# ESD105-B1-02EL

## Low Capacitance Bi-directional ESD DIODE

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## Features

- Low operating voltage: 5V
- Ultra low capacitance: 0.3pF(Typ)
- Ultra low leakage: nA level
- Low clamping voltage
- –IEC 61000-4-2 (ESD) immunity test
  Air discharge: ±30kV
  Contact discharge: ±30kV
  –IEC61000-4-4 (EFT) 40A (5/50ns)
  –IEC61000-4-5 (Lightning) 5.5A (8/20μs)
- 2-pin leadless package
- These are Pb−Free Devices
- Response Time is Typically < 1 ns

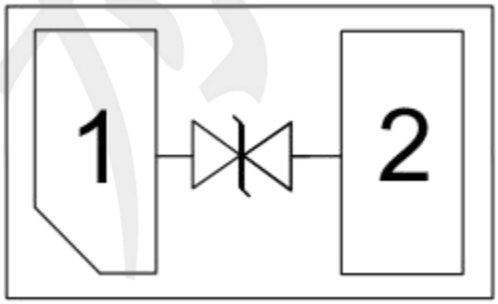
## Mechanical Characteristics

- Package: DFN1006-2(0402)
- Lead Finish: Matte Tin
- Case Material: “Green” Molding Compound
- Terminal Connections: See Diagram Below
- -IEC 61000-4-2 (ESD) immunity test

## Applications

- Cellular Handsets and Accessories
- Personal Digital Assistants
- Notebooks and Handhelds
- Portable Instrumentation
- USB power and data line

## Dimensions and Pin Configuration






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## Absolute Maximum Ratings(Tamb=25°C unless otherwise specified)

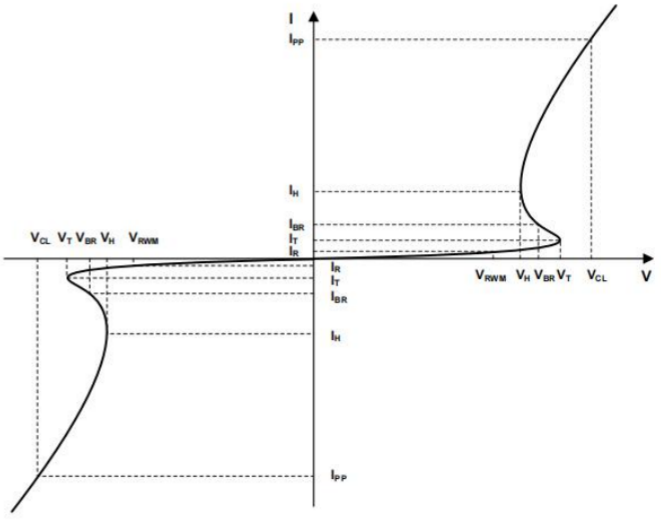
| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Peak Pulse Power (8/20μs) | Ppk | 55 | W |
| Peak Pulse Current (8/20μs) | Ipp | 5.5 | A |
| ESD per IEC 61000−4−2 (Air)<br>ESD per IEC 61000−4−2 (Contact) | VESD | ±30<br>±30 | KV |
| Operating Temperature Range | TJ | −55 to +125 | °C |
| Storage Temperature Range | Tstg | −55 to +150 | °C |

## Electrical Characteristics (TA=25°C unless otherwise specified)

| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| Reverse Working Voltage | VRWM | -- | -- | 5 | V | |
| Breakdown Voltage | VBR | 5.8 | 8.0 | 9.5 | V | IT= 1mA |
| Reverse Leakage Current | IR | -- | -- | 200 | nA | VRWM=5V |
| Clamping Voltage | VC | -- | 5.8 | 7.5 | V | Ipp=1A(8x 20us pulse) |
| Clamping Voltage | VC | -- | 8 | 10 | V | Ipp=5.5A(8x 20us pulse) |
| Junction Capacitance | CJ | -- | 0.3 | 0.4 | pF | VR = 0V, f = 1MHz |

**Electrical Characteristics**

| Symbol | Parameter |
|---|---|
| $V_{BR}$ | Reverse Breakdown Voltage |
| $I_{BR}$ | Reverse Breakdown Current |
| $V_{RWM}$ | Reverse Stand-off Voltage |
| $I_R$ | Reverse Leakage Current |
| $V_H$ | Holding Voltage |
| $I_H$ | Holding Current |
| $V_T$ | Trigger Voltage |
| $I_T$ | Trigger Current |
| $I_{PP}$ | Peak Pulse Current |
| $V_{CL}$ | Clamping Voltage |



