Leiditech

# PESD1663U005

ESD Protection Diode in 0603

## 1 Feature

- Ultra-low capacitance:0.05pF(Typ.)
- Low leakage current(<10nA)
- Fast response time(<1ns)
- IEC61000-4-2(Contact) : 8KV
  IEC61000-4-2(Air) : 15KV
- Bi-directional, single line protection

## 2 Description

PESD1663U005 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).

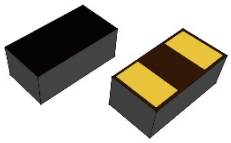
## 3 Application

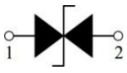
- Smart phone/Mobile internet device
- Laptop/Desktop computer
- Antennas (Cell Phones, GPS…)
- USB 3.0, USB 3.1 and high speed interface

## 4 Device Information

| Model | Package | Size |
|---|---|---|
| PESD1663U005 | 0603-2 | 1.60 mm × 0.80 mm × 0.30 mm |

## 5 Pin Description






## 6 General Characteristics

| Parameter | Value | Unit |
|---|---|---|
| Contact Discharge Voltage Per IEC61000-4-2 | 8 | KV |
| Air Discharge Voltage Per IEC61000-4-2 | 15 | KV |
| Operating Temperature | -55 to +125 | ℃ |
| Storage Temperature | -40 to +85 | ℃ |

## 7 Electrical Characteristics（$T_A$ =25°C）

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Continuous Operating Voltage | $V_{DC}$ | --- | --- | --- | 16 | V |
| Trigger Voltage | $V_T$ | IEC61000-4-2 8KV contact discharge | --- | 450 | --- | V |
| Clamping Voltage | $V_C$ | IEC61000-4-2 8KV contact discharge | --- | 40 | --- | V |
| Leakage Current | $I_L$ | DC 18V shall be applied on component | --- | --- | 10 | nA |
| Capacitance | $C_P$ | Measured at 10MHz | --- | 0.05 | --- | pF |
| ESD Pulse Withstand | Pulses | IEC61000-4-2 8KV contact discharge | 1000 | --- | --- | --- |

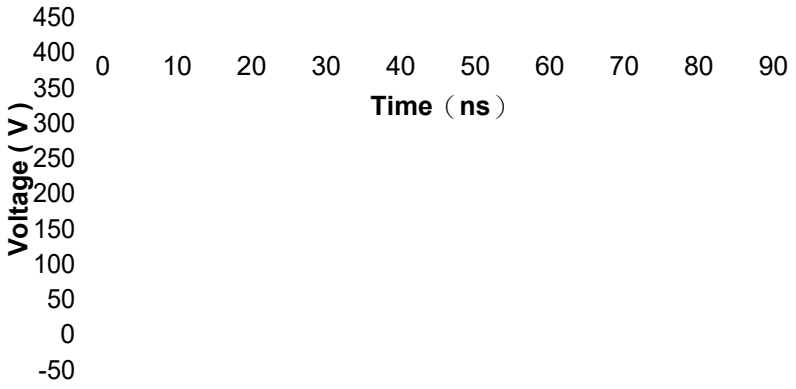
*Notes: Trigger and clamping voltage are measured per IEC 61000-4-2, 8KV contact discharge method.*



