

Small Signal Diode



Features

- ✧ Meet IEC61000-4-2 (ESD) $\pm 15\text{kV}$ (air), $\pm 8\text{kV}$ (contact)
- ✧ Meet IEC61000-4-4 (EFT) rating. 40A (5/50 μs)
- ✧ 100W Peak Pulse Power per Line ($t_p=8/20\mu\text{s}$)
- ✧ Protects one bi-directional I/O line
- ✧ Working Voltage : 5V
- ✧ Pb free version, RoHS compliant, and Halogen free

Mechanical Data

- ✧ Case : DFN1006(0402) 1.0mm x 0.6mm x 0.5mm package, molded plastic
- ✧ Molding Compound Flammability Rating: UL94V-0
- ✧ Terminal: Gold plated, solder per MIL-STD-750, Method 2026 guaranteed
- ✧ High temperature soldering guaranteed: 260°C/10s
- ✧ Mounting position: Any
- ✧ Weight :0.5 mg (approximately)
- ✧ Marking Code : M

Applications

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

Ordering Information

| Part No. | Package | Packing | Marking |
|--------------|----------------|--------------|---------|
| TESDQ5V0 RJG | DFN1006 (0402) | 5K / 7" Reel | M |

Maximum Ratings and Electrical Characteristics

Rating at 25°C ambient temperature unless otherwise specified.

Maximum Ratings

| Type Number | Symbol | Value | Units |
|--|----------------|---------------------|-------|
| Peak Pulse Power ($t_p=8/20\mu\text{s}$ waveform) | P_{PP} | 100 | W |
| 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 | °C |

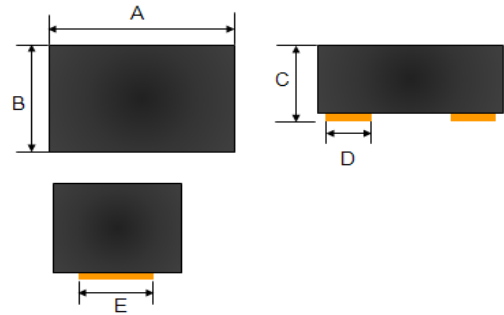
Electrical Characteristics

| Type Number | Symbol | Min | Max | Units |
|---------------------------|---|-----------|------------|---------------|
| Stand-Off Voltage | V_{WM} | - | 5 | V |
| Reverse Breakdown Voltage | $I_R= 1\text{mA}$ $V_{(BR)}$ | 6 | - | V |
| Reverse Leakage Current | $V_R= 5\text{V}$ I_R | - | 1 | μA |
| Clamping Voltage | $I_{PP}= 1\text{A}$ $I_{PP}= 2\text{A}$ V_C | - - | 12.5 20 | V |
| Junction Capacitance | $V_R=0\text{V}, f=1.0\text{MHz}$ C_J | 10 (Typ.) | | pF |

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

TESDQ5V0 Bi-directional ESD Protection Diode

DFN1006(0402)

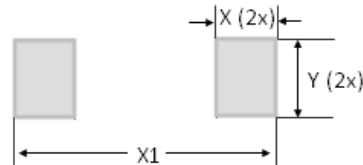


| Dimensions | Unit (mm) | | Unit (inch) | |
|------------|-----------|-------|-------------|-------|
| | Min | Max | Min | Max |
| A | 0.950 | 1.050 | 0.037 | 0.041 |
| B | 0.550 | 0.650 | 0.022 | 0.026 |
| C | 0.450 | 0.550 | 0.018 | 0.022 |
| D | 0.275 | 0.325 | 0.011 | 0.013 |
| E | 0.275 | 0.325 | 0.011 | 0.013 |

Pin Configuration



Suggested PAD Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| X | 0.354 |
| X1 | 1.110 |
| Y | 0.354 |

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Rating and Characteristic Curves