## Characteristic Curves

**Fig1. 8/20μs Pulse Waveform**

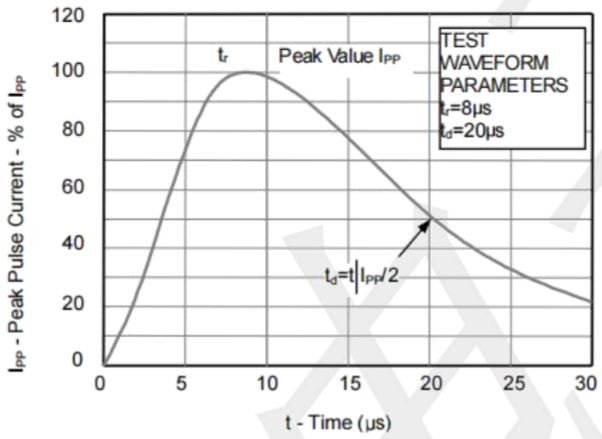



**Fig2. ESD Pulse Waveform (according to IEC 61000-4-2)**

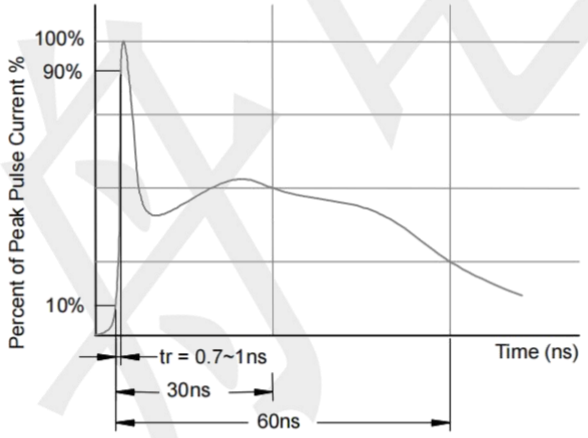
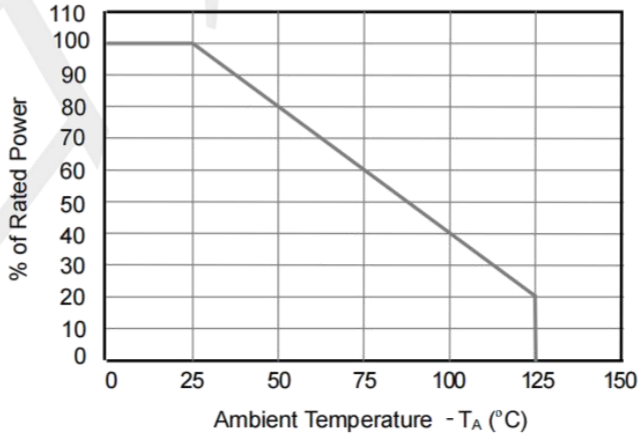
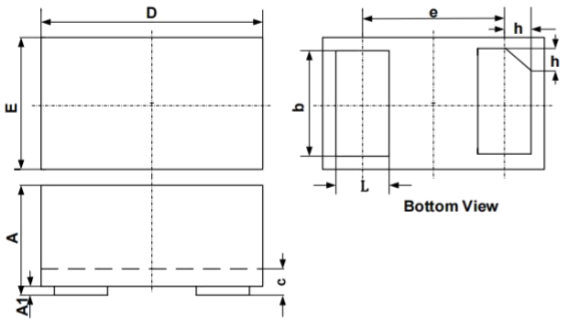



**Fig3. Power Derating Curve**



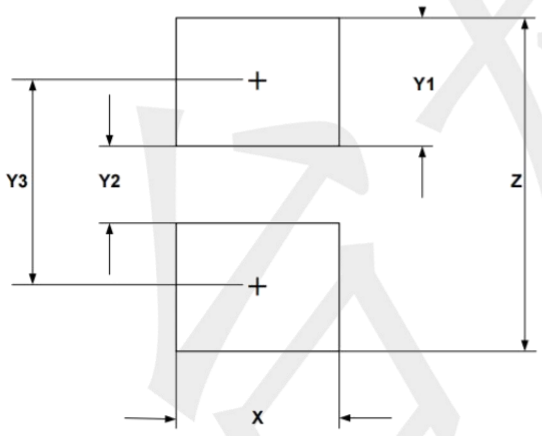
## Package Outline & Dimensions

### DFN1006-2 (0402)




| SYM | DIMENSIONS | | | | | |
|---|---|---|---|---|---|---|
| | MILLIMETERS | | | INCHES | | |
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.45 | 0.50 | 0.55 | 0.018 | 0.020 | 0.022 |
| A1 | 0.00 | 0.02 | 0.05 | 0.000 | 0.001 | 0.002 |
| b | 0.45 | 0.50 | 0.55 | 0.018 | 0.020 | 0.022 |
| c | 0.12 | 0.15 | 0.18 | 0.005 | 0.006 | 0.007 |
| D | 0.95 | 1.00 | 1.05 | 0.037 | 0.039 | 0.041 |
| e | 0.65 BSC | | | 0.026 BSC | | |
| E | 0.55 | 0.60 | 0.65 | 0.022 | 0.024 | 0.026 |
| L | 0.20 | 0.25 | 0.30 | 0.008 | 0.010 | 0.012 |
| h | 0.07 | 0.12 | 0.17 | 0.003 | 0.005 | 0.007 |

## Suggested Land Pattern




| SYM | DIMENSIONS | |
|---|---|---|
| | MILLIMETERS | INCHES |
| X | 0.60 | 0.024 |
| Y1 | 0.50 | 0.020 |
| Y2 | 0.30 | 0.012 |
| Y3 | 0.80 | 0.032 |
| Z | 1.30 | 0.052 |