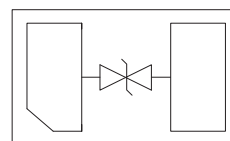


## 1-Line Ultra Low Capacitance Bi-directional TVS Diode

### Description

The BTUC05V1006B 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 high-speed data lines. The BTUC05V1006B has an ultra-low capacitance with a typical value at 0.3pF, and complies with the IEC 61000-4-2 (ESD) with  $\pm 25\text{kV}$  air and  $\pm 20\text{kV}$  contact discharge. It is assembled into a DFN1006-2 lead-free package. The small size, ultra-low capacitance and high ESD surge protection make BTUC05V1006B an ideal choice to protect cell phone, digital video interfaces and other high speed ports.



**DFN1006-2**

### Features

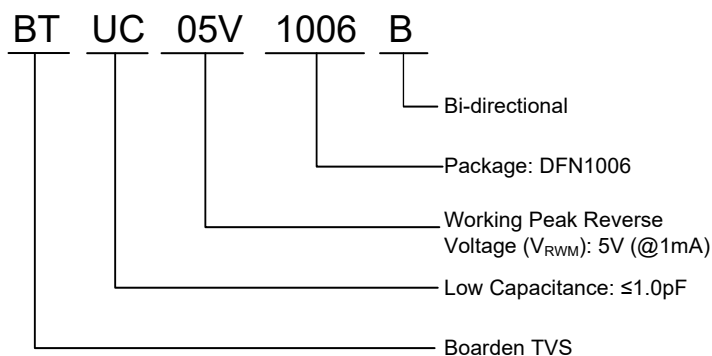
- Ultra low capacitance: 0.3pF typical
- Ultra low leakage: nA level
- Operating voltage: 5V
- Low clamping voltage
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge:  $\pm 25\text{kV}$
    - Contact discharge:  $\pm 20\text{kV}$
  - IEC61000-4-5 (Lightning) 4A (8/20 $\mu\text{s}$ )
- RoHS Compliant

### Marking Information



Device Marking Code

### Part Numbering System



### Applications

- Cellular Handsets and Accessories
- Display Ports
- MDDI Ports
- USB Ports
- Digital Visual Interface (DVI)
- PCI Express and Serial SATA Ports

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

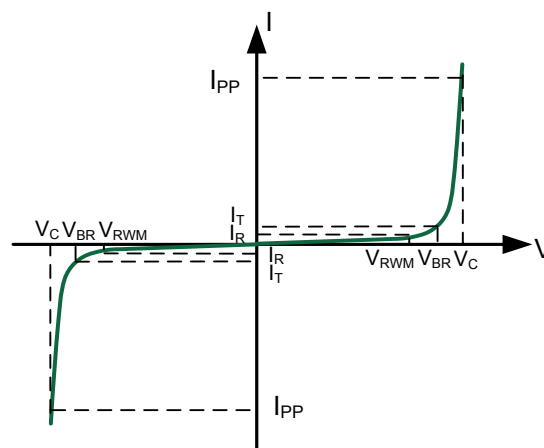
| Parameter                                | Symbol           | Value       | Unit               |
|------------------------------------------|------------------|-------------|--------------------|
| Peak Pulse Power (8/20 $\mu\text{s}$ )   | Ppk              | 100         | W                  |
| Peak Pulse Current (8/20 $\mu\text{s}$ ) | I <sub>PP</sub>  | 4           | A                  |
| ESD per IEC 61000-4-2 (Air)              | VESD             | $\pm 25$    | kV                 |
| ESD per IEC 61000-4-2 (Contact)          |                  | $\pm 20$    |                    |
| Operating Temperature Range              | T <sub>J</sub>   | -55 to +125 | $^{\circ}\text{C}$ |
| Storage Temperature Range                | T <sub>stg</sub> | -55 to +150 | $^{\circ}\text{C}$ |

