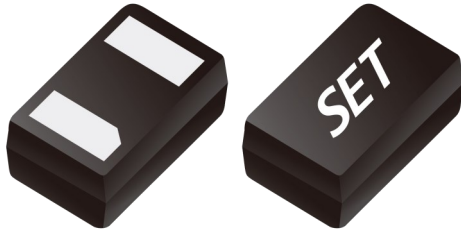


# ESD Protection Diodes

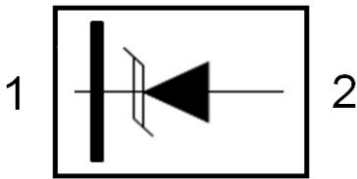
ESD and Transient Voltage Protection

SD1265F16G1

DFN1610-2L



## Pinout and Functional Block Diagram



## Applications

- Power management
- Power supply protection

## Order Information

| Type        | Package     | Marking | Size (mm)       | Delivery Form | Delivery Quantity |
|-------------|-------------|---------|-----------------|---------------|-------------------|
| SD1265F16G1 | DFN 1610-2L | MT      | 1.6 x 1.0 x 0.5 | 7" T&R        | 3000 PCS          |

## Description

The SD1265F16G1 is a transient voltage suppressor designed to protect power interfaces. It is suitable to replace multiple discrete components in portable electronics. The SD1265F16G1 is specifically designed to protect power lines. The SD1265F16G1 is available in DFN1610-2L package. Standard products are Pb-free and Halogen-free.

## Features

- IEC61000-4-2 (ESD)  $\pm 30$  kV (Air),  $\pm 30$  kV (Contact)
- IEC61000-4-5 (Lighting) 65 A (8 / 20  $\mu$ s)
- 2275 Watts Peak Pulse Power (tp=8 / 20  $\mu$ s)
- Protects One Vcc with One Directional
- Low Leakage Current
- Low Clamping Voltage
- Ultra-small Package (1.6 mm x 1.0 mm x 0.5 mm)
- Flammability Rating: UL 94 V-0
- Halogen Free and RoHS Compliant

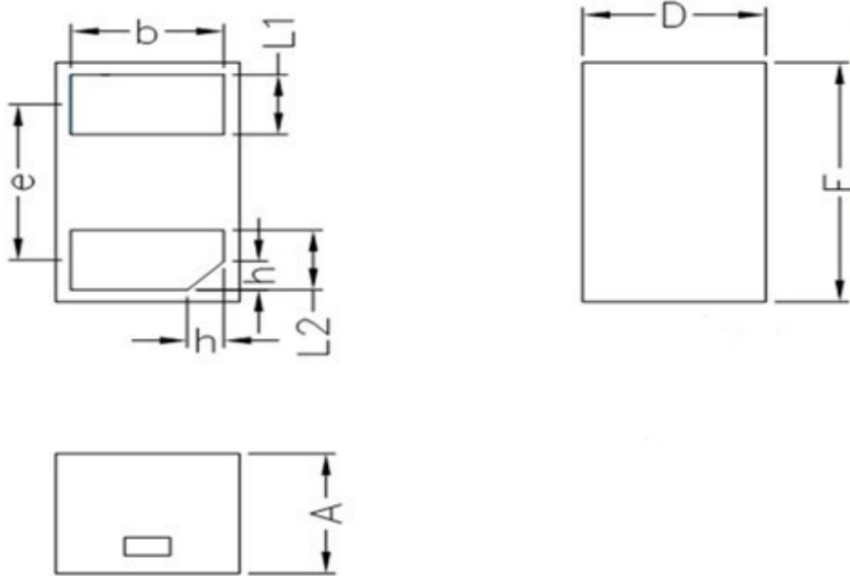
# ESD Protection Diodes

ESD and Transient Voltage Protection

SD1265F16G1

DFN1610-2L

## Package Dimensions



| Symbol | Millimeters |      | Inches    |       |
|--------|-------------|------|-----------|-------|
|        | Min.        | Max. | Min.      | Max.  |
| D      | 0.95        | 1.05 | 0.037     | 0.041 |
| E      | 1.55        | 1.65 | 0.061     | 0.065 |
| L1     | 0.35        | 0.45 | 0.014     | 0.018 |
| L2     | 0.35        | 0.45 | 0.014     | 0.018 |
| b      | 0.75        | 0.85 | 0.030     | 0.033 |
| e      | 1.09 BSC    |      | 0.043 BSC |       |
| A      | 0.45        | 0.55 | 0.018     | 0.022 |
| h      | 0.15        | 0.25 | 0.006     | 0.010 |

