

## 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



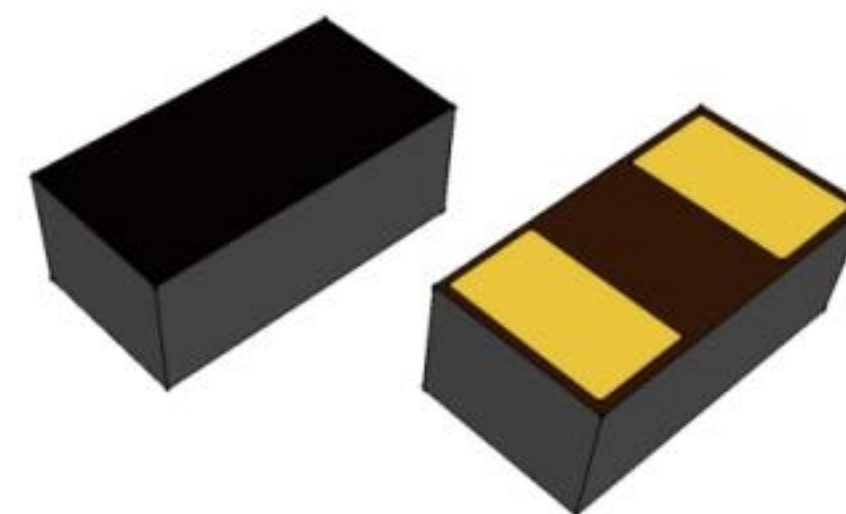
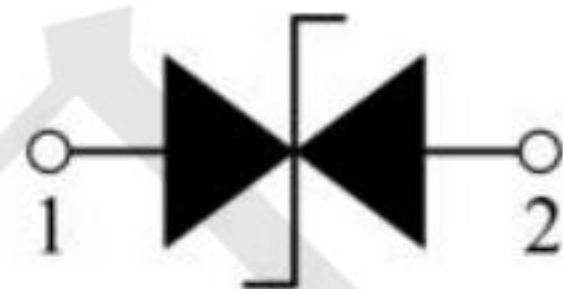
## Applications

- 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 <sub>DC</sub>			3	V	
Trigger Voltage	V <sub>T</sub>		450		V	IEC61000-4-2 8kV contact discharge
Clamping Voltage	V <sub>C</sub>		40		V	IEC61000-4-2 8kV contact discharge
Leakage Current	I <sub>L</sub>			10	nA	DC 3V shall be applied on component
Capacitance	C <sub>J</sub>		0.05		pF	Measured at 10MHz

#### TPESD0402G05V

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Continuous Operating Voltage	V <sub>DC</sub>			5	V	
Trigger Voltage	V <sub>T</sub>		450		V	IEC61000-4-2 8kV contact discharge
Clamping Voltage	V <sub>C</sub>		40		V	IEC61000-4-2 8kV contact discharge
Leakage Current	I <sub>L</sub>			10	nA	DC 5V shall be applied on component
Capacitance	C <sub>J</sub>		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

