

Ultra-Low Capacitance TVS/ESD Protection

SE05N7R02GA

Features

- ◆ Protects two data, control or power line
- ◆ Low capacitance: 6 pF Typical (I/O-GND)
- ◆ Low leakage current: 0.1μA @ V_{RWM} (Typical)
- ◆ Low clamping voltage

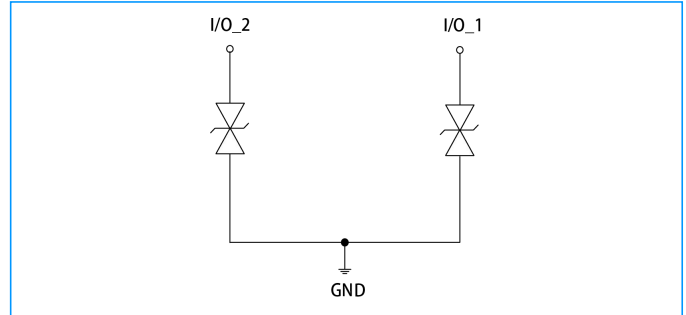
Applications

- ◆ Serial ATA
- ◆ PCI Express
- ◆ Desktops, Servers and Notebooks
- ◆ Cellular Phones

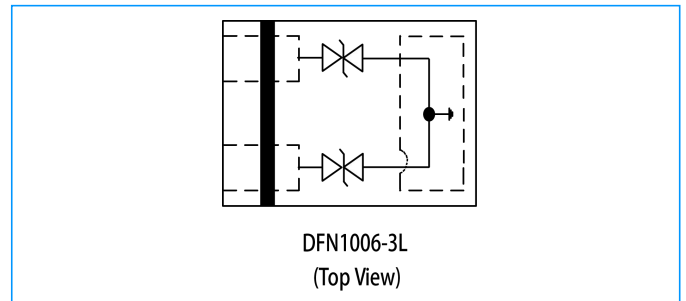
Mechanical Characteristics

- ◆ DFN1006-3L package
- ◆ Flammability Rating: UL 94V-0
- ◆ Marking: Part number
- ◆ Quantity Per Reel: 10,000pcs
- ◆ Reel size: 7 inch

Circuit Diagram



Pin Configuration

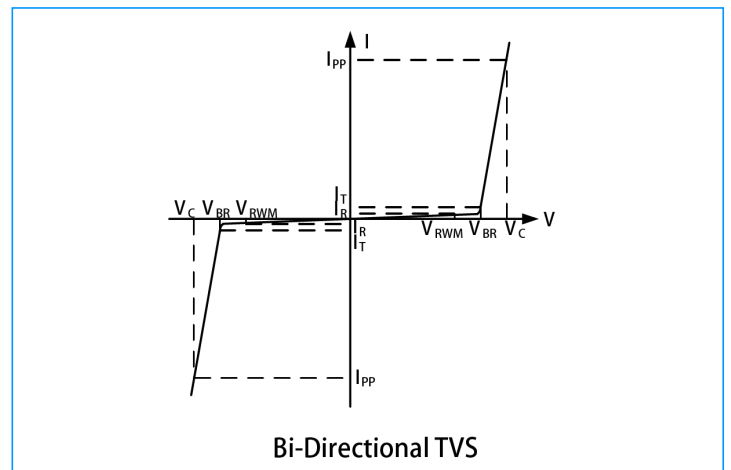


Absolute Maximum Rating

| Symbol | Parameter | Value | Units |
|-----------|---------------------------------|----------|-------|
| V_{ESD} | ESD per IEC 61000-4-2(Air) | ±25 | kV |
| | ESD per IEC 61000-4-2 (Contact) | ±17 | |
| T_{OPT} | Operating Temperature | -55/+125 | °C |
| T_{STG} | Storage Temperature | -55/+150 | °C |

Electrical Parameters (T=25°C)

| Symbol | Parameter |
|-----------|-------------------------------------|
| V_{RWM} | Nominal Reverse Working Voltage |
| I_R | Reverse Leakage Current @ V_{RWM} |
| V_{BR} | Reverse Breakdown Voltage @ I_T |
| I_T | Test Current for Reverse Breakdown |
| V_C | Clamping Voltage @ I_{PP} |
| I_{PP} | Maximum Peak Pulse Current |
| C_J | Parasitic Capacitance |
| V_R | Reverse Voltage |
| f | Small Signal Frequency |



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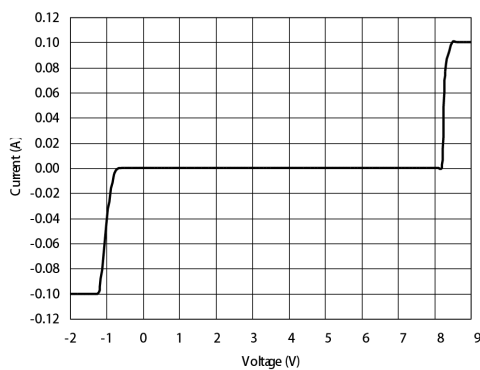
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Electrical Characteristics

