

Small Signal Diode



Features

- ✧ Meet IEC61000-4-2 (ESD) $\pm 15\text{kV}$ (air), $\pm 8\text{kV}$ (contact)
- ✧ Designed for mounting on small surface.
- ✧ Moisture sensitivity level 1
- ✧ Protects one birectional I/O line
- ✧ Working Voltage : 5V, 12V, 24V
- ✧ Pb free version, RoHS compliant, and Halogen free

Mechanical Data

- ✧ Case : 0603 standard package, molded plastic
- ✧ Terminal: Gold plated,solder per MIL-STD-750, Method 2026 guaranteed
- ✧ High temperature soldering guaranteed: $260^{\circ}\text{C}/10\text{s}$
- ✧ Mounting position: Any
- ✧ Weight :3 mg (approximately)
- ✧ Marking Code : E05, E12, E24

Applications

- ✧ Cell Phone Handsets and Accessories
- ✧ Notebooks, Desktops, and Servers
- ✧ Keypads, Side Keys, USB 2.0, LCD Displays
- ✧ Portable Instrumentation
- ✧ Touch panel

Ordering Information

| Part No. | Package code | Package | Packing | Marking |
|----------|--------------|---------|--------------|---------|
| TESDU5V0 | RZG | 0603 | 4K / 7" Reel | E05 |
| TESDU12V | RZG | 0603 | 4K / 7" Reel | E12 |
| TESDU24V | RZG | 0603 | 4K / 7" Reel | E24 |

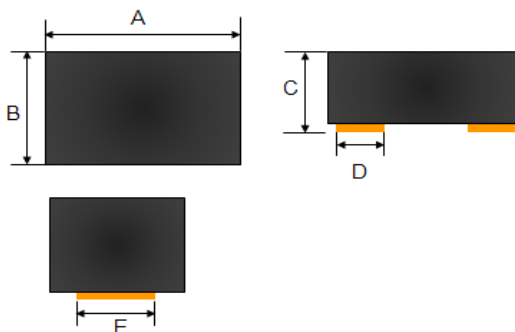
Maximum Ratings and Electrical Characteristics

Rating at 25°C ambient temperature unless otherwise specified.

Maximum Ratings

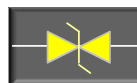
| Type Number | Symbol | Value | Units |
|--|-----------------------------------|---------------------|--------------------|
| Peak Pulse Power (tp=8/20 μs waveform) | P _{PP} | TESDU5V0 | 75 |
| | | TESDU12V | 25 |
| | | TESDU24V | 47 |
| ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact) | V _{ESD} | ± 15 ± 8 | KV |
| Junction and Storage Temperature Range | T _J , T _{STG} | -55 to + 150 | $^{\circ}\text{C}$ |

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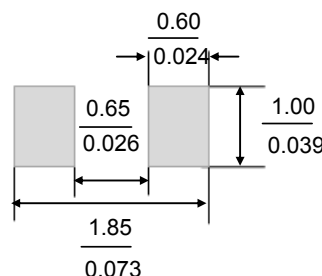


| Dimensions | Unit (mm) | | Unit (inch) | |
|------------|------------|------|-------------|-------|
| | Min | Max | Min | Max |
| A | 1.60 | 1.80 | 0.063 | 0.071 |
| B | 0.80 | 1.00 | 0.031 | 0.039 |
| C | 0.70 | 0.85 | 0.027 | 0.033 |
| D | 0.45(Typ.) | | 0.018(Typ.) | |
| E | 0.70(Typ.) | | 0.028(Typ.) | |