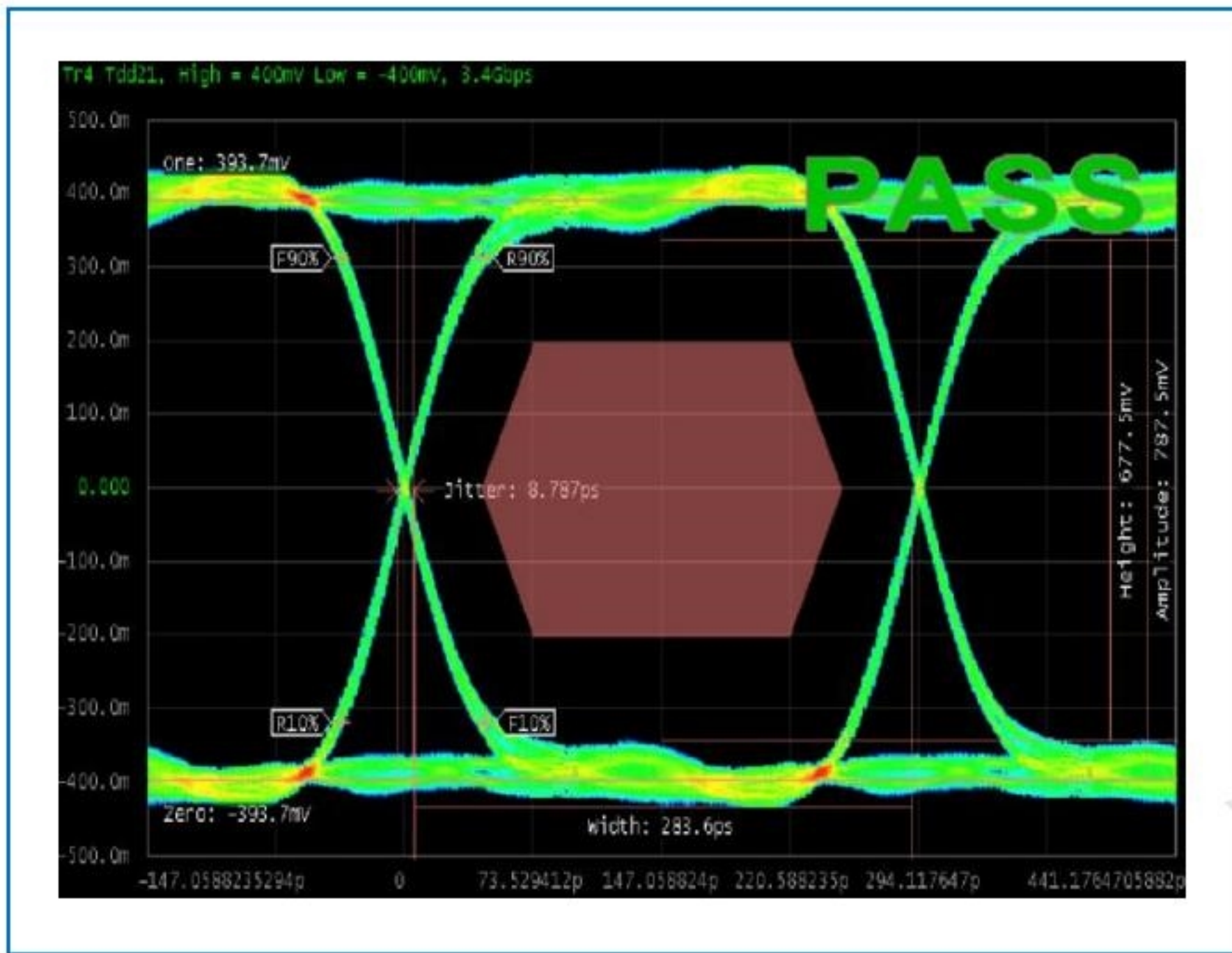
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Continuous Operating Voltage	$V_{DC}$			24	V	
Trigger Voltage	$V_T$		450		V	IEC61000-4-2 8kV contact discharge
Clamping Voltage	$V_C$		40		V	IEC61000-4-2 8kV contact discharge
Leakage Current	$I_L$			10	nA	DC 24V shall be applied on component
Capacitance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