## Limiting Values

(T<sub>A</sub> = 25 °C, unless otherwise specified)

| Symbol           | Parameter                       | Conditions                       | Min | Max  | Unit |
|------------------|---------------------------------|----------------------------------|-----|------|------|
| V <sub>ESD</sub> | Electrostatic Discharge Voltage | IEC 61000-4-2; Contact Discharge | -   | 30   | kV   |
|                  |                                 | IEC 61000-4-2; Air Discharge     | -   | 30   | kV   |
| P <sub>PP</sub>  | Peak Pulse Power (8 / 20 μs)    | t <sub>p</sub> =8 / 20 μs        | -   | 2275 | W    |
| T <sub>A</sub>   | Operating Temperature Range     | -                                | -40 | 125  | °C   |
| T <sub>stg</sub> | Storage Temperature Range       | -                                | -55 | 150  | °C   |

## Electrical Characteristics

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

| Symbol    | Parameter               | Conditions  | Min  | Typ. | Max  | Unit          |
|-----------|-------------------------|---|------|------|------|---------------|
| $V_{RWM}$ | Reverse Working Voltage | $T_A = 25\text{ }^\circ\text{C}$                        | -    | -    | 12.0 | V             |
| $V_{BR}$  | Breakdown Voltage       | $I_R = 1\text{ mA}; T_A = 25\text{ }^\circ\text{C}$     | 12.7 | -    | -    | V             |
| $I_R$     | Reverse Leakage Current | $V_{RWM} = 12\text{ V}; T_A = 25\text{ }^\circ\text{C}$ | -    | -    | 0.1  | $\mu\text{A}$ |
| $V_C$     | Clamping Voltage        | $I_{PP}=25\text{ A}, t_p=8 / 20\text{ }\mu\text{s}$     | -    | -    | 25   | V             |
|           |                         | $I_{PP}=65\text{ A}, t_p=8 / 20\text{ }\mu\text{s}$     | -    | -    | 35   | V             |
| $C_J$     | Junction Capacitance    | $V_R = 0\text{ V}, f = 1\text{ MHz}$                    | -    | -    | 510  | pF            |

