                      | 2000V/DC            |
| WHHCMC2217-341N | 344                                                 | 1.70                                         | 17.28                   | 1:1                                      | 2000V/DC            |
| WHHCMC2217-221N | 220                                                 | 1.10                                         | 21.60                   | 1:1                                      | 2000V/DC            |
| WHHCMC2217-121N | 124                                                 | 0.70                                         | 25.92                   | 1:1                                      | 2000V/DC            |

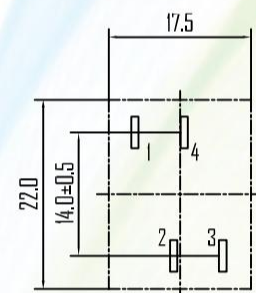
#### NOTES:

- WHHCMC2217Series-Flat Wire Winding And EPC Type Ferrite Core
- Self-Lead Structure Terminal
- All Test Data Is Referenced To 25°C Ambient
- Inductance : At 100kHz, 0.1V

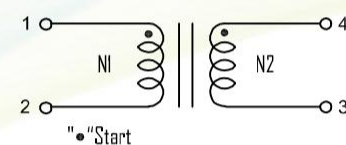
### WHHCMC2217 Series Mechanical & Schematics



Dimensions(Unit:mm)



Suggested PAD Layout(Top view)



Schematics

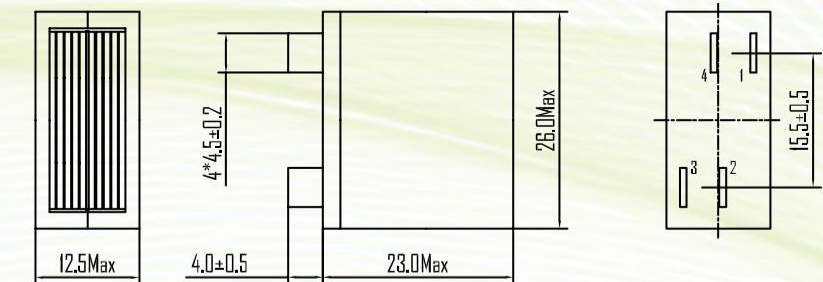
### WHHCMC2532 Series Electrical Specifications

| Part Number     | Inductance<br>1-2/4-3<br>( $\mu\text{H} \pm 30\%$ ) | DCR<br>1-2/4-3<br>( $\text{m}\Omega$ , Max.) | I <sub>rat</sub><br>(A) | Turn Ratio<br>1-2 : 4-3<br>( $\pm 5\%$ ) | Hi-pot<br>Coil-Coil |
|-----------------|-----------------------------------------------------|----------------------------------------------|-------------------------|------------------------------------------|---------------------|
| WHHCMC2523-102N | 1070                                                | 5.20                                         | 10.80                   | 1:1                                      | 2000V/DC            |
| WHHCMC2523-841N | 840                                                 | 4.10                                         | 12.15                   | 1:1                                      | 2000V/DC            |
| WHHCMC2523-641N | 640                                                 | 3.30                                         | 13.50                   | 1:1                                      | 2000V/DC            |
| WHHCMC2523-471N | 470                                                 | 2.35                                         | 16.20                   | 1:1                                      | 2000V/DC            |
| WHHCMC2523-331N | 330                                                 | 1.70                                         | 18.90                   | 1:1                                      | 2000V/DC            |
| WHHCMC2523-201N | 200                                                 | 1.20                                         | 21.60                   | 1:1                                      | 2000V/DC            |
| WHHCMC2523-121N | 120                                                 | 0.73                                         | 27.00                   | 1:1                                      | 2000V/DC            |

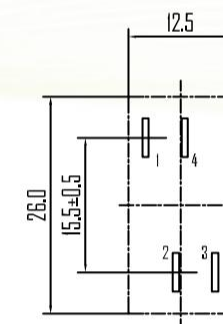
#### NOTES:

- WHHCMC2523Series-Flat Wire Winding And ECW Type Ferrite Core
- Self-Lead Structure Terminal
- All Test Data Is Referenced To 25°C Ambient
- Inductance : At 100kHz, 0.1V

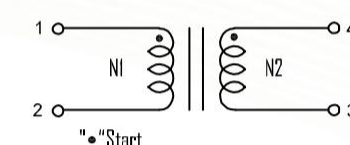
### WHHCMC2532 Series Mechanical & Schematics



Dimensions(Unit:mm)



Suggested PAD Layout(Top view)



Schematics



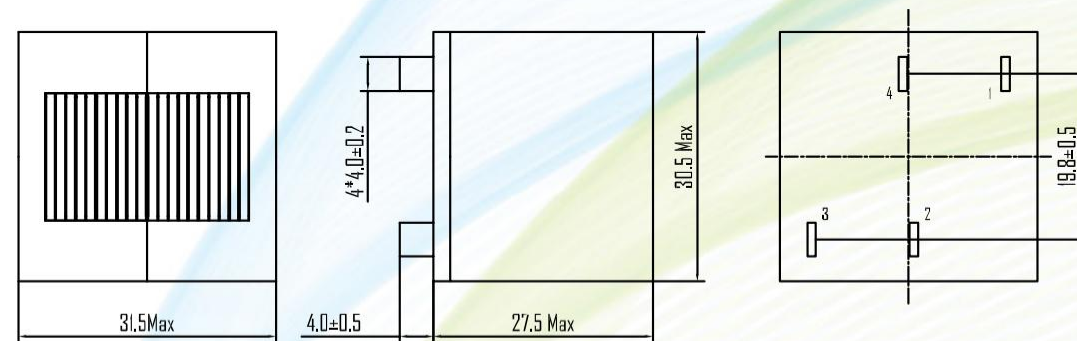
### WHHCMC3032 Series Electrical Specifications

| Part Number     | Inductance<br>1-2/4-3<br>( $\mu\text{H} \pm 30\%$ ) | DCR<br>1-2/4-3<br>( $\text{m}\Omega$ , Max.) | I <sub>rat</sub><br>(A) | Turn Ratio<br>1-2 : 4-3<br>( $\pm 5\%$ ) | Hi-pot<br>Coil-Coil |
|-----------------|-----------------------------------------------------|----------------------------------------------|-------------------------|------------------------------------------|---------------------|
| WHHCMC3032-482N | 4800                                                | 9.80                                         | 14.40                   | 1:1                                      | 2000V/DC            |
| WHHCMC3032-382N | 3790                                                | 7.50                                         | 16.80                   | 1:1                                      | 2000V/DC            |
| WHHCMC3032-292N | 2905                                                | 5.70                                         | 19.20                   | 1:1                                      | 2000V/DC            |
| WHHCMC3032-212N | 2134                                                | 4.40                                         | 21.60                   | 1:1                                      | 2000V/DC            |
| WHHCMC3032-152N | 1482                                                | 3.30                                         | 24.00                   | 1:1                                      | 2000V/DC            |
| WHHCMC3032-122N | 1200                                                | 2.50                                         | 28.80                   | 1:1                                      | 2000V/DC            |
| WHHCMC3032-721N | 726                                                 | 1.55                                         | 36.00                   | 1:1                                      | 2000V/DC            |
| WHHCMC3032-531N | 534                                                 | 1.10                                         | 43.20                   | 1:1                                      | 2000V/DC            |
| WHHCMC3032-371N | 371                                                 | 0.85                                         | 48.00                   | 1:1                                      | 2000V/DC            |
| WHHCMC3032-240N | 237                                                 | 0.54                                         | 60.00                   | 1:1                                      | 2000V/DC            |
| WHHCMC3032-131N | 133                                                 | 0.35                                         | 72.00                   | 1:1                                      | 2000V/DC            |

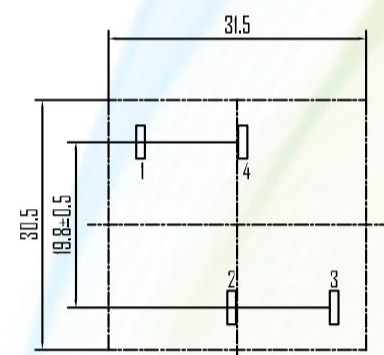
#### NOTES:

- WHHCMC3032Series-Flat Wire Winding And EPC Type Ferrite Core
- Self-Lead Structure Terminal
- All Test Data Is Referenced To 25°C Ambient
- Inductance : At 100kHz, 0.1V

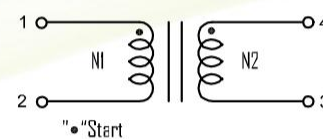
### WHHCMC3032 Series Mechanical & Schematics



Dimensions(Unit:mm)



Suggested PAD Layout(Top view)



Schematics

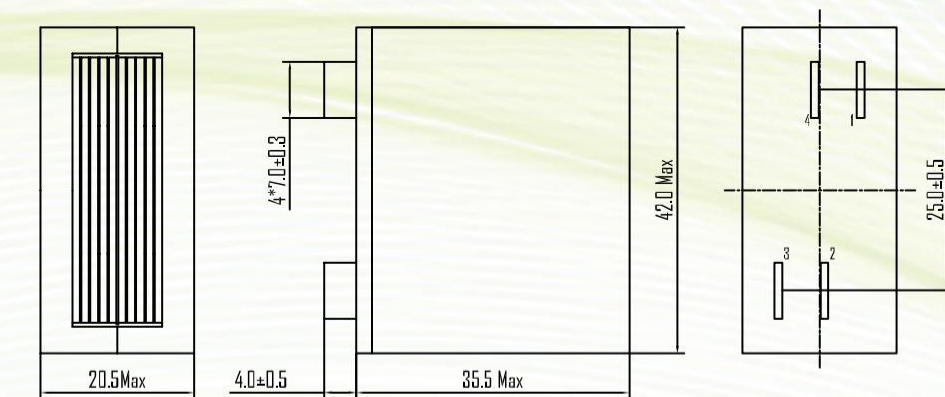
### WHHCMC4236 Series Electrical Specifications

| Part Number     | Inductance<br>1-2/4-3<br>( $\mu\text{H} \pm 30\%$ ) | DCR<br>1-2/4-3<br>( $\text{m}\Omega$ , Max.) | I <sub>rat</sub><br>(A) | Turn Ratio<br>1-2 : 4-3<br>( $\pm 5\%$ ) | Hi-pot<br>Coil-Coil |
|-----------------|-----------------------------------------------------|----------------------------------------------|-------------------------|------------------------------------------|---------------------|
| WHHCMC4236-122N | 1200                                                | 3.15                                         | 25.20                   | 1:1                                      | 2000V/DC            |
| WHHCMC4236-931N | 930                                                 | 2.40                                         | 29.40                   | 1:1                                      | 2000V/DC            |
| WHHCMC4236-681N | 680                                                 | 1.80                                         | 33.60                   | 1:1                                      | 2000V/DC            |
| WHHCMC4236-471N | 470                                                 | 1.34                                         | 37.80                   | 1:1                                      | 2000V/DC            |
| WHHCMC4236-301N | 300                                                 | 0.90                                         | 46.20                   | 1:1                                      | 2000V/DC            |
| WHHCMC4236-171N | 170                                                 | 0.50                                         | 63.00                   | 1:1                                      | 2000V/DC            |

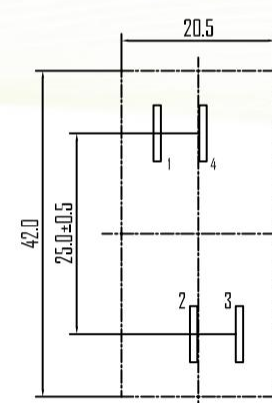
#### NOTES:

- WHHCMC4236Series-Flat Wire Winding And ECW Type Ferrite Core
- Self-Lead Structure Terminal
- All Test Data Is Referenced To 25°C Ambient
- Inductance : At 100kHz, 0.1V

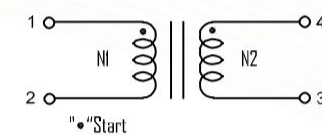
### WHHCMC4236 Series Mechanical & Schematics



Dimensions(Unit:mm)



Suggested PAD Layout(Top view)



Schematics





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## POWER PRODUCT

### HIGH CURRENT POWER BEAD INDUCTOR

功率磁珠电感器通常用于大电流多相稳压器，功率处理器，内存模块和大电流专用集成电路和控制电源，广泛应用于服务器，图形卡，存储和数据中心。在多相体系结构中，电流被分成并行路径，每个路径的操作(开/关)是交错的，这样在输出处的组合纹波电流比每个单独路径的要小得多。这种纹波消除允许在每个路径上使用非常小的电感值(50-300nH)，这意味着电源可以比单相实现更快地响应负载的变化(瞬态响应)。

Power Bead Inductors Are Typically Used In High Current Multi-Phase Voltage Regulators That Power Processors, Memory Modules And High Current ASICs And FPGAs In A Wide Range Of Applications Including Servers, Graphic Cards, Storage And Data Centers. In A Multiphase Architecture The Current Is Broken Into Parallel Paths And The Operation (Turn On/Off) Of Each Path Is Staggered Such That The Combined Ripple Current At The Output Is Much Less Than That Of Each Individual Path. This Ripple Cancellation Allows For The Use Of Very Small Inductance Values (50-300nH) In Each Path Which Means The Power Supply Can Respond To Changes In Load (Transient Response) Much Faster Than A Single Phase Implementation.

#### Features And Benefits

- Single Turn Construction For Ultra Low DCR
- Ferrite Core Minimizes AC Loss
- Highest Energy Density
- Flat Inductance With Frequency
- Fully Automated Assembly
- High Reliability And Exceptional Quality

#### Applications

- High Current DC-DC Converter
- Telecom Soft Switch, Base Station
- Battery Powered Devices
- VRM, Multi-Phase Buck Regulators
- Storage And Data Center
- Graphic Cards, PC

#### Electrical Specifications @ 25°C

| Part Number      | Inductance @DADC | Inductance @Irated | Irated | DCR      | Saturation Current (A Typ) |       |       | Heating Current |
|------------------|------------------|--------------------|--------|----------|----------------------------|-------|-------|-----------------|
|                  | nH ±15%          | nH Typ             | ADC    | mΩ       | 25°C                       | 100°C | 125°C | A TYP           |
| WHPBC-1008A-R15T | 150              | 142                | 57.5   | 0.29±10% | 70.0                       | 57.5  | 54.0  | 64              |
| WHPBC-1008A-R22T | 220              | 216                | 35.0   | 0.29±10% | 45.0                       | 35.0  | 32.5  | 64              |
| WHPBC-1008A-R28T | 280              | 264                | 27.0   | 0.29±10% | 36.5                       | 24.0  | 25.5  | 64              |
| WHPBC-1008A-R30T | 300              | 276                | 25.5   | 0.29±10% | 34.0                       | 25.5  | 24.0  | 64              |

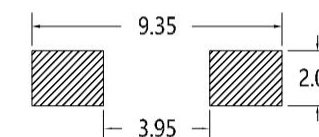
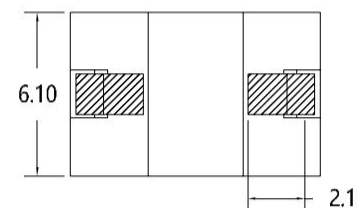
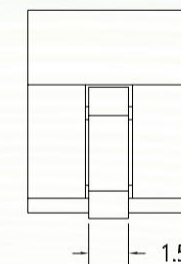
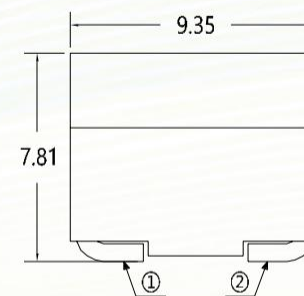
#### NOTE:

1. Inductance Measured At 100kHz, 100mVrms.
2. Inductance At Irated Is The Value Of The Inductance At 25°C At The Listed Rated Current.
3. The Rated Current As Listed Is Either The Saturation Current (25°C Or 100°C) Or The Heating Current Depending On Which Value Is Lower.
4. The Saturation Current Is The Typical Current Which Causes The Inductance To Drop By 20% At The Stated Ambient Temperatures(25°C, 100°C).
5. The Heating Current Is The DC Current Which Causes The Part Temperature To Increase By Approximately 40°C When Used In A Typ Application.
6. Operating Temperature -40°C To +125°C.
7. Storage Temperature(with Package): +10°C To +40°C.
8. Storage Temperature(Without Package, Just For Components): -40°C To +125°C.

#### Mechanical

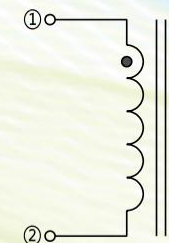
WHPBC-1008A-Rxxx  
VOOHU® YYWW

Dimensions:mm  
Unless Otherwise specified,  
All Tolerances Are ±0.25



Suggested PAD Layout  
Tolerances ±0.05

#### Schematics

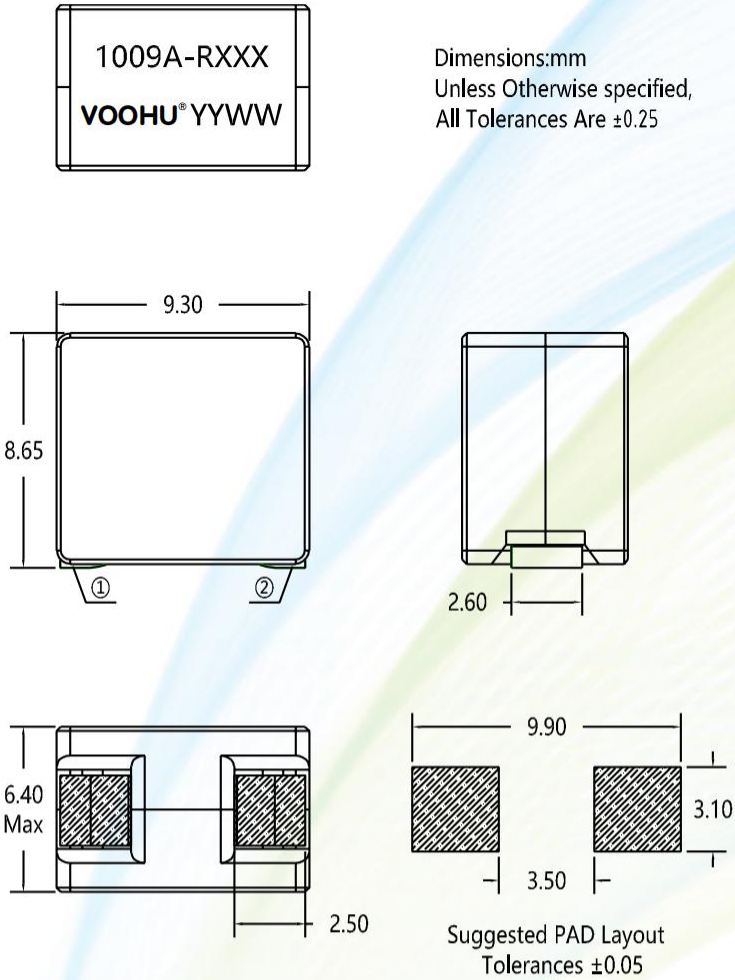




| Electrical Specifications @ 25°C |                           |                             |          |                            |       |       |                         |
|----------------------------------|---------------------------|-----------------------------|----------|----------------------------|-------|-------|-------------------------|
| Part Number                      | Inductance @0ADC (nH±15%) | Inductance @Irated (nH TYP) | DCR (mΩ) | Saturation Current (A TYP) |       |       | Heating Current (A TYP) |
|                                  |                           |                             |          | 25°C                       | 100°C | 125°C |                         |
| WHPBU-1009A-R12T                 | 120                       | 86                          | 0.17±5%  | 100                        | 80    | 75    | 66                      |
| WHPBU-1009A-R1ST                 | 150                       | 108                         | 0.17±5%  | 80                         | 64    | 60    | 66                      |

- NOTE:
1. Inductance Measured At 100kHz, 100mVrms.
  2. Inductance At Irated Is The Value Of The Inductance At 25°C At The Listed Rated Current.
  3. The Saturation Current Is The Typical Current Which Causes The Inductance To Drop By 28% At The Stated Ambient Temperatures (25°C, 100°C , 125°C). This Current Is Determined By Placing The Component In The Specified Ambient Environment And Applying A Short Duration Pulse Current (To Eliminate Self-heating Effects) To The Component.
  4. The Heating Current Is The DC Current Which Causes The Part Temperature To Increase By Approximately 40°C When Used In A Typical Application.
  5. In High Volt\*time Applications, Additional Heating In The Component Can Occur Due To Core Losses In The Inductor Which May Neccessitate Derating The Current In Order To Limit The Temperature Rise Of The Component. To Determine The Approximate Total Losses (Or Temperature Rise) For A Given Application, The Core loss And Temperature Rise Curves Can Be Used.

