

Features

- Ultra-Low capacitance:0.05pF(typ.)
- Low leakage current(<10nA)
- Fast response time(<1ns)
- Bi-directional,single line protection
- IEC 61000-4-2 (ESD Air): 15kV
- IEC 61000-4-2 (ESD Contact): 8kV

Mechanical Characteristics

- USB 3.0/3.1
- HDMI 1.3/1.4/2.0
- RF Antenna
- SATA and eSATA Interface



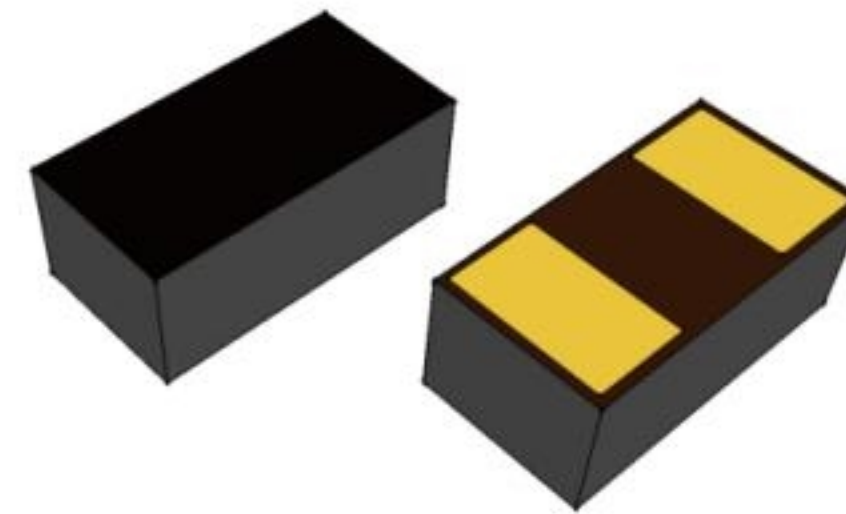
Applications

- Smart Phone/Mobile Internet Device
- Laptop/Desktop Computer
- Bi-directional, single line protection
- Antennas (Cell Phones, GPS...)
- High Speed Ethernet
- USB 3.0 and USB 3.1

Ordering Information

| Part Number | Qty per Reel | Reel Size |
|-------------------|--------------|-----------|
| TPESD0402G Series | 10000 | 7" |

Dimensions and Pin Configuration



Absolute Maximum Ratings (Tamb=25°C unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|---------------------------------|--------|-------------|------|
| ESD per IEC 61000-4-2 (Air) | VESD | ±15 | kV |
| ESD per IEC 61000-4-2 (Contact) | | ±8 | |
| Operating Temperature Range | TJ | -55 to +125 | °C |
| Storage Temperature Range | Tstg | -40 to +85 | °C |

Electrical Characteristics (TA=25°C unless otherwise specified)

TPESD0402G03V

| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
|------------------------------|-----------------|-----|------|-----|------|-------------------------------------|
| Continuous Operating Voltage | V _{DC} | | | 3 | V | |
| Trigger Voltage | V _T | | 450 | | V | IEC61000-4-2 8kV contact discharge |
| Clamping Voltage | V _C | | 40 | | V | IEC61000-4-2 8kV contact discharge |
| Leakage Current | I _L | | | 10 | nA | DC 3V shall be applied on component |
| Capacitance | C _J | | 0.05 | | pF | Measured at 10MHz |

TPESD0402G05V

| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
|------------------------------|-----------------|-----|------|-----|------|-------------------------------------|
| Continuous Operating Voltage | V _{DC} | | | 5 | V | |
| Trigger Voltage | V _T | | 450 | | V | IEC61000-4-2 8kV contact discharge |
| Clamping Voltage | V _C | | 40 | | V | IEC61000-4-2 8kV contact discharge |
| Leakage Current | I _L | | | 10 | nA | DC 5V shall be applied on component |
| Capacitance | C _J | | 0.05 | | pF | Measured at 10MHz |

TPESD0402G08V

| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
|------------------------------|----------|-----|------|-----|------|-------------------------------------|
| Continuous Operating Voltage | V_{DC} | | | 8 | V | |
| Trigger Voltage | V_T | | 450 | | V | IEC61000-4-2 8kV contact discharge |
| Clamping Voltage | V_C | | 40 | | V | IEC61000-4-2 8kV contact discharge |
| Leakage Current | I_L | | | 10 | nA | DC 8V shall be applied on component |
| Capacitance | C_J | | 0.05 | | pF | Measured at 10MHz |