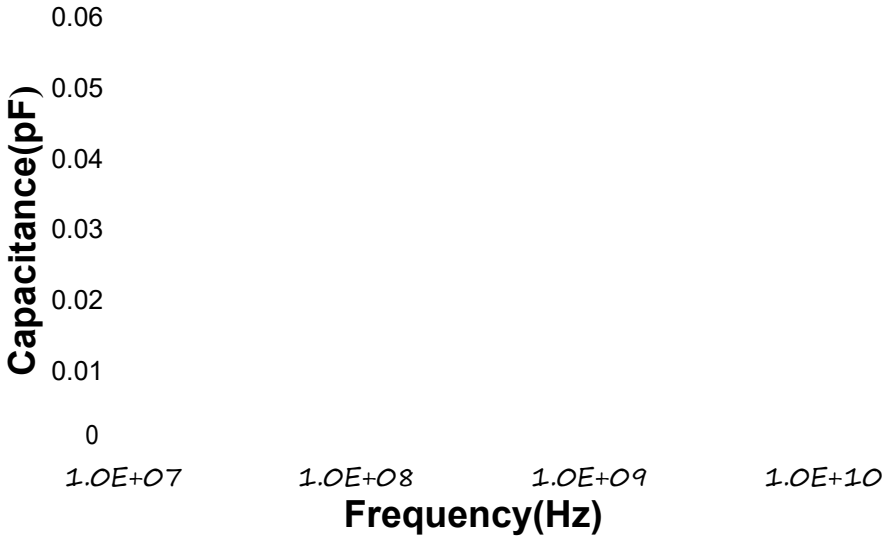
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## 8 Typical ESD Response（IEC 61000-4-2, 8KV contact discharge）

## 9 Typical ESD Response（IEC 61000-4-2, 8KV contact discharge）




## 10 Typical Device Capacitance VS. Frequency

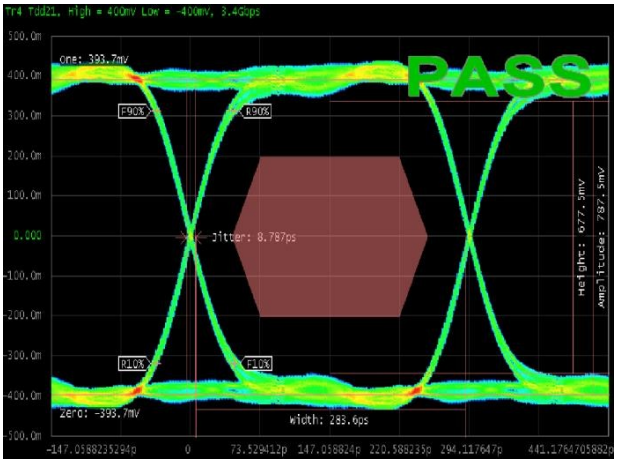




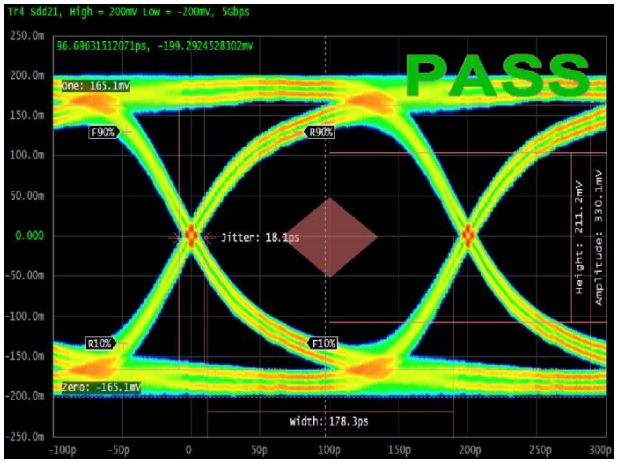

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## 11 Eye Diagram Measurement

**HDMI Mask at 3.4 Gbps**




**USB3.0 Mask at 5.0 Gbps**

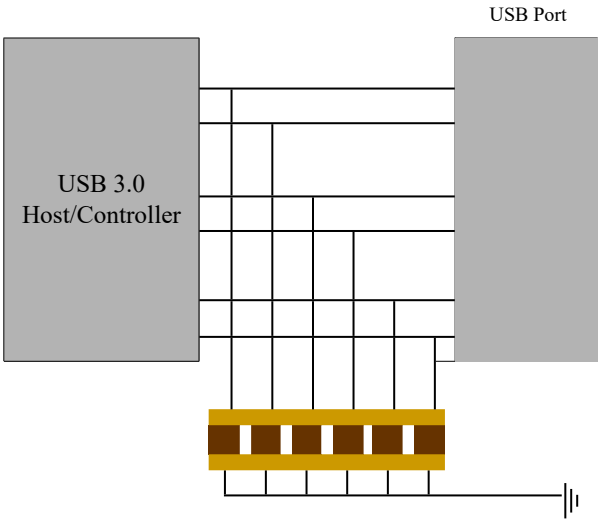



## 12 ESD Protection for Signal Line

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.