Pin Configuration



Suggested PAD Layout



Unit : $\frac{\text{mm}}{\text{inch}}$

Small Signal Diode
Electrical Characteristics

| Type Number | | | Symbol | Min | Max | Units |
|---------------------------|----------|--|------------|-----------|-----|---------------|
| Reverse Stand-Off Voltage | TESDU5V0 | | V_{RWM} | - | 5 | V |
| | TESDU12V | | | | 12 | |
| | TESDU24V | | | | 24 | |
| Reverse Breakdown Voltage | TESDU5V0 | $I_R = 1\text{mA}$ | $V_{(BR)}$ | 5.1 | - | V |
| | TESDU12V | | | 13 | - | |
| | TESDU24V | | | 25 | - | |
| Reverse Leakage Current | TESDU5V0 | $V_R = 5\text{V}$ | I_R | - | 2 | μA |
| | TESDU12V | $V_R = 12\text{V}$ | | | | |
| | TESDU24V | $V_R = 24\text{V}$ | | | | |
| Clamping Voltage | TESDU5V0 | $I_{PP} = 1\text{A}$ $I_{PP} = 5\text{A}$ | V_C | - | 9.8 | V |
| | | | | - | 15 | |
| Clamping Voltage | TESDU12V | $I_{PP} = 1\text{A}$ $I_{PP} = 5\text{A}$ | V_C | - | 25 | V |
| | | | | - | 33 | |
| Clamping Voltage | TESDU24V | $I_{PP} = 1\text{A}$ $I_{PP} = 5\text{A}$ | V_C | - | 47 | V |
| | | | | - | 51 | |
| Junction Capacitance | TESDU5V0 | $V_R = 0\text{V}, f = 1.0\text{MHz}$ | C_J | 15 (Typ.) | | pF |
| | TESDU12V | | | 12 (Typ.) | | |
| | TESDU24V | | | 10 (Typ.) | | |

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Rating and Sharacteristic Curves

FIG 1 Non-Repetitive Peak Pulse Power vs. Pulse Time



FIG 2 Pulse Waveform

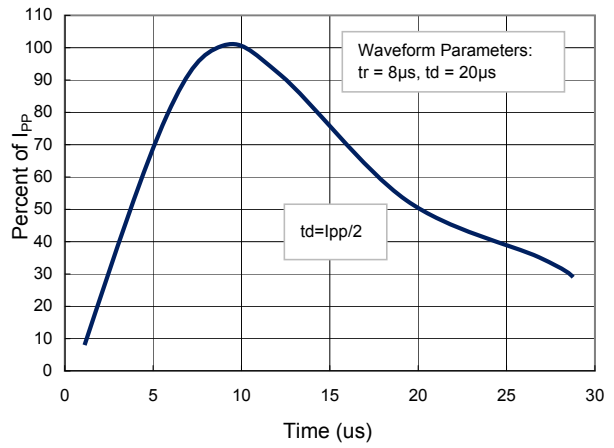


FIG 3 Admissible Power Dissipation Curve

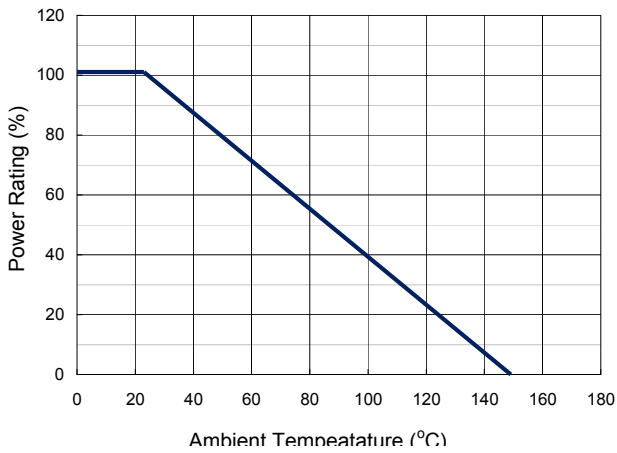


FIG 4 Typical Junction Capacitance

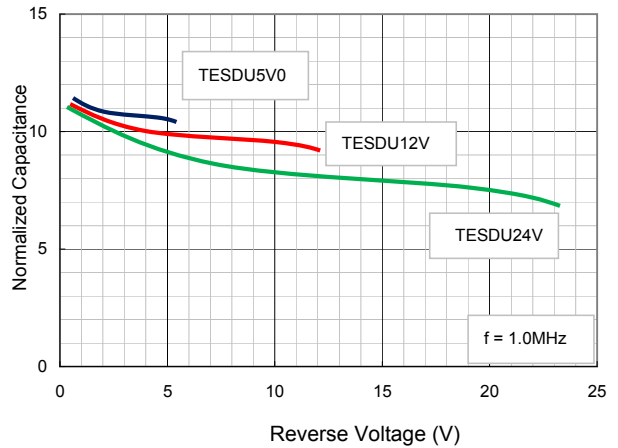
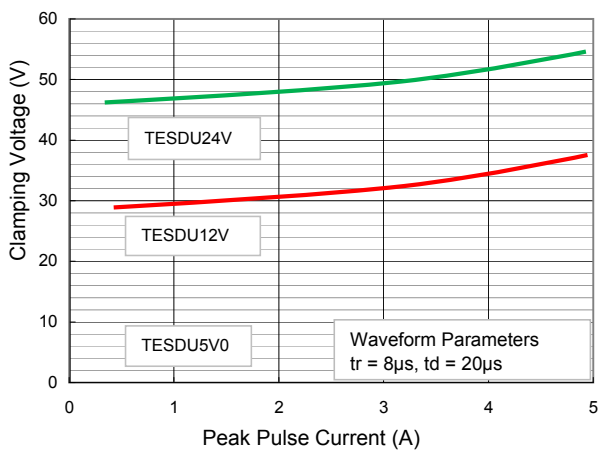