## Performance Curve for Reference

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

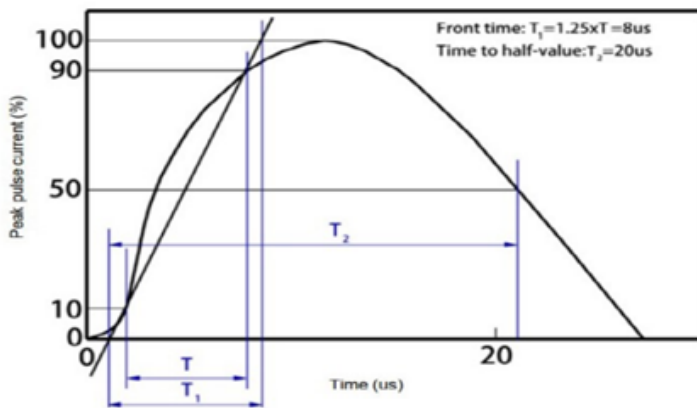


FIGURE 1

8 / 20  $\mu\text{s}$  Waveform Per IEC61000-4-5

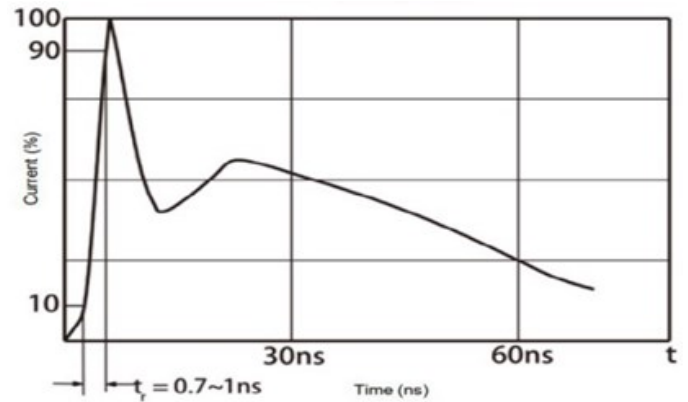


FIGURE 2

Contact Discharge Current Waveform Per IEC 61000-4-2

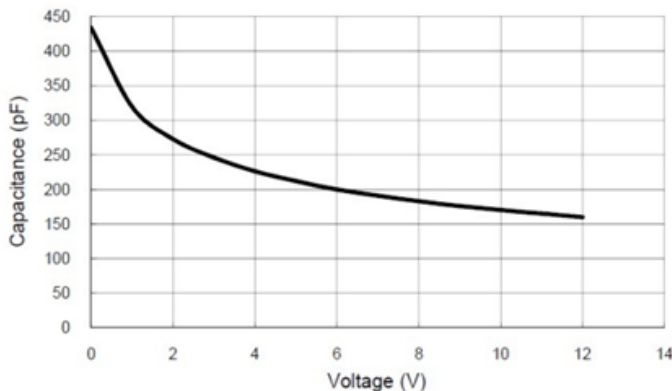


FIGURE 3

Voltage VS. Capacitance

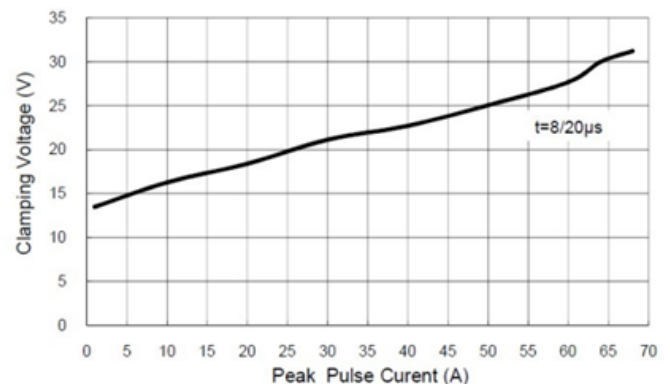
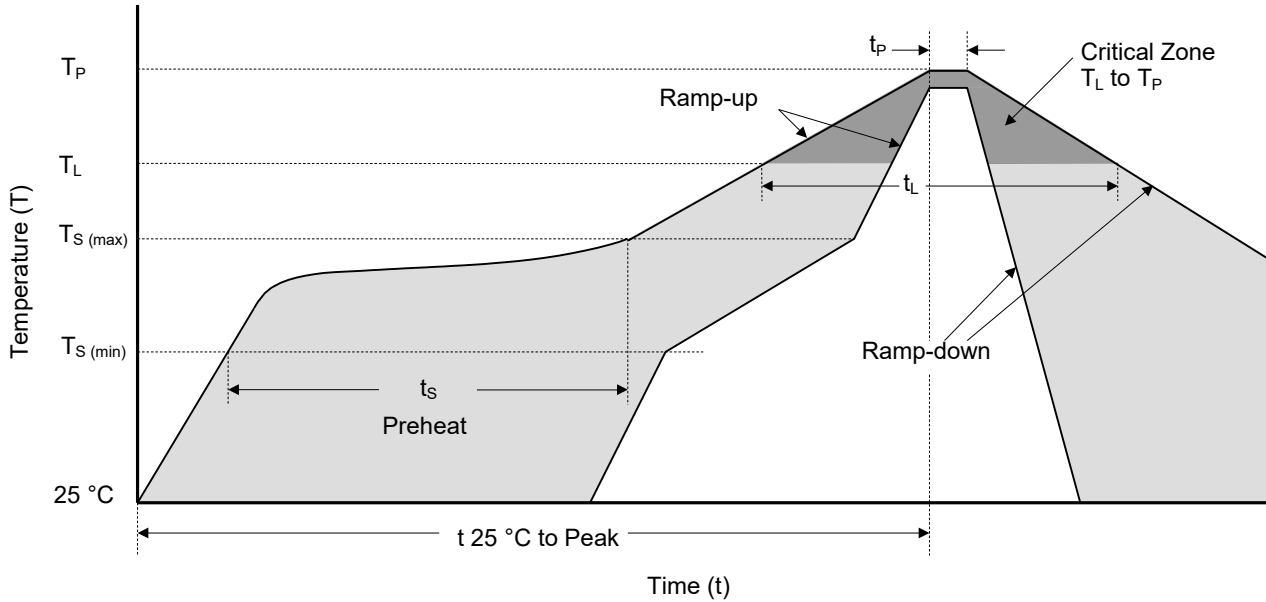


