PESD0402E Series

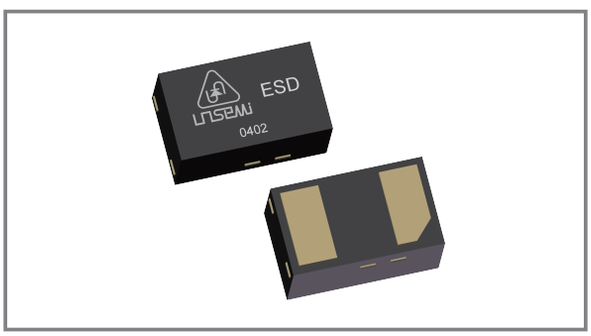
ROHS

Surface Mount Polymeric ESD Suppressor

www.unsemi.com.tw

Description

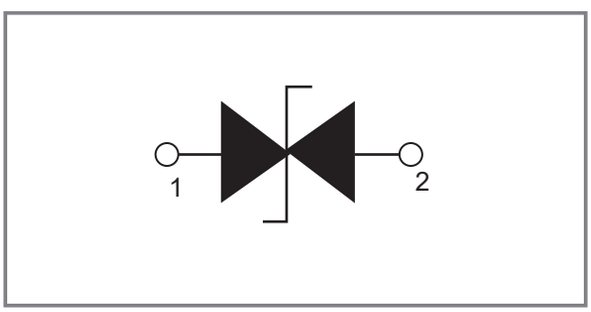
PESD0402E polymeric ESD suppressor help protect sensitive electronic equipment against electrostatic discharge (ESD) without distorting data signals. This protection is a result of its ultra-low capacitance of only 0.05 pF (I/O to GND), and it can be used to help equipment to pass IEC61000-4-2 level 4 test (15KV air, 8KV contact discharge).



Features

- The best ESD protection for high speed, low voltage applications
- RoHS compliant and halogen free
- Compact size for EIA 0402
- Ultra low capacitance, 0.05 pF (typ.)
- Extremely quick response time (<1ns)
- Extremely low leakage current
- Bi-directional, single line protection

Functional Diagram



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

Caution: This component is designed for signal line protection only, not intended to be used on power lines or for power bus applications.

Order Information

Type	Package	Size (mm)	Delivery Form	Delivery Quantity
PESD0402EXXV	0402	1.00x0.52x0.38	7” T&R	10,000

Electrical Characteristics @ 25℃ Unless Otherwise Specified)

Part Number	Working Voltage V_{DC}	Capacitance @10MHz Cp	Leakage Current @V_{DC} I_L	ESD Pulse Withstand	Clamping Voltage Vc	Trigger Voltage Vt	Maximum ESD IEC61000-4-2
	V	pF	μA	IEC61000-4-2 8KV contact discharge			
	Max.	Typ.	Max.	Max.	Typ.	Typ.	
PESD0402E03V	3.0	0.05	0.05	1000	40	450	Contact Discharge Voltage: 8 KV Air Gap Discharge Voltage: 15 KV
PESD0402E05V	5.0	0.05	0.05	1000	40	450	
PESD0402E07V	7.0	0.05	0.05	1000	40	450	
PESD0402E08V	8.0	0.05	0.05	1000	40	450	
PESD0402E10V	10.0	0.05	0.05	1000	40	450	
PESD0402E12V	12.0	0.05	0.05	1000	40	450	
PESD0402E14V	14.0	0.05	0.05	1000	40	450	
PESD0402E15V	15.0	0.05	0.05	1000	40	450	
PESD0402E18V	18.0	0.05	0.05	1000	40	450	
PESD0402E24V	24.0	0.05	0.05	1000	40	450	

Notes:Trigger and clamping voltage are measured per IEC 61000-4-2, 8KV contact discharge method.

