

## 1-Line Unidirectional ESD Protection Diode



### General description

These surge protection diodes are designed for applications requiring transient overvoltage protection capability. They are intended for use in voltage and ESD sensitive equipment such as computers, printers, business machines, communication systems, medical equipment and other applications. These devices are ideal for situations where board space is at a premium.

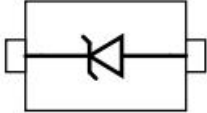
### Features and benefits

- Working Voltage 7.0V
- Response time is typically < 1 ns
- Low leakage current: nA Level
- IEC 61000-4-2 (ESD Air):  $\pm 30\text{kV}$
- IEC 61000-4-2 (ESD Contact):  $\pm 30\text{kV}$
- IEC 61000-4-5 (Lightning 8/20 $\mu\text{s}$ ): 18A

### Application information

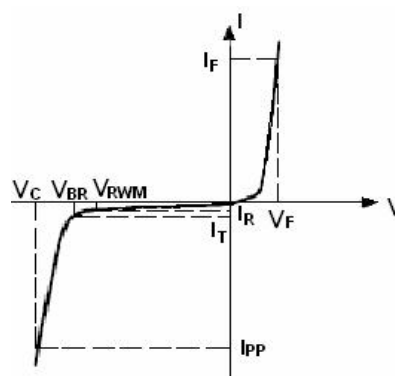
- Cell Phone Handsets and Accessories
- Microprocessor based equipment
- Personal Digital Assistants (PDA's)
- Notebooks, Desktops, and Servers

### Schematic & Pin configuration

| Simplified outline                                                                  | Graphic symbol                                                                        |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |

### Portion Electronics Parameter

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



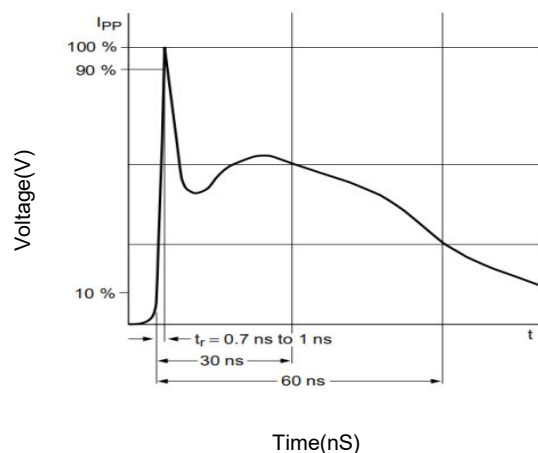
**Maximum Ratings** ( $T_A = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

| Parameter                                            | Symbol    | Value       | Unit               |
|------------------------------------------------------|-----------|-------------|--------------------|
| Peak Pulse Power ( $T_p = 8/20\mu\text{s}$ )         | $P_{PPM}$ | 200         | W                  |
| Rated Peak Pulse Current ( $T_p = 8/20\mu\text{s}$ ) | $I_{PPM}$ | 18          | A                  |
| ESD voltage IEC 61000-4-2 (air discharge)            | $V_{ESD}$ | 30          | kV                 |
| ESD voltage IEC 61000-4-2 (contact discharge)        | $V_{ESD}$ | 30          | kV                 |
| Maximum lead temperature for soldering during 10s    | $T_L$     | 260         | $^{\circ}\text{C}$ |
| Storage Temperature Range                            | $T_{stg}$ | -55 to +150 | $^{\circ}\text{C}$ |
| Operating Temperature Range                          | $T_J$     | -40 to +125 | $^{\circ}\text{C}$ |

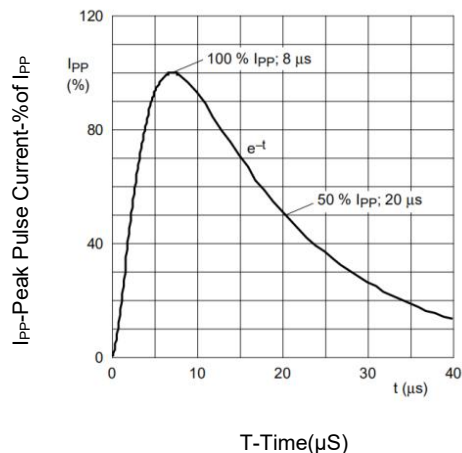
**Electrical Characteristics** ( $T_A = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