Mechanical



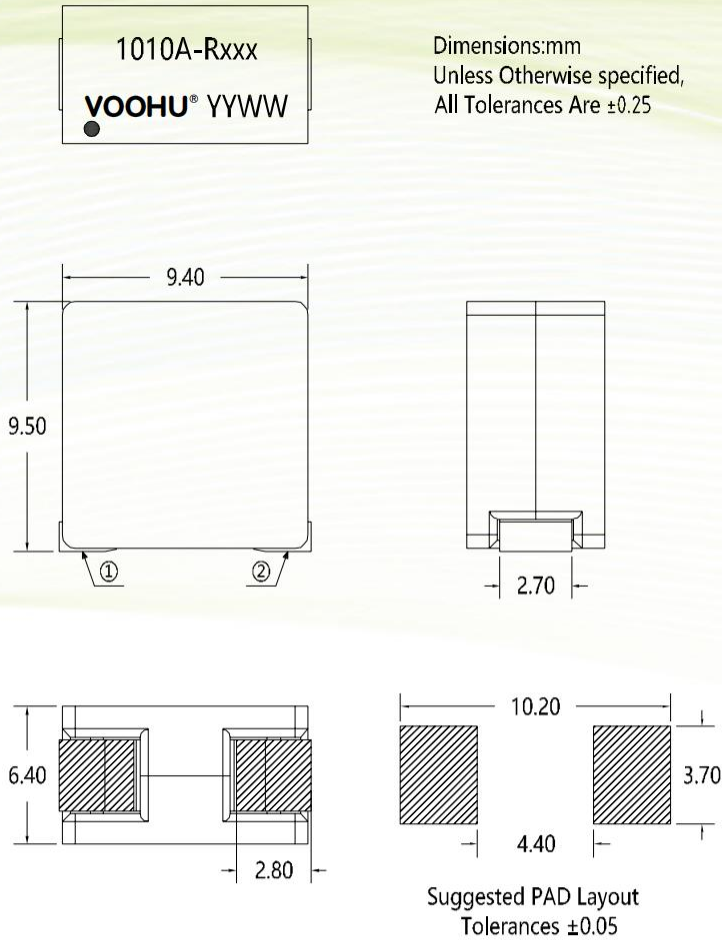
Schematics



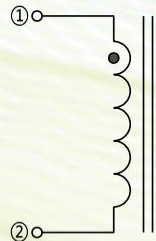
| Electrical Specifications @ 25°C |                            |                             |            |          |                            |       |       |                       |
|----------------------------------|----------------------------|-----------------------------|------------|----------|----------------------------|-------|-------|-----------------------|
| Part Number                      | Inductance @0ADC (nH ±15%) | Inductance @Irated (nH Typ) | Irated ADC | DCR mΩ   | Saturation Current (A Typ) |       |       | Heating Current A TYP |
|                                  |                            |                             |            |          | 25°C                       | 100°C | 125°C |                       |
| WHPBU-1010A-R07T                 | 70                         | 70                          | 78         | 0.15±10% | 125+                       | 125+  | 125+  | 78                    |
| WHPBU-1010A-R08T                 | 80                         | 80                          | 78         | 0.15±10% | 125+                       | 125+  | 120   | 78                    |
| WHPBU-1010A-R10T                 | 100                        | 100                         | 78         | 0.15±10% | 113                        | 96    | 89    | 78                    |
| WHPBU-1010A-R12T                 | 120                        | 120                         | 78         | 0.15±10% | 102                        | 86    | 81    | 78                    |
| WHPBU-1010A-R1ST                 | 150                        | 150                         | 64         | 0.15±10% | 76                         | 64    | 60    | 78                    |

- NOTE:
- 1.Inductance Measured At 100kHz, 100mVrms.
  - 2.Inductance At Irated Is The Value Of The Inductance At 25°C At The Listed Rated Current.
  - 3.The Rated Current As Listed Is Either The Saturation Current (25°C Or 100°C) Or The Heating Current Depending On Which Value Is Lower.
  - 4.The Saturation Current Is The Typical Current Which Causes The Inductance To Drop By 20% At The Stated Ambient Temperatures(25°C, 100°C).
  - 5.The Heating Current Is The DC Current Which Causes The Part Temperature To Increase By Approximately 40°C When Used In A Typ Application.
  - 6.Operating Temperature -40°C To +125°C.
  - 7.Storage Temperature(with Package): +10°C To +40°C.
  - 8.Storage Temperature(Without Package, Just For Components): -40°C To +125°C.

Mechanical



Schematics





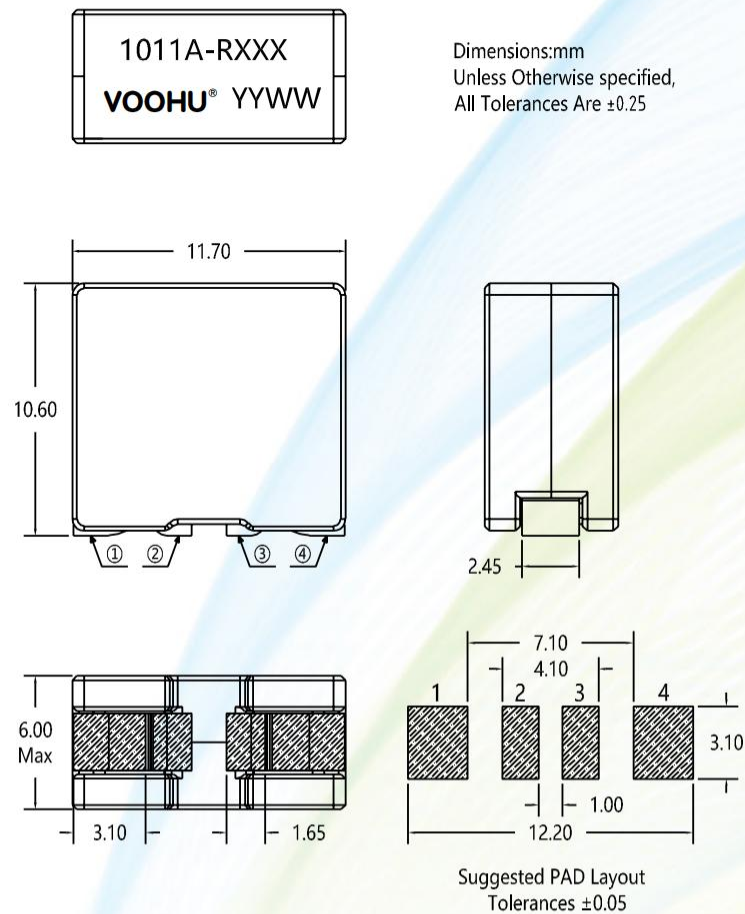
### Electrical Specifications @ 25°C

| Part Number      | Inductance @0ADC (nH) ±15% | Inductance @Irated (nH TYP) | Lk (nH) Max | DCR (mΩ) ±10% |      | Saturation Current (A TYP) |       | Heating Current (A TYP) |     | Hi-pot (1mA/2s) |
|------------------|----------------------------|-----------------------------|-------------|---------------|------|----------------------------|-------|-------------------------|-----|-----------------|
|                  |                            |                             |             | 1-4           | 2-3  | 25°C                       | 100°C | 1-4                     | 2-3 |                 |
| WHPBE-1011A-R11T | 105                        | 84                          | 10          | 0.125         | 0.37 | 125                        | 103   | 77                      | 45  | 100VDC          |
| WHPBE-1011A-R12T | 120                        | 96                          |             |               |      | 102                        | 87    |                         |     |                 |
| WHPBE-1011A-R15T | 150                        | 120                         |             |               |      | 84                         | 71    |                         |     |                 |
| WHPBE-1011A-R18T | 180                        | 144                         |             |               |      | 68                         | 55    |                         |     |                 |
| WHPBE-1011A-R20T | 200                        | 160                         |             |               |      | 58                         | 50    |                         |     |                 |

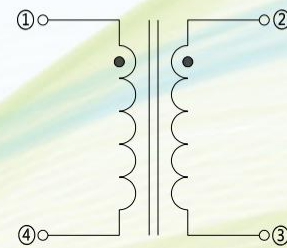
Note.

1. Inductance Measured At 100kHz, 100mVrms.
2. Inductance At Irated Is The Value Of The Inductance At Saturation Current.
3. The Saturation Current Is The Typical Current Which Causes The Inductance To Drop By 20% At The Stated Ambient Temperatures (25°C, 100°C). This Current Is Determined By Placing The Component In The Specified Ambient Environment And Applying A Short Duration Pulse Current (To Eliminate Self-Heating Effects) To The Component.
4. Lk Is Two Times Of Leakage Inductance: Lx(1-2) At 100kHz, 100mVrms With (3-4) Short.
5. The Heating Current Is The DC Current Which Causes The Part Temperature To Increase By Approximately 40°C When Used In A Typical Application.

### Mechanical



### Schematics



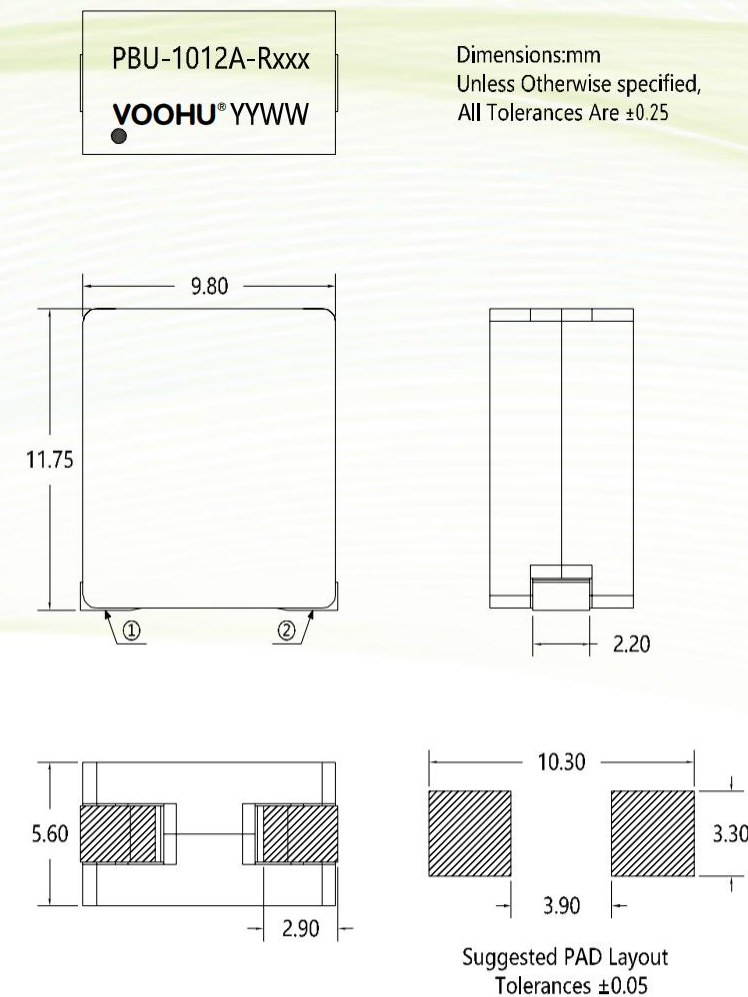
### Electrical Specifications @ 25°C

| Part Number      | Inductance @0ADC (nH) ±15% | Inductance @Irated (nH TYP) | Irated ADC | DCR mΩ    | Saturation Current (A TYP) |       |       | Heating Current A TYP |
|------------------|----------------------------|-----------------------------|------------|-----------|----------------------------|-------|-------|-----------------------|
|                  |                            |                             |            |           | 25°C                       | 100°C | 125°C |                       |
| WHPBU-1012A-R10T | 100                        | 100                         | 77         | 0.125±10% | 125                        | 105   | 95    | 77                    |
| WHPBU-1012A-R12T | 120                        | 120                         | 77         | 0.125±10% | 105                        | 88    | 81    | 77                    |
| WHPBU-1012A-R15T | 150                        | 140                         | 77         | 0.125±10% | 83                         | 78    | 71    | 77                    |
| WHPBU-1012A-R33T | 330                        | 300                         | 32         | 0.125±10% | 40                         | 32    | 28    | 77                    |

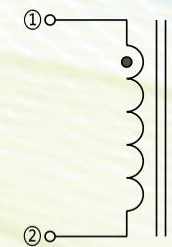
NOTE:

1. Inductance Measured At 100kHz, 100mVrms.
2. Inductance At Irated Is The Value Of The Inductance At 25°C At The Listed Rated Current.
3. The Rated Current As Listed Is Either The Saturation Current (25°C Or 100°C) Or The Heating Current Depending On Which Value Is Lower.
4. The Saturation Current Is The Typical Current Which Causes The Inductance To Drop By 20% At The Stated Ambient Temperatures (25°C, 100°C).
5. The Heating Current Is The DC Current Which Causes The Part Temperature To Increase By Approximately 40°C When Used In A Typ Application.
6. Operating Temperature -40°C To +125°C.
7. Storage Temperature(with Package): +10°C To +40°C.
8. Storage Temperature(Without Package, Just For Components): -40°C To +125°C.

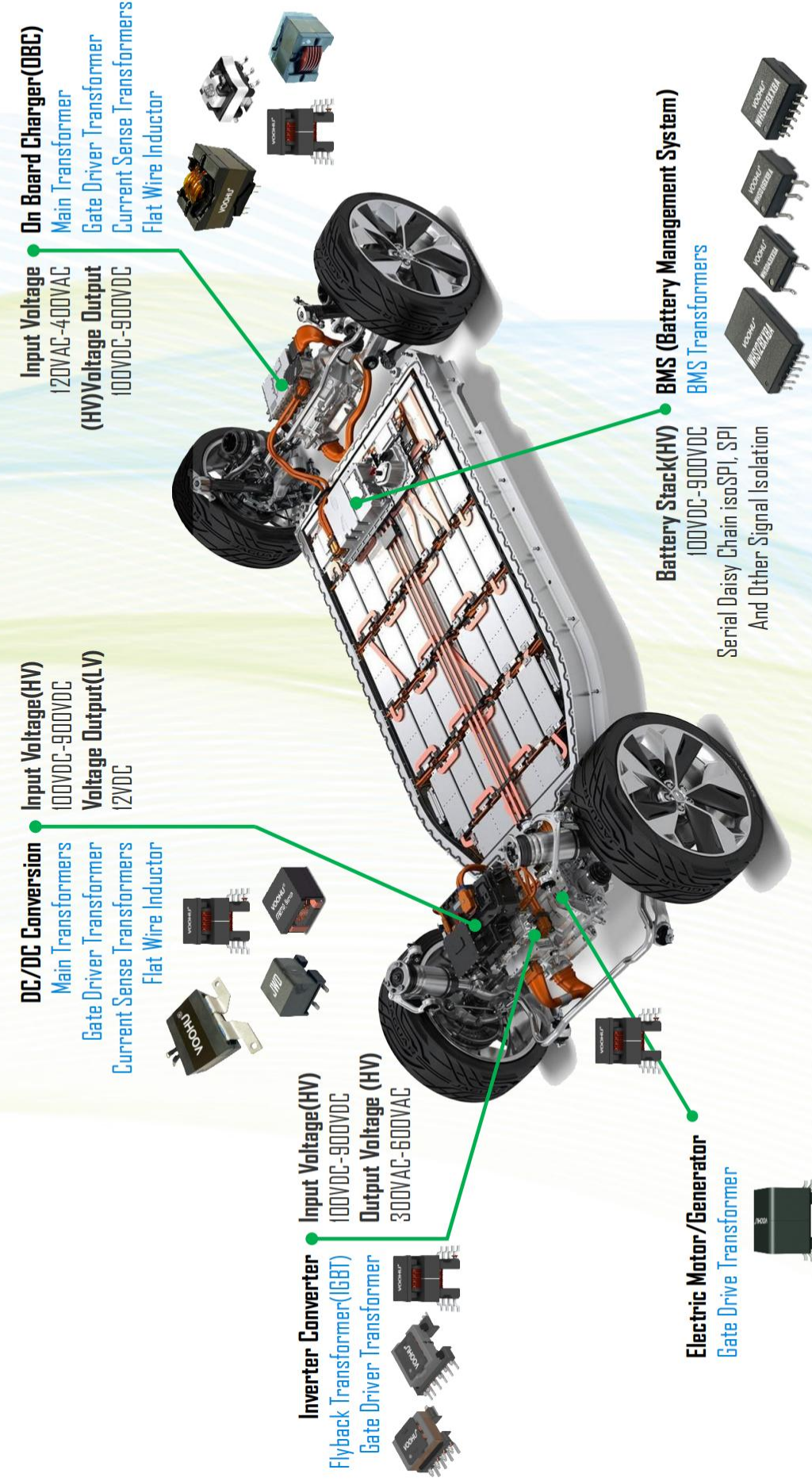
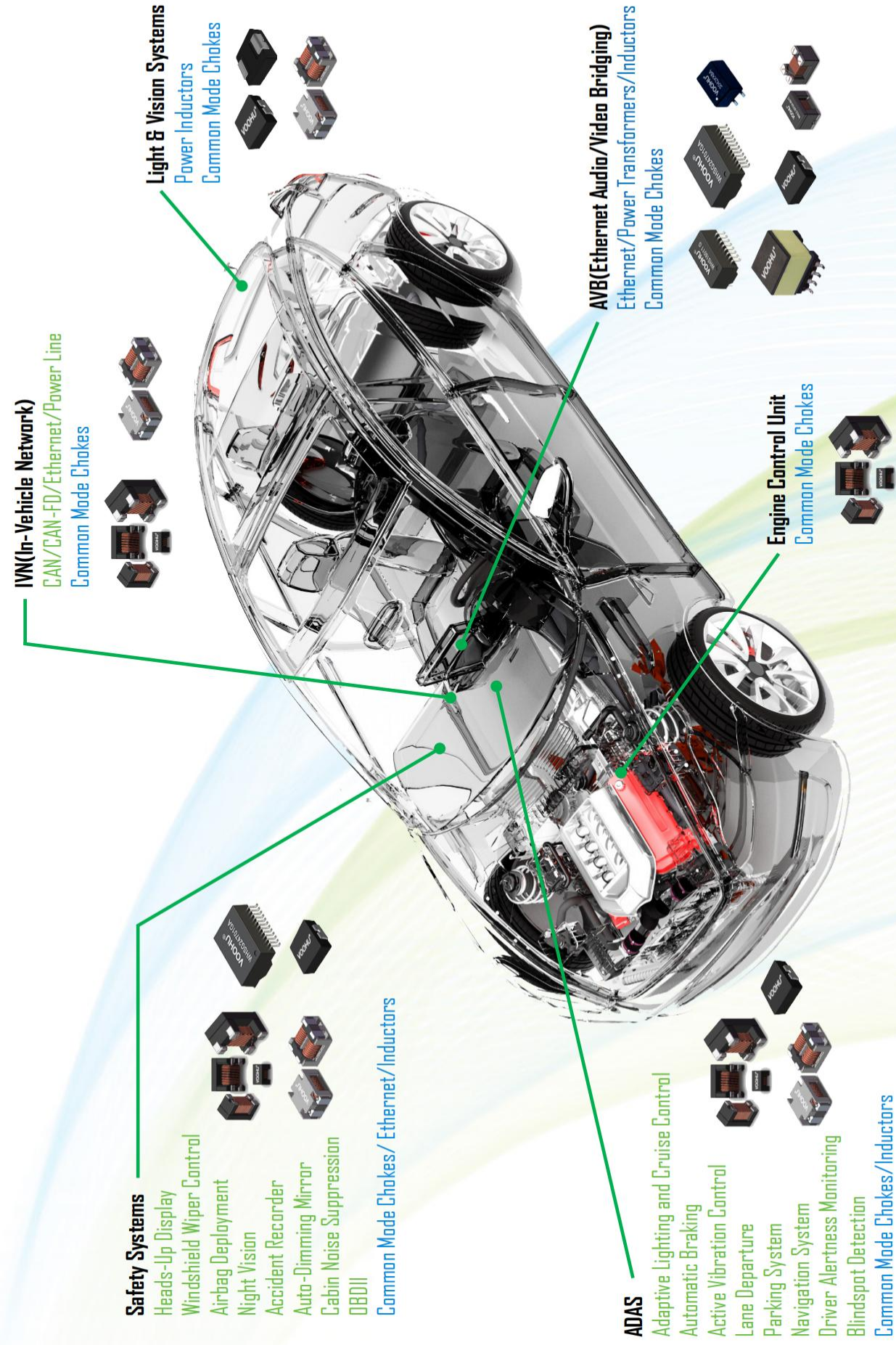
### Mechanical



### Schematics











# AUTOMOTIVE

## BATTERY MANAGEMENT SYSTEM - BMS TRANSFORMERS

在使用菊花链连接的大型电池组应用中，串联连接的电池数量非常高，而且电压差异很大，需要组件对组件的隔离。板之间的串行通信链路需要用变压器耦合电路而不是电容耦合电路来隔离。VOOHU全系列隔离变压器，适用于各类大小的电池组系统，用于串口安全隔离和电磁干扰抑制。我们帮助设计师为更高能效的现代汽车(如电动汽车、混合动力汽车和插电式混合动力汽车)创建电池管理系统。我们所有的电池管理部件都符合AEC-Q200的汽车应用要求。

In Large Battery Pack Applications With Daisy Chain Connections, The Number Of Cells Connected In Series Is Very High, And The Large Voltage Differences Demand Component-To-Component Isolation. The Serial Communication Links Between Boards Need To Be Isolated By Transformer Coupling Circuits Instead Of Capacitor Coupling. VOOHU Electronics A Full Line Of Isolation Transformers For Small To Large Battery Pack Systems For Serial Port Safety Isolation And EMI Noise Suppression. We Help Designers Create Battery Management Systems For Higher Energy-Efficiency Modern Cars Such As EVs, HEVs, And PHEVs. All Our Battery Management Parts Meet AEC-Q200 Requirements For Automotive Applications.

