

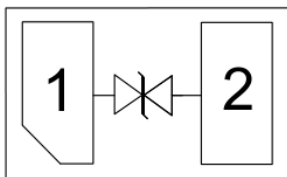
Features

- ◆ Ultra low capacitance: 8pF typical
- ◆ Ultra low leakage: nA level
- ◆ Low operating voltage: 7V
- ◆ Low clamping voltage
- ◆ 2-pin leadless package
- ◆ Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
 - Air discharge: $\pm 30\text{kV}$
 - Contact discharge: $\pm 30\text{kV}$
 - IEC61000-4-5 (Lightning) 9A (8/20 μs)
- ◆ RoHS Compliant

Description

The ESDK7B0U3D2 is a bi-directional TVS diode,utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive data and power line. The ESDK7B0U3D2 complies with the IEC 61000-4-2 (ESD) standard with $\pm 30\text{kV}$ air and $\pm 30\text{kV}$ contact discharge. It is assembled into an ultra-small 1.0x0.6x0.5mm lead-free 0402 package. The small size and high ESD surge protection make ESDK7B0U3D2 an ideal choice to protect cell phone, digital cameras, audio players and many other portable applications.

Circuit Diagram



Applications

- ◆ Cellular Handsets and Accessories
- ◆ Personal Digital Assistants
- ◆ Notebooks and Handhelds
- ◆ Portable Instrumentation
- ◆ Digital Cameras
- ◆ Peripherals
- ◆ Audio Players
- ◆ Keypads, Side Keys, LCD Displays

Absolute Maximum Ratings : ($T_c=25^{\circ}\text{C}$ unless otherwise noted)

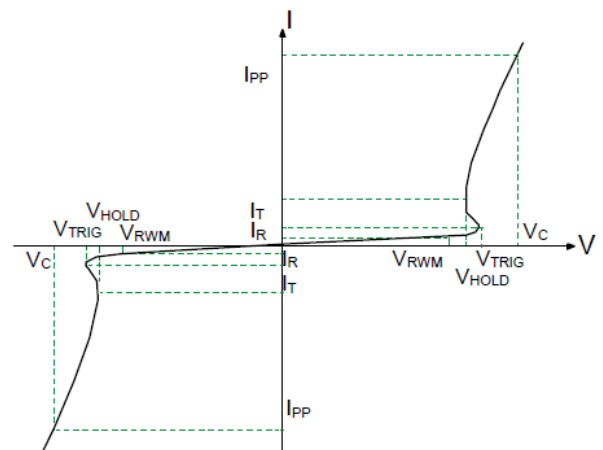
| Parameter | Symbol | Value | Unit |
|--|--------|-------------|--------------------|
| Peak Pulse Power (8/20 μs) | Ppk | 135 | W |
| Peak Pulse Current (8/20 μs) | IPP | 9 | A |
| ESD per IEC 61000-4-2 (Air) | VESD | ± 30 | kV |
| ESD per IEC 61000-4-2 (Contact) | | ± 30 | |
| Operating Temperature Range | TJ | -55 to +125 | $^{\circ}\text{C}$ |
| Storage Temperature Range | Tstg | -55 to +150 | $^{\circ}\text{C}$ |

Electrical Characteristics : ($T_c=25^{\circ}\text{C}$ unless otherwise noted)

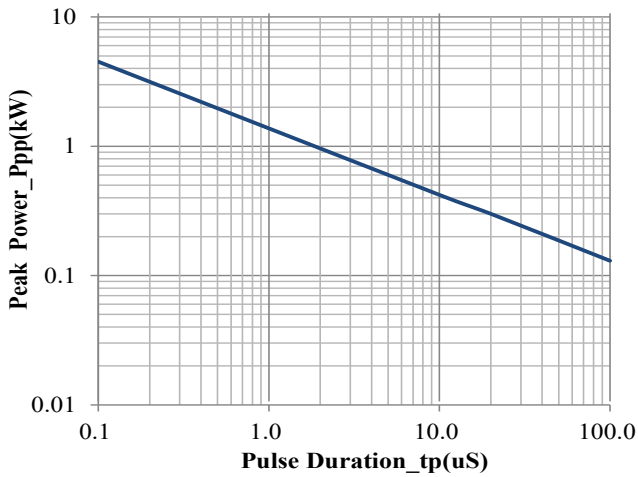
| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|-------------------------|-----------|---|-----|------|------|------|
| Reverse Working Voltage | V_{RWM} | | | | 7.0 | V |
| Breakdown Voltage | V_{BR} | $I_T = 1\text{mA}$ | 7.7 | 8.1 | 9.0 | V |
| Reverse Leakage Current | I_R | $V_{RWM} = 7.0\text{V}$ | | 3 | 100 | nA |
| Clamping Voltage | V_C | $I_{PP} = 1\text{A}$ (8 / 20 μs pulse) | | 10.0 | 13.0 | V |
| Clamping Voltage | V_C | $I_{PP} = 9\text{A}$ (8 / 20 μs pulse) | | 11.0 | 15.0 | V |
| Junction Capacitance | C_J | $V_R = 0\text{V}$, $f = 1\text{MHz}$ | | 8 | 12 | pF |