FIG 5 Clamping Voltage vs. Peak Pulse Current)



Small Signal Diode

Applications Information

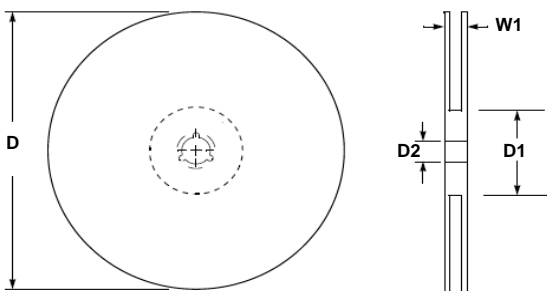
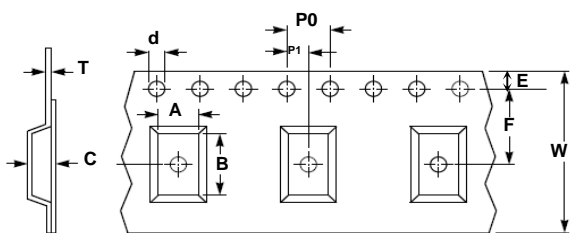
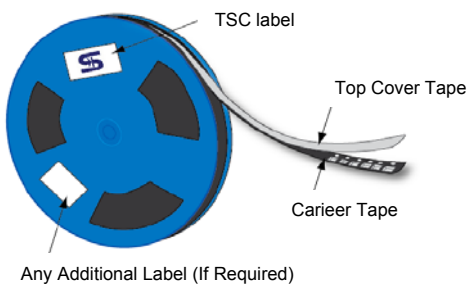
- ◇ Designed to protect one data, I/O, or power supply line.
- ◇ Designed to protect sensitive electronics from damage or latch-up due to ESD
- ◇ Designed to replace multilayer varistors (MLVs) in portable applications
- ◇ Features large crosssectional area junctions for conducting high transient currents
- ◇ Offers superior electrical characteristics such as lower clamping voltage and no device degradation when compared to MLVs
- ◇ The combination of small size and high ESD surge capability makes them ideal for use in portable applications.

Circuit Board Layout Recommendations

Good circuit board layout is critical for the suppression of ESD induced transients.

- ◇ Place the ESD Protection Diode near the input terminals or connectors to restrict transient coupling.
- ◇ Minimize the path length between the ESD Protection Diode and the protected line.
- ◇ Minimize all conductive loops including power and ground loops.
- ◇ The ESD transient return path to ground should be kept as short as possible.
- ◇ Never run critical signals near board edges.
- ◇ Use ground planes whenever possible.

Tape & Reel specification



| Item | Symbol | Dimension (mm) |
|------------------------|--------|----------------|
| Carrier width | A | 1.00 ± 0.10 |
| Carrier length | B | 1.85 ± 0.10 |
| Carrier depth | C | 1.00 ± 0.10 |
| Sprocket hole | d | 1.55 ± 0.05 |
| Reel outside diameter | D | 178 ± 1 |
| Reel inner diameter | D1 | 60.0 Min |
| Feed hole width | D2 | 13.0 ± 0.20 |
| Sprocket hole position | E | 1.75 ± 0.10 |
| Punch hole position | F | 3.50 ± 0.05 |
| Punch hole pitch | P | 4.00 ± 0.10 |
| Sprocket Hole pitch | P0 | 4.00 ± 0.10 |
| Embossment center | P1 | 2.00 ± 0.05 |
| Overall tape thickness | T | 0.23 ± 0.05 |
| Tape width | W | 8.00 ± 0.20 |
| Reel width | W1 | 13.5 Max |