### Features And Benefits

- Supports BMS Safety Isolation And EMI Noise Suppression
- Meets AEC-Q200 Requirements
- Multiple Options For Working Voltages And Voltage Isolation
- Functional, Basic, And Reinforced Insulation Available.

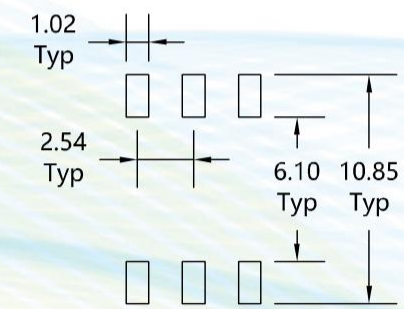
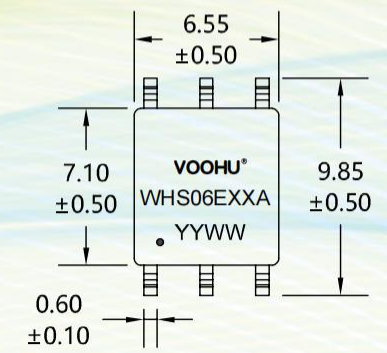
### Applications

- Electric Vehicle
- Energy Storage Systems
- Data Center UPS
- Solar Energy Storage
- Green - Renewable
- Marine

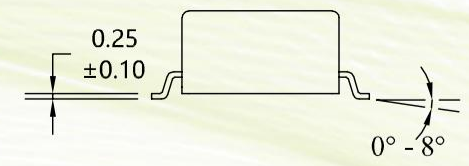
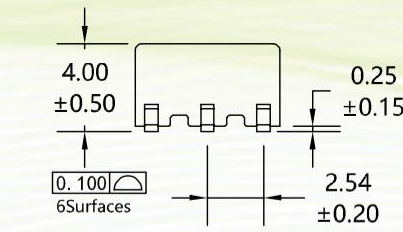
### Electrical Specifications @ 25°C

| Part Number | OCL<br>(μH)  | DCR<br>(mΩ) |      | Isolation Hipot<br>(V) | Working<br>Voltage<br>(V) | Turns<br>Ratio | Operating<br>Temperature<br>(°C) |
|-------------|--------------|-------------|------|------------------------|---------------------------|----------------|----------------------------------|
|             | Min          | Max         |      | Min                    |                           |                |                                  |
|             | 100kHz, 0.1V | PRI         | SEC  | 1mA, 2s                |                           |                |                                  |
| WHS06E12BA  | 475          | 650         | 1000 | 3100VAC                | 400                       | 1:1.3±5%       | -40 to 125                       |
| WHS06E14BA  | 475          | 650         | 1000 | 3100VAC                | 400                       | 1:1.1±5%       | -40 to 125                       |
| WHS06E16BA  | 475          | 650         | 1000 | 3100VAC                | 400                       | 1:1.7±5%       | -40 to 125                       |
| WHS06E17BA  | 475          | 650         | 1000 | 3100VAC                | 400                       | 1:2±5%         | -40 to 125                       |

### Mechanical

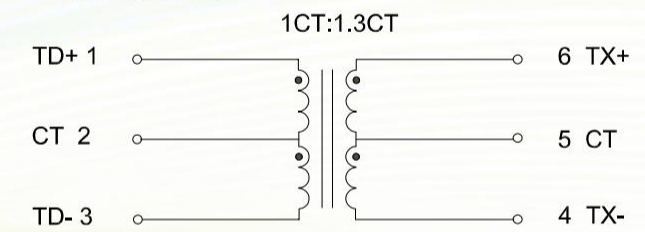


Suggested PAD Layout

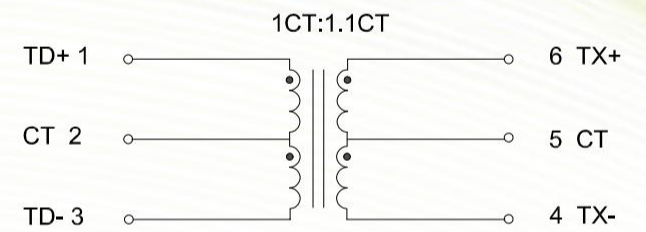


### Schematics

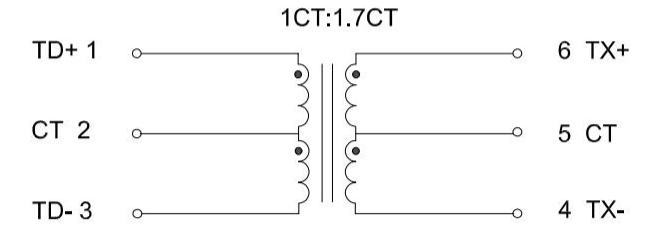
#### WHS06E12BA



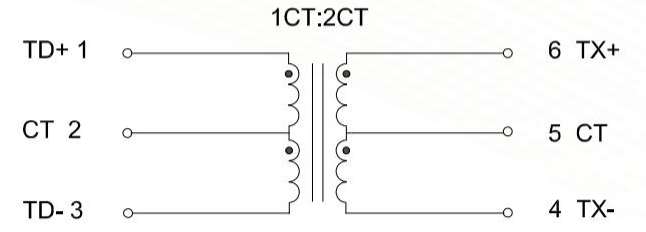
#### WHS06E14BA



#### WHS06E16BA

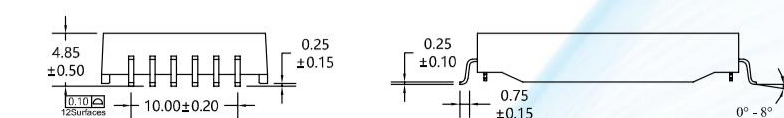
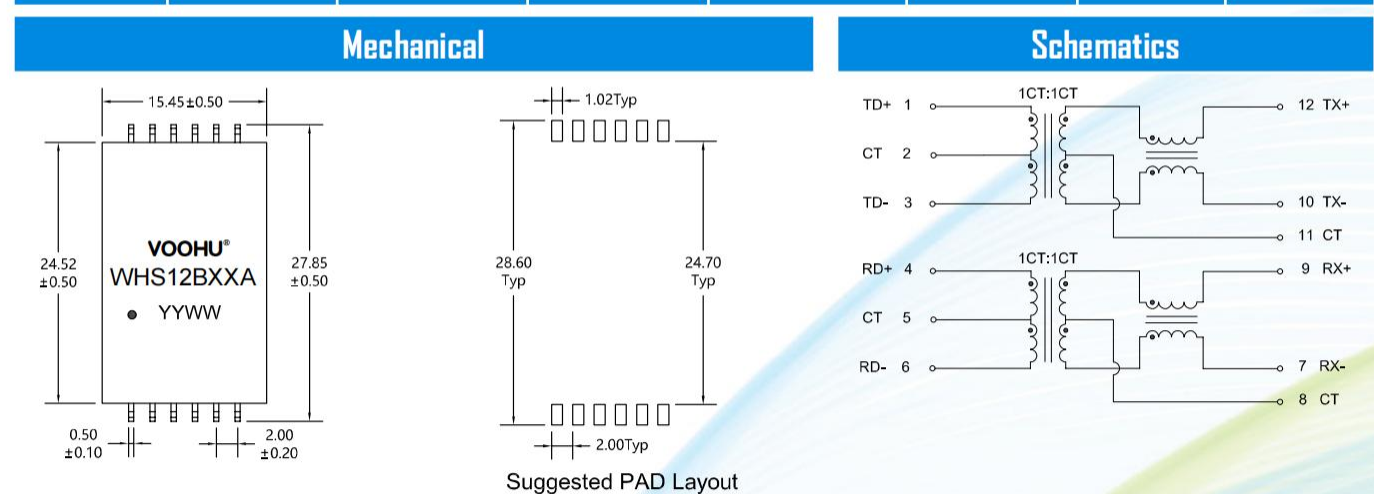


#### WHS06E17BA

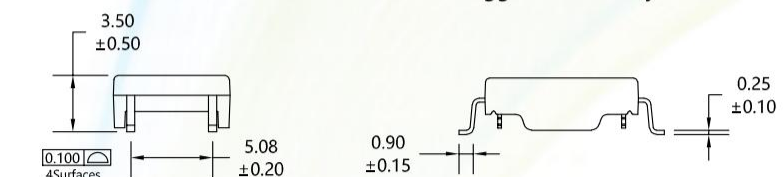
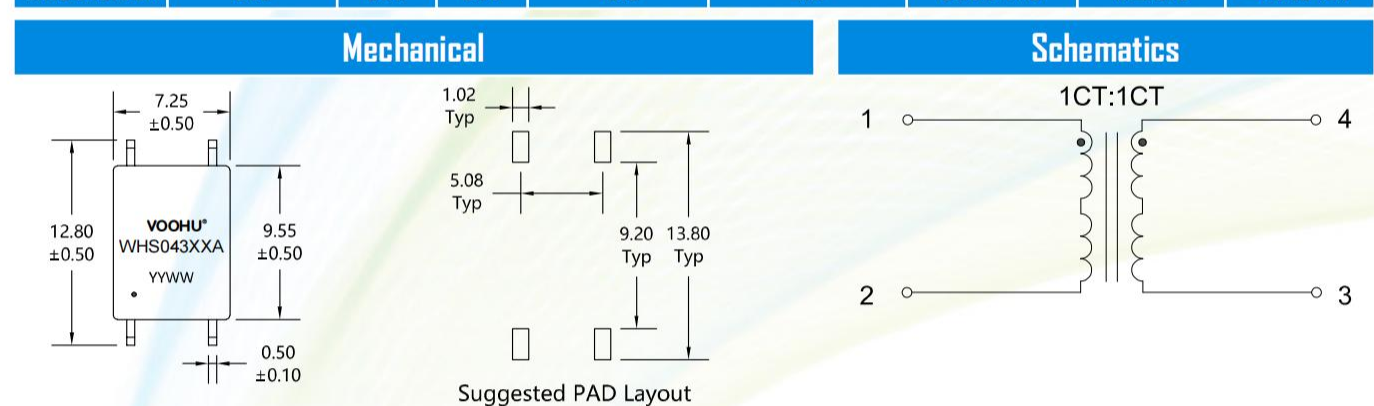




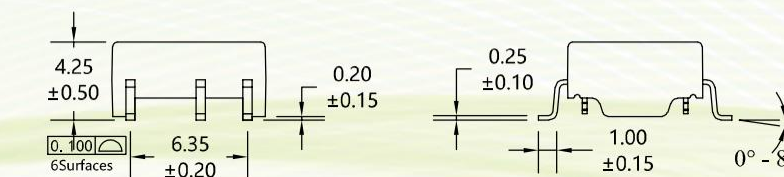
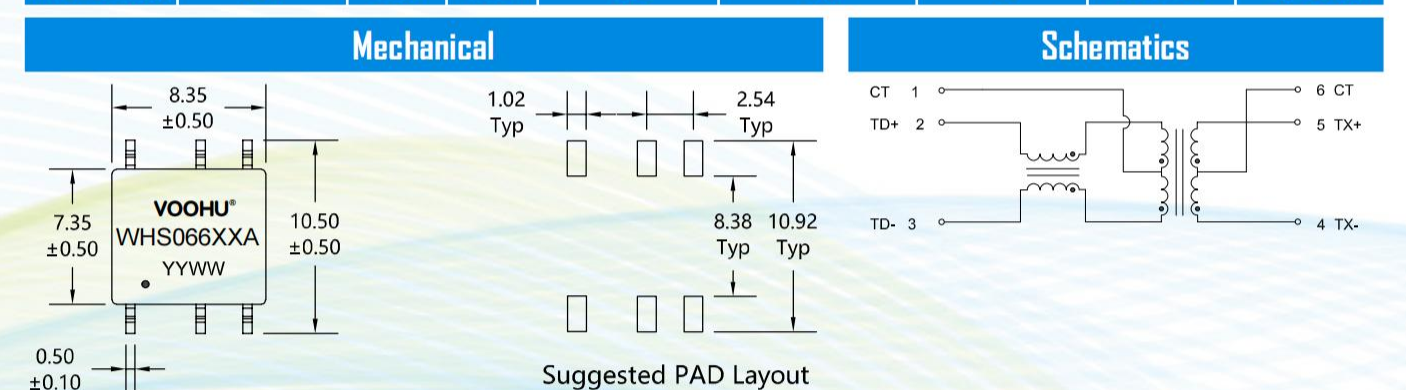
| Electrical Specifications @ 25°C |             |                     |                  |           |                 |                     |                            |
|----------------------------------|-------------|---------------------|------------------|-----------|-----------------|---------------------|----------------------------|
| Part Number                      | OCL (μH)    | Insertion Loss (dB) | Return Loss (dB) | CMRR (dB) | Cross Talk (dB) | Isolation Hipot (V) | Operating Temperature (°C) |
|                                  | Min         | Max                 | Min              | Min       | Min             | Min                 |                            |
|                                  | 100kHz,0.1V | 1-4 MHz             | 1-4 MHz          | 1-100 MHz | 1-4 MHz         | 1mA,60s             |                            |
| WHS12B03BA                       | 250         | -0.4                | -20              | -20       | -50             | 6300VDC             | -40 to 125                 |



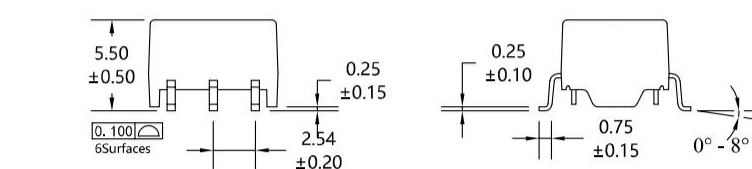
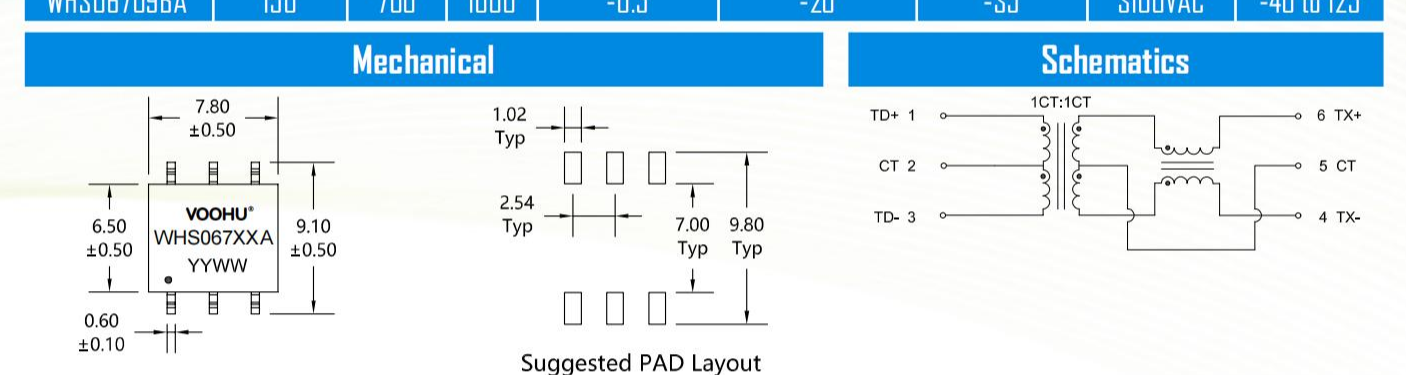
| Electrical Specifications @ 25°C |             |          |     |                     |                  |                     |                            |
|----------------------------------|-------------|----------|-----|---------------------|------------------|---------------------|----------------------------|
| Part Number                      | OCL (MH)    | DCR (mΩ) |     | Insertion Loss (dB) | Return Loss (dB) | Isolation Hipot (V) | Operating Temperature (°C) |
|                                  | Min         | Max      |     | Max                 | Min              | Min                 |                            |
|                                  | 100kHz,0.1V | PRI      | SEC | 1-4 MHz             | 1-4 MHz          | 1mA,60s             |                            |
| WHS04313BA                       | 350         | 800      | 800 | -0.5                | -20              | 3000 VAC            | -40 to 125                 |



| Electrical Specifications @ 25°C |             |          |     |                     |                  |           |                            |
|----------------------------------|-------------|----------|-----|---------------------|------------------|-----------|----------------------------|
| Part Number                      | OCL (μH)    | DCR (mΩ) |     | Insertion Loss (dB) | Return Loss (dB) | CMRR (dB) | Operating Temperature (°C) |
|                                  | Min         | Max      |     | Max                 | Min              | Min       |                            |
|                                  | 100kHz,0.1V | PRI      | SEC | 1-4 MHz             | 1-4 MHz          | 1-100 MHz |                            |
| WHS06601BA                       | 300         | 950      | 650 | -0.5                | -20              | -35       | -40 to 125                 |
| WHS06602BA                       | 500         | 950      | 650 | -0.5                | -20              | -35       | -40 to 125                 |



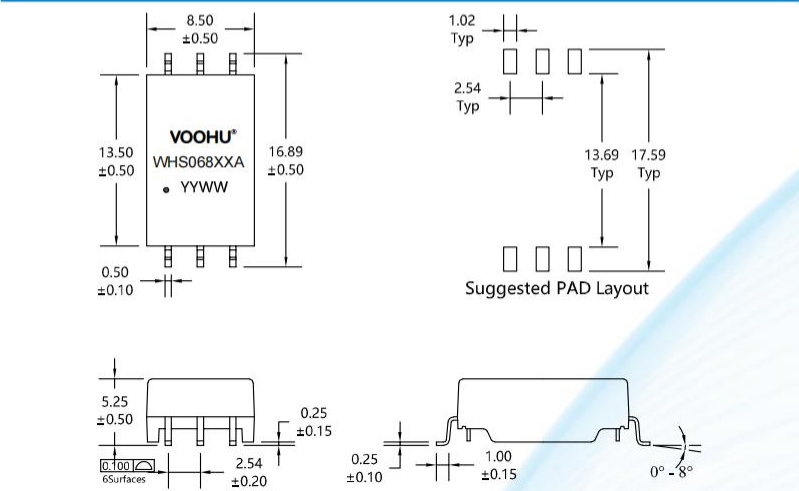
| Electrical Specifications @ 25°C |             |          |      |                     |                  |           |                            |
|----------------------------------|-------------|----------|------|---------------------|------------------|-----------|----------------------------|
| Part Number                      | OCL (MH)    | DCR (mΩ) |      | Insertion Loss (dB) | Return Loss (dB) | CMRR (dB) | Operating Temperature (°C) |
|                                  | Min         | Max      |      | Max                 | Min              | Min       |                            |
|                                  | 100kHz,0.1V | PRI      | SEC  | 1-4 MHz             | 1-4 MHz          | 1-100 MHz |                            |
| WHS06709BA                       | 150         | 700      | 1000 | -0.5                | -20              | -35       | -40 to 125                 |