FIGURE 4

Clamping Voltage VS. Peak Pulse Current

Soldering Parameters



Reflowing Condition

| Reflow Soldering Parameters                              |                                   | Lead-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 ~ 120 seconds        |
| Average Ramp Up Rate (Liquidus Temp ( $T_L$ ) to Peak)   |                                   | 3 °C / second max.      |
| $T_S (max)$ to $T_L$ Ramp-up Rate                        |                                   | 3 °C / second max.      |
| Reflow   | Temperature ( $T_L$ ) (Liquidus)  | 217 °C                  |
|  | Time (min to max) ( $t_L$ )       | 60 ~ 150 seconds        |
| Peak Temperature ( $T_P$ )                               |                                   | 260 <sup>+0/-5</sup> °C |
| Time of within 5 °C of Actual Peak Temperature ( $t_p$ ) |                                   | 20 ~ 40 seconds         |
| Ramp-down Rate   |                                   | 6 °C / second max.      |
| Time from 25 °C to Peak Temperature                      |                                   | 8 Minutes max.          |
| Do Not Exceed  |                                   | 260 °C                  |



# ATTENTION

## Usage

1. TVS must be operated in the specified ambient temp.
2. Do not clean the TVS with strong polar solvent such as ketone, esters, benzene and halogenated hydrocarbon, to avoid damaging the encapsulating layer.
3. Please do not apply severe vibration, shock or pressure to TVS, to avoid element cracking.

## Replacement

1. If TVS is visually damaged, please replace it.
2. TVS is a non-repairable product. For safety sake, please use equivalent TVS for replacement.

## Storage

1. Storage Temp. Range: (-55 to 150) °C.
2. Do not store the TVS at the high temp., high humidity or corrosive gas environment, to avoid influencing the solder-ability of the lead wires. The product shall be used up within 1 year after receiving the goods.

## Environmental Conditions













































1. TVS should not be exposed to the open air, nor direct sunshine.
2. TVS should avoid rain, water vapor or other condition of high temp. and high humidity.
3. TVS should avoid sand dust, salt mist, or other harmful gases.

## Max. Typical Capacitance of TVS

The typical capacitance of TVS is listed in the specifications. Designers may refer to it when designing TVS in High frequency circuit.

## Installation Mechanical Stress

1. Do not knock TVS when installing, to avoid mechanical damage.
2. Please do not apply severe vibration, shock or pressure to TVS, to avoid surface resin or element cracking.

| Package Outline   |   |   |   |   | Circuit Diagram  |   |   |   |   |   |
|---|---|---|---|---|--|---|---|---|---|---|
|    |    |    |    |    |   |    |    |    |    |    |
| DFN0603   | DFN1006   | DFN1006-3L  | DFN1610   | DFN2020-3L  | 1CH/UNI  | 1CH/BI  | 2CH/UNI   | 2CH/BI  | 1CH/BI  | 1CH/UNI   |
|    |    |    |    |    |   |    |    |    |    |    |
| DFN1610-6L  | DFN2010-8L  | DFN2510   | DFN2626-10L   | DFN3810-9L  | 1CH/UNI  | 1CH/BI  | 1CH/UNI   | 1CH/BI  | 2CH/UNI   | 2CH/BI  |
|    |    |    |    |    |   |    |    |    |    |    |
| SOD-923   | SOD-523   | SOD-323   | SOD-123   | SOT-143   | 1CH/UNI  | 2CH/UNI   | 2CH/UNI   | 4CH/UNI   | 5CH/UNI   | 4CH/UNI   |
|  |  |  |  |  |  |  |  |  |  |  |
| SOT-523   | SOT-323   | SOT-23  | SOT-363   | SOT-23-6L   | 2CH/BI   | 4CH/UNI   | 4CH/UNI   | 8CH/UNI   | 8CH/UNI   | 8CH/UNI   |