FIG 1 Admissible Power Derating Curve

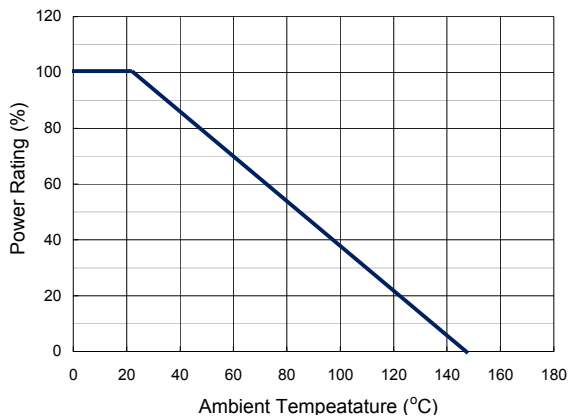


FIG 2 Pulse Waveform

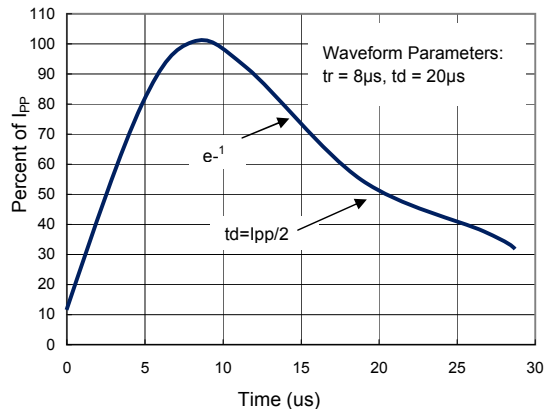


FIG 3 Max. Clamping Voltage vs. Peak Pulse

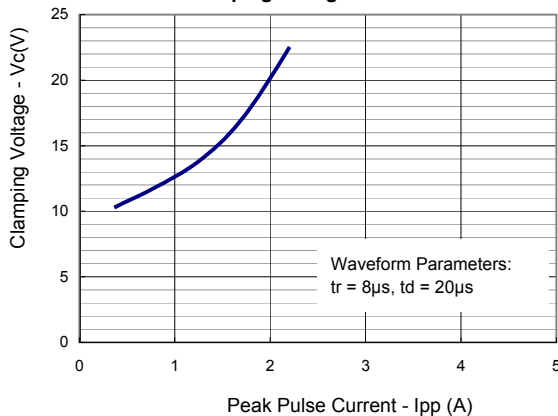
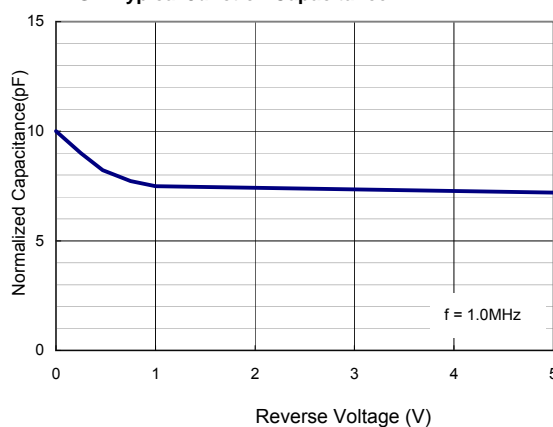


FIG 4 Typical Junction Capacitance



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.

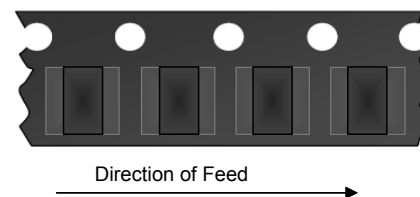
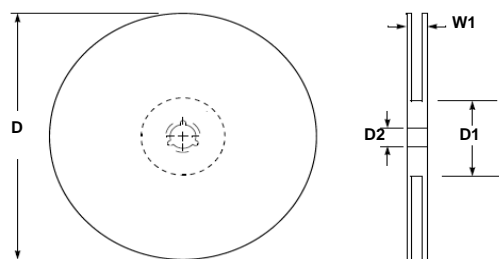
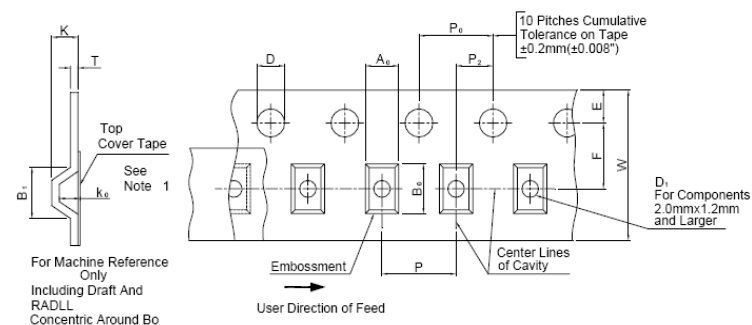
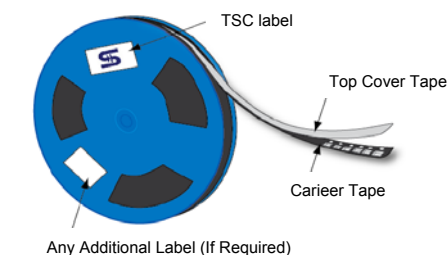
Circuit Board Layout Recommendations

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
- ✦ 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.

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Carrier & Reel specification



| Item | Symbol | Dimension(mm) |
|------------------------|--------|---------------|
| Carrier depth | K | 1.2 Max. |
| Sprocket hole | D | 1.50 +0.10 |
| Reel outside diameter | A | 178 ± 1 |
| Reel inner diameter | D1 | 50 Min. |
| Feed hole width | D2 | 13.0 ± 0.5 |
| Sprocket hole position | E | 1.75 ± 0.10 |
| Sprocket hole pitch | P0 | 4.00 ± 0.10 |
| Embossment center | P1 | 2.00 ± 0.10 |
| Overall tape thickness | T | 0.6 Max. |
| Tape width | W | 8.30 Max. |
| Reel width | W1 | 14.4 Max. |

Note 1: A0, B0, and K0 are determined by component size. The clearance between the components and the cavity must be within 0.05 mm min. to 0.1 mm max. The component cannot rotate more than 10° within the determined cavity.

Note 2: If B1 exceeds 4.2 mm(0.165") for 8 mm embossed tape, the tape may not feed through all tape feeders.