| Parameter                  | Symbol    | Min | Typ | Max | Unit | Condition                                    |
|----------------------------|-----------|-----|-----|-----|------|----------------------------------------------|
| Reverse Working Voltage    | $V_{RWM}$ | --  | --  | 7.0 | V    |                                              |
| Breakdown Voltage          | $V_{BR}$  | 7.8 | 8.2 | 9.8 | V    | $I_T = 1\text{mA}$                           |
| Leakage Current $I_{Leak}$ | $I_R$     | --  | --  | 100 | nA   | $V_{RWM} = 7.0\text{V}$                      |
| Forward Voltage            | $V_F$     | 0.7 | 0.8 | 0.9 | V    | $I_F = 10\text{mA}$                          |
| Clamping Voltage           | $V_C$     | --  | 9   | --  | V    | $I_{PP} = 1\text{A}, T_p = 8/20\mu\text{s}$  |
| Clamping Voltage           | $V_C$     | --  | 13  | 15  | V    | $I_{PP} = 18\text{A}, T_p = 8/20\mu\text{s}$ |
| Junction Capacitance       | $C_j$     | --  | 120 | 130 | pF   | $V_R = 0\text{V}, f = 1\text{MHz}$           |
| Junction Capacitance       | $C_j$     | --  | 48  | 50  | pF   | $V_R = 7.0\text{V}, f = 1\text{MHz}$         |

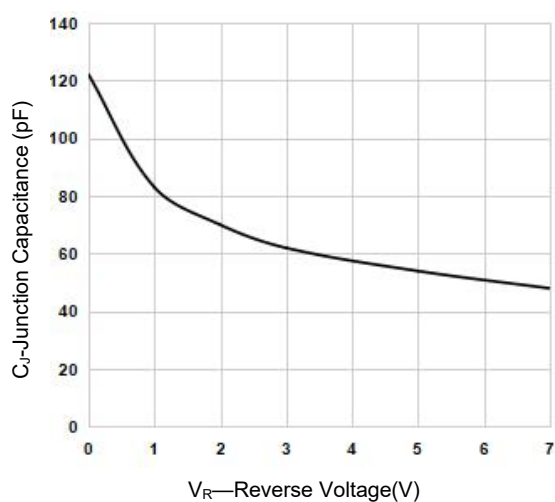
## Typical Performance Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise Specified)