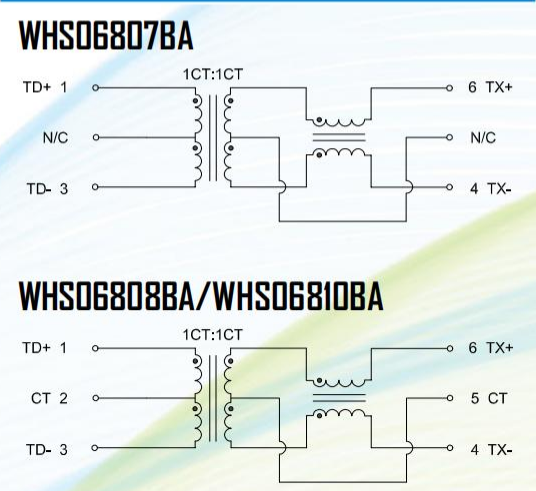


| Electrical Specifications @ 25°C |             |             |      |                        |                     |              |                           |                                  |
|----------------------------------|-------------|-------------|------|------------------------|---------------------|--------------|---------------------------|----------------------------------|
| Part Number                      | OCL<br>(μH) | DCR<br>(mΩ) |      | Insertion Loss<br>(dB) | Return Loss<br>(dB) | CMRR<br>(dB) | Isolation<br>Hipot<br>(V) | Operating<br>Temperature<br>(°C) |
|                                  | Min         | Max         |      | Max                    | Min                 | Min          | Min                       |                                  |
|                                  | 100kHz,0.1V | PRI         | SEC  | 1-4 MHz                | 1-4 MHz             | 1-100 MHz    | 1mA,60s                   |                                  |
| WHS06807BA                       | 150         | 700         | 1000 | -0.5                   | -20                 | -35          | 4300VDC                   | -40 to 125                       |
| WHS06808BA                       | 150         | 1000        | 1000 | -0.5                   | -20                 | -35          | 4300VDC                   | -40 to 125                       |
| WHS06810BA                       | 500         | 1000        | 1000 | -0.5                   | -20                 | -35          | 4300VDC                   | -40 to 125                       |

Mechanical

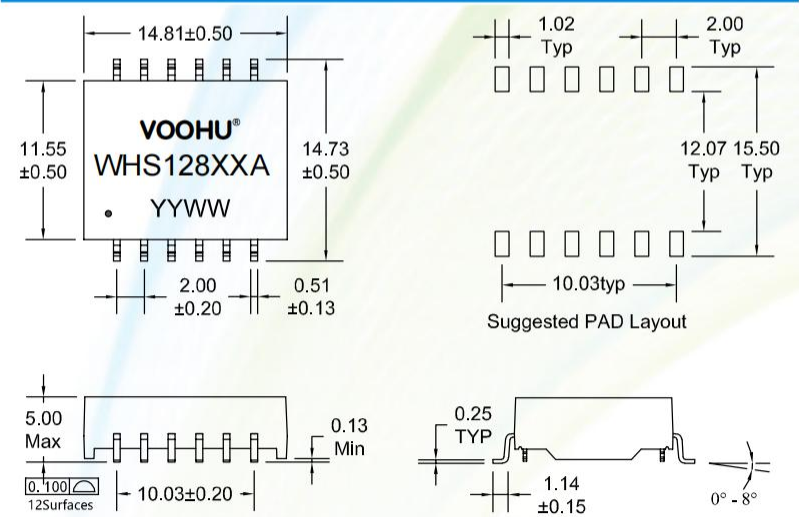


Schematics

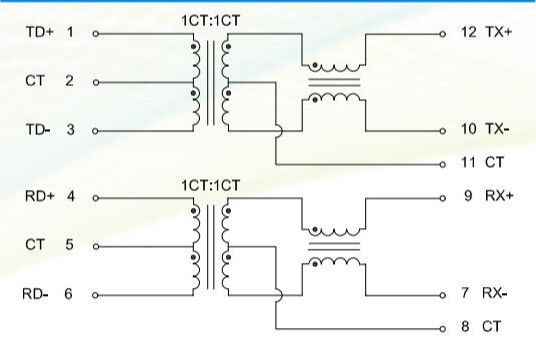


| Electrical Specifications @ 25°C |             |                        |                     |                    |                  |              |                           |                                  |
|----------------------------------|-------------|------------------------|---------------------|--------------------|------------------|--------------|---------------------------|----------------------------------|
| Part Number                      | OCL<br>(MH) | Insertion Loss<br>(dB) | Return Loss<br>(dB) | Cross Talk<br>(dB) |                  | CMRR<br>(dB) | Isolation<br>Hipot<br>(V) | Operating<br>Temperature<br>(°C) |
|                                  | Min         | Max                    | Min                 | Min                |                  | Min          | Min                       |                                  |
|                                  | 100kHz,0.1V | 1-4 MHz                | 1-4 MHz             | 1-10 MHz           | 10-100 MHz       | 1-100 MHz    | 1mA,60s                   |                                  |
| WHS12802BA                       | 150         | -0.25                  | -22                 | -50                | -50+20*log(f/10) | -45          | 4300VDC                   | -40 to 125                       |

Mechanical

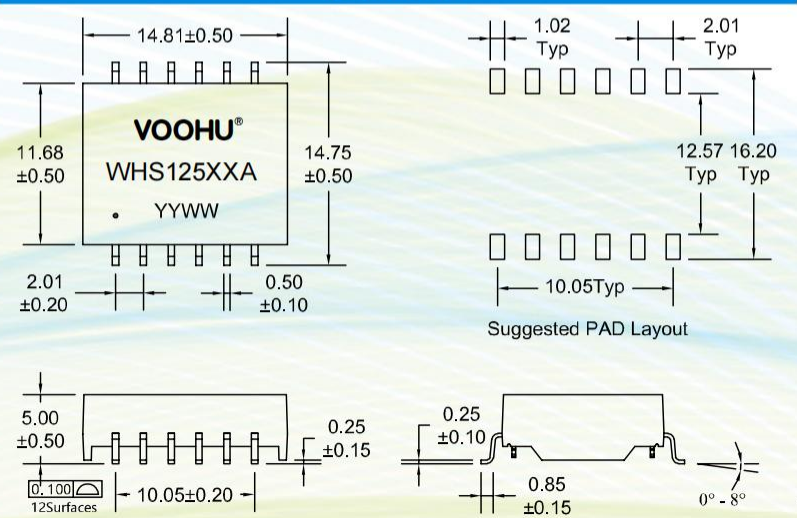


Schematics

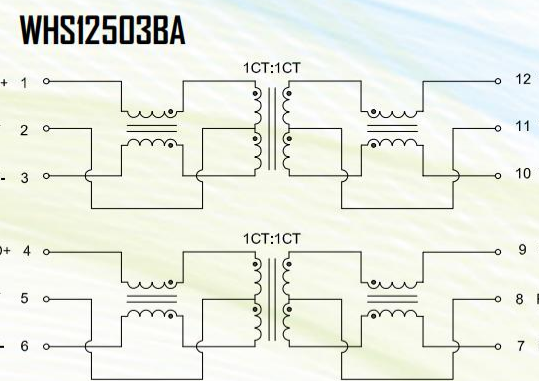
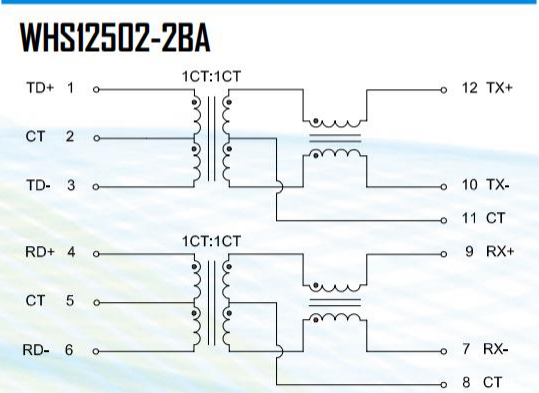


| Electrical Specifications @ 25°C |             |                        |                     |              |                    |                           |                                  |
|----------------------------------|-------------|------------------------|---------------------|--------------|--------------------|---------------------------|----------------------------------|
| Part Number                      | OCL<br>(μH) | Insertion Loss<br>(dB) | Return Loss<br>(dB) | CMRR<br>(dB) | Cross Talk<br>(dB) | Isolation<br>Hipot<br>(V) | Operating<br>Temperature<br>(°C) |
|                                  | Min         | Max                    | Min                 | Min          | Min                | Min                       |                                  |
|                                  | 100kHz,0.1V | 1-4 MHz                | 1-4 MHz             | 1-100 MHz    | 1-100 MHz          | 1mA,60s                   |                                  |
| WHS12502-2BA                     | 600         | -0.5                   | -20                 | -30          | -30                | 4300VDC                   | -40 to 125                       |
| WHS12503BA                       | 600         | -0.5                   | -20                 | -30          | -30                | 4300VDC                   | -40 to 125                       |

Mechanical



Schematics







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## AUTOMOTIVE

### IVN(IN-VEHICLE NETWORK)-CAN/CAN-FD/ETHERNET USE CHIP CHOKES

车内电子设备通过车载网络相互通信,并且需要满足在汽车恶劣环境(如噪音和温度)下的可靠数据传输;沃虎电子扩充了片式电感类产品范围,适用于汽车 CAN/CANFD/A2B和100BASE-T1/1000BASE-T1车载以太网应用。它们结合了小尺寸和优异的抑制性能,可以满足需要汽车以太网和运输解决方案使用CAN, CAN-FD, A2B和IsoSPI。沃虎的部件设计可在-40°C至+125°C的环境下工作,具有高可靠性,高批量生产,长期生产支持,并满足AEC-Q200要求。

Electronics Inside The Car Communicate With Each Other Over In-Vehicle-Network. Reliable Data Transfer At Automotive Harsh Environment Like Noise And Temperature. VOOHU Electronics Has Expanded Its Chip Choke Product Range For Automotive CAN/CAN-FD/A2B And 100BASE-T1/1000BASE-T1 Ethernet Applications. They Combine Small Size With The Same Excellent Suppression Performance Needed For Automotive Ethernet And Transportation Solutions Using CAN, CAN-FD, A2B And IsoSPI. VOOHU Parts Are Designed To Operate From -40°C Up To +125°C, Have High Reliability, High Volume Manufac-Turing, Long Term Manufacturing Support, And Meet AEC-Q200 Requirements.

#### Features And Benefits

- Meets IEEE 802.3 Single Twisted Pair Standards
- Meets AEC-Q200 Requirement
- PPAP Documentation Support
- Tested With Leading PHY Partners
- Operating Temperature: - 40°C to +125°C
- 100Base-T1, 1000Base-T1 & PoDL Products
- IATF16949 Capable

#### Applications

- 100Base-T1 Automotive Ethernet
- 1000Base-T1 Automotive Ethernet
- CAN, CAN-FD
- Flex Ray And IsoSPI
- A2B

#### CAN/CAN-FD 3225 Series Electrical Specifications @ 25°C

| Part Number      | Common Mode Impedance (10MHz) |        | Inductance (μH) +50/-30% | RDC (Ω)Max | Leakage Inductance (nH) Typ | Isolation Resistance (MΩ) Min | Rated Current (mA) Max | Rated Voltage (V) Max |
|------------------|-------------------------------|--------|--------------------------|------------|-----------------------------|-------------------------------|------------------------|-----------------------|
|                  | (Ω)Min                        | (Ω)Typ |                          |            |                             |                               |                        |                       |
| WHAC-3225B-110U0 | 300                           | 550    | 11                       | 0.4        | 50                          | 10                            | 300                    | 80                    |
| WHAC-3225B-220U0 | 500                           | 1100   | 22                       | 0.5        | 70                          | 10                            | 250                    | 80                    |
| WHAC-3225B-510U0 | 1000                          | 2600   | 51                       | 0.7        | 130                         | 10                            | 200                    | 80                    |
| WHAC-3225B-101U0 | 2200                          | 5100   | 100                      | 1.5        | 180                         | 10                            | 150                    | 80                    |

#### CAN/CAN-FD 4532 Electrical Specifications @ 25°C

| Part Number      | Common Mode Impedance (10MHz) |        | Inductance (μH) +50/-30% | RDC (Ω)Max | Leakage Inductance (nH) Typ | Isolation Resistance (MΩ) Min | Rated Current (mA) Max | Rated Voltage (V) Max |
|------------------|-------------------------------|--------|--------------------------|------------|-----------------------------|-------------------------------|------------------------|-----------------------|
|                  | (Ω)Min                        | (Ω)Typ |                          |            |                             |                               |                        |                       |
| WHAC-4532A-110U0 | 300                           | 600    | 11                       | 0.6        | 50                          | 10                            | 250                    | 50                    |
| WHAC-4532A-220U0 | 500                           | 1200   | 22                       | 1.0        | 80                          | 10                            | 200                    | 50                    |
| WHAC-4532A-510U0 | 1000                          | 2800   | 51                       | 1.0        | 150                         | 10                            | 200                    | 50                    |
| WHAC-4532A-101U0 | 2000                          | 5800   | 100                      | 2.0        | 200                         | 10                            | 150                    | 50                    |

#### 1000Base-T1 Series Electrical Specifications @ 25°C

| Part Number      | Insertion Loss (dB MAX) |             |           | Return Loss (dB MIN) |         |           | Common Mode Rejection (dB MIN) |            |          | Differential to Common Mode Rejection (dB MIN) |         |         |          |
|------------------|-------------------------|-------------|-----------|----------------------|---------|-----------|--------------------------------|------------|----------|------------------------------------------------|---------|---------|----------|
| WHAC-3225B-800U3 | 20 MHz                  | 100 MHz     | 400 MHz   | 30-80 MHz            | 200 MHz | 600 MHz   | 10 MHz                         | 30-200 MHz | 600 MHz  | 1-80 MHz                                       |         | 600 MHz |          |
|                  | -0.5                    | -0.8        | -1.5      | -25                  | -20     | -14.5     | -32.5                          | -42        | -32.5    | -65                                            |         | -47.5   |          |
| WHAC-4532A-800U3 | 10-100 MHz              | 100-400 MHz | 30-80 MHz | 200 MHz              | 400 MHz | 30-80 MHz | 200 MHz                        | 400 MHz    | 1000 MHz | 1-30 MHz                                       | 100 MHz | 200 MHz | 1000 MHz |
|                  | -1                      | -1.7        | -22       | -20                  | -15     | -45       | -35                            | -32        | -25      | -60                                            | -47     | -40     | -38      |

#### 100Base-T1 Series Electrical Specifications @ 25°C

| Part Number      | Insertion Loss (dB MAX) |       |       | Return Loss (dB MIN) |       |       | Common Mode Rejection (dB MIN) |          |         | Differential to Common Mode Rejection (dB MIN) |        |         |  |
|------------------|-------------------------|-------|-------|----------------------|-------|-------|--------------------------------|----------|---------|------------------------------------------------|--------|---------|--|
| WHLC-3225B-201U4 | 1-10MHz                 | 33MHz | 66MHz | 1-10MHz              | 33MHz | 66MHz | 1MHz                           | 10-80MHz | 200MHz  | 1-10MHz                                        | 100MHz | 200MHz  |  |
|                  | -0.5                    | -0.7  | -1    | -27                  | -22   | -19   | -25                            | -45      | -37     | -70                                            | -50    | -40     |  |
| WHLC-4532A-201U4 | 1-60MHz                 |       |       | 1-10MHz              | 30MHz | 60MHz | 1MHz                           | 400MHz   | 1000MHz | 1-10MHz                                        | 100MHz | 1000MHz |  |
|                  | -1                      |       |       | -26                  | -21.1 | -18   | -23                            | -25      | -15     | -70                                            | -50    | -24     |  |

#### Measurement Equipment

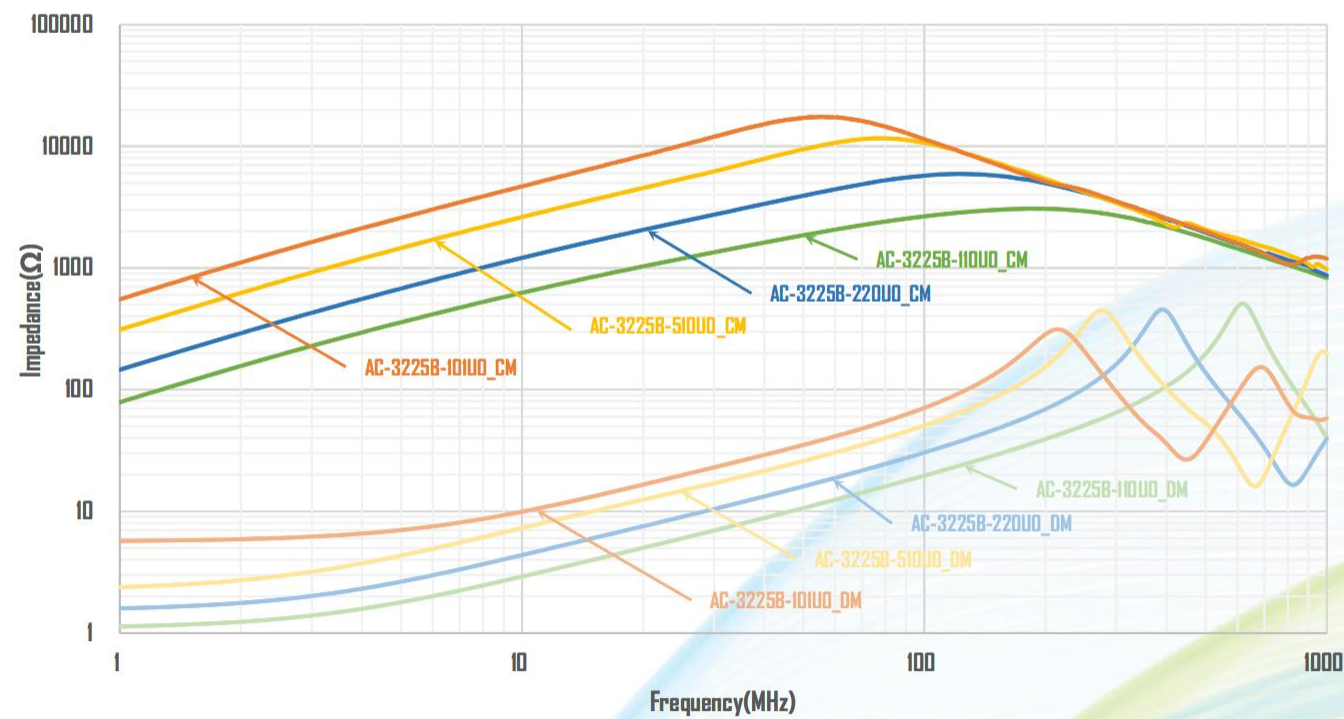
|             |                       |
|-------------|-----------------------|
| Product No. | Manufacturer          |
| E5071B      | Keysight Technologies |

\*Equivalent Measurement Equipment May Be Used.