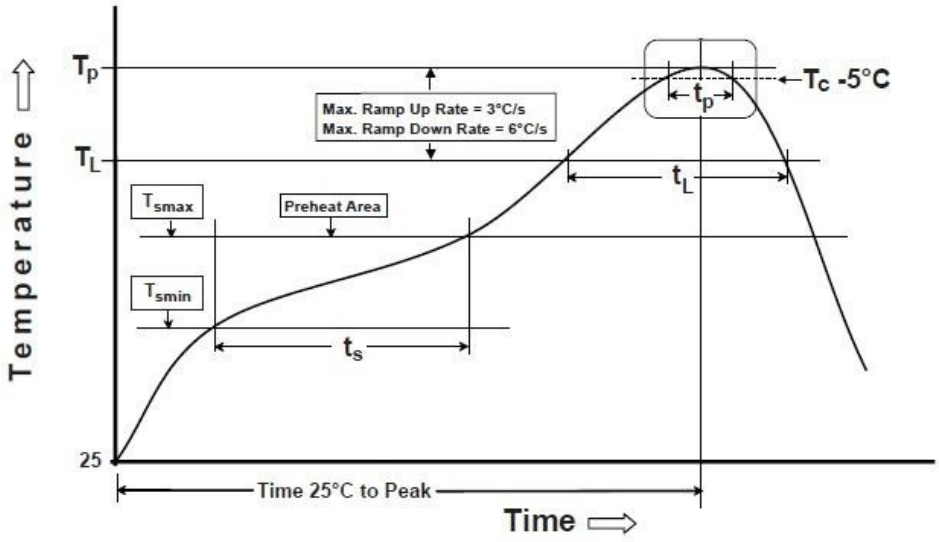
Signal line to be protected






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## 12 Soldering Parameters




| Profile Feature | Pb-Free Assembly |
|---|---|
| Pre Heat<br>Temperature Min ($T_{smin}$)<br>Temperature Max ($T_{smax}$)<br>Time ($t_s$) from ($T_{smin}$ to $T_{smax}$) | <br>150 °C<br>200 °C<br>60-120 seconds |
| Ramp-up Rate ($T_L$ to $T_p$) | 3 °C/second max. |
| Liquidus temperature ($T_L$)<br>Time ($t_L$) maintained above $T_L$ | 217 °C<br>60-150 seconds |
| Peak package body temperature ($T_p$) | $260^{+0/-5}$ °C |
| Time ($t_p$)* within 5 °C of the specified classification temperature ($T_c$) | 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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## 0603-2 Package

### 13 Package Dimension



| Dimension | Unit: Millimeters | | |
|---|---|---|---|
| | Min. | Typ. | Max. |
| L | 1.45 | 1.60 | 1.75 |
| W | 0.70 | 0.83 | 0.95 |
| P | 0.20 | 0.35 | 0.50 |
| H | 0.26 | 0.36 | 0.46 |

