

# JE24B1UD20-2

## 1-Line Bi-directional TVS Diode



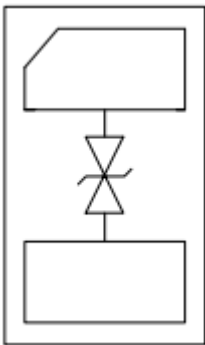
### Description

The JE24B1UD20-2 is an uni-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 JE24B1UD20-2 complies with the IEC 61000-4-2 (ESD) with  $\pm 30\text{kV}$  air and  $\pm 25\text{kV}$  contact discharge. It is assembled into an ultra-small  $1.0 \times 0.6 \times 0.5\text{mm}$  lead-free DFN package. The small size and high ESD surge protection make JE24B1UD20-2 an ideal choice to protect cell phone, digital cameras, audio players and many other portable applications.

### Features

- \* 300W peak pulse power (8/20 $\mu\text{s}$ )
- \* Low leakage:nA level
- \* Operating voltage: 24V
- \* Low clamping voltage
- \* One power line protects
- \* Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge:  $\pm 30\text{kV}$
    - Contact discharge:  $\pm 25\text{kV}$
  - IEC61000-4-5 (Lightning) 5A (8/20 $\mu\text{s}$ )
- \* RoHS Compliant
- \* Package:DFN1006-2

### Circuit Diagram

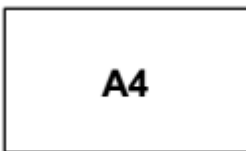


Circuit and Pin Schematic

### Applications

- \* Cellular Handsets and Accessories
- \* Personal Digital Assistants
- \* Notebooks and Handhelds
- \* Portable Instrumentation
- \* Digital Cameras
- \* Peripherals
- \* Audio Players

### Marking Diagram



Transparent top view

A4:Device Marking Code

### Ordering Information

| Part Number  | Packaging        | Reel Size |
|--------------|------------------|-----------|
| JE24U1GD20-2 | 3000/Tape & Reel | 7 inch    |

**Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$  unless otherwise specified)**

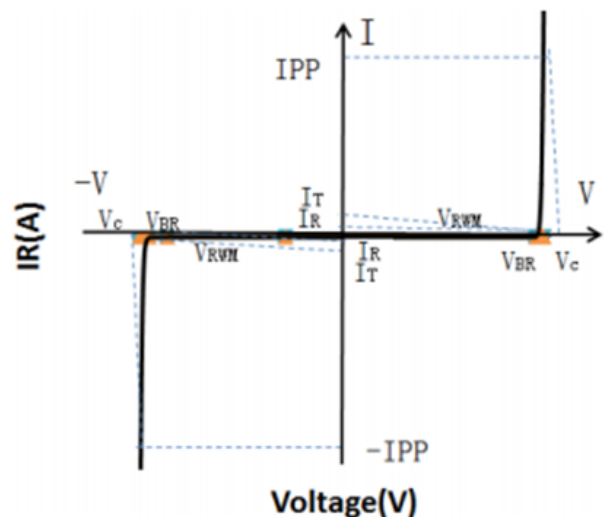
| Parameter                                | Symbol | Value       | Unit               |
|--|--------|-------------|--------------------|
| Peak Pulse Power (8/20 $\mu\text{s}$ )   | Ppk    | 300         | W                  |
| Peak Pulse Current (8/20 $\mu\text{s}$ ) | IPP    | 5           | A                  |
| ESD per IEC 61000-4-2 (Air)              | VESD   | $\pm 30$    | kV                 |
| ESD per IEC 61000-4-2 (Contact)          |        | $\pm 25$    |                    |
| Operating Temperature Range              | TJ     | -55to +125  | $^{\circ}\text{C}$ |
| Storage Temperature Range                | Tstg   | -55 to +150 | $^{\circ}\text{C}$ |