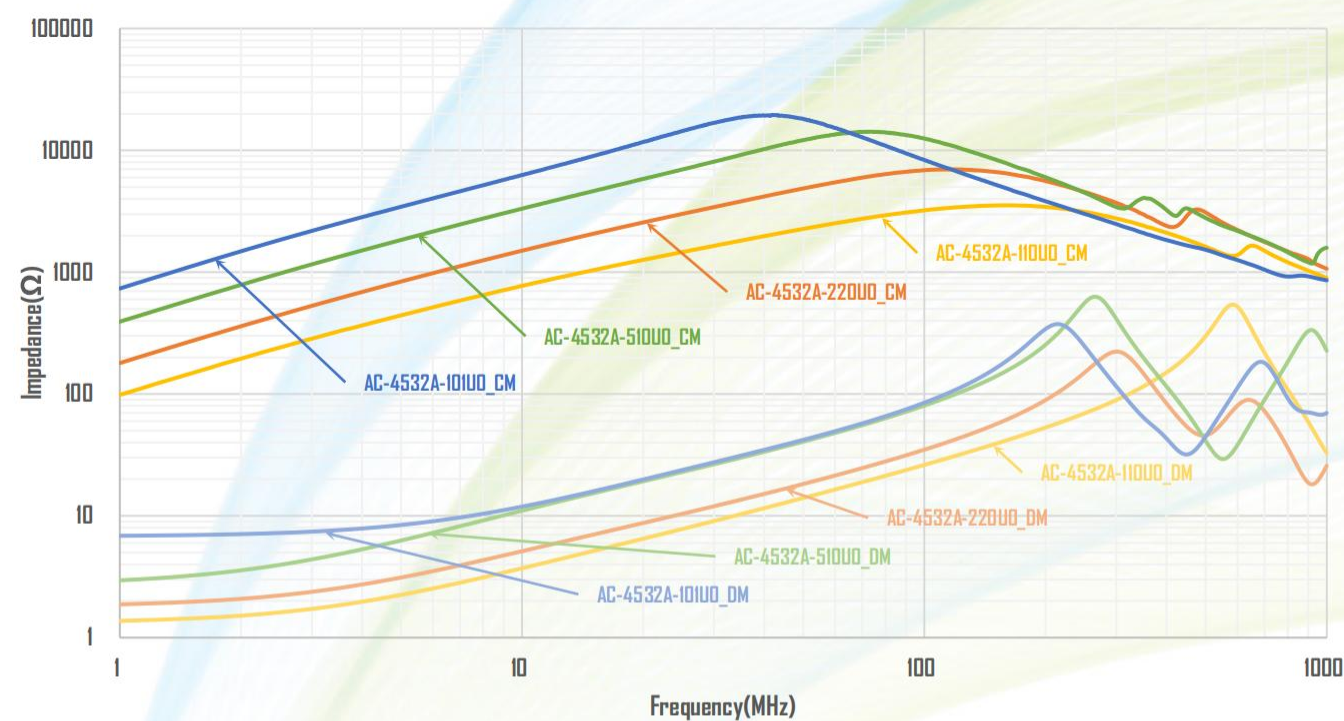


## Impedance VS. Frequency

### WHCAN/WHCAN-FD 3225 Series



### WHCAN/WHCAN-FD 4532 Series



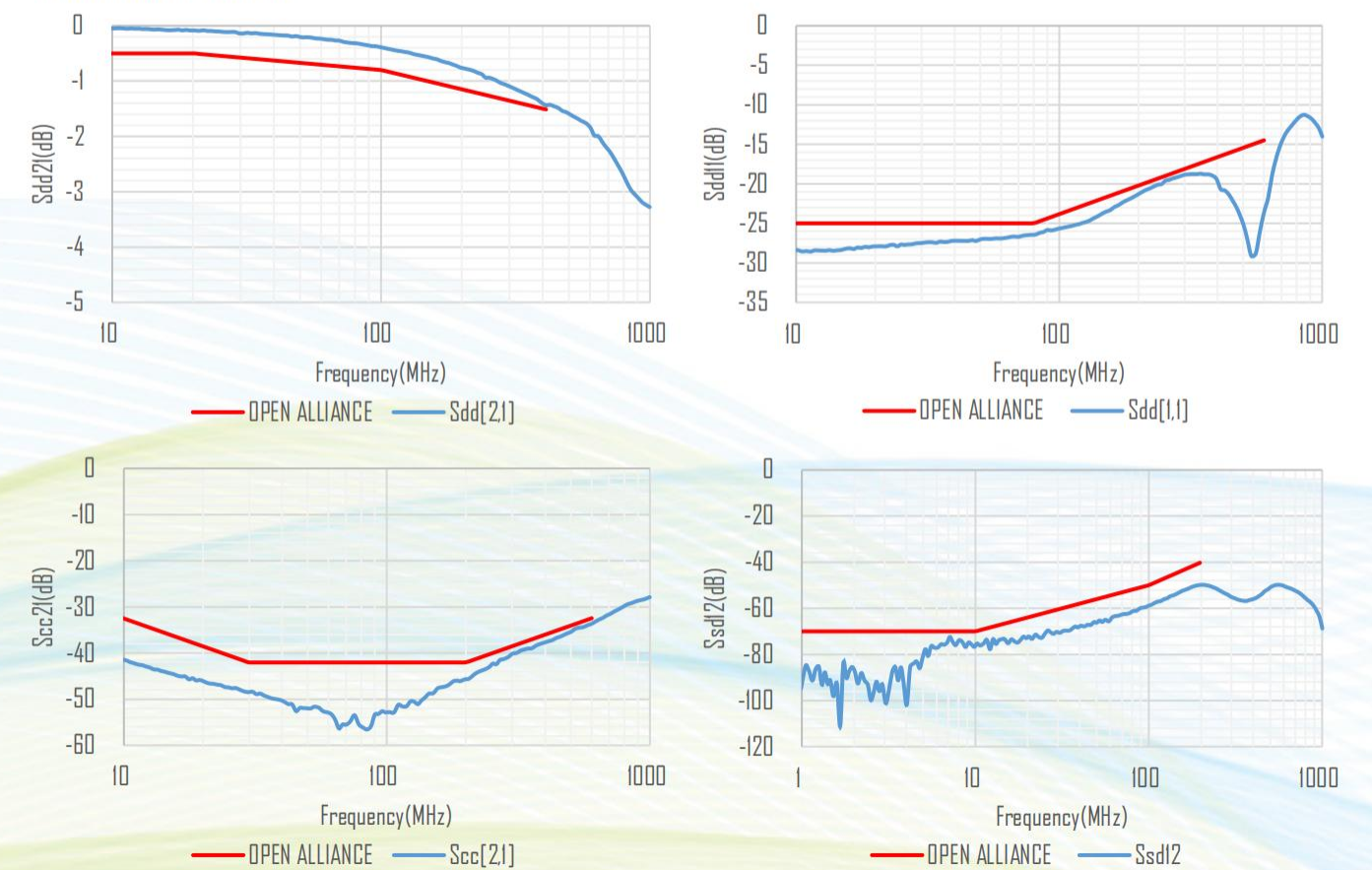
### Measurement Equipment

Product No. Manufacturer  
E4991A Keysight Technologies

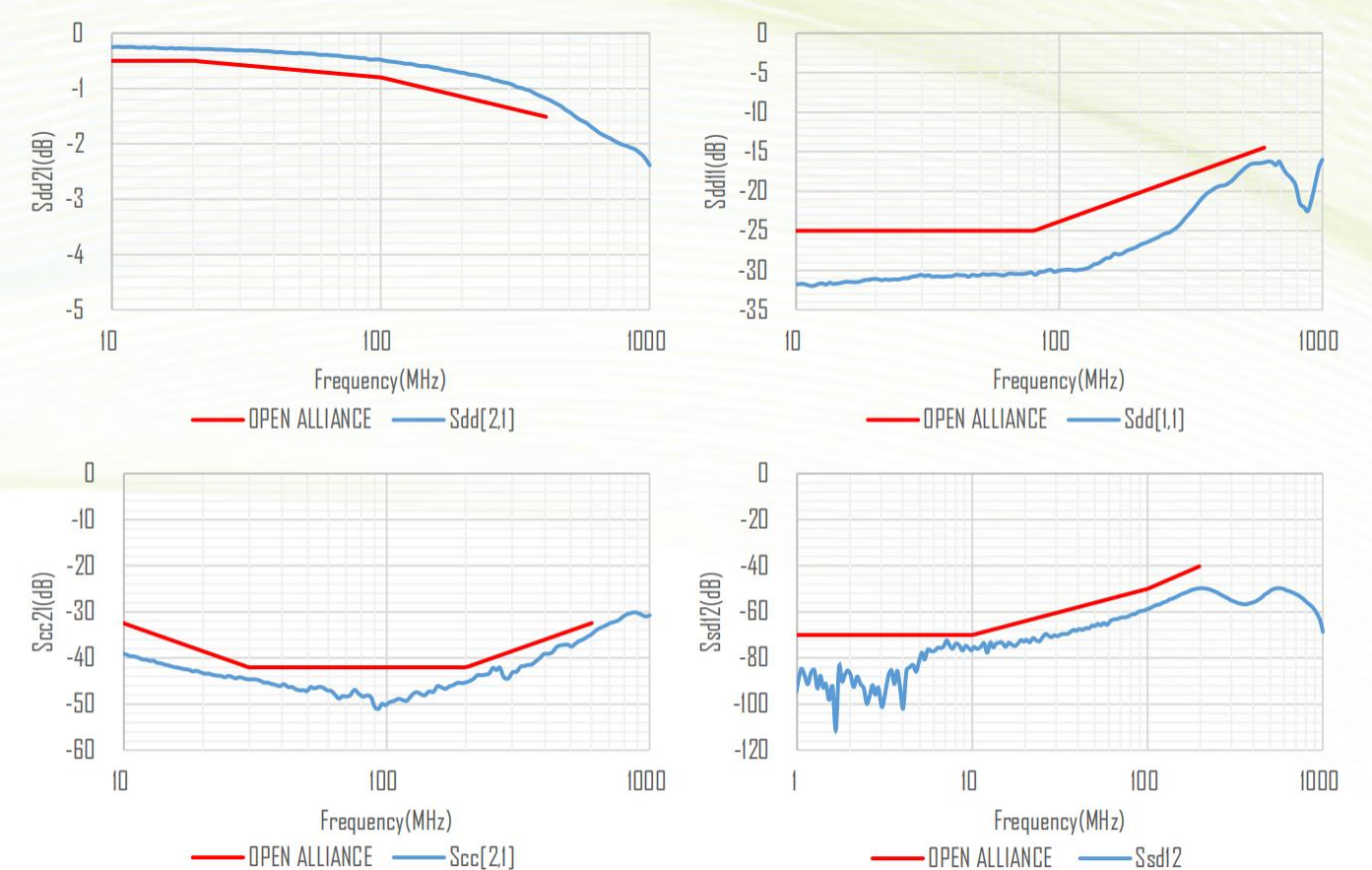
\*Equivalent Measurement Equipment May Be Used.