TPESD0402G12V

| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
|------------------------------|----------|-----|------|-----|------|--------------------------------------|
| Continuous Operating Voltage | V_{DC} | | | 12 | V | |
| Trigger Voltage | V_T | | 450 | | V | IEC61000-4-2 8kV contact discharge |
| Clamping Voltage | V_C | | 40 | | V | IEC61000-4-2 8kV contact discharge |
| Leakage Current | I_L | | | 10 | nA | DC 12V shall be applied on component |
| Capacitance | C_J | | 0.05 | | pF | Measured at 10MHz |

TPESD0402G15V

| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
|------------------------------|----------|-----|------|-----|------|---------------------------------------|
| Continuous Operating Voltage | V_{DC} | | | 15 | V | |
| Trigger Voltage | V_T | | 450 | | V | IEC61000-4-2 8kV contact discharge |
| Clamping Voltage | V_C | | 40 | | V | IEC61000-4-2 8kV contact discharge |
| Leakage Current | I_L | | | 10 | nA | DC 15 V shall be applied on component |
| Capacitance | C_J | | 0.05 | | pF | Measured at 10MHz |

TPESD0402G24V

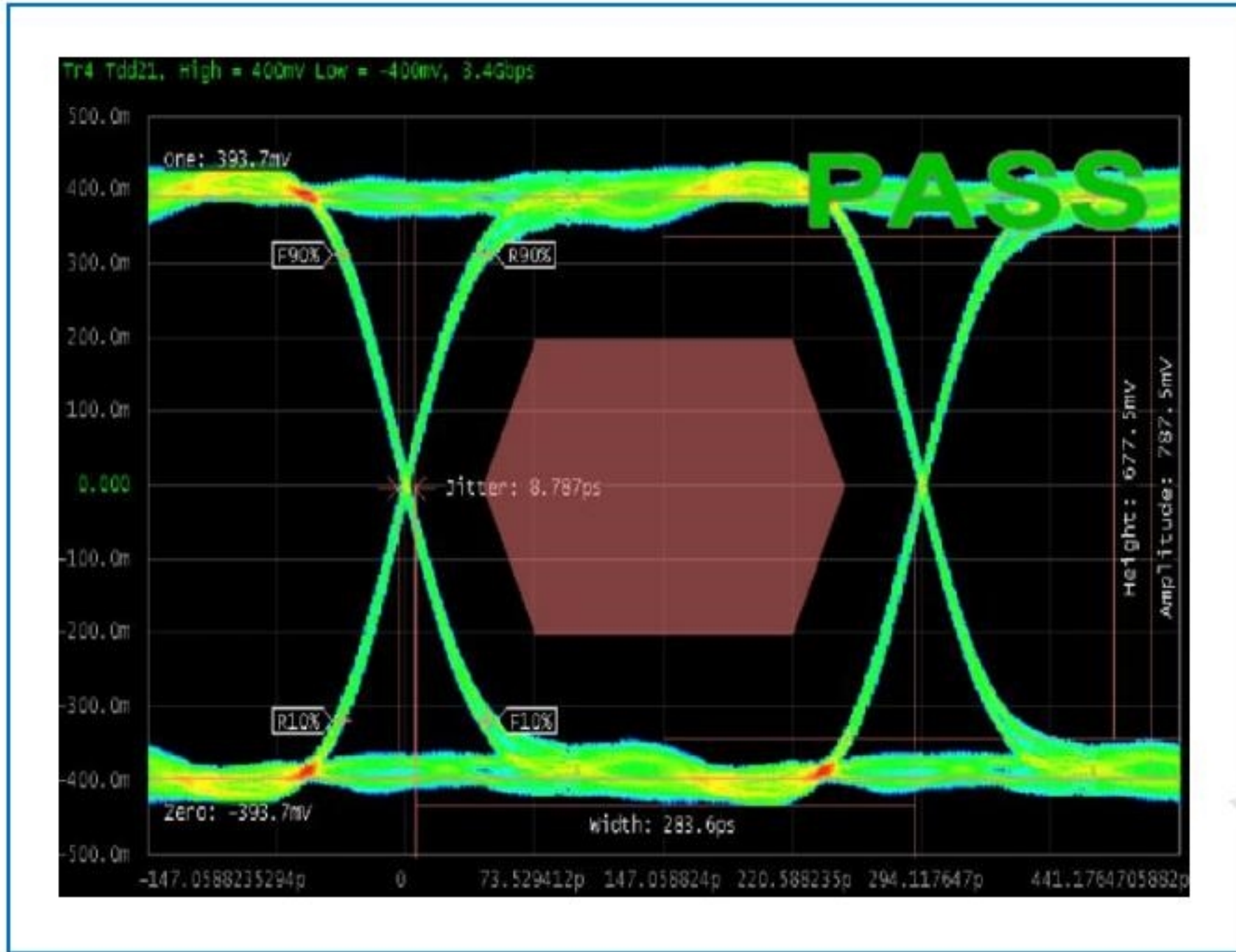
| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
|------------------------------|----------|-----|------|-----|------|--------------------------------------|
| Continuous Operating Voltage | V_{DC} | | | 24 | V | |
| Trigger Voltage | V_T | | 450 | | V | IEC61000-4-2 8kV contact discharge |
| Clamping Voltage | V_C | | 40 | | V | IEC61000-4-2 8kV contact discharge |
| Leakage Current | I_L | | | 10 | nA | DC 24V shall be applied on component |
| Capacitance | C_J | | 0.05 | | pF | Measured at 10MHz |