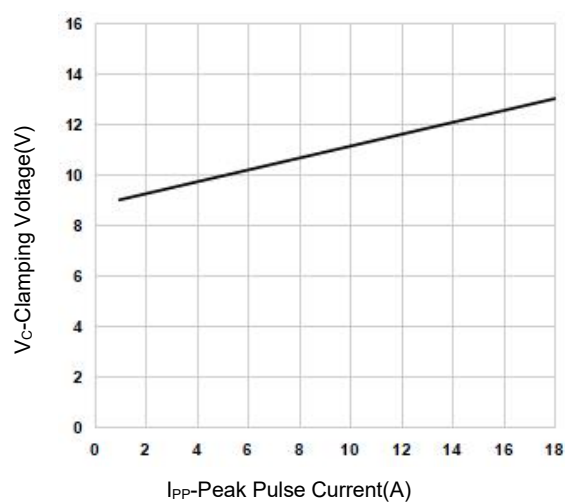
IEC61000-4-2 Pulse Waveform



IEC61000-4-5 8X20 $\mu\text{s}$  Pulse Waveform



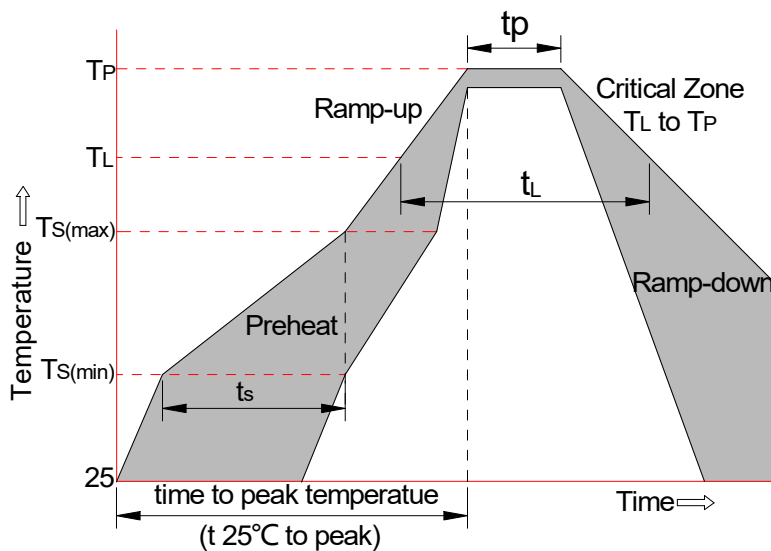
Junction Capacitance vs. Reverse Voltage



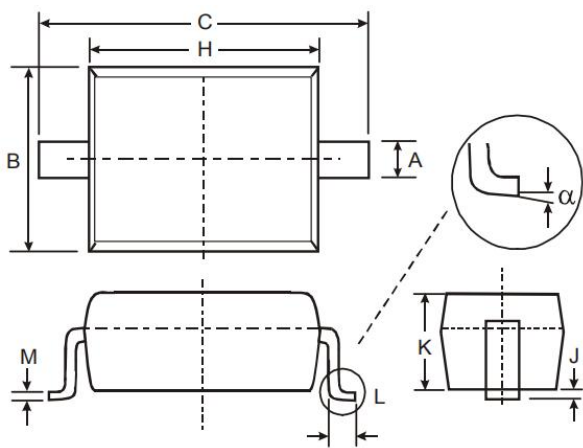
Clamping Voltage vs. Peak Pulse Current

## Soldering Parameters

| Reflow Condition                                        |                                   | Pb-Free Assembly |
|---------------------------------------------------------|-----------------------------------|------------------|
| Pre-heat                                                | -Temperature Min ( $T_{s(min)}$ ) | +150°C           |
|                                                         | -Temperature Max( $T_{s(max)}$ )  | +200°C           |
|                                                         | -Time (Min to Max) ( $t_s$ )      | 60-180 secs.     |
| Average ramp up rate (Liquid us Temp ( $T_L$ ) to peak) |                                   | 3°C/sec. Max     |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                    |                                   | 3°C/sec. Max     |
| Reflow                                                  | -Temperature( $T_L$ )(Liquid us)  | +217°C           |
|                                                         | -Temperature( $t_L$ )             | 60-150 secs.     |
| Peak Temp ( $T_p$ )                                     |                                   | +260(+0/-5)°C    |
| Time within 5°C of actual Peak Temp ( $t_p$ )           |                                   | 30 secs. Max     |
| Ramp-down Rate                                          |                                   | 6°C/sec. Max     |
| xTime 25°C to Peak Temp ( $T_P$ )                       |                                   | 8 min. Max       |
| Do not exceed                                           |                                   | +260°C           |

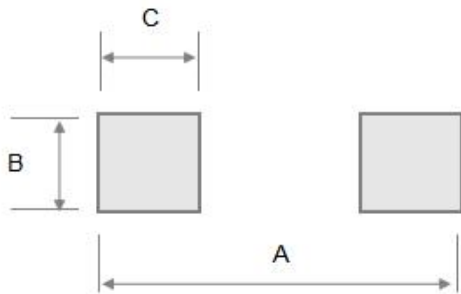


Package Outline Dimensions (SOD323)



| SYMBOL   | MILLIMETERS |      |
|----------|-------------|------|
|          | MIN         | MAX  |
| A        | 0.25        | 0.35 |
| B        | 1.20        | 1.40 |
| C        | 2.40        | 2.70 |
| H        | 1.60        | 1.80 |
| J        | 0.01        | 0.15 |
| K        | 0.70        | 0.90 |
| L        | 0.20        | 0.40 |
| M        | 0.08        | 0.15 |
| $\alpha$ | 0°          | 8°   |

Soldering Footprint (mm)



| SYMBOL | DIMENSIONS |
|--------|------------|
| A      | 3.20       |
| B      | 0.80       |
| C      | 0.80       |