**Electrical Characteristics ( $T_A=25^{\circ}\text{C}$  unless otherwise specified)**

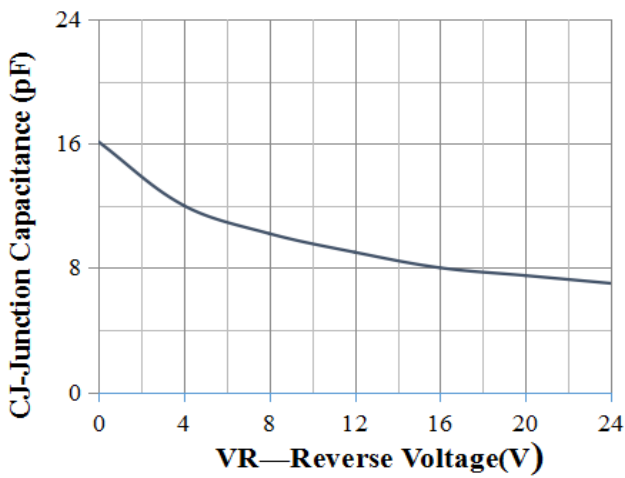
| Parameter               | Symbol    | Test Condition                                    | Min | Typ | Max | Unit          |
|-------------------------|-----------|---|-----|-----|-----|---------------|
| Reverse Working Voltage | $V_{RWM}$ |   |     |     | 24  | V             |
| Breakdown Voltage       | $V_{BR}$  | $I_T = 1\text{mA}$                                | 27  |     |     | V             |
| Reverse Leakage Current | $I_R$     | $V_{RWM} = 24\text{V}$                            |     |     | 0.2 | $\mu\text{A}$ |
| Clamping Voltage        | $V_C$     | $I_{PP} = 1\text{A}$ (8 x 20 $\mu\text{s}$ pulse) |     |     | 40  | V             |
| Junction Capacitance    | $C_J$     | $V_R = 0\text{V}$ , $f = 1\text{MHz}$ ,)          |     |     | 20  | pF            |

**Portion Electronics Parameter**

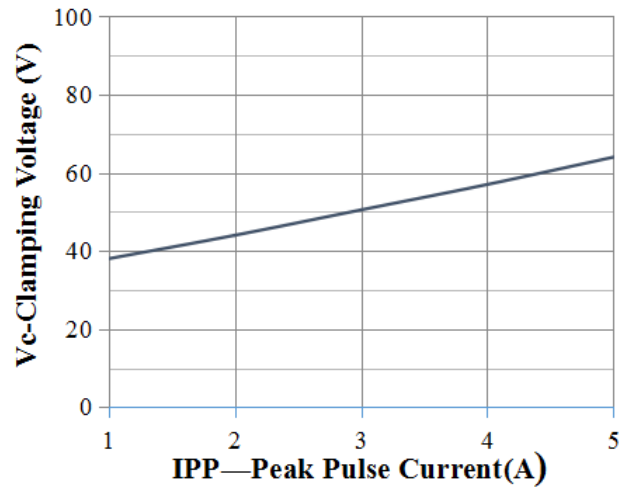
| Symbol   | Parameter                          |
|----------|------------------------------------|
| $I_T$    | Test Current                       |
| $I_{PP}$ | Maximum Reverse Peak Pulse Current |
| $V_C$    | Clamping Voltage @ $I_C$           |



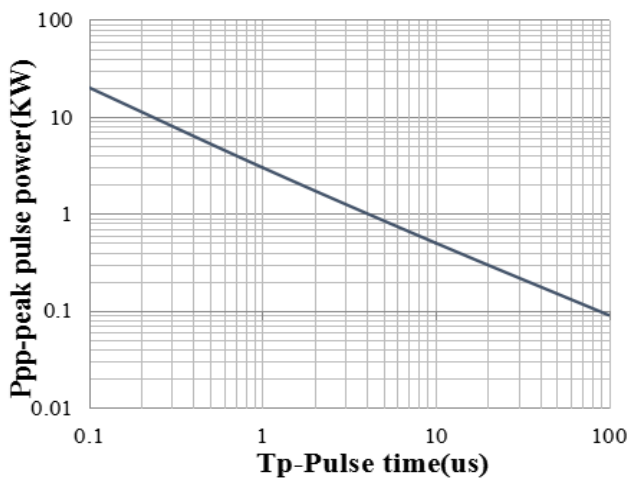
Typical Performance Characteristics ( $T_A=25^{\circ}\text{C}$  unless otherwise Specified)