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

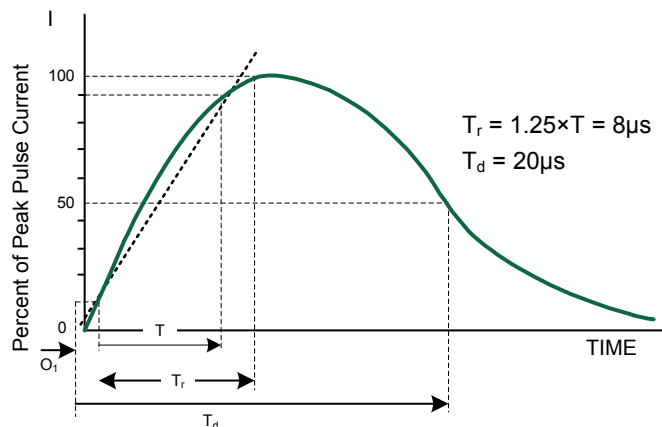
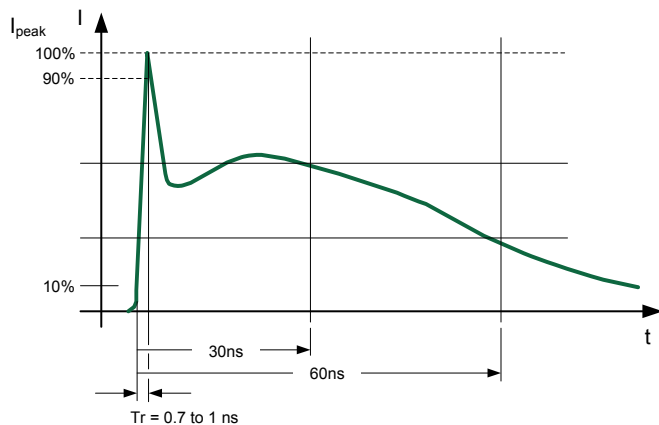
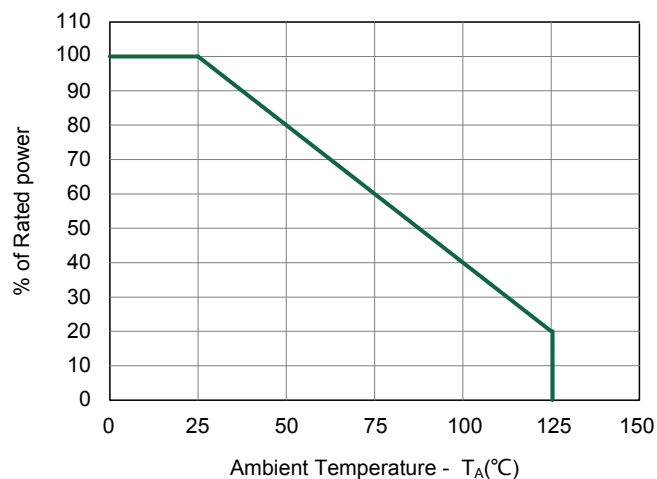
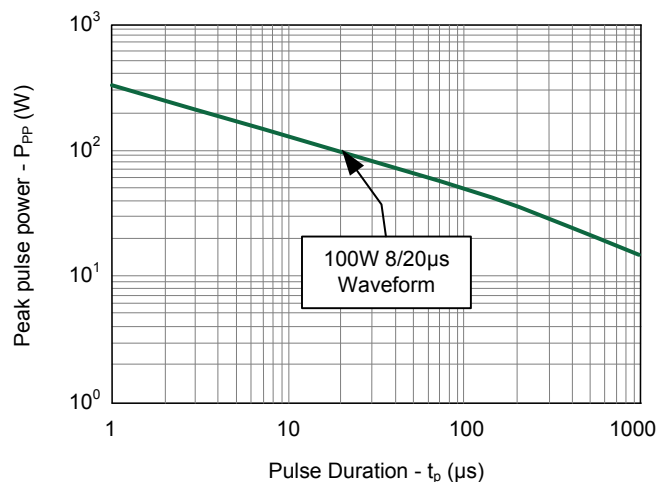
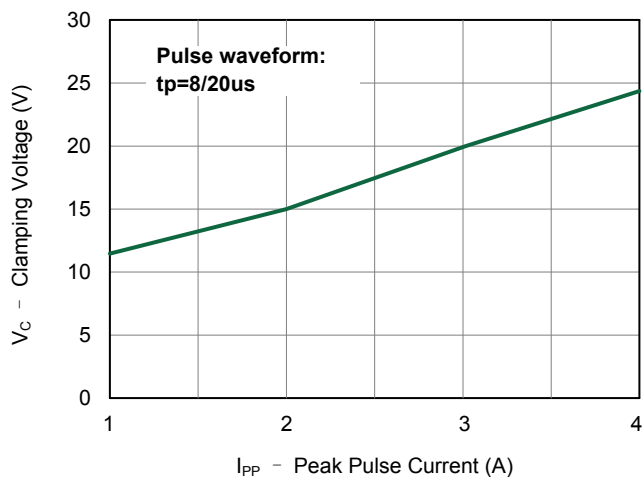
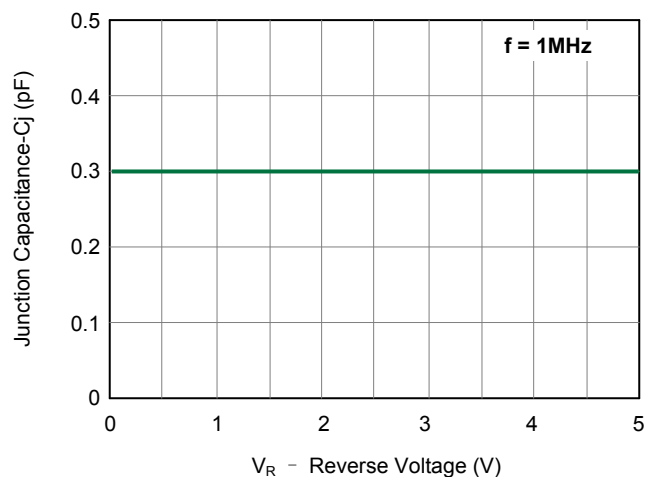
| Parameter               | Symbol           | Min | Typ  | Max | Unit          | Test Condition                                    |
|-------------------------|------------------|-----|------|-----|---------------|---------------------------------------------------|
| Reverse Working Voltage | V <sub>RWM</sub> |     |      | 5   | V             |                                                   |
| Breakdown Voltage       | V <sub>BR</sub>  | 6.5 |      | 9.5 | V             | I <sub>T</sub> = 1mA                              |
| Reverse Leakage Current | I <sub>R</sub>   |     | 0.02 | 0.2 | $\mu\text{A}$ | V <sub>RWM</sub> = 5V                             |
| Clamping Voltage        | V <sub>C</sub>   |     |      | 12  | V             | I <sub>PP</sub> = 1A (8 x 20 $\mu\text{s}$ pulse) |
| Clamping Voltage        | V <sub>C</sub>   |     |      | 25  | V             | I <sub>PP</sub> = 4A (8 x 20 $\mu\text{s}$ pulse) |
| Junction Capacitance    | C <sub>J</sub>   |     | 0.3  | 0.5 | pF            | V <sub>R</sub> = 0V, f = 1MHz                     |

