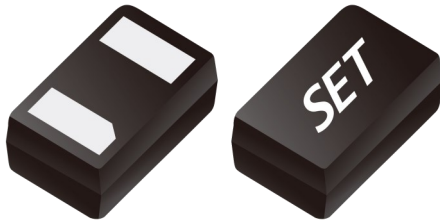


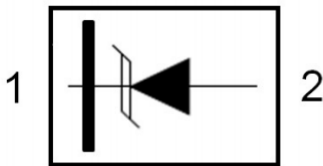
# ESD Protection Diodes

Unidirectional ESD and Transient Voltage Protection

SDxxxxF10G1 DFN1006



## Pinout and Functional Block Diagram



## Applications

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

## Order Information

Type	Package	Marking	Size (mm)	Delivery Form	Delivery Quantity
SDxxxxF10G1	DFN1006	Refer to page 3	1.00 x 0.60 x 0.50	7" T&R	10000 PCS

## Description

The SDxxxxF10G1 Series is 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.

This series has been specifically designed to protect sensitive components which are connected to power, data and transmission lines from overvoltage caused by ESD (electrostatic discharge), CDE (Cable Discharge Events), and EFT (electrical fast transients).

## Features

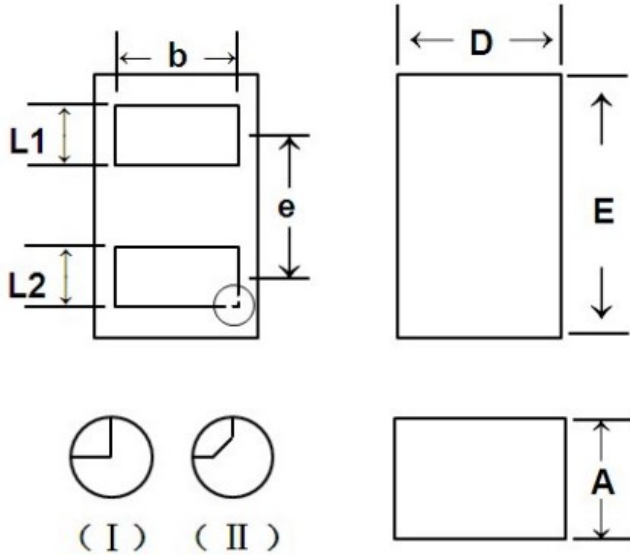
- IEC61000-4-2 (ESD)  $\pm 30$  kV (Air),  $\pm 30$  kV (Contact)
- IEC61000-4-4 (EFT) 40 A (5 / 50 ns)
- 350 Watts Peak Pulse Power Per (