## TPESD0402G36V

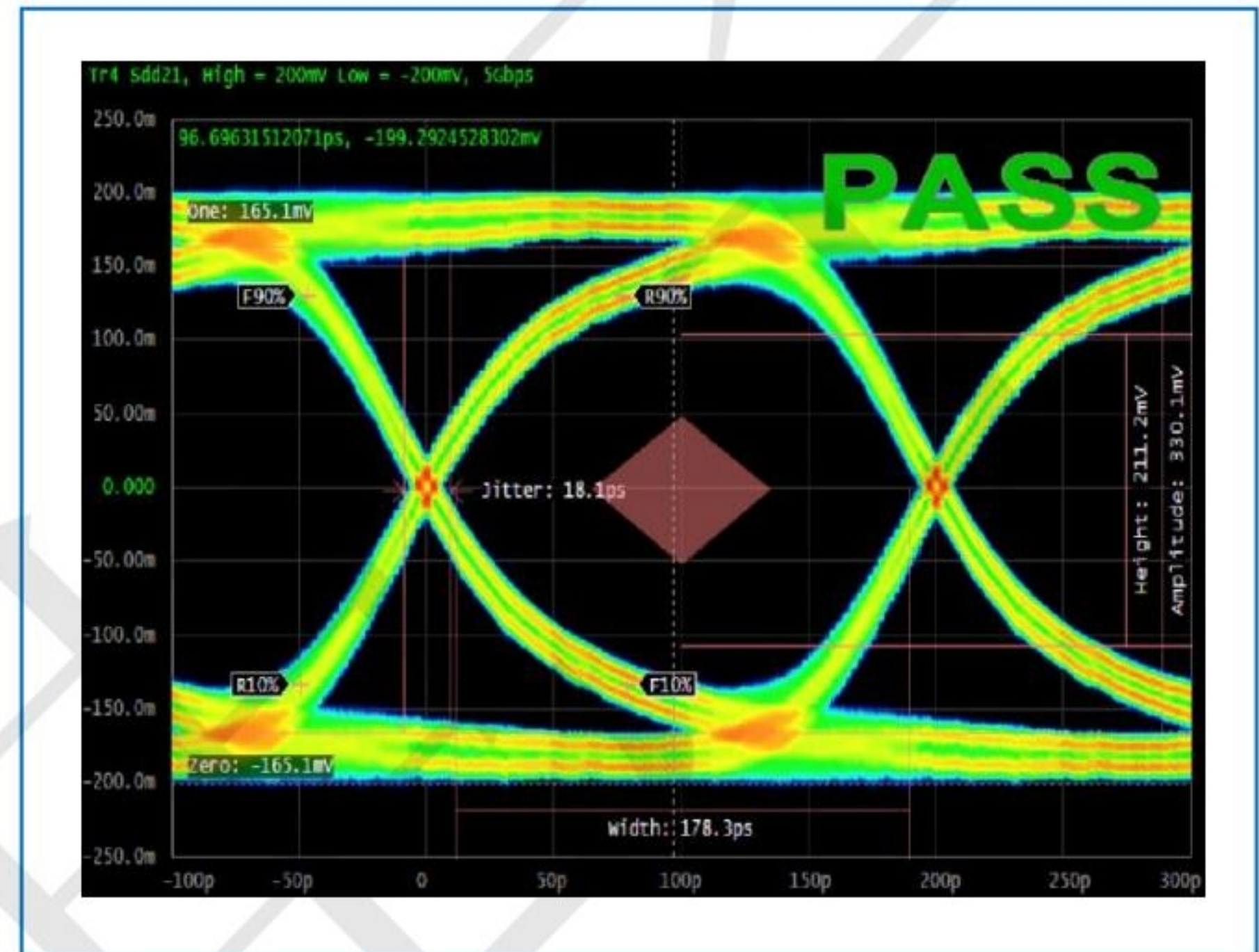
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Continuous Operating Voltage	$V_{DC}$			36	V	
Trigger Voltage	$V_T$		450		V	IEC61000-4-2 8kV contact discharge
Clamping Voltage	$V_C$		40		V	IEC61000-4-2 8kV contact discharge
Leakage Current	$I_L$			10	nA	DC 36V shall be applied on component
Capacitance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

