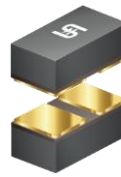


Small Signal Product

Bi-directional ESD Protection Diode

FEATURES

- Meet IEC61000-4-2 (ESD) $\pm 15\text{kV}$ (air), $\pm 8\text{kV}$ (contact)
- Designed for mounting on small surface
- Protects one Bi-directional I/O line
- Moisture sensitivity level 1
- Working Voltage : 5V, 12V, 24V
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21


0503


MECHANICAL DATA

- Case: 0503 small outline plastic package
- Terminal : Gold plated, solder per MIL-STD-705, method 2026 guaranteed
- High temperature soldering guaranteed : $260^{\circ}\text{C}/10\text{s}$
- Weight: $2 \pm 0.5 \text{ mg}$



APPLICATIONS

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

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

| PARAMETER | SYMBOL | VALUE | UNIT |
|---|-----------------------|-------------|--------------------|
| Peak Pulse Power ($t_p=8/20\mu\text{s}$ waveform) | TESDE5V0 | 75 | W |
| | TESDE12V | 25 | |
| | TESDE24V | 47 | |
| ESD per IEC 61000-4-2 (Air) | V_{ESD} | ± 15 | KV |
| ESD per IEC 61000-4-2 (Contact) | | ± 8 | |
| Junction and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | $^{\circ}\text{C}$ |

| PARAMETER | SYMBOL | MIN | MAX | UNIT |
|---------------------------|-------------------|-------------------------------|-----|---------------|
| Reverse Stand-Off Voltage | V_{RWM} | - | 5 | V |
| | | - | 12 | |
| | | - | 24 | |
| Reverse Breakdown Voltage | $V_{(\text{BR})}$ | 5.1 | - | V |
| | | 13 | - | |
| | | 25 | - | |
| Reverse Leakage Current | I_{R} | $V_{\text{R}} = 5 \text{ V}$ | - | μA |
| | | $V_{\text{R}} = 12 \text{ V}$ | - | |
| | | $V_{\text{R}} = 24 \text{ V}$ | - | |
| Clamping Voltage | V_{C} | $I_{\text{PP}} = 1 \text{ A}$ | 9.8 | V |
| | | $I_{\text{PP}} = 5 \text{ A}$ | 15 | |
| Clamping Voltage | V_{C} | $I_{\text{PP}} = 1 \text{ A}$ | 25 | V |
| | | $I_{\text{PP}} = 5 \text{ A}$ | 33 | |
| Clamping Voltage | V_{C} | $I_{\text{PP}} = 1 \text{ A}$ | 47 | V |
| | | $I_{\text{PP}} = 5 \text{ A}$ | 51 | |
| Junction Capacitance | C_{J} | $V_{\text{R}} = 0 \text{ V}$ | 15 | pF |
| | | $f = 1.0 \text{ MHz}$ | 12 | |
| | | | 10 | |

Small Signal Product

RATINGS AND CHARACTERISTICS CURVES

($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Fig. 1 Non-Repetitive Peak Pulse Power VS. Pulse Time