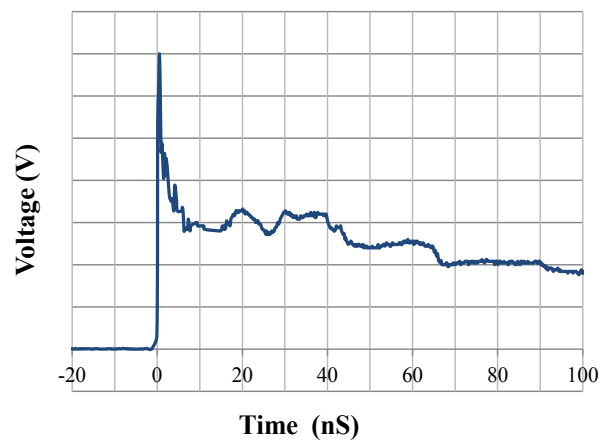
Junction Capacitance vs. Reverse Voltage



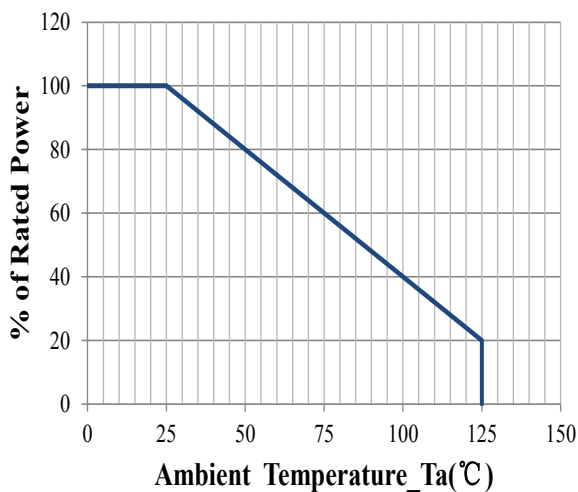
Clamping Voltage vs. Peak Pulse Current



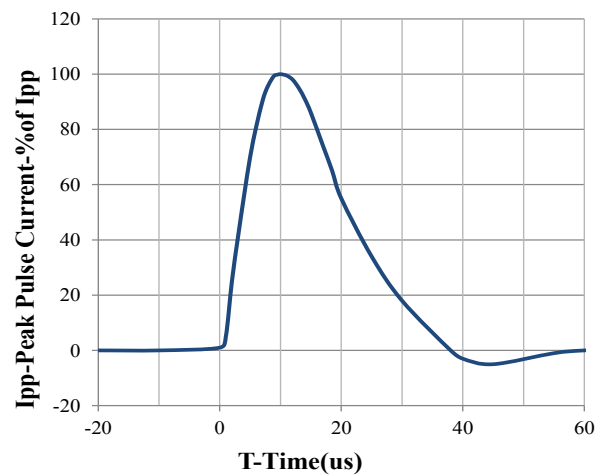
Peak Pulse Power vs. Pulse Time



IEC61000-4-2 Pulse Waveform

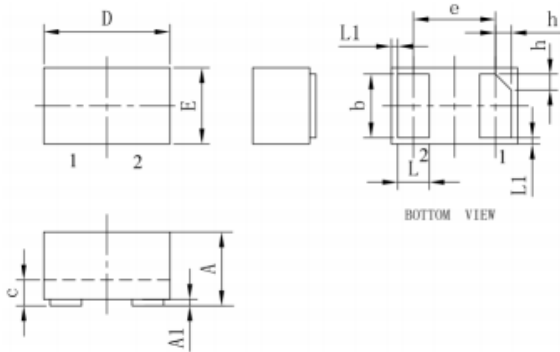


Power Derating Curve



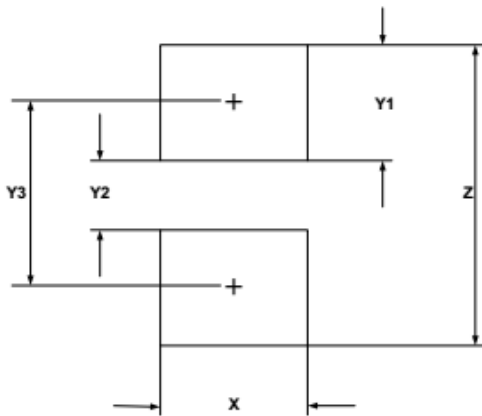
8 X 20us Pulse Waveform

**DFN1006-2 Package Outline Drawing** (Dimensions in millimeters)



| 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 |
| L1  | 0.05REF     |      |      | 0.002REF  |       |       |
| 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  |

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