## S-Parameter VS. Frequency (1000Base-T1)

### WHAC-4532A-800U3

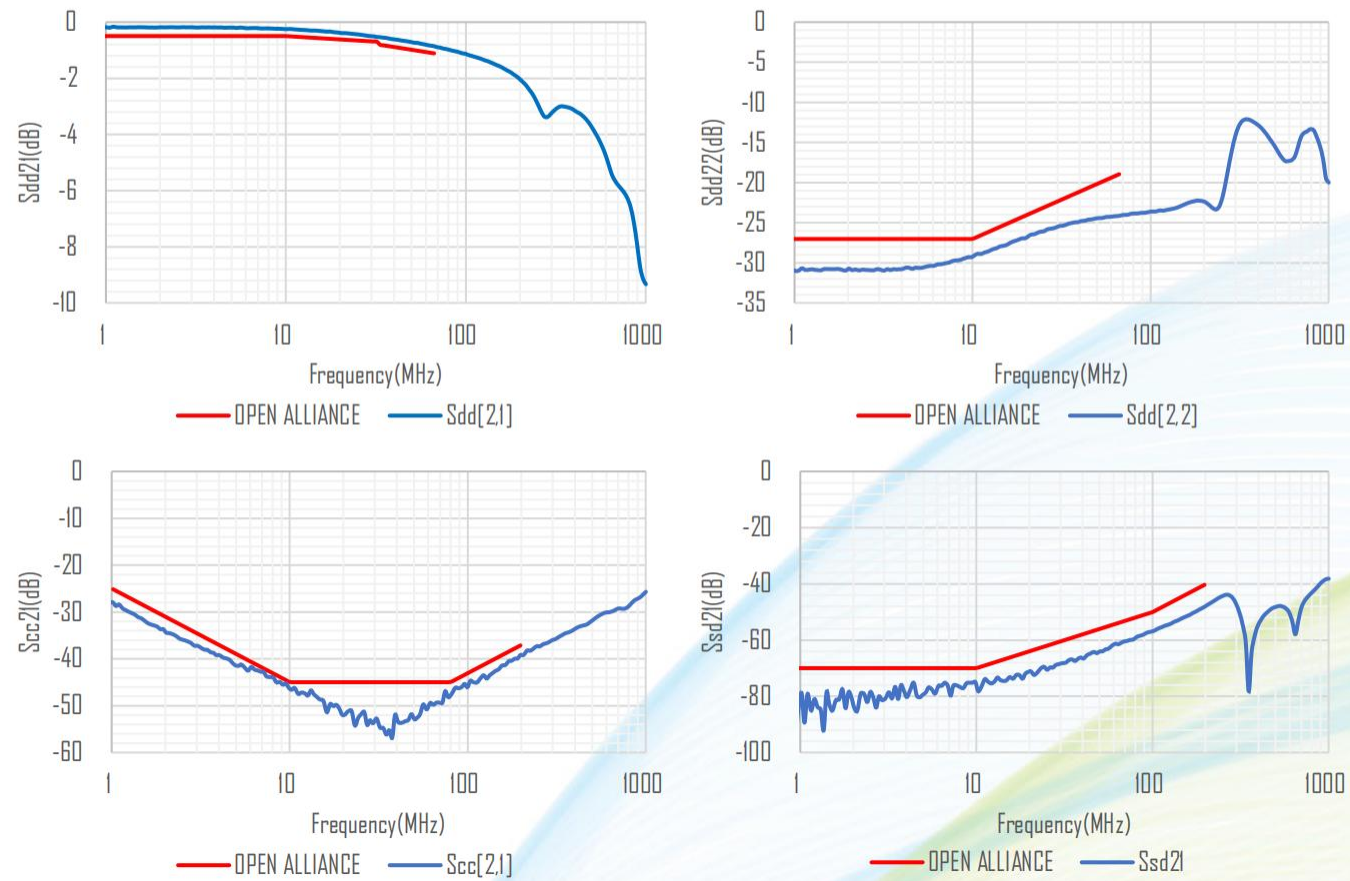


### WHAC-3225B-800U3

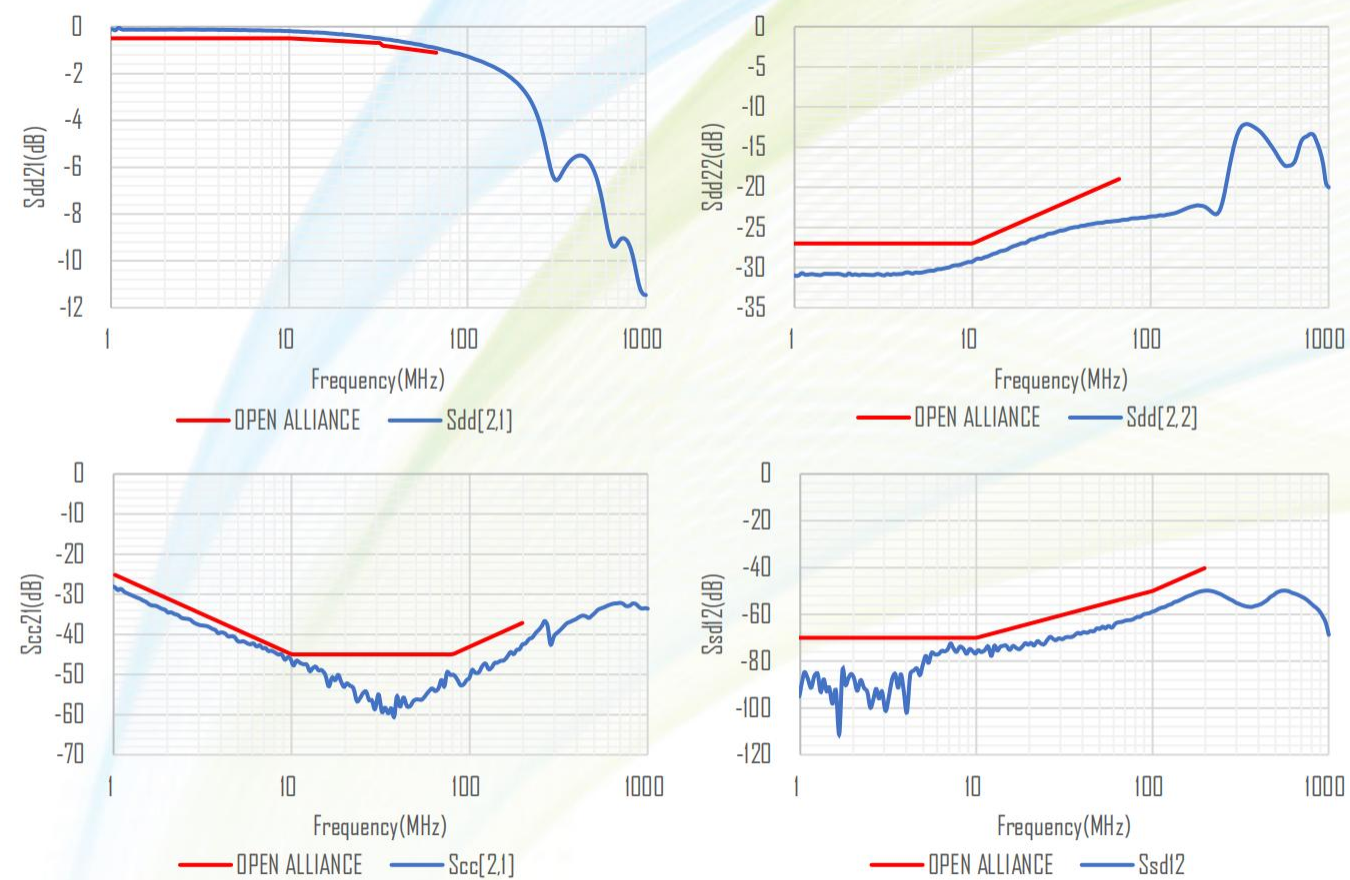




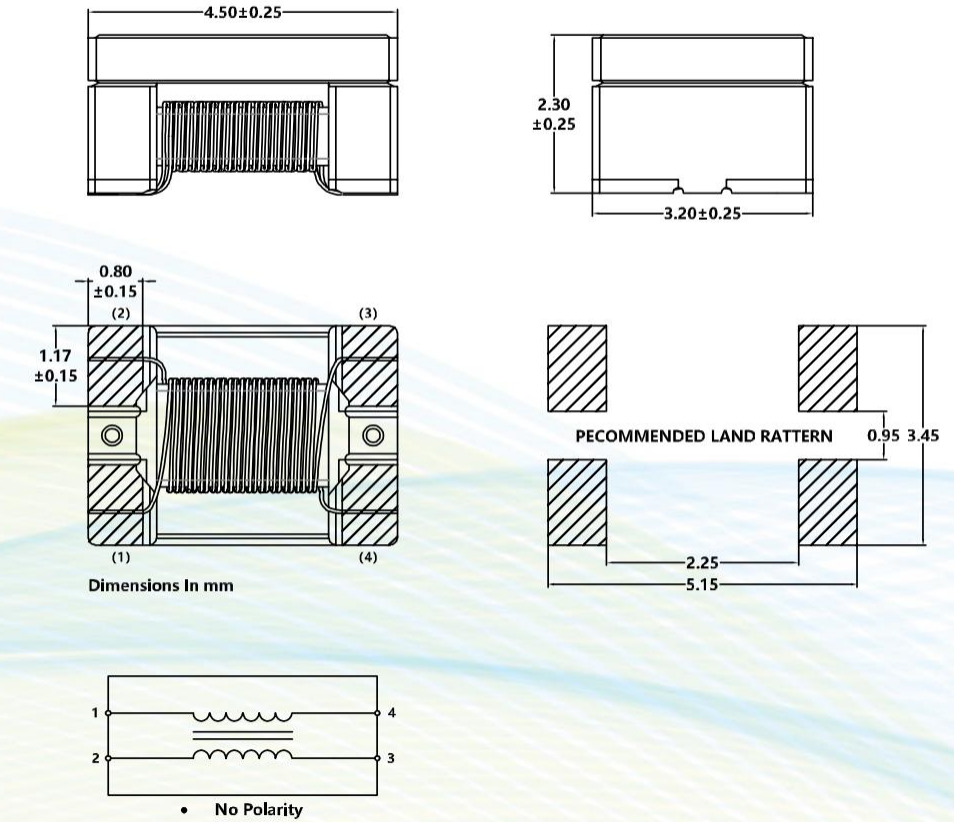
WHLC-4532A-20IU4



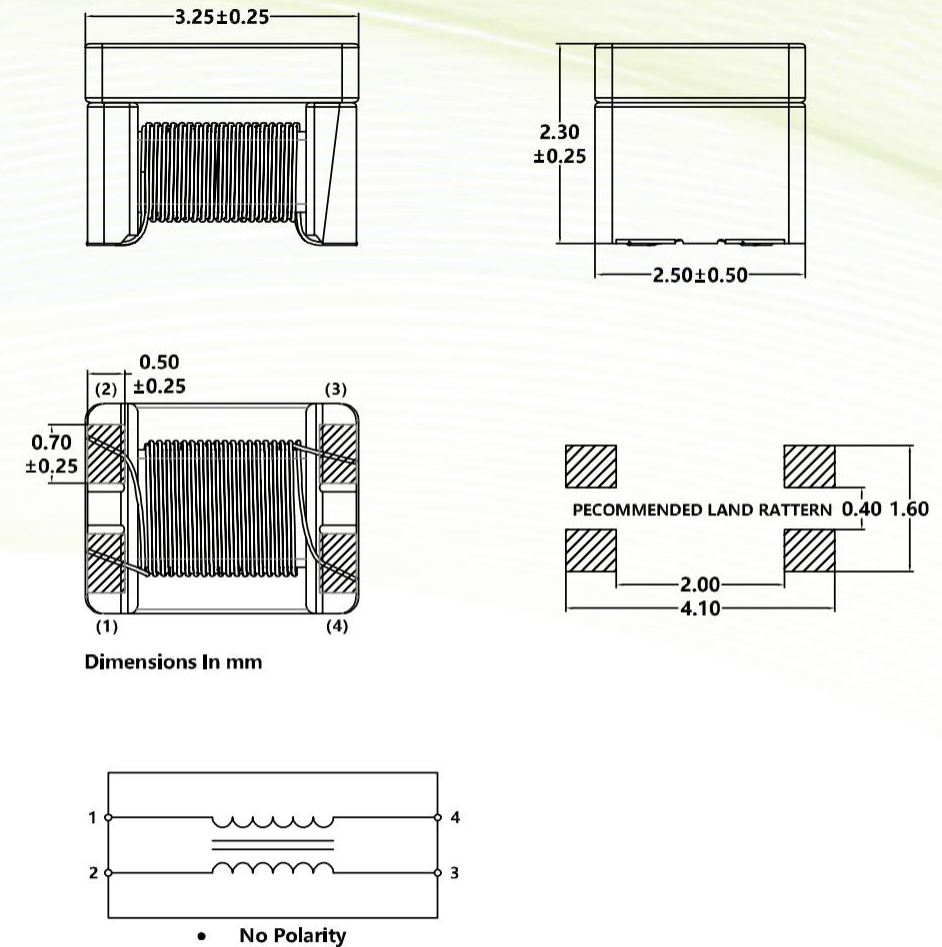
WHLC-3225B-20IU4



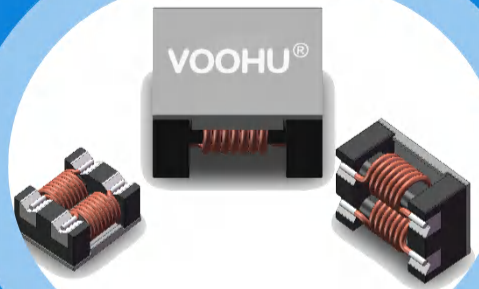
4532 Series



3225 Series







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## AUTOMOTIVE POWER LINE-CM CHOKES

安全性和舒适性不断增强的汽车搭载了很多电子设备。电子电路有信号线路和电源线路，需要分别采取防噪声对策。VOOHU的电源线用共模滤波器的特点是可以根据用途分别提出多种产品阵容，准备了追求小型薄型化的产品群、为了在车载用途中能应对严格的环境条件，采用独有端子结构的产品群。VOOHU的电源线用共模滤波器主要应用于包括车载动力传动/安全用途的各种DC电源线、多媒体设备、各种电子产品的电源线的共模噪声对策。

As The Safety And Comfort Of Automobiles Increases, More Electronic Devices Are Being Used In Vehicles. Electronic Circuits Have Signal Lines And Power Supply Lines, And Both Require Noise Countermeasures. VOOHU Power Line Common-Mode Filters Are Characterized By A Diverse Lineup Of Products For Specific Applications Including Product Groups That Pursue Compact Size Or A Low Profile And Product Groups That Adopt An Independent Terminal Structure To Meet The Harsh Environmental Conditions Of Automotive Applications. The Common Mode Filter For Power Line Of VOOHU Electronic Is Mainly Applied To The Common Mode Noise Countermeasure Of Various DC Power Lines, Multimedia Equipment And Power Lines Of Various Electronic Products, Including Automotive Power Transmission/Safety Purposes.

### Features And Benefits

- Exclusive Square Type Closed Magnetic Core Designed As An Exclusive Core Is Used, So It Can Be Small While Maintaining The Same Features.
- Meets AEC-Q200 Requirement
- PPAP Documentation Support
- Operating Temperature: - 40°C to +125°C
- IATF16949 Capable

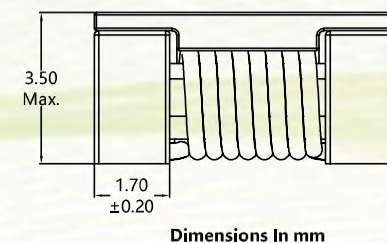
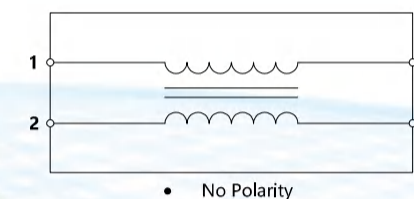
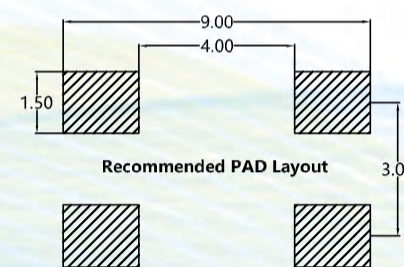
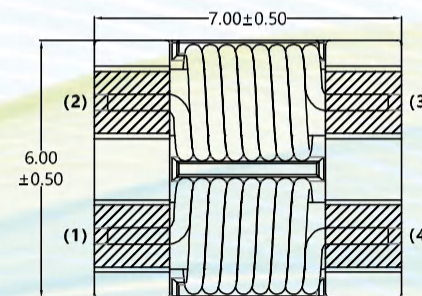
### Applications

- Automotive Power Trains And Safety Applications
- Measures Against CM Noise In Power Lines For DC Power Lines
- Multimedia Devices
- Various Electronic Devices

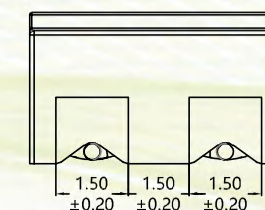
### Electrical Specifications @ 25°C

| Part Number      | Mech. Drawing | Common Mode Impedance (@100MHz) |         | DCR (One Line) | Rated Current | Rated Voltage | Insulation Resistance |
|------------------|---------------|---------------------------------|---------|----------------|---------------|---------------|-----------------------|
|                  |               | (Ω)Min.                         | (Ω)Typ. | (mΩ)Max.       | (A)Max.@25°C  | (V)Max.       | (MΩ)Min.              |
| WHAL-7060A-70ITD | A Type        | 500                             | 700     | 15             | 4.0           | 80            | 10                    |
| WHAL-9070A-70ITD | B Type        | 500                             | 700     | 10             | 5.0           | 80            | 10                    |
| WHAL-9070A-152TD | B Type        | 1100                            | 1500    | 16             | 3.6           | 80            | 10                    |
| WHAL-1211A-70ITD | C Type        | 500                             | 700     | 6              | 8.0           | 80            | 10                    |
| WHAL-1211A-172TD | C Type        | 1200                            | 1700    | 12             | 4.8           | 80            | 10                    |

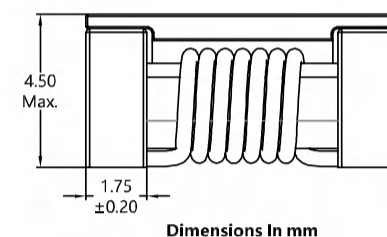
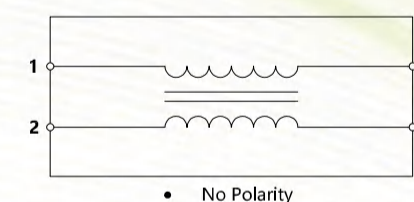
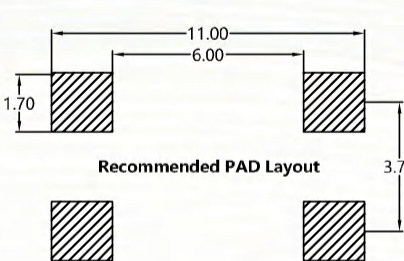
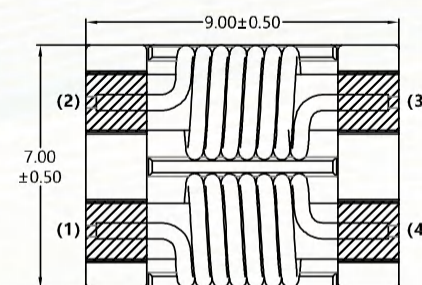
### Mechanical & Schematics



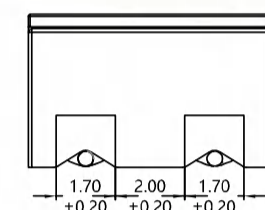
Dimensions In mm



A Type



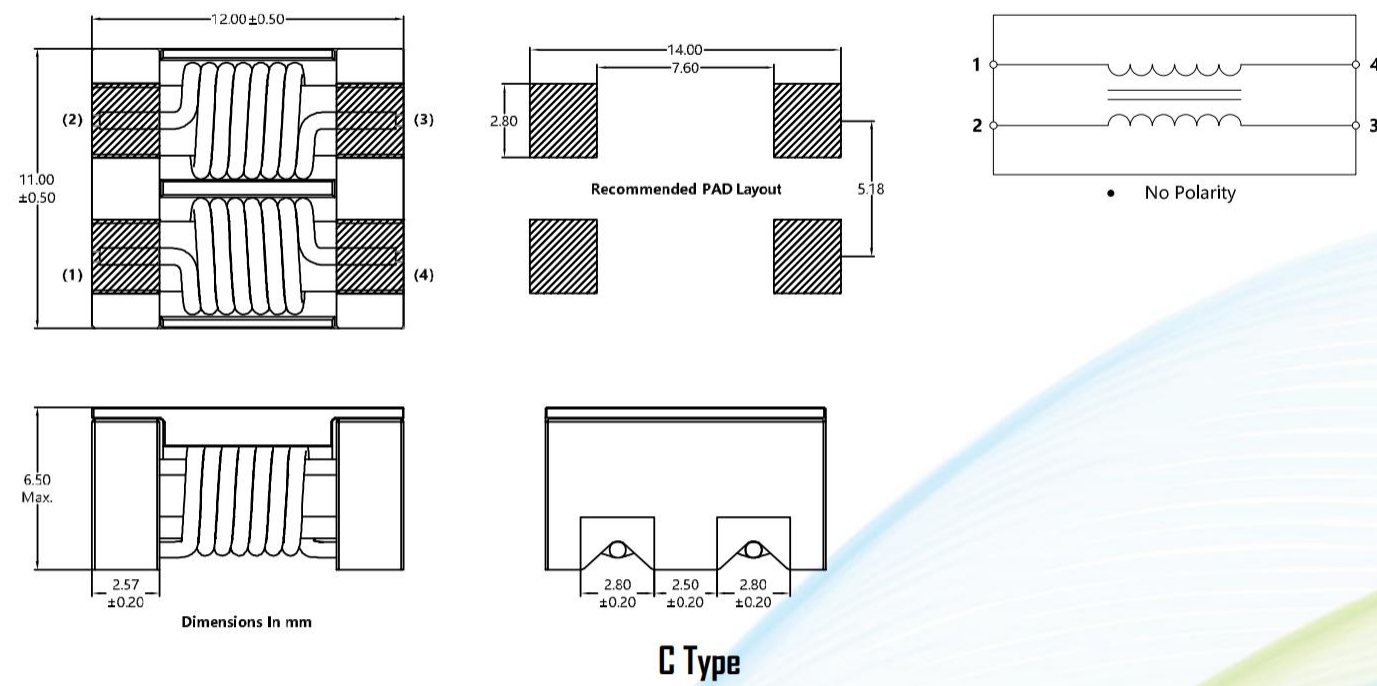
Dimensions In mm



B Type

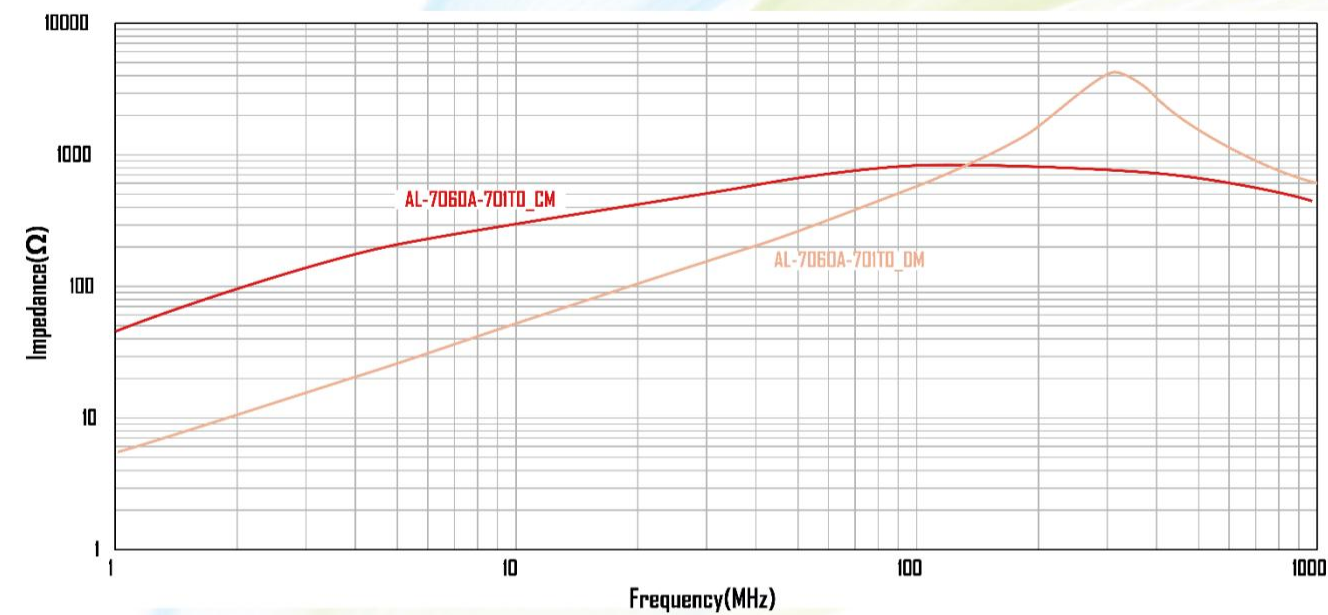


## Mechanical & Schematics



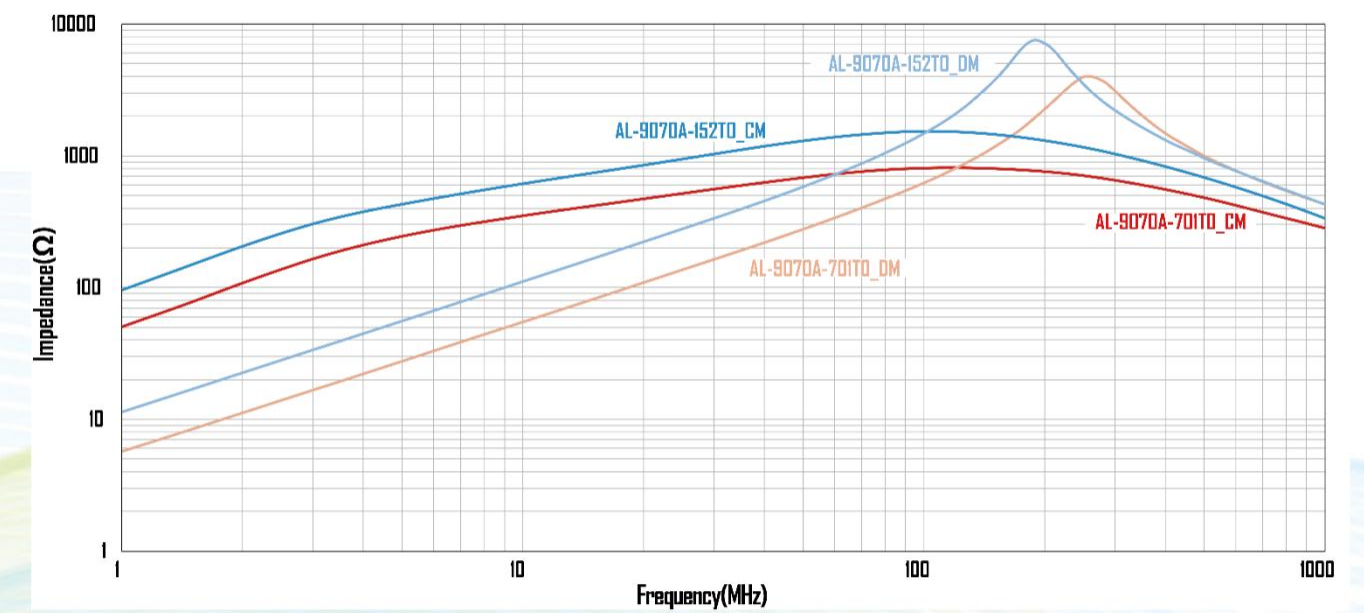
## Impedance VS. Frequency

### WHAL-7060A-70ITD

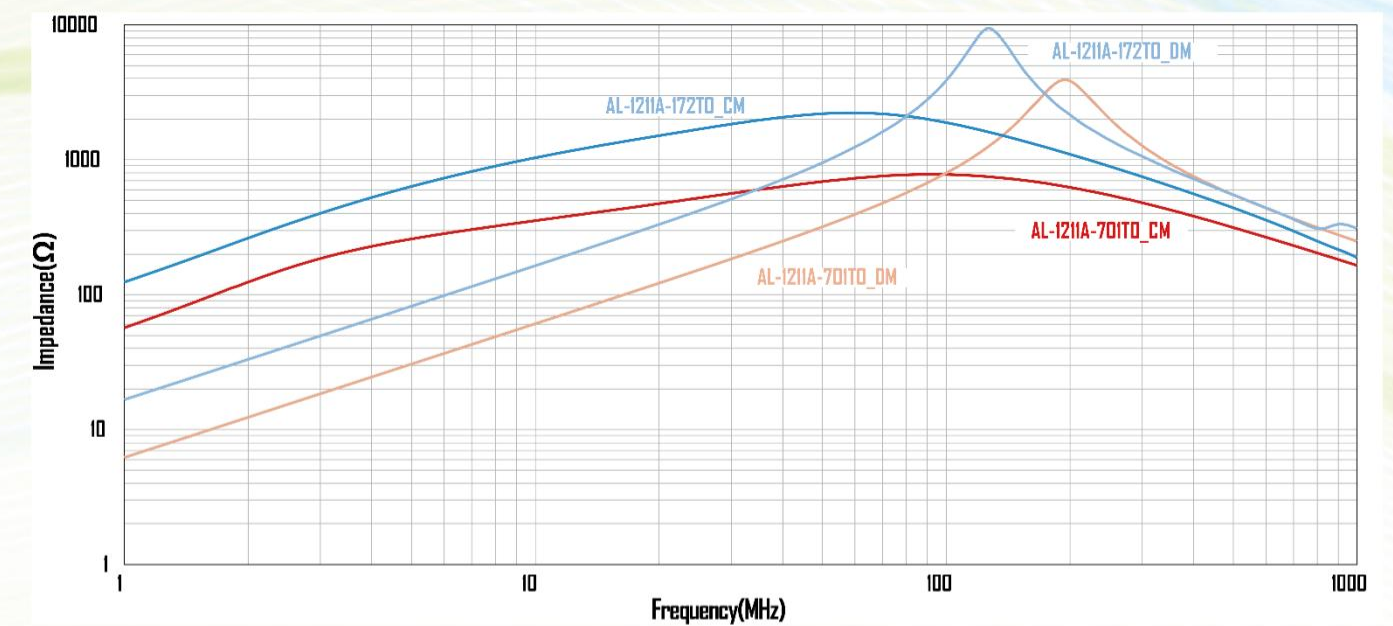


## Impedance VS. Frequency

### WHAL-9070A-70ITD/WHAL-9070A-152TD



### WHAL-1211A-70ITD/WHAL-1211A-172TD

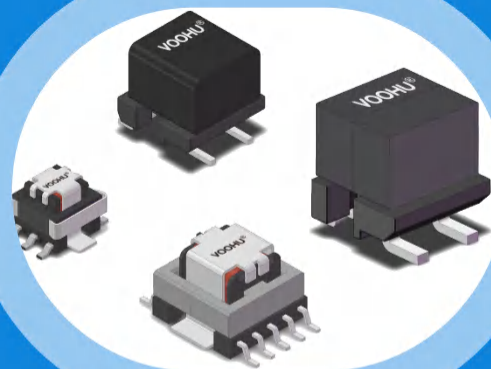


## Measurement Equipment

| Product No. | Manufacturer          |
|-------------|-----------------------|
| E4991A      | Keysight Technologies |

\*Equivalent Measurement Equipment May Be Used.