**PROTECTION PRODUCTS**  
Typical characteristics

**HDMI Mask at 3.4 Gbps**



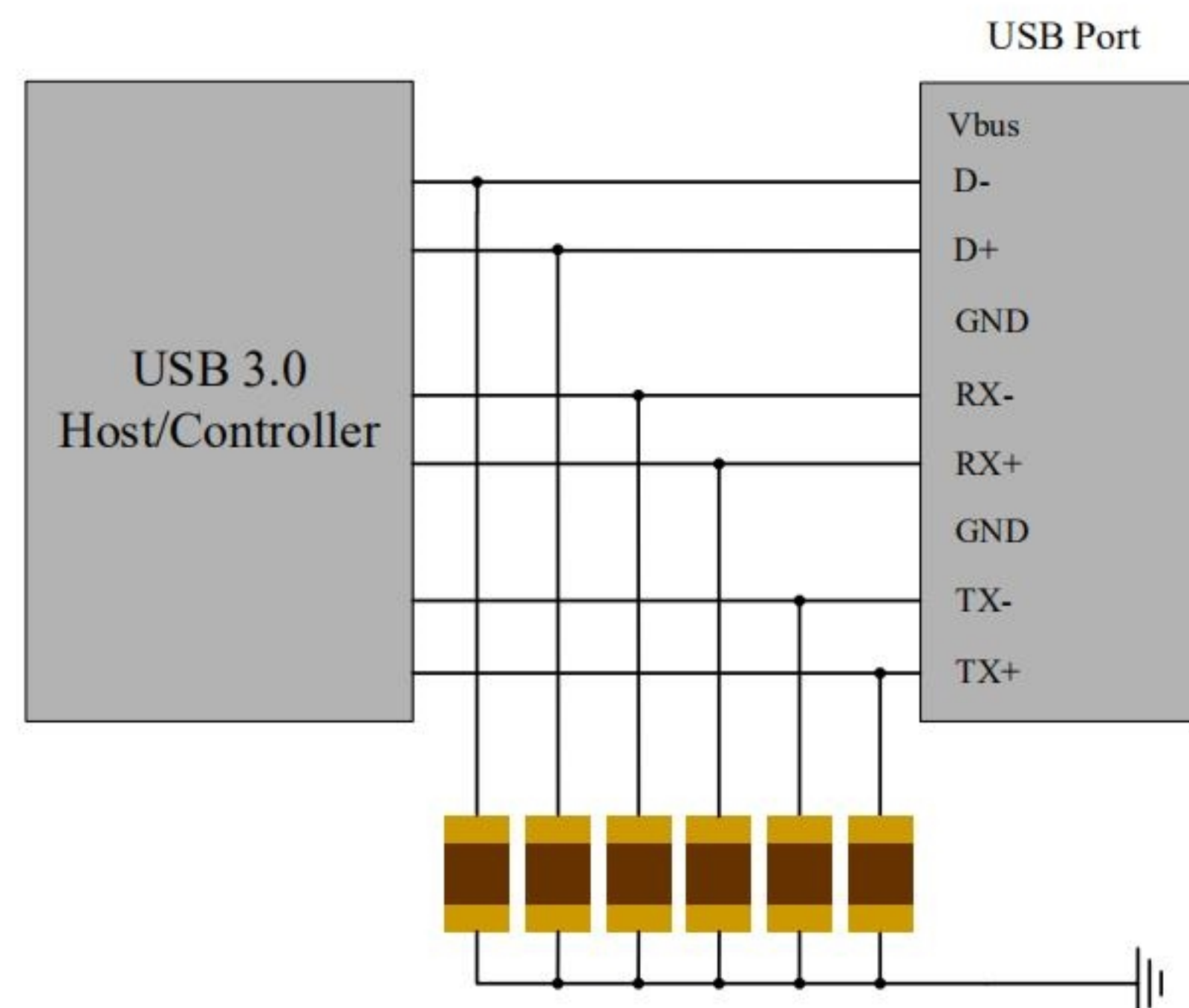
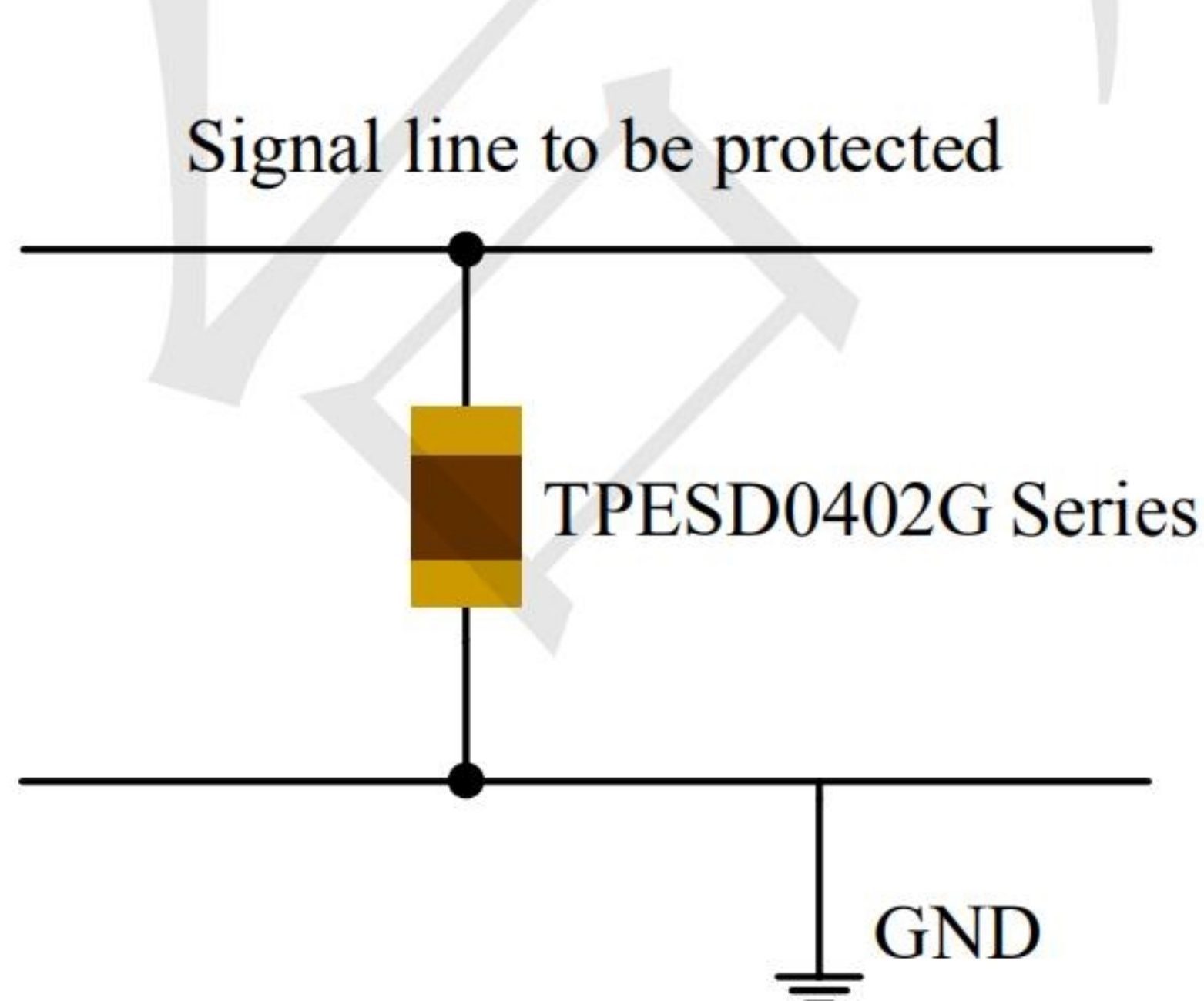
**USB3.0 Mask at 5.0 Gbps**