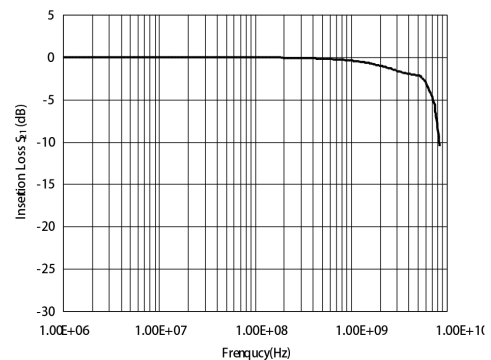
| Symbol | Test Condition | Minimum | Typical | Maximum | Units |
|-----------|---|---------|---------|---------|---------|
| V_{RWM} | — | — | — | 5.0 | V |
| I_R | $V_{RWM} = 5V, T = 25^\circ C$ Between I/O and GND | — | 0.1 | 1.0 | μA |
| V_{BR} | $I_T = 1mA$ Between I/O and GND | 6.0 | 8.0 | 10.0 | V |
| V_C | $I_{PP}=4A, t_p=8/20\mu s$ Between I/O and GND | — | 10 | 12 | V |
| C_J | $V_R=0V, f=1MHz$ Between I/O and GND | — | 6 | 13 | pF |

Typical Characteristics

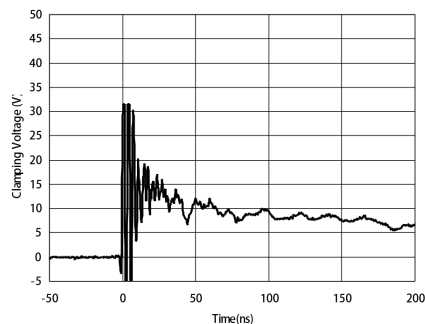
Voltage Sweeping of I/O to I/O



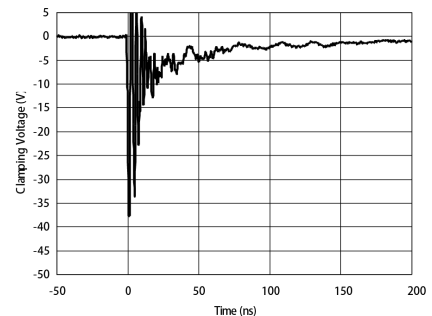
Insertion Loss S21 of I/O to I/O



ESD Clamping of I/O to GND (+8kV Contact per IEC 61000-4-2)



ESD Clamping of I/O to GND (-8kV Contact per IEC 61000-4-2)

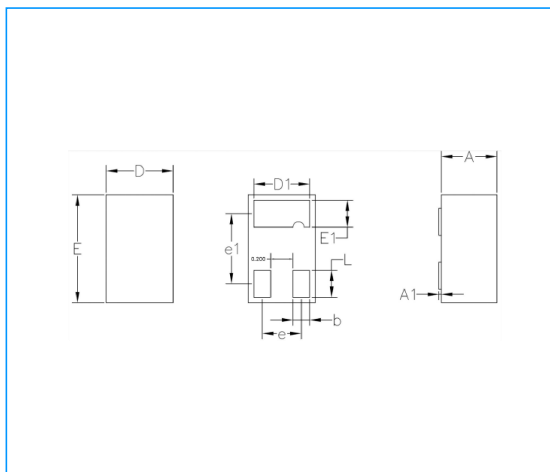


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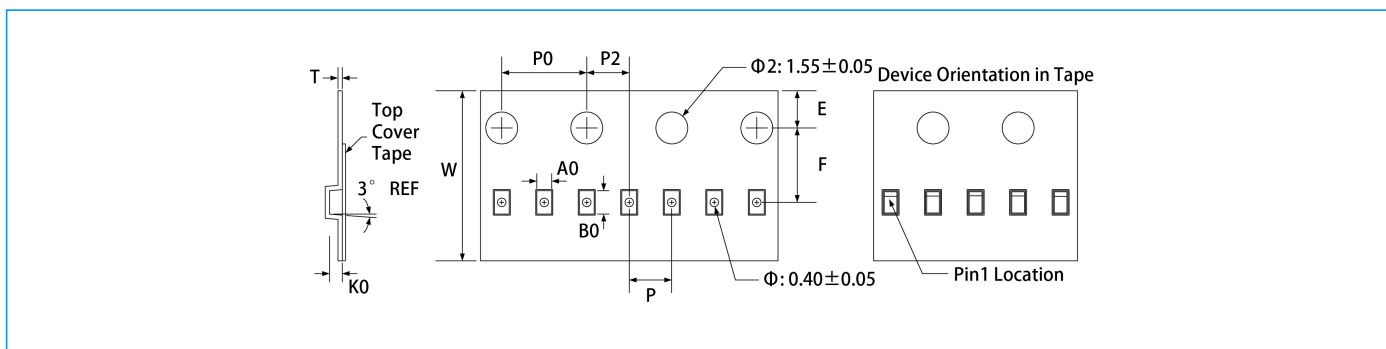
Package Outline

- ◆ DFN1006-3L package
- ◆ 3 leads, very small package



| Symbol | Min | Nom | Max |
|--------|---------|------|------|
| A | 0.45 | 0.50 | 0.55 |
| A1 | 0.00 | — | 0.05 |
| D | 0.55 | 0.60 | 0.65 |
| E | 0.95 | 1.00 | 1.05 |
| D1 | 0.45 | 0.50 | 0.55 |
| E1 | 0.20 | 0.25 | 0.30 |
| L | 0.20 | 0.25 | 0.30 |
| b | 0.10 | 0.15 | 0.20 |
| e | 0.35BSC | | |
| e1 | 0.65BSC | | |

Tape and Reel Specification



| Symbol | W | A0 | B0 | K0 | E | F | P | P0 | P2 | T |
|-----------------|----------|----------|-----------|-----------|----------|----------|---------|---------|----------|----------|
| Dimensions (mm) | 8.00±0.1 | 0.7±0.05 | 1.15±0.05 | 0.55±0.05 | 1.75±0.1 | 3.5±0.05 | 2.0±0.1 | 4.0±0.1 | 2.0±0.05 | 0.2±0.05 |