



## 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.

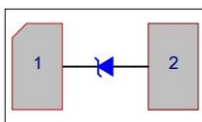
## Features and benefits

- Unidirectional ESD protection of one line
- Reverse stand-off voltage: 12V Max
- 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 $\mu\text{S}$ ): 90A

## Application information

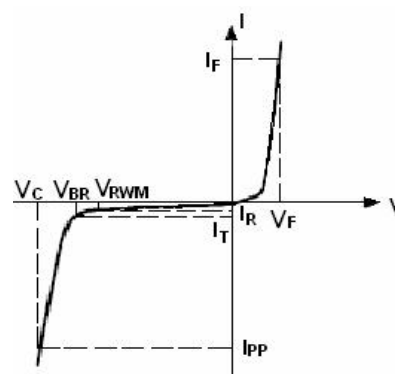
- Power Lines Protection
- Battery Protection
- Vbat pin for Mobile Devices
- Hand Held Portable Applications
- Cell phone Handsets and Accessories
- Portable Electronics

## 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 @ $I_F$             |



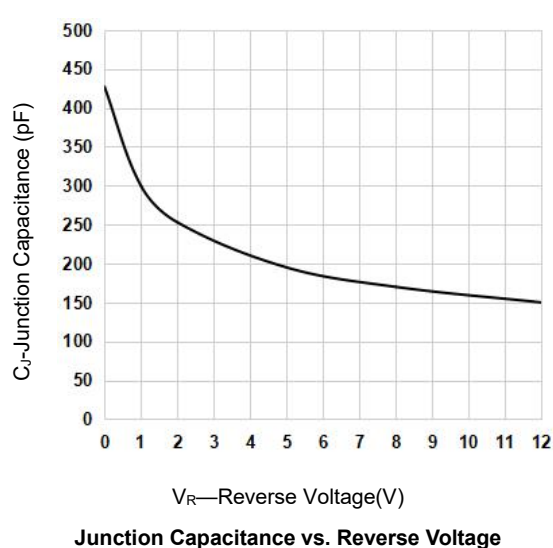
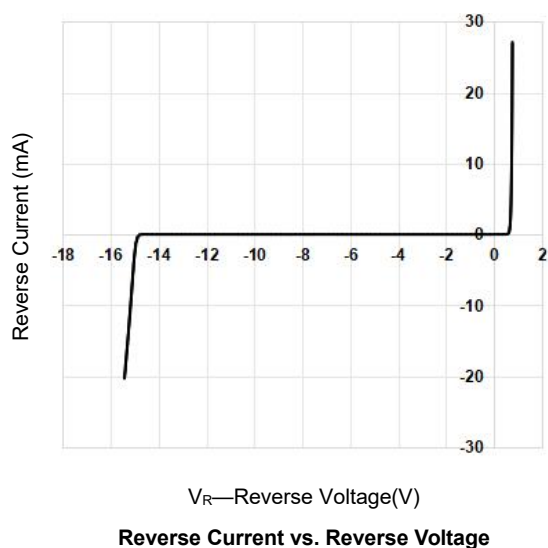
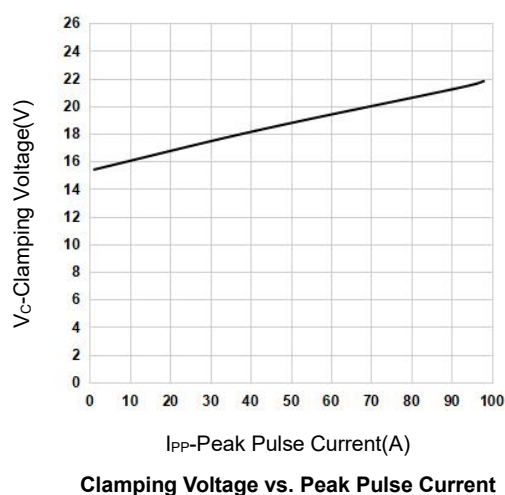
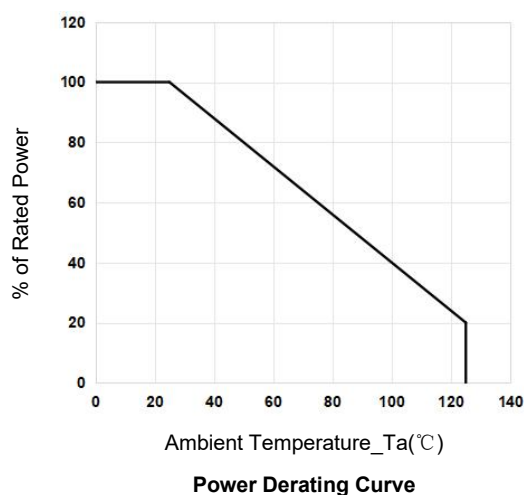
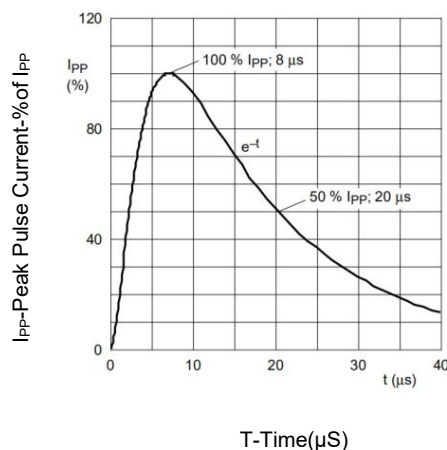
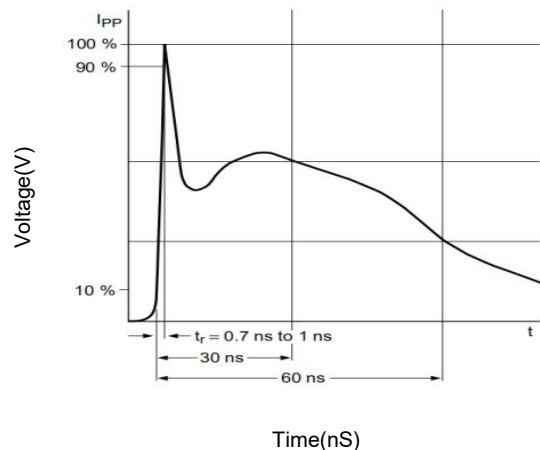
**Maximum Ratings** ( $T_A = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