TPESD0402G36V

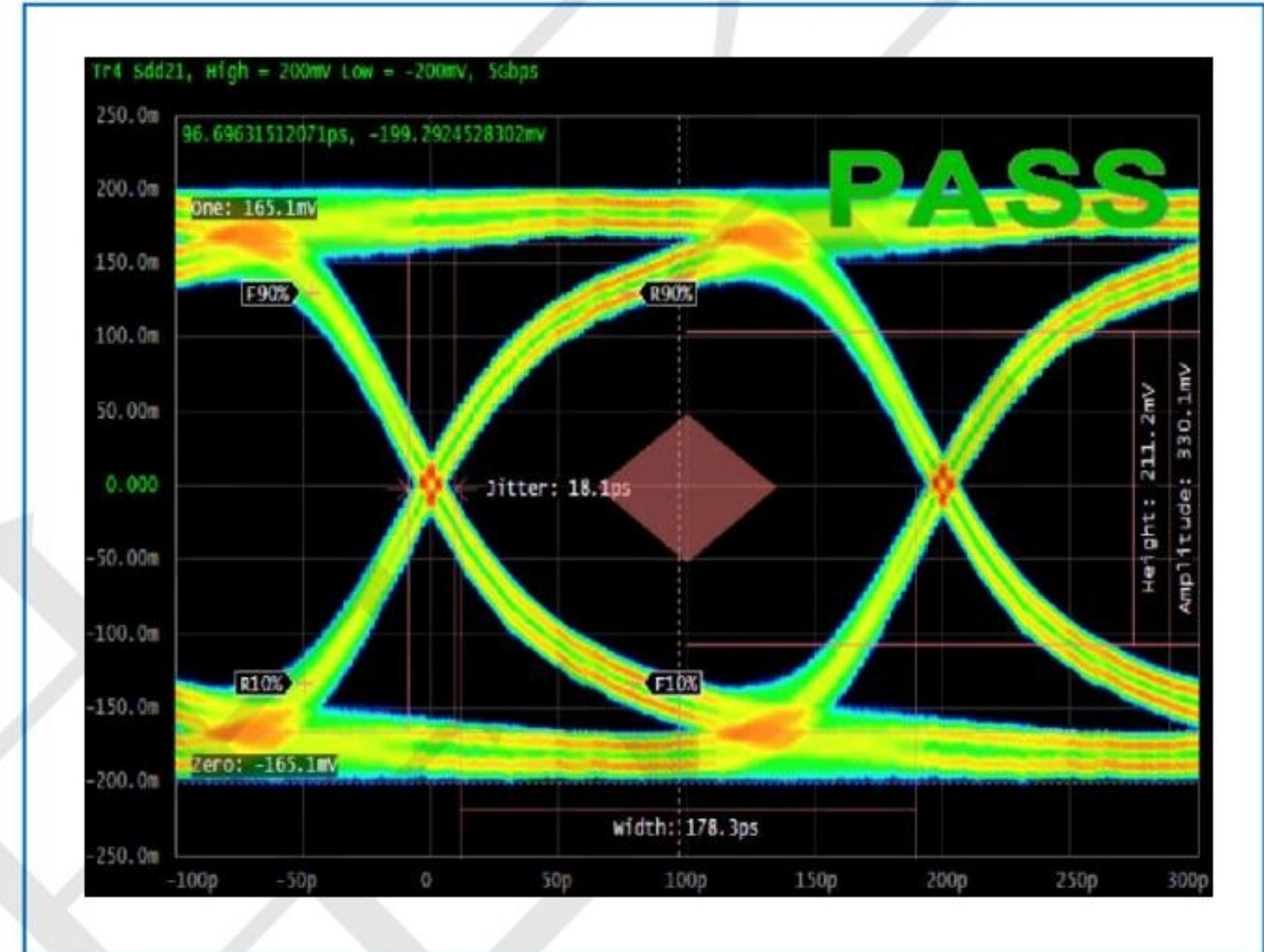
| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
|------------------------------|----------|-----|------|-----|------|--------------------------------------|
| Continuous Operating Voltage | V_{DC} | | | 36 | V | |
| Trigger Voltage | V_T | | 450 | | V | IEC61000-4-2 8kV contact discharge |
| Clamping Voltage | V_C | | 40 | | V | IEC61000-4-2 8kV contact discharge |
| Leakage Current | I_L | | | 10 | nA | DC 36V shall be applied on component |
| Capacitance | C_J | | 0.05 | | pF | Measured at 10MHz |