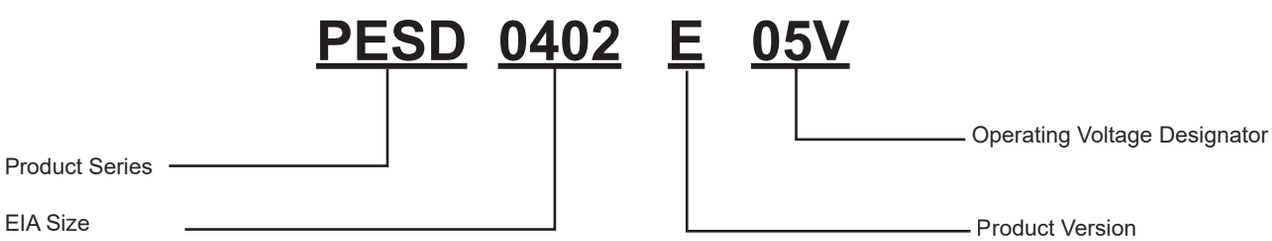
General Technical Data

Operating Temperature	-40 ~ +85℃
Storage Temperature (on board)	-55 ~+125℃
Response Time	<1ns
Solderabity	245 ± 5℃, 3 ±1sec.
Solder Leach Resistance	260 ± 5℃, 10 ± 1sec.

Environmental

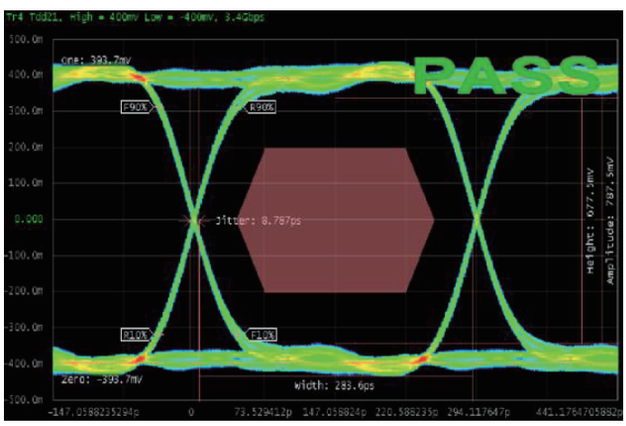
Item	Specifications	Test Condition
Bias Humidity	I_L ≦ 100 nA	85%RH, 85℃, Working Voltage, 1000 hrs
Thermal Shock		-55℃ to 125℃, 30 min. cycle, 1000 cycles
Preconditioning		125℃, 24H; 85℃, 85%RH, 162H; 260℃ Reflow,3 Times