| Parameter                                            | Symbol    | Value       | Unit               |
|------------------------------------------------------|-----------|-------------|--------------------|
| Peak Pulse Power ( $T_p = 8/20\mu\text{s}$ )         | $P_{PPM}$ | 2160        | W                  |
| Rated Peak Pulse Current ( $T_p = 8/20\mu\text{s}$ ) | $I_{PPM}$ | 90          | 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)

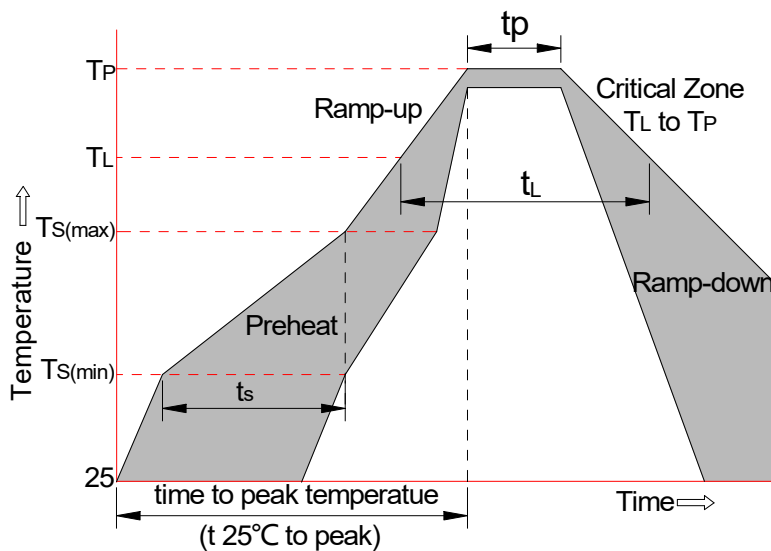
| Parameter                  | Symbol    | Min  | Typ  | Max  | Unit | Condition                                |
|----------------------------|-----------|------|------|------|------|------------------------------------------|
| Reverse Working Voltage    | $V_{RWM}$ | --   | --   | 12.0 | V    |                                          |
| Breakdown Voltage          | $V_{BR}$  | 13.5 | 15.0 | 16.0 | V    | $I_T=1\text{mA}$                         |
| Leakage Current $I_{Leak}$ | $I_R$     | --   | --   | 100  | nA   | $V_{RWM}=12\text{V}$                     |
| Clamping Voltage           | $V_F$     | 0.6  | --   | 0.9  | V    | $I_F=10\text{mA}$                        |
| Clamping Voltage           | $V_C$     | --   | 16.0 | --   | V    | $I_{pp}=10\text{A}, T_p=8/20\mu\text{s}$ |
| Clamping Voltage           | $V_C$     | --   | 21.0 | 24.0 | V    | $I_{pp}=90\text{A}, T_p=8/20\mu\text{s}$ |
| Junction Capacitance       | $C_j$     | --   | 430  | 500  | pF   | $V_R=0\text{V}, f=1\text{MHz}$           |

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

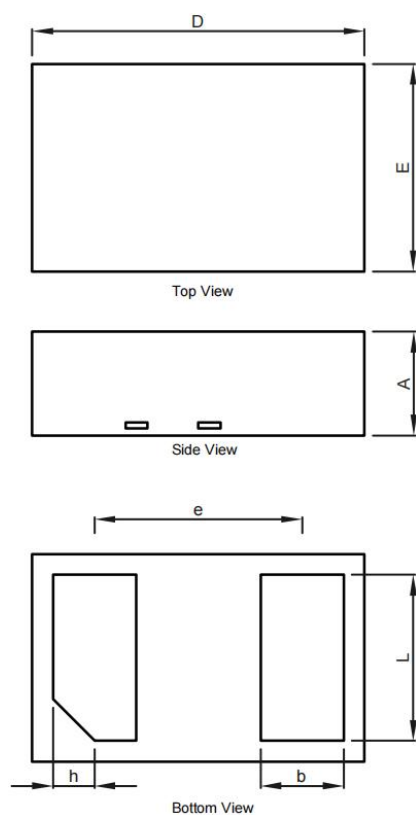


### Soldering Parameters

| 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           |

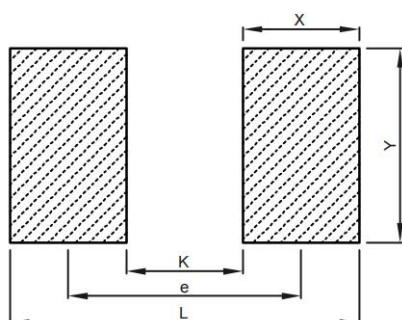


### Package Outline Dimensions (DFN1610-2L)



| SYMBOL | MILLIMETERS |       |       |
|--------|-------------|-------|-------|
|        | MIN         | TYP   | MAX   |
| A      | 0.535       | 0.585 | 0.635 |
| D      | 1.550       | 1.600 | 1.650 |
| E      | 0.950       | 1.000 | 1.050 |
| b      | 0.350       | 0.400 | 0.450 |
| L      | 0.750       | 0.80  | 0.850 |
| e      | 1.10BSC     |       |       |
| h      | 0.150       | 0.200 | 0.250 |

### Soldering Footprint (mm)



| SYMBOL | MILLIMETERS |      |
|--------|-------------|------|
|        | MIN         | MAX  |
| X      | 0.57        | 0.67 |
| Y      | 0.95        | 1.05 |
| L      | 1.79        | 1.89 |
| e      | 1.17        | 1.27 |
| K      | 0.55        | 0.65 |