PROTECTION PRODUCTS
Typical characteristics

HDMI Mask at 3.4 Gbps



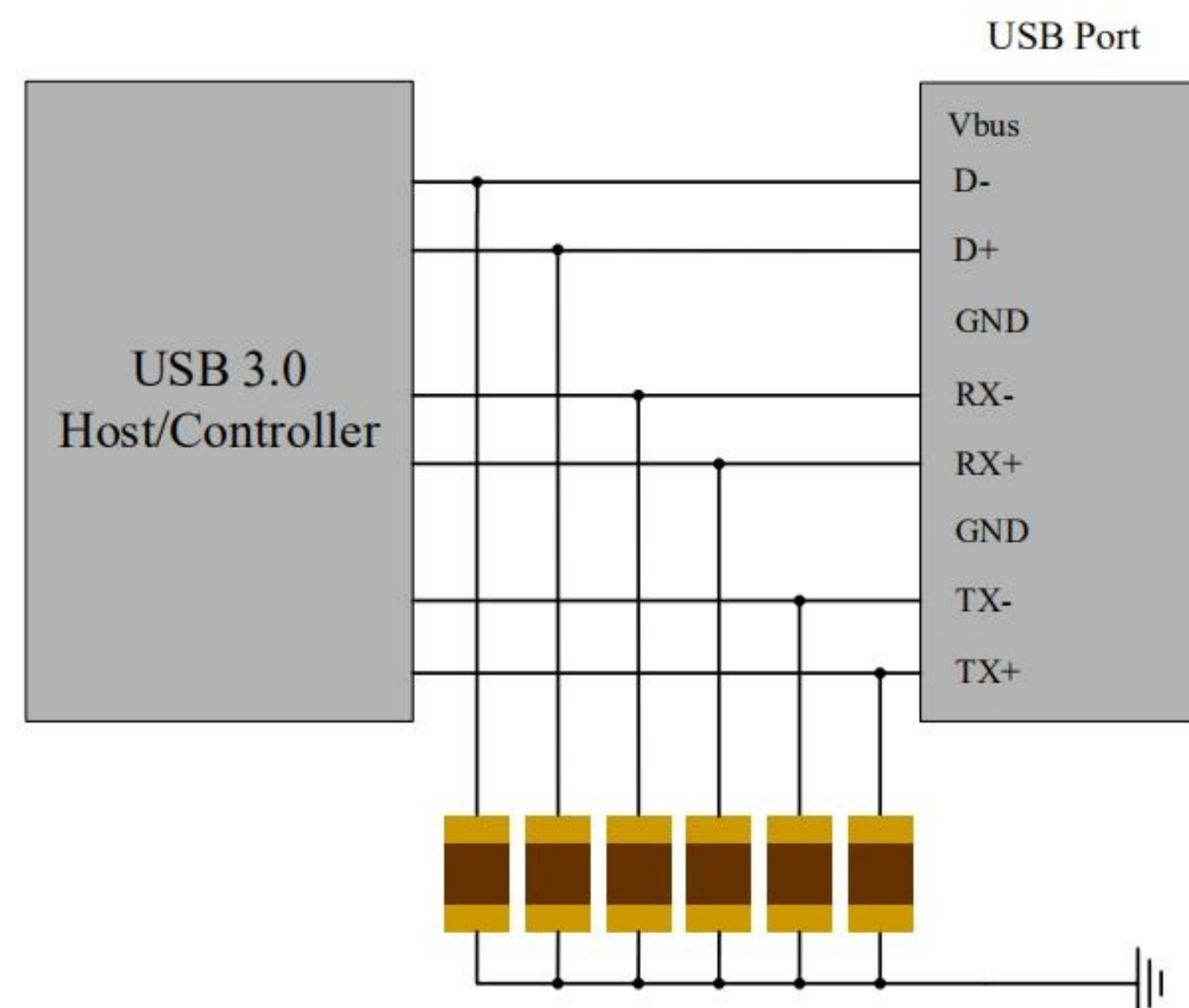
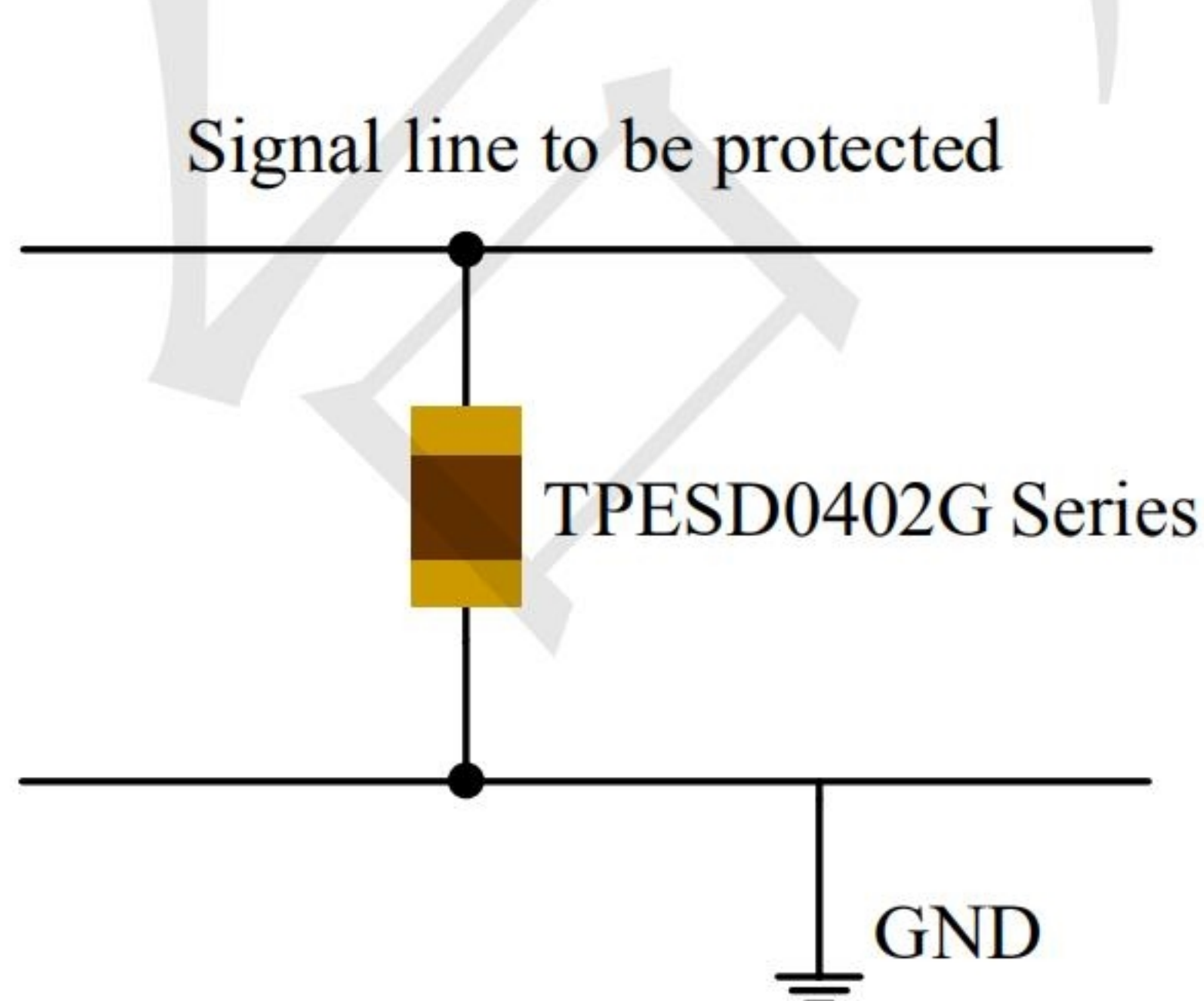
USB3.0 Mask at 5.0 Gbps