Portion Electronics Parameter

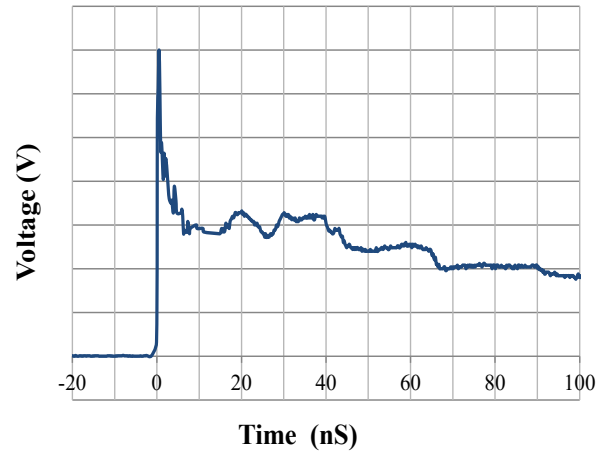
| Symbol | Parameter |
|-----------|-------------------------------------|
| V_{RWM} | Peak Reverse Working Voltage |
| I_R | Reverse Leakage Current @ V_{RWM} |
| V_{BR} | Breakdown Voltage @ I_T |
| I_T | Test Current |
| I_{PP} | Maximum Reverse Peak Pulse Current |
| V_C | Clamping Voltage @ I_{PP} |



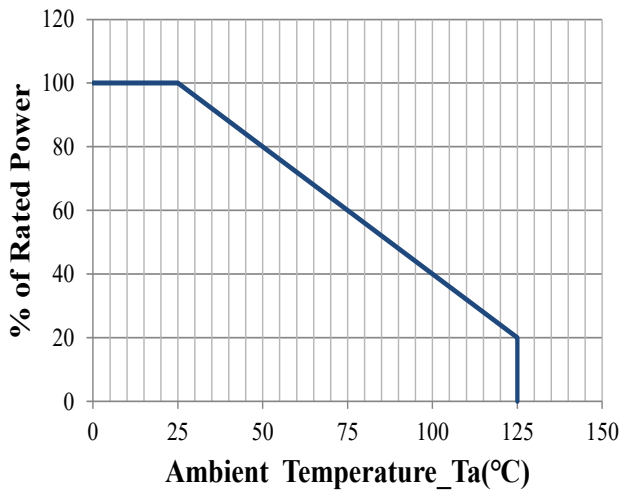
Typical Characteristics: (T_c=25°C unless otherwise noted)