### Recommended Solder Pad Footprint

***Sizes in mm**

Notes：

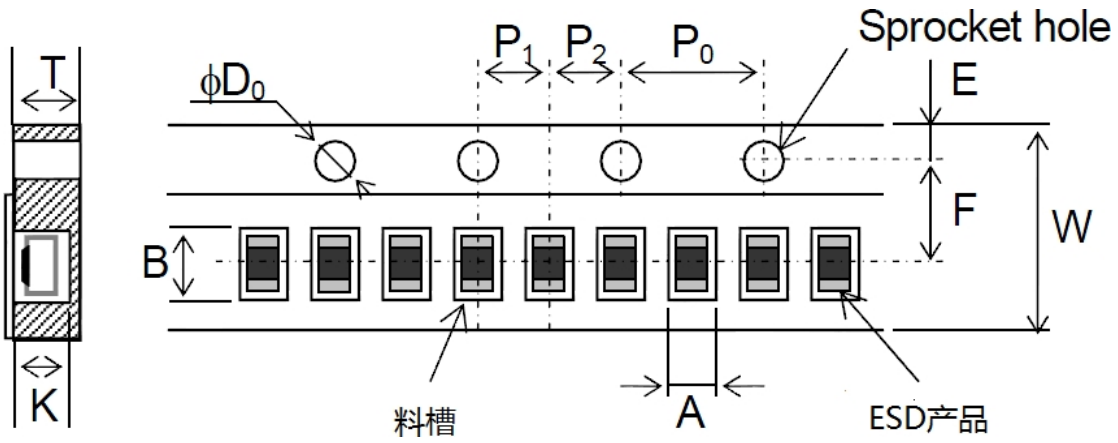
This solder pad layout is for reference purposes only.



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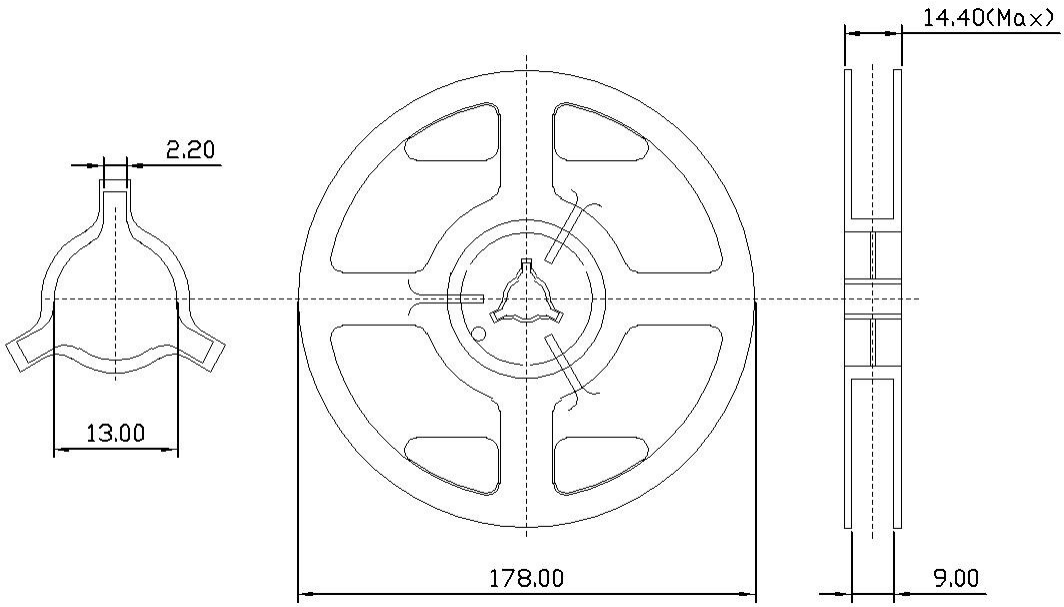
## 14 Taping Specification

**Unit: Millimeters**




| | A | B | W | F | E | $P_1$ | $P_2$ | $P_0$ | $\phi D_0$ | K | T |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Tape Dimension** | 1.00±0.03 | 1.9±0.03 | 8.00±0.10 | 3.50±0.05 | 1.75±0.10 | 2.00±0.05 | 2.00±0.05 | 4.00±0.10 | 1.55±0.05 | 0.43±0.03 | 0.43±0.03 |

**Unit: Millimeters**






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## 15 Ordering & Contact Information

| Ordering Code | Package | Net Weight | Delivery Form | Delivery Quantity |
|---|---|---|---|---|
| PESD1663U005 | 0603-2 | 1.0 mg / 1 pce | Mini T&R (7”) | 5,000 pcs/reel |

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