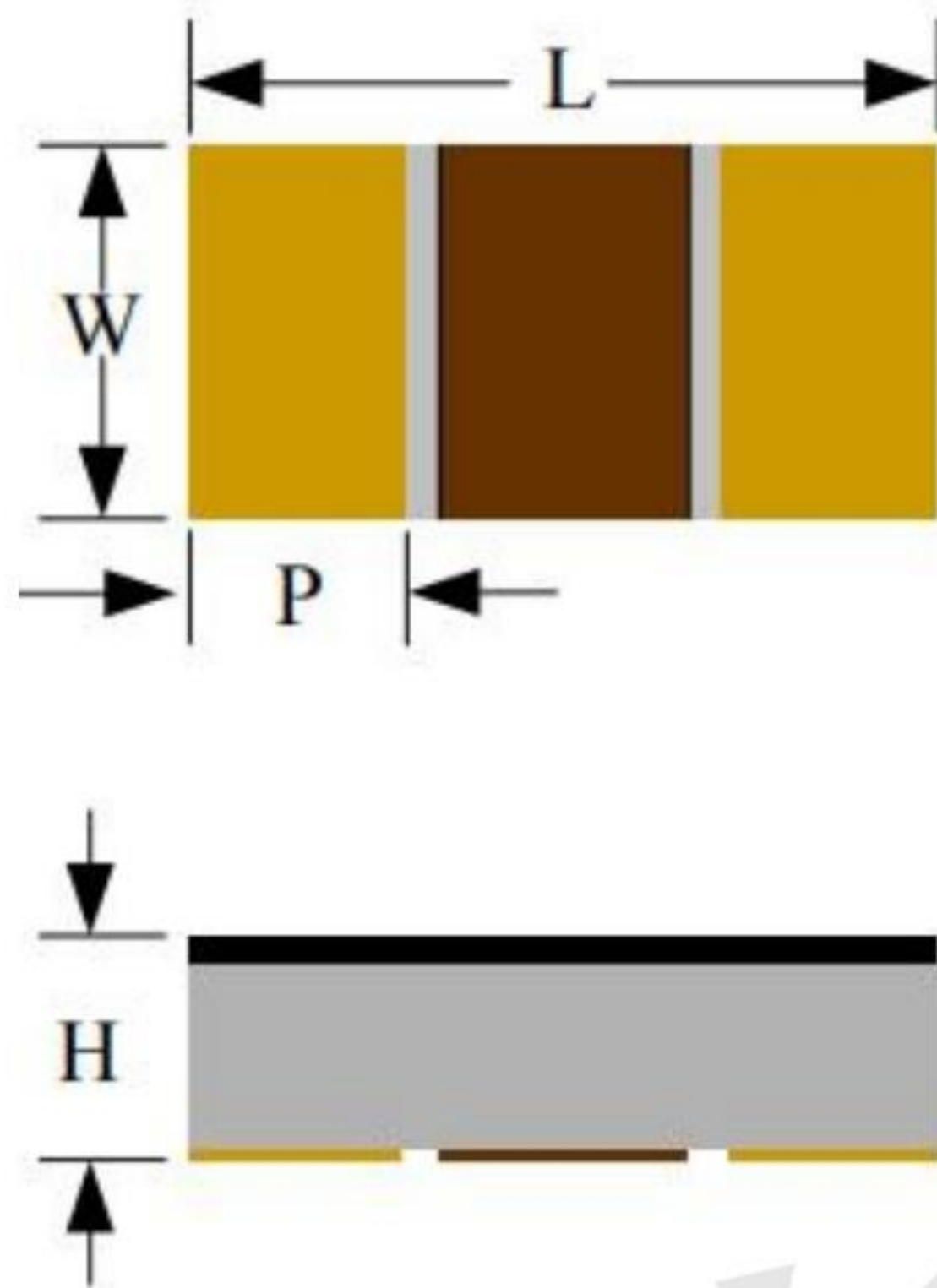
ESD Protection for Signal Line

The TPESD0402G is designed for the protection of one bidirectional data line from ESD damage.