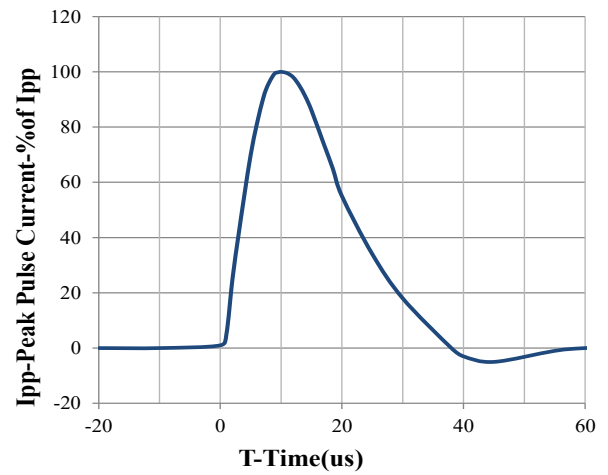
Peak Pulse Power vs. Pulse Time



IEC61000-4-2 Pulse Waveform



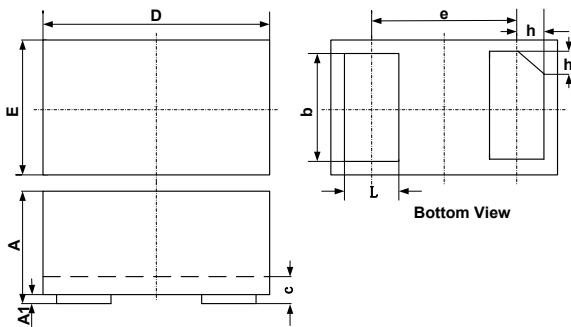
Power Derating Curve



8 / 20us Pulse Waveform

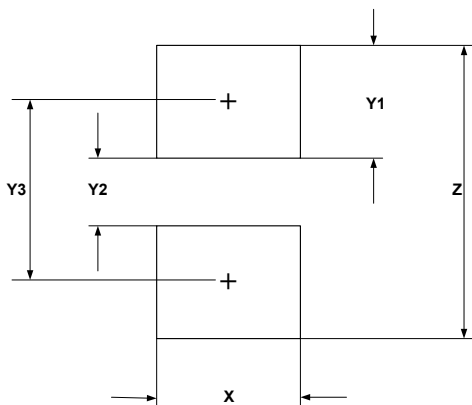
Package Dimension

DFN1006-2(0402) Package Outline



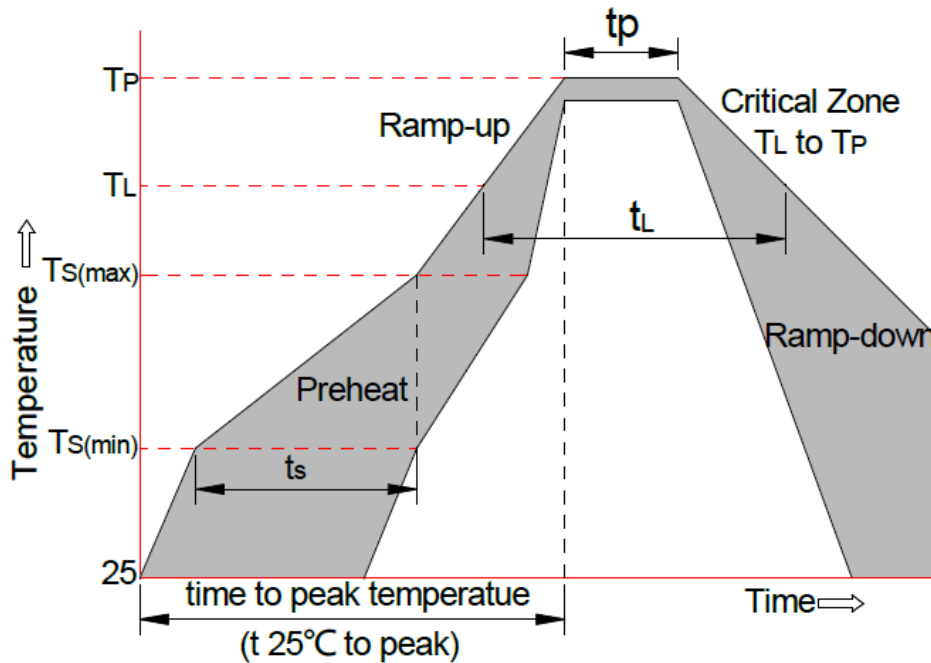
| SYM | DIMENSIONS | | | | | |
|-----|-------------|------|------|-----------|-------|-------|
| | MILLIMETERS | | | INCHES | | |
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.45 | 0.50 | 0.55 | 0.018 | 0.020 | 0.022 |
| A1 | 0.00 | 0.02 | 0.05 | 0.000 | 0.001 | 0.002 |
| b | 0.45 | 0.50 | 0.55 | 0.018 | 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 |

Soldering Parameters



| Reflow Condition | | Pb-Free Assembly |
|--|-------------------------------|------------------|
| Pre-heat | -Temperature Min (Ts (min)) | +150°C |
| | -Temperature Max (Ts (max)) | +200°C |
| | -Time (Min to Max) (ts) | 60-180 secs |
| Average ramp up rate(Liquid us Temp (TL) to peak) | | 3°C/sec. Max |
| Ts (max) to TL-Ramp-up Rate | | 3°C/sec. Max |
| Reflow | -Temperature (TL) (Liquid us) | +217°C |
| | -Temperature (tL) | 60-150 secs |
| Peak Temp (Tp) | | +260(+0/-5)°C |
| Time within 5°C of actual Peak Temp (tp) | | 30 secs. Max |
| Ramp-down Rate | | 6 °C/secs. Max |
| xTime 25°C to Peak Temp (Tp) | | 8 min. Max |
| Do not exceed | | +260°C |