### IV Curve Characteristics

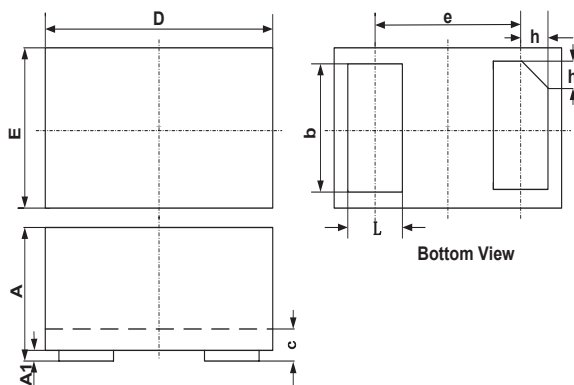
| Symbol           | Parameter                                          |
|------------------|----------------------------------------------------|
| V <sub>RWM</sub> | Working Peak Reverse Voltage                       |
| I <sub>R</sub>   | Maximum Reverse Leakage Current @ V <sub>RWM</sub> |
| V <sub>BR</sub>  | Breakdown Voltage @ I <sub>T</sub>                 |
| I <sub>T</sub>   | Test Current                                       |
| V <sub>C</sub>   | Clamping Voltage @ I <sub>PP</sub>                 |
| I <sub>PP</sub>  | Maximum Reverse Peak Pulse Current                 |



Bi-Directional TVS

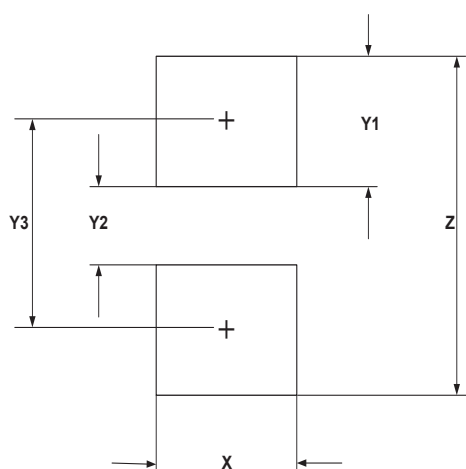
**Typical characteristics ( $T_A = 25^\circ\text{C}$ , unless otherwise noted)**

**8/20µs Waveform per IEC61000-4-5**

**ESD Waveform per IEC61000-4-2**

**Power Derating vs. Ambient Temperature**

**Non-repetitive Peak Pulse Power vs. Pulse Time**

**Clamping Voltage vs. Peak Pulse Current**

**Junction Capacitance vs. Reverse Voltage**

## DFN1006-2 Package Outline Drawing



| SYM | DIMENSIONS  |       |       |
|-----|-------------|-------|-------|
|     | MILLIMETERS |       |       |
|     | MIN         | NOM   | MAX   |
| A   | 0.450       | 0.500 | 0.550 |
| A1  | 0.000       | 0.020 | 0.050 |
| b   | 0.450       | 0.500 | 0.550 |
| c   | 0.120       | 0.150 | 0.180 |
| D   | 0.950       | 1.000 | 1.050 |
| e   | 0.650 BSC   |       |       |
| E   | 0.550       | 0.600 | 0.650 |
| L   | 0.200       | 0.250 | 0.300 |
| h   | 0.12 BSC    |       |       |

## 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  |

## Ordering Information

| Part Number  | Packaging         | Reel Size |
|--------------|-------------------|-----------|
| BTUC05V1006B | 10000/Tape & Reel | 7 inch    |