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## AUTOMOTIVE

### CURRENT SENSE-CURRENT SENSE TRANSFORMERS

随着对最终产品效率的日益关注，准确感应和监测电子电路中的电流的需求是至关重要的；电流感应磁性器件被用作感应电路中交流电流的低损耗方法，并在电流源和测量电路之间提供电气和安全隔离。电流感应互感器的关键参数是均方根电流额定值(以确保它在应用中不会过热) 和安全电压隔离 (以确保它符合最终应用的要求)。沃虎电子的电流感应变压器绝缘系统包括功能性绝缘，基础绝缘和加强型绝缘。另外我们还可以为客户提供定制化方案。

With The Increased Focus On End-product Efficiency The Need To Accurately Monitor Current In Electronic Circuits Is Paramount. Current Sense Magnetics Are Used As A Low Loss Method For Sensing AC Current In A Circuit And Also Provide Electrical And Safety Isolation Between The Source Of The Current And The Measurement Circuit. The Key Parameters For A Current Sense Transformer Are The Rms Current Rating (To Ensure It Does Not Overheat In The Application) And The Safety And Voltage Isolation (To Ensure It Conforms To The End-Application Requirements).VOOHU Current Sense Transformers Insulation Systems Including Functional, Basic And Reinforced. Custom Solutions Are Available.

#### Features And Benefits

- Wide Measuring Range
- Low Ohmic Resistance
- Creepage Distances According To IEC 60664 (Basic Insulation)
- High Dielectric Strength For Compact Design
- Qualified To AEC-Q200
- Wide Range Of Turn Ratios

#### Applications

- Current Measurement On-Board Power Supplies
- DC/DC Inverters In xEV Applications
- Switch-Mode Power Supplies And All Types Of Converters

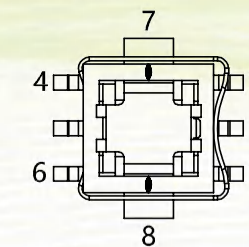
#### WHCTEE0500 Series Electrical Specifications @25°C

| Part Number     | Secondary Inductance (μH MIN) | Current Rating (A) | Turns Ratio | DCR (mΩ MAX)  |                 | Hipot (V <sub>AC</sub> ) |
|-----------------|-------------------------------|--------------------|-------------|---------------|-----------------|--------------------------|
|                 |                               |                    |             | Primary (8-7) | Secondary (1-3) |                          |
| WHCTEE0500-0200 | 80                            | 20                 | 1:20        | 0.75          | 400             | 1000                     |
| WHCTEE0500-0300 | 180                           | 20                 | 1:30        | 0.75          | 870             | 1000                     |
| WHCTEE0500-0400 | 320                           | 20                 | 1:40        | 0.75          | 1140            | 1000                     |
| WHCTEE0500-0500 | 500                           | 20                 | 1:50        | 0.75          | 1500            | 1000                     |
| WHCTEE0500-0600 | 720                           | 20                 | 1:60        | 0.75          | 1980            | 1000                     |
| WHCTEE0500-0700 | 980                           | 20                 | 1:70        | 0.75          | 3000            | 1000                     |
| WHCTEE0500-1000 | 2000                          | 20                 | 1:100       | 0.75          | 5500            | 1000                     |
| WHCTEE0500-1250 | 3000                          | 20                 | 1:125       | 0.75          | 6500            | 1000                     |
| WHCTEE0500-2000 | 8000                          | 20                 | 1:200       | 0.75          | 33240           | 1000                     |

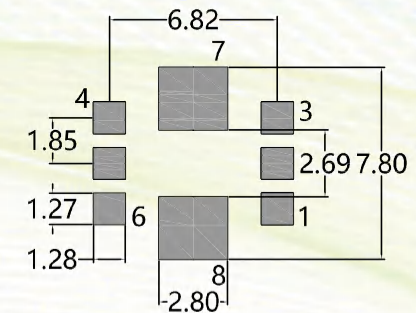
#### NOTE:

1. Inductance Measured At 100kHz, 100mVrms, 0 ADC.
2. Sensed Current: The Max. Primary Current Of 20 A Causes Approx. +40 °C Temperature Rise.
3. DC Resistance R Max Measured At +25 °C
4. Hi-Pot:1000VAC At 50Hz/1mA/2S (Winding To Winding).
5. Storage Temperature(with Package): -20°C To +40°C
6. Qualification: Meet AEC-Q200

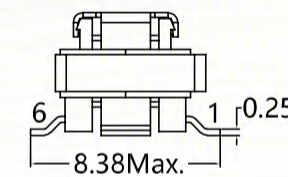
#### WHCTEE0500 Series Mechanical & Schematics



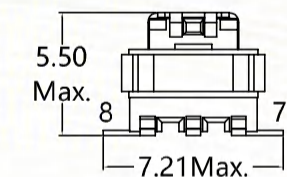
Top View



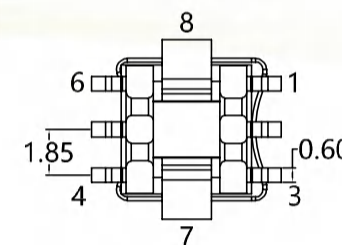
Suggested PAD Layout



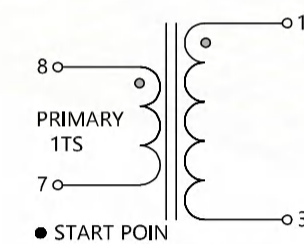
Front View



Side View



Bottom View



Schematics



### WHCTEE1260 Series Electrical Specifications @25°C

| Part Number     | Secondary Inductance (mH MIN) | Current Rating (A) | Turns Ratio | DCR                    |                       | Hipot (V <sub>AC</sub> ) |
|-----------------|-------------------------------|--------------------|-------------|------------------------|-----------------------|--------------------------|
|                 |                               |                    |             | Primary (11-12 mΩ MAX) | Secondary (2-4 Ω MAX) |                          |
| WHCTEE1260-0500 | 1.4                           | 40                 | 1:50        | 0.28                   | 0.4                   | 1500                     |
| WHCTEE1260-1000 | 5.6                           | 40                 | 1:100       | 0.28                   | 1.0                   | 1500                     |
| WHCTEE1260-1500 | 12.6                          | 40                 | 1:150       | 0.28                   | 2.2                   | 1500                     |
| WHCTEE1260-2000 | 22.4                          | 40                 | 1:200       | 0.28                   | 2.9                   | 1500                     |

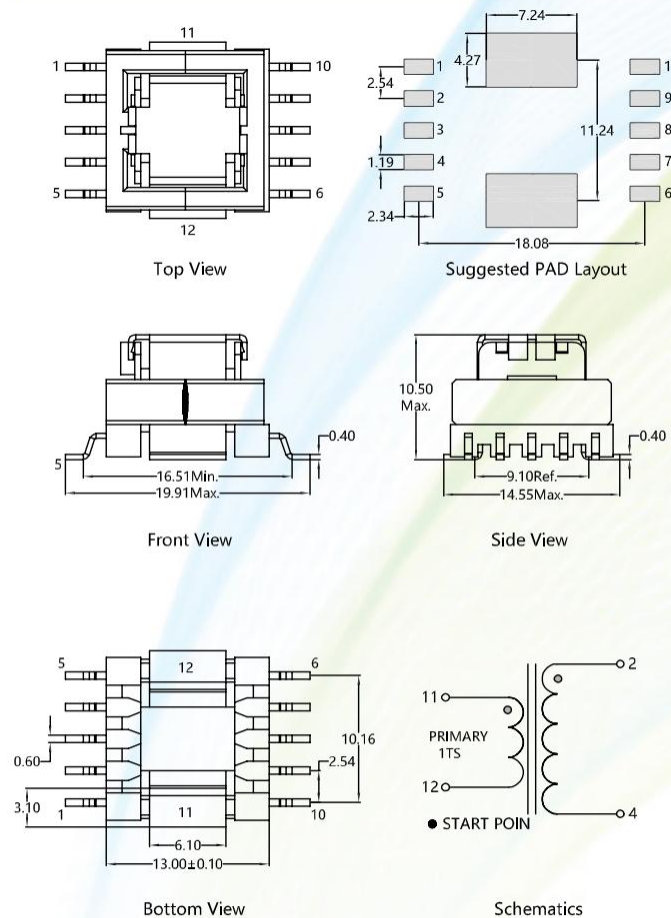
### WHCTEP0700 Series ELECTRICAL SPECIFICATIONS @25°C

| Part Number     | Secondary Inductance (mH MIN) | Current Rating (A) | Turns Ratio | DCR                  |                       | Hipot (V <sub>AC</sub> ) |
|-----------------|-------------------------------|--------------------|-------------|----------------------|-----------------------|--------------------------|
|                 |                               |                    |             | Primary (1-2 mΩ MAX) | Secondary (4-5 Ω MAX) |                          |
| WHCTEP0700-0500 | 1.7                           | 20                 | 1:50        | 1.9                  | 2.1                   | 3000                     |
| WHCTEP0700-0700 | 3.0                           | 20                 | 1:70        | 1.9                  | 2.9                   | 3000                     |
| WHCTEP0700-1000 | 7.0                           | 20                 | 1:100       | 1.9                  | 5.0                   | 3000                     |
| WHCTEP0700-1250 | 11.0                          | 20                 | 1:125       | 1.9                  | 5.3                   | 3000                     |

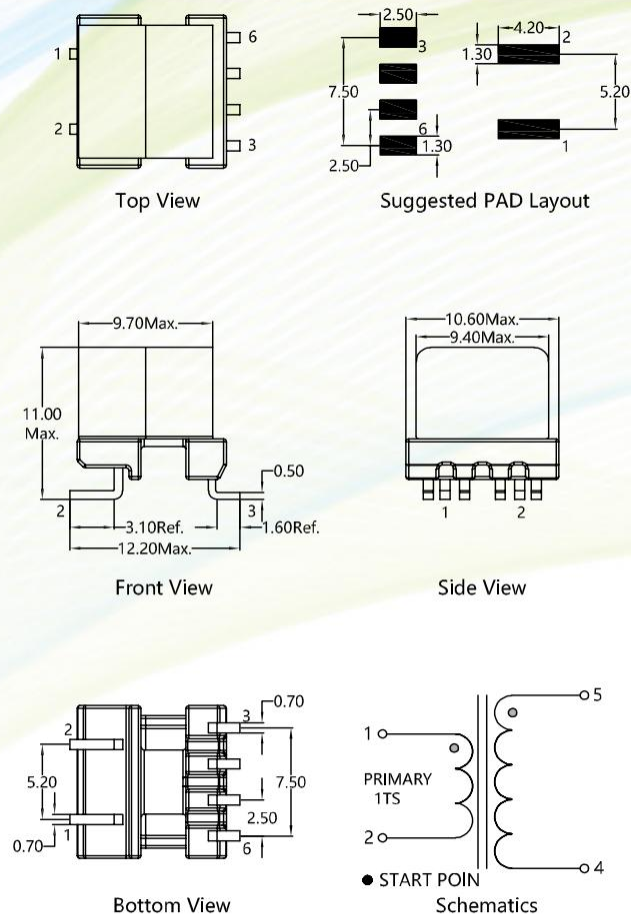
#### NOTE :

1. Inductance Measured At 100kHz, 100mVrms, 0 ADC.
2. Sensed Current The Max. Primary Current Of 40 A Causes Approx. +40 °C Temperature Rise.
3. DC Resistance R Max Measured At +25 °C
4. Hi-Pot: 1000VAC At 50Hz/1mA/2S (Winding To Winding).
5. Storage Temperature (with Package): -20°C To +40°C
6. Qualification: Meet AEC-Q200

### WHCTEE1260 Series Mechanical & Schematics



### WHCTEP0700 Series Mechanical & Schematics



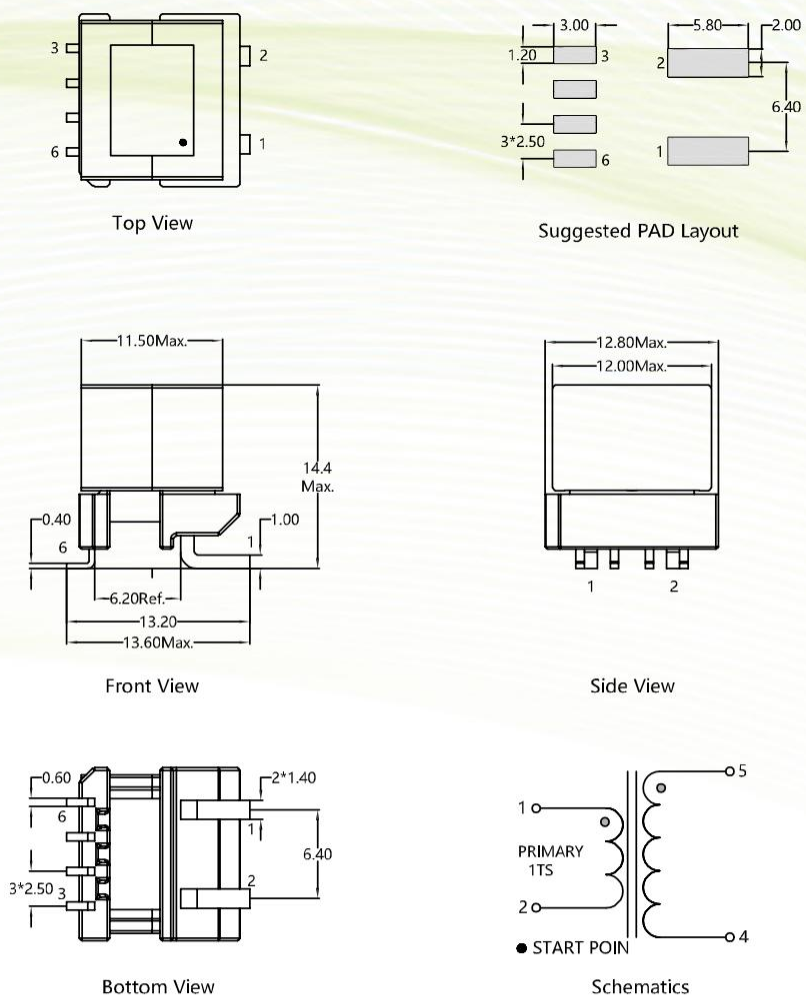
### WHCTEP1110 Series Electrical Specifications @25°C

| Part Number     | Secondary Inductance (mH MIN) | Current Rating (A) | Turns Ratio | DCR (mΩ MAX)  |                 | Hipot (V <sub>AC</sub> ) |
|-----------------|-------------------------------|--------------------|-------------|---------------|-----------------|--------------------------|
|                 |                               |                    |             | Primary (1-2) | Secondary (5-4) |                          |
| WHCTEP1110-0500 | 1.7                           | 30.0               | 1:50        | 0.5           | 1500            | 3000                     |
| WHCTEP1110-0700 | 3.0                           | 30.0               | 1:70        | 0.5           | 2100            | 3000                     |
| WHCTEP1110-1000 | 7.0                           | 30.0               | 1:100       | 0.5           | 3100            | 3000                     |
| WHCTEP1110-1250 | 11.0                          | 30.0               | 1:125       | 0.5           | 4000            | 3000                     |
| WHCTEP1110-1800 | 25.0                          | 30.0               | 1:180       | 0.5           | 9000            | 3000                     |
| WHCTEP1110-2000 | 32.0                          | 30.0               | 1:200       | 0.5           | 10400           | 3000                     |

#### NOTE:

1. Inductance Measured At 100kHz, 100mVrms, 0 ADC.
2. Primary Current Of 30 A Causes Less Than 40°C Temperature Rise From 25°C Ambient. Higher Current Causes A Greater Temperature Rise.
3. Terminating Resistance (DCR) Value Is Based On 1 Volt Output With 30 Amps Flowing Through The Primary. Varying Terminating Resistance Increases Or Decreases Output Voltage/Ampere According To The Following Equation:  
DCR (Ω) =  $V_{out} \times N_{sec} / I_{in}$
4. 3000 Vrms, One Minute Isolation (Hipot) Winding To Winding.
5. Storage Temperature (With Package): +10°C To +40°C
6. Qualification: Meet AEC-Q200

### Mechanical & Schematics







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## AUTOMOTIVE

### ULTRASONIC SENSORS-ULTRASONIC TRANSFORMERS

沃虎电子推出适合超声波应用的全新 AT-EP060 系列紧凑型EP6变压器。新系列元件为表面安装 (SMD) 型, 所有元件均满足AEC-Q200标准, 具有超紧凑尺寸设计, 屏蔽设计使其具有优良的干扰抑制性能。

在超声波应用中变压器为驱动器集成电路 (IC) 和超声波发射器或接收器之间提供阻抗匹配, 典型应用包括停车辅助系统、工业机器人、无人机、物流机器人、自动导引车 (AGV) 和填充物位测量系统。

VOOHU Electronics Presents The New AT-EP060 Series Of Compact EPCOS Transformers With EP 6 Cores For Ultrasonic Applications. The New Series Of Components Is Surface Mounted (SMD) Type. The Components Are Compliant With AEC-Q200, Feature Highly Compact Dimensions And Are Magnetically Shielded For Better Interference Suppression.

The Transformers Serve Optimal Impedance Matching Between The Driver IC And The Ultrasonic Transmitter Or Receiver In Ultrasonic Applications. Typical Applications Include Parking Aids, Industrial Robots, Drones, Logistics Robots, Automated Guided Vehicles (AGVs) And Systems For Fill Level Measurement.