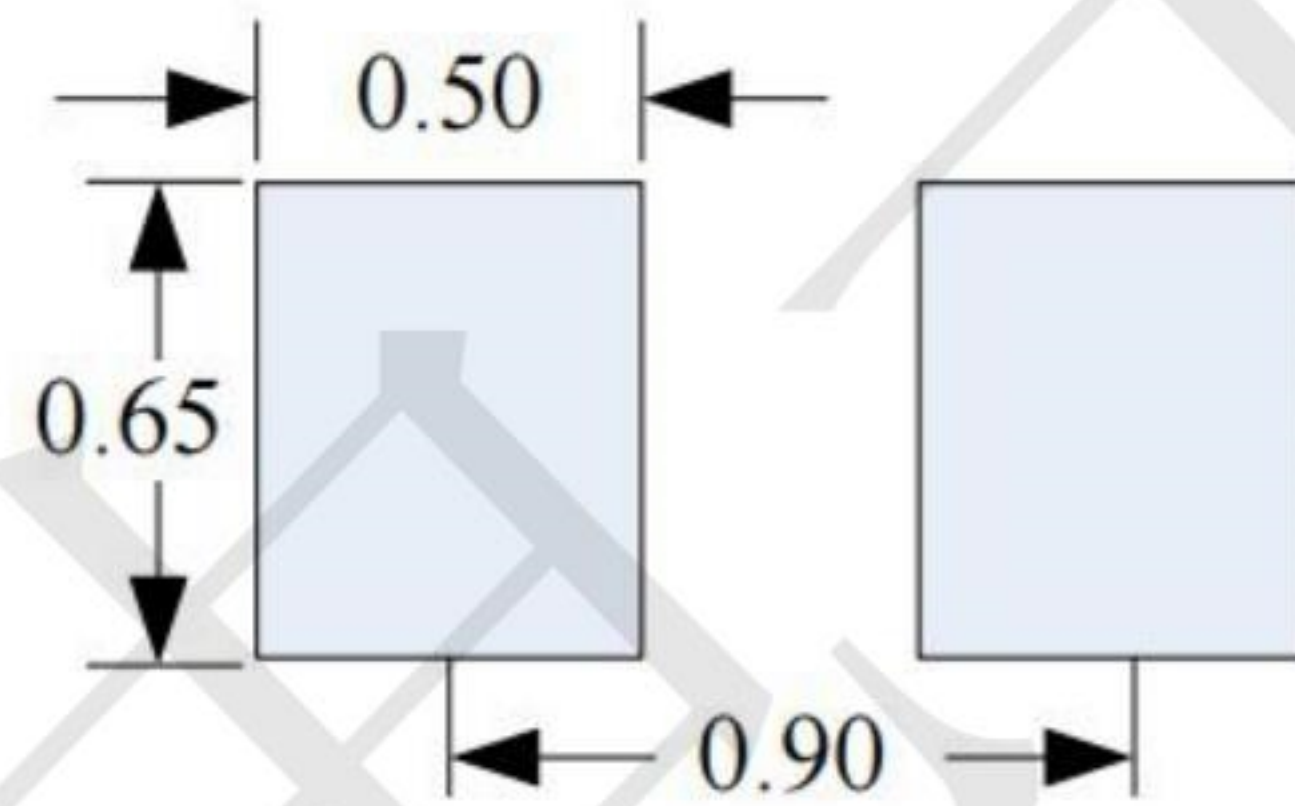
- Place the TPESD0402G as close to the input terminal or connector as possible
- Minimize the path length between the TPESD0402G and the protected signal line.
- Use ground planes whenever possible.



Package Dimension



Recommended Solder Pad Footprint



***Sizes in mm**

Notes:

This solder pad layout is for reference purposes only.

| Dimension | Unit: Millimeters | |
|-----------|-------------------|------|
| | Min. | Max. |
| L | 0.90 | 1.10 |
| W | 0.42 | 0.62 |
| p | 0.15 | 0.35 |
| H | 0.25 | 0.45 |

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