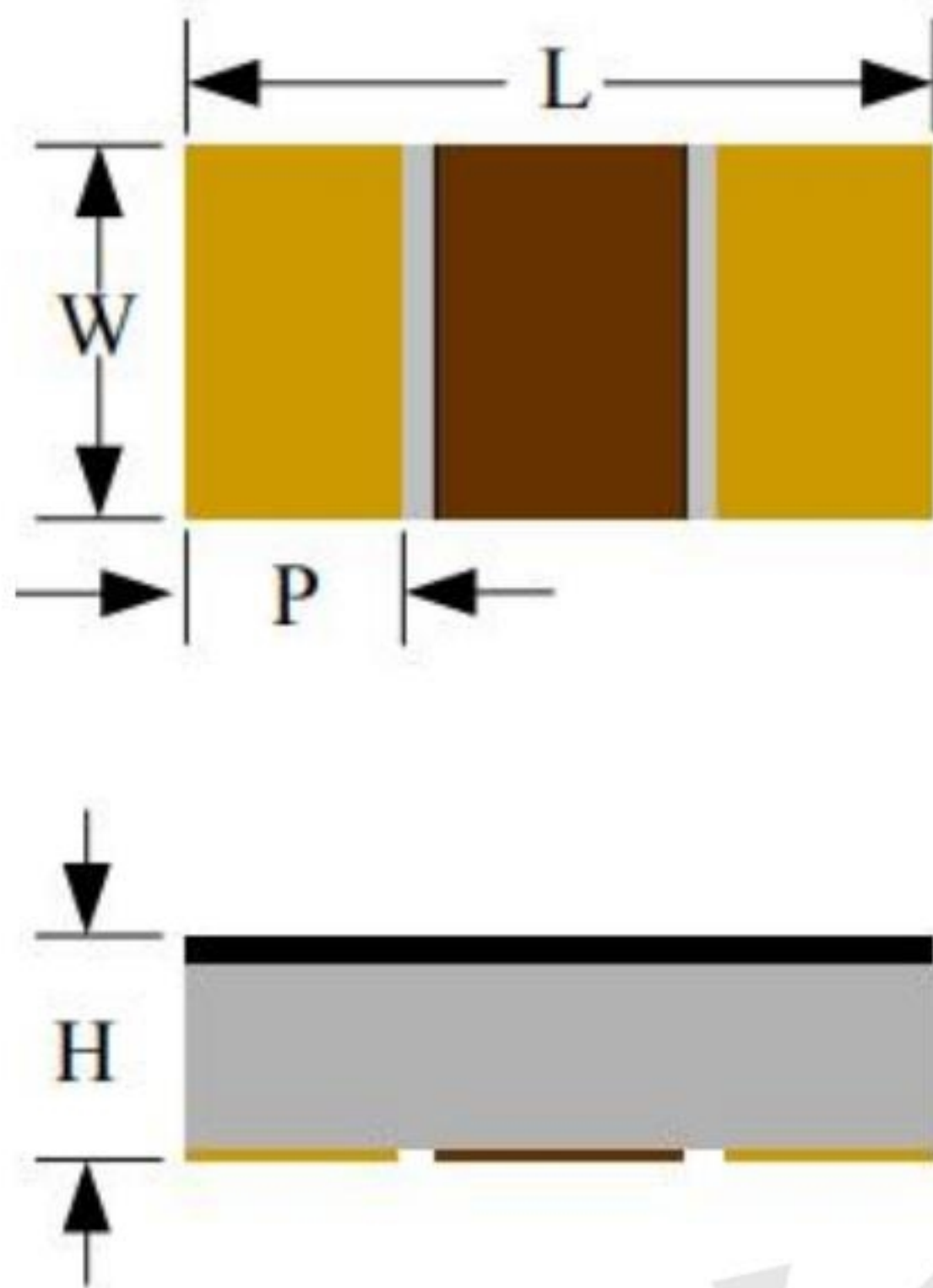
**ESD Protection for Signal Line**

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

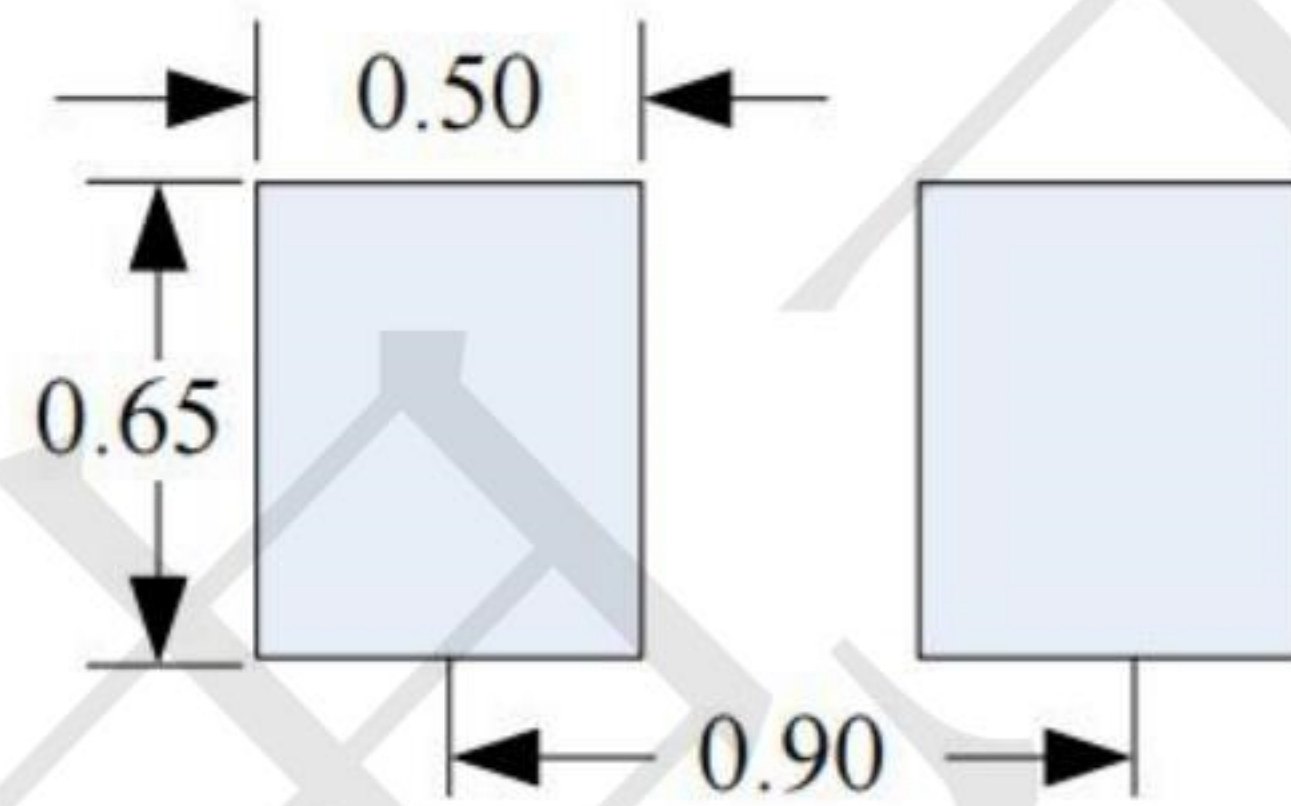
- Place the TPESD0402G as close to the input terminal or connector as possible
- Minimize the path length between the TPESD0402G and the protected signal line.
- Use ground planes whenever possible.



**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