#### Features And Benefits

- Highly Compact Dimensions
- Working Frequencies Of Between 52 kHz And 300 kHz
- Permissible Temperature Range Of -40 °C To +125 °C
- Qualified To AEC-Q200
- IATF16949 Capable

#### Applications

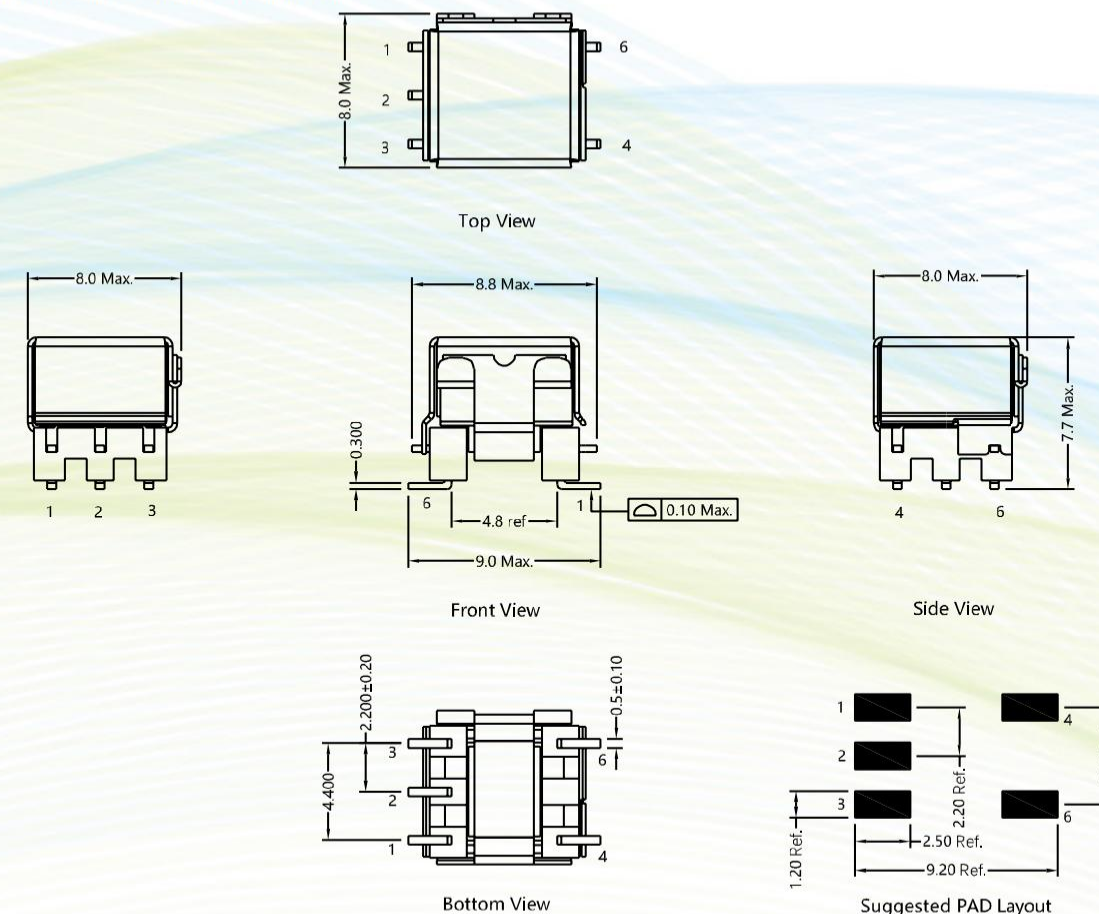
- Parking Aids
- Industrial Robots
- Drones And Logistics Robots
- Systems For Fill Level Measurement

#### Electrical Specifications @ 25°C

| Part Number    | Inductance<br>(@52kHz, 1.0V ) | Leakage Inductance<br>(@52kHz, 1.0V)    | DCR                                                         | Turns Ratio<br>(@20kHz, 1.0V )    | Hi-pot<br>(@50Hz/1mA/1s)         |
|----------------|-------------------------------|-----------------------------------------|-------------------------------------------------------------|-----------------------------------|----------------------------------|
| WHAT-EP060-002 | L(4-6)=3.0±10% mH             | L(4-6)=78.2µH Max.<br>Short Other Pins  | P(2-1)=0.59ΩType.<br>P(3-2)=0.59ΩType.<br>P(4-6)=23.0ΩType. | P(4-6):P(2-1):P(3-2)<br>218:22:22 | NIa-N 2:200VAC<br>NIb-N 2:200VAC |
| WHAT-EP060-002 | L(4-6)=4.2±10% mH             | L(4-6)=125.4µH Max.<br>Short Other Pins | P(2-1)=0.55ΩType.<br>P(3-2)=0.55ΩType.<br>P(4-6)=33.0ΩType. | P(4-6):P(2-1):P(3-2)<br>218:22:22 | NIa-N 2:200VAC<br>NIb-N 2:200VAC |

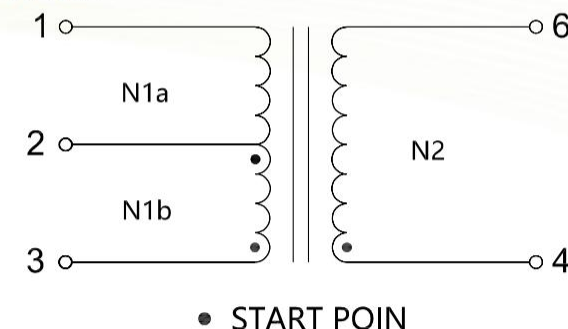
#### Mechanical

WHAT-EP060-002/WHAT-EP060-004



#### Schematics

WHAT-EP060-002/WHAT-EP060-004







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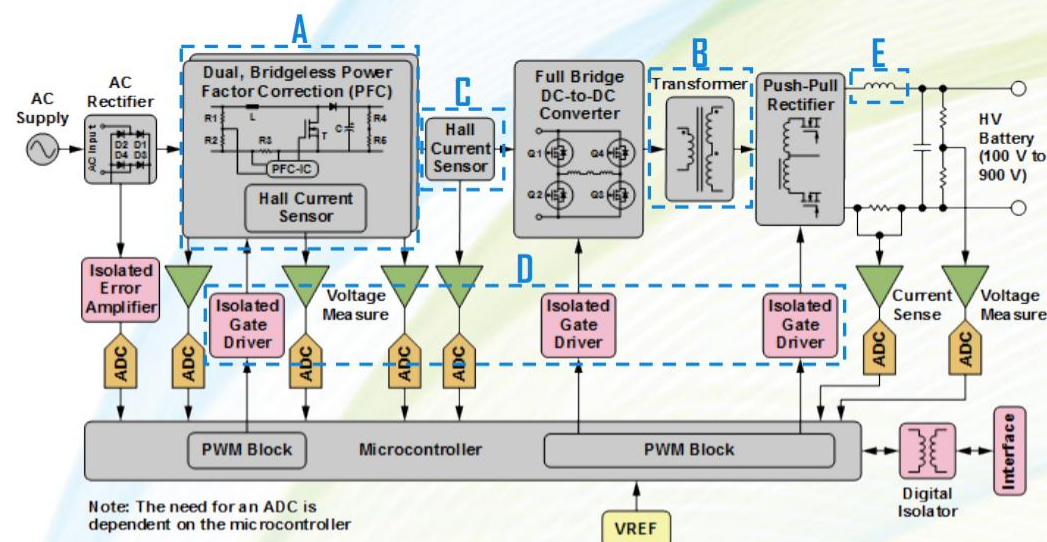


## AUTOMOTIVE

### ON-BOARD CHARGER (OBC) - CUSTOM-TRANSFORMERS/INDUCTORS

车载充电器(OBC)在电动汽车(EV)或混合动力车辆(HEV)中用于对动力蓄电池进行充电;车载充电器系统将来自电网的AC输入转换为对蓄电池充电的DC输入;该系统的效率是至关重要的,以减少充电时间,并确保在相对安全的发热温度限制内运行。

The On-Board Charger (OBC) Is A Sophisticated High Voltage Power Supply That Converts The AC Power From The Charging Source To The DC Voltage Required To Charge Battery Packs In An EV Or HEV Vehicle. Efficiency Of The System Is Critical To Minimize Charging Times And Ensuring Operation Within Thermal Limits. The Power Magnetics Within The System Are A Combination Of Off-The-Shelf Standard Magnetics And Highly Engineered Customized Solutions To Maximize Performance.



| Map Point | Category     | Product          | Characteristic                    | Remarks           |
|-----------|--------------|------------------|-----------------------------------|-------------------|
| A         | PFC          | PFC Choke        | Current: Up To 40A                | Custom Contact Us |
| B         | Transformers | Main Transformer | LLC/Power:3.3/6.6/11/22kW         |                   |
| C         |              | Current Sense    | Functional Isolation/Current: 40A |                   |
| D         |              | Gate Driver      | Flyback/Isolation: Up To 6000VAC  |                   |
| E         | EMC Choke    | CMC              | Current: Up To 60A                |                   |



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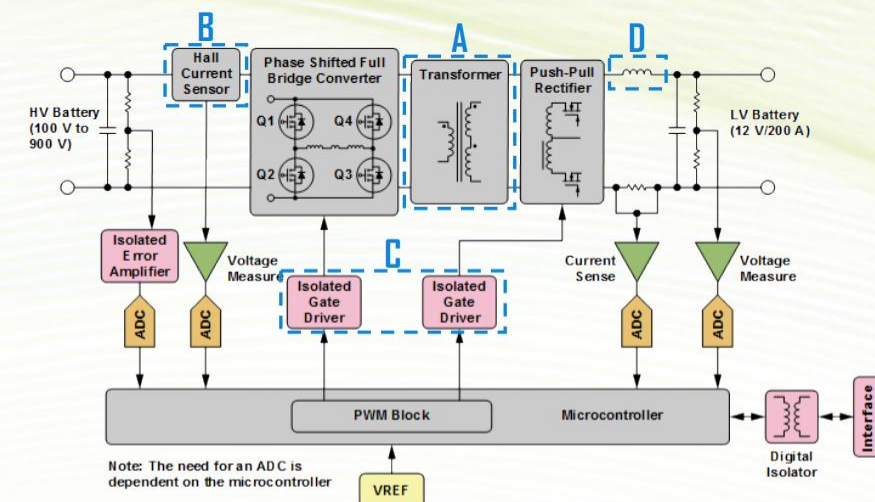
## AUTOMOTIVE

### DC/DC CONVERSION - CUSTOM-TRANSFORMERS/INDUCTORS

大功率DC-DC变换器用于将电池组的高压(100-900VDC)转换为低压(12VDC),用于为汽车子系统供电。与车载充电器(OBC)一样,系统的效率对于确保最大限度的电池利用率至关重要。DC-DC变换器内部的隔离也至关重要,以确保敏感的低压系统不被损坏,并保证用户端的系统是安全的。

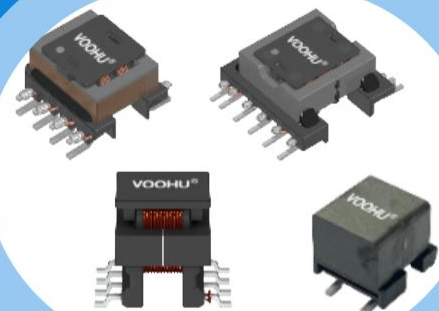
The High-Power DC-DC Converter Is Used To Change The High-Voltage (100-900VDC) From The Battery Pack To The Lower Voltage (12V/200A) That Is Used To A Power The Automotive Sub-Systems.

As In The OBC, Efficiency Of The System Is Critical To Ensure Maximum Battery Utilization. Isolation Within The DC-DC Converter Is Also Critical To Ensure That Sensitive Low Voltage Systems Are Not Damaged And To Ensure User Accessible Systems Are Safe.



| Map Point | Category     | Product          | Characteristic                    | Remarks           |
|-----------|--------------|------------------|-----------------------------------|-------------------|
| A         | Transformers | Main Transformer | Full-bridge/Power:2.5/3/3.5kW     | Custom Contact Us |
| B         |              | Current Sense    | Functional Isolation/Current: 30A |                   |
| C         |              | Gate Driver      | Flyback/Isolation: Up To 6000VAC  |                   |
| D         | Inductors    | Flat Wire        | Current: UP To 250A               |                   |





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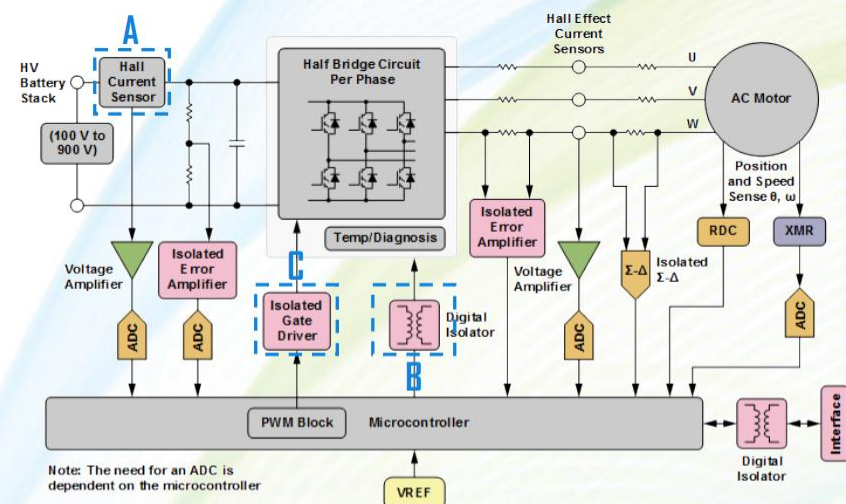


## AUTOMOTIVE

### HIGH VOLTAGE INVERTER - CUSTOM-TRANSFORMERS/INDUCTORS

逆变器利用绝缘栅双极型晶体管芯片模块(IGBT)或开关切换器(Switch)将高直流电压电池组能量转换为交流信号，以驱动和控制交流电机。另外通过再生制动系统，逆变器还可以利用制动回馈能量给电池组充电。逆变器对车辆运行至关重要，通常需要处理高功率大电流(高达100KW)，故必须隔离多个高压节点以确保安全运行。

The Inverter Uses High Power IGBTs Or Switches To Change The High DC Voltage Battery Pack Energy Into An AC Signal To Drive And Control The AC Motor. Through Regenerative Braking The Inverter Can Also Use The Braking Energy To Charge The Battery Pack. The Inverter Is Critical To Vehicle Operation And Handles Significant Amounts Of Power (Up To 100kW) And It Is Necessary To Isolate Multiple High Voltage Nodes To Ensure Safe Operation.



| Map Point | Category     | Product                    | Characteristic                   | Remarks           |
|-----------|--------------|----------------------------|----------------------------------|-------------------|
| A         | Transformers | Current Sense              | Functional Isolation/20A         | Custom Contact Us |
| B         |              | ISOLATION (DISTRIBUTED)    | Reinforced Insulation            |                   |
| C         |              | ISOLATION (CENTRALIZATION) | Reinforced Insulation            |                   |
|           |              | Gate Driver                | Flyback/Isolation: Up To 6000VAC |                   |

## ABOUT VOOHU ELECTRONICS AUTOMOTIVE

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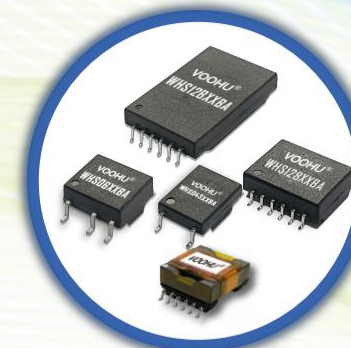
随着整个交通运输市场的电气化、互联性和智能化的进步和发展，则离不开功能更高，体积更小小的磁性器件的支持。无论您的需求是用于OBC的高功率磁材，或用于BMS的高隔离信号和功率，还是用于ADAS的有线和无线解决方案，或其他车内、外部或充电解决方案，沃虎电子都致力于成为您的开发合作伙伴。

The Advances In Electrification, Connectivity And Intelligence Across The Transportation Market Segment Continues To Demand Higher Functionality, Smaller And More Efficient Components. Whether Your Needs Are For High Power Magnetics For OBC, High Isolation Signal And Power Magnetics For BMS, Wired And Wireless Solutions For ADAS Or Other In-vehicle, External Or Charging Solutions VOOHU Technology Is Committed To Being Your Development Partner.



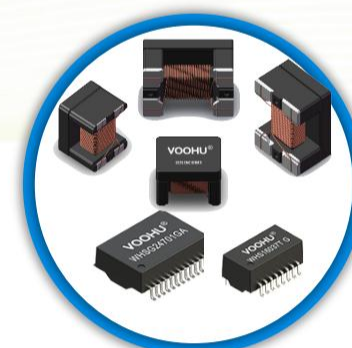
#### OBC/DC-DC MAGNETIC

- TRANSFORMER/INDUCTANCE/PFC CHOKE
- OBC : SUPPORT-3.3/6.6/11/22kW
- DC-DC : UP TO 10kW



#### BMS MAGNETIC

- ISOLATION : UP TO 6kV
- CHANNELS : SINGLE & DUAL
- SAFETY LEVEL : FUNCTIONAL/BASIC/REINFORCED



#### IN-VEHICLE NETWORK MAGNETIC

- LEGACY : LIN/CAN/CANFD/FLEX REY
- ETHERNET : 100BASE-T1/1000BASE-T1
- SUPPORT PoDL PRODUCTS



#### CURRENT SENSE/ULTRASONIC MAGNETIC

- LOW RESISTANCE CURRENT SHUNTS
- CURRENT TRANSFORMERS WITH AMORPHOUS METAL CORE
- HALL EFFECT DEVICES





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## Custom Power Magnetics

mW TO kW

沃虎电子功率磁性器件业务的很大一部分来自为我们的终端客户的应用开发独特的磁性解决方案。事实上，我们的许多目录产品开始作为一个特定客户的项目，然后扩展到一个广泛的系列产品。客户通常不愿意参与定制设计，因为他们预计较高的成本，一次性工程费用或较长的交货期，但在现实中，大多数项目利用现有的材料和平台，因此交货期，成本和一次性工程费用不受影响。虽然我们有一个广泛的功率磁性器件产品目录，它仍然是经常需要创新定制或应用程序特定的设计，其主要原因：

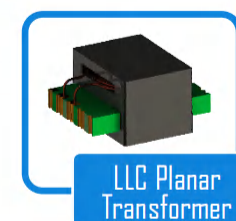
A Significant Portion Of VOOHU Power Business Is Derived From Developing Unique Magnetic Solutions For Our End-customer's Applications. In Fact, Many Of Our Catalog Parts Began As Projects For A Specific Customer And Then Were Expanded Into A Broader Offering. Often Customers Are Reluctant To Engage On A Custom Design As They Anticipate Higher Costs, NRE Charges Or Longer Lead Times But In Reality Most Projects Leverage Existing Materials And Platforms And Therefore Lead Time, Cost And NRE Are Not Affected. Although We Do Have A Wide Selection Of Catalog Power Magnetics It Is Still Often Necessary To Create Custom Or Application Specific Designs Due To Variations In:

- 电源拓扑 Power Supply Topologies
- 输入电压范围 Input Voltage Ranges
- 工作频率 Operating Frequency
- 输出电压和功率要求 Output Voltage And Power Requirements
- 机械性能和热约束要求 Mechanical And Thermal Constraints

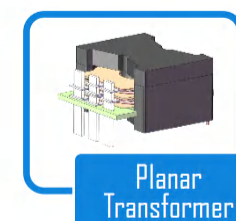
这些定制或应用程序特定的设计通常是对现有目录解决方案的简单调整，尽管客户担心“定制”意味着高成本，长的交付时间和一次性工程费用，但这不是在利用现有平台和材料时的情况。然而，有些设计可能需要使用定制材料(铁芯、线圈和塑料)的全新设计，在这种情况下，任何一次性工程费用、价格或交货时间的影响都需要提前告知我们的客户。通过利用我们的材料知识，设计专业知识和分析仿真工具，沃虎电子可以快速评估您的需求，确定项目是否可行，并设计和制造满足您的确切需求的零部件。

These Custom Or Application Specific Designs Are Often Simple Tweaks To Existing Catalog Solutions And Although Customers Are Concerned That 'Custom' Means Higher Costs, Longer Lead Times And NRE This Is Not The Case When Leveraging Existing Platforms And Material. However, Some Designs May Require Completely New Designs Utilizing Custom Materials (Cores, Windings And Plastics) And In These Cases Any NRE, Price Or Lead-time Impacts Will Communicated Up Front To Our Customers. By Leveraging Our Material Knowledge, Design Expertise And Finite Element Analysis Simulation Tools VOOHU Can Quickly Evaluate Your Requirements, Detelf A Project Is Feasible And Design And Manufacture Parts That Meet Your Exact Requirements.

### High Power Custom Power Transformers



- Power : 1000W
- Efficiency : 98%Typ
- 25\*33\*15mm

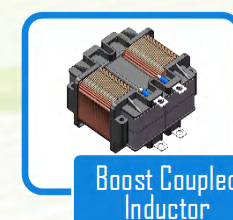


- Power : 1000W
- Efficiency : 98%Up
- 60\*70\*40mm

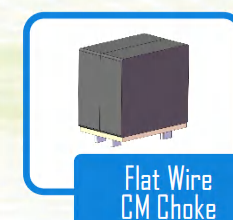


- Power : 20KW
- Efficiency : 98%Up
- 100\*90\*55mm

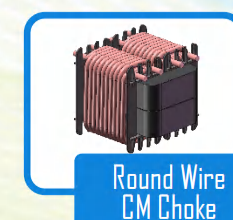
### High Current Custom Inductor And CM Choke



- Current : 100A
- Insulation : 3000VAC
- 103\*92\*62mm



- Current : 50A
- 50\*45\*50mm



- Current : 500A
- 160\*200\*120mm

如果您有任何要求，请联系我们，我们将评估您的项目是否适合我们的制造能力和商务模式。我们通常会在24小时内回复您的询问。

If You Have Any Requirements, Please Contact Us And We Will Evaluate Whether Your Project Fits Our Manufacturing Capability And Business Model. We Will Normally Respond To Your Inquiry Within 24 Hours.