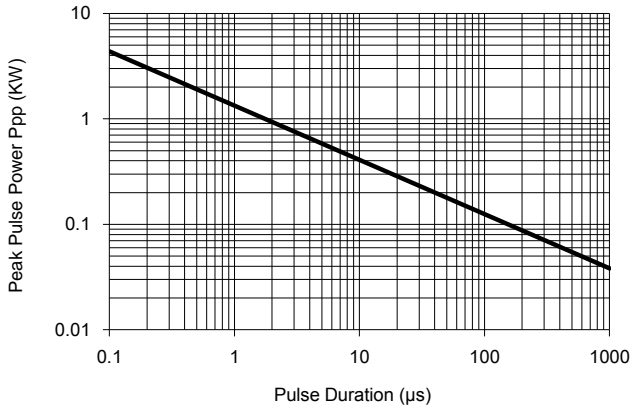


Fig. 2 Pulse Waveform

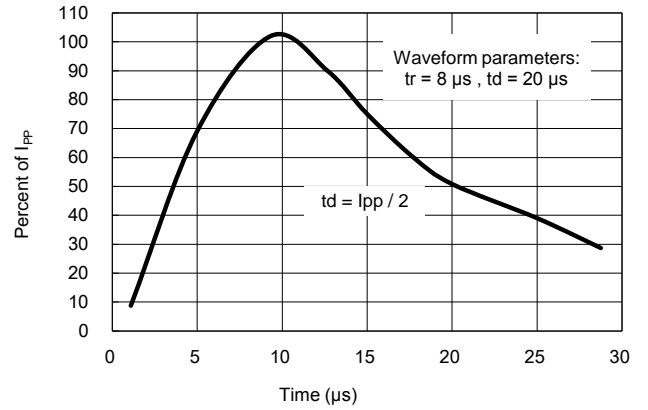


Fig. 3 Admissible Power Dissipation Curve

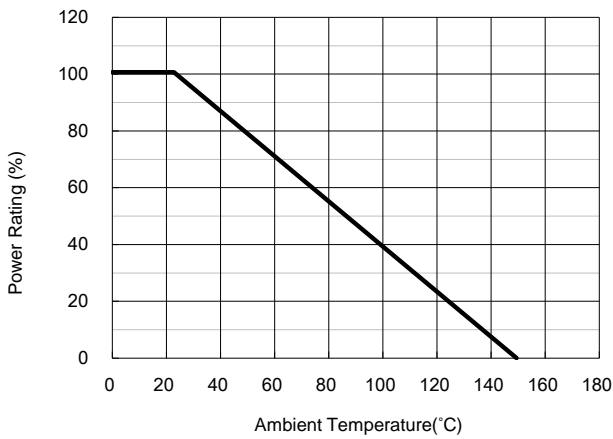


Fig. 4 Typical Junction Capacitance

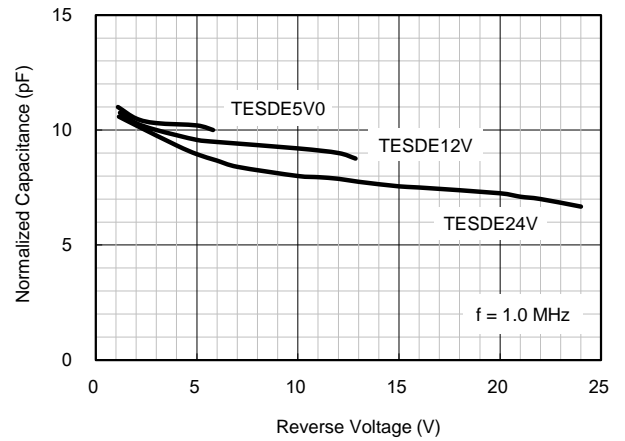
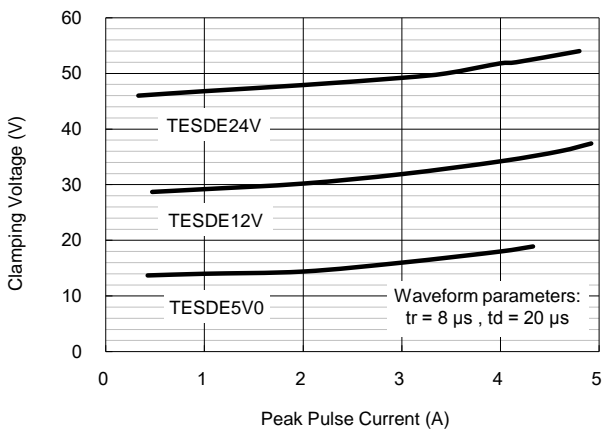


Fig. 5 Clamping Voltage VS. Peak Pulse Current



Small Signal Product

ORDERING INFORMATION

| PART NO. | PACKING CODE | PACKING CODE SUFFIX | PACKAGE | PACKING |
|-------------------------|--------------|---------------------|---------|-----------------|
| TESDExxx (Note 1, 2) | RG | G | 0503 | 4,000 / 7" reel |

Note 1: "xxx" is Device Code from "5V0" - "24V".

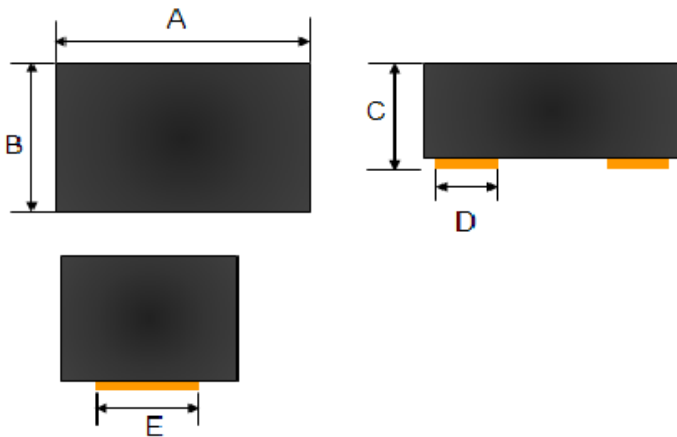
Note 2: Whole series with green compound

EXAMPLE

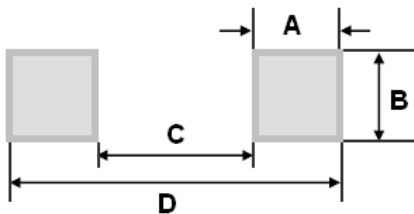
| EXAMPLE P/N | PART NO. | PACKING CODE | PACKING CODE SUFFIX | DESCRIPTION |
|--------------|----------|--------------|---------------------|----------------|
| TESDE5V0 RGG | TESDE5V0 | RG | G | Green compound |

PACKAGE OUTLINE DIMENSIONS

0503



| DIM. | Unit (mm) | | Unit (inch) | |
|------|-------------|------|--------------|-------|
| | Min | Max | Min | Max |
| A | 1.15 | 1.35 | 0.045 | 0.053 |
| B | 0.65 | 0.85 | 0.026 | 0.033 |
| C | 0.60 | 0.75 | 0.024 | 0.030 |
| D | 0.40 (Typ.) | | 0.016 (Typ.) | |
| E | 0.55 (Typ.) | | 0.022 (Typ.) | |

SUGGEST PAD LAYOUT


| DIM. | Unit (mm) | | Unit (inch) | |
|------|-----------|--|-------------|--|
| | Typ. | | Typ. | |
| A | 0.55 | | 0.022 | |
| B | 0.85 | | 0.033 | |
| C | 0.30 | | 0.012 | |
| D | 1.40 | | 0.055 | |

Note: The suggested land pattern dimensions have been provided for reference only, as actual pad layouts may vary depending on application.

MARKING

| Part NO. | Marking |
|----------|---------|
| TESDE5V0 | E05 |
| TESDE12V | E12 |
| TESDE24V | E24 |

Small Signal Product

APPLICATION 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 cross-sectional 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