Part Numbering

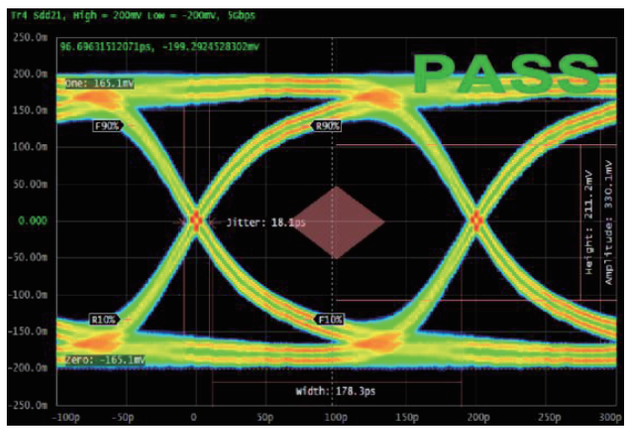


Eye Diagram Measuremen

HDMI Mask at 3.4 Gbps



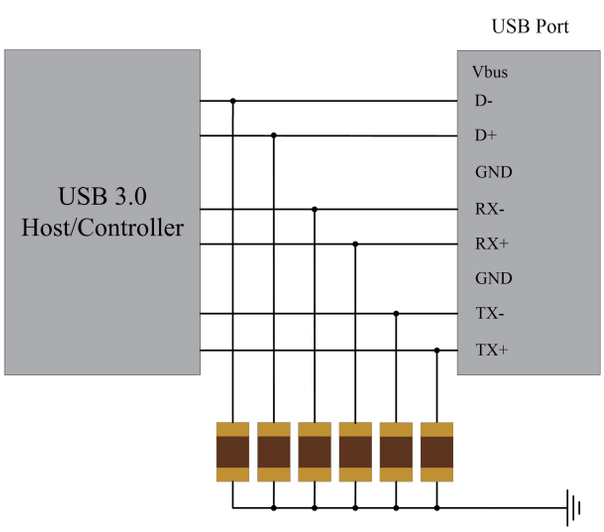
USB3.0 Mask at 5.0 Gbps

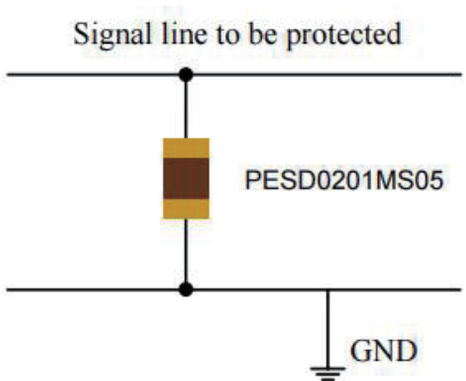


ESD Protection for Signal Line

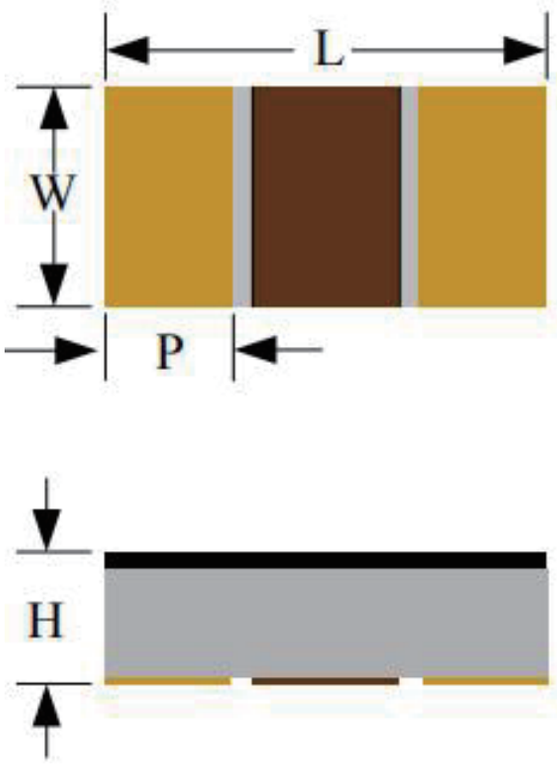
The PESD is designed for the protection of one bidirectional data line from ESD damage.

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

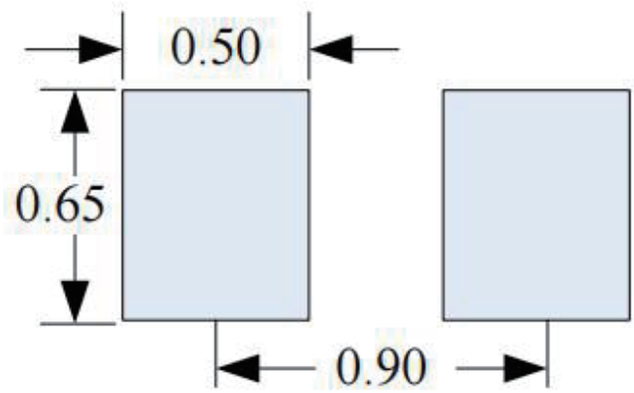




Package Dimension



Recommended Solder Pad Footprint



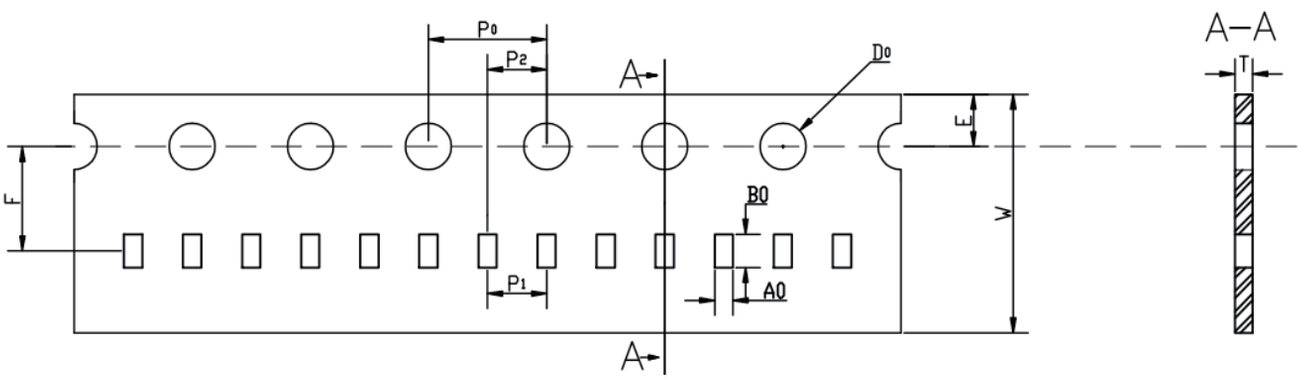
*Sizes in mm

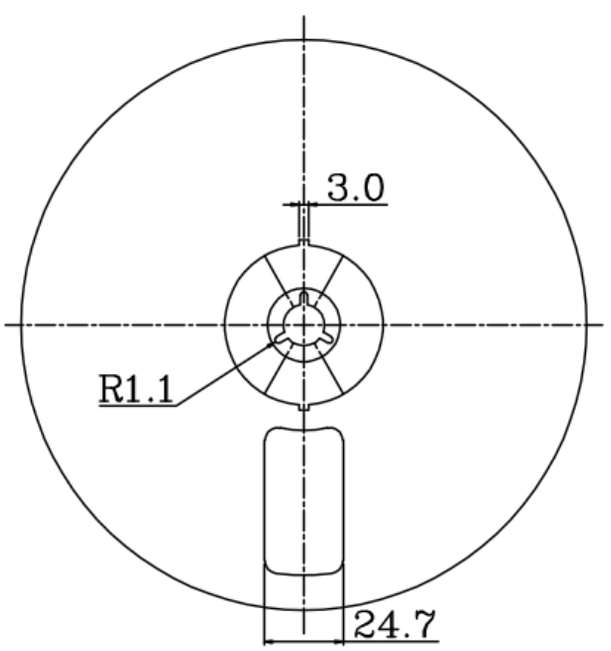
Notes:

This solder pad layout is for reference purposes only.

Model	Unit: Millimeters		
	Min	Typ.	Max.
L(mm)	0.90	1.00	1.10
W(mm)	0.42	0.52	0.62
H(mm)	0.25	0.38	0.45
P(mm)	0.15	0.25	0.35

Taping Specification Unit: mm

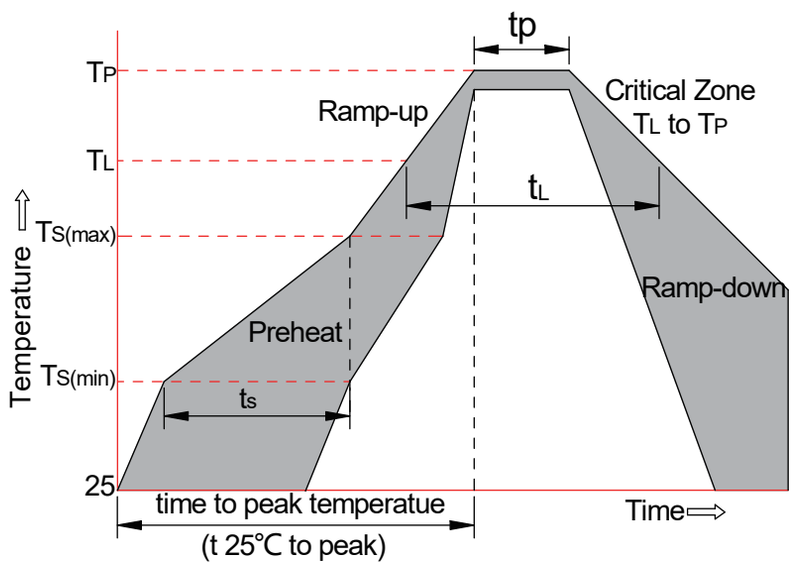




A	N Min.	C	W2 Max.	W1 Min.	W1 Max.
178.0 ± 2.0	50	13.0 ± 0.2	14.4	8.4	9.9

Soldering Parameters

FIG.5: Reflow condition



Profile Feature	Pb-Free Assembly
Pre Heat Temperature Min (T_{smin}) Temperature Max (T_{smax}) Time (t_s) from (T_{smin} to T_{smax})	 150 °C 200 °C 60-120 seconds
Ramp-up Rate (T_L to T_P)	3 °C/second max.
Liquidus temperature (T_L) Time (t_L) maintained above T_L	217 °C 60-150 seconds
Peak package body temperature (Tp)	260(+0/-5)°C
Time (t_P)* within 5 °C of the specified classification temperature (Tc)	30* seconds
Ramp-down Rate (T_P to T_L)	6 °C/second max.
Time 25 °C to peak temperature	8 minutes max.
* Tolerance for peak profile temperature (T_P) is defined as a supplier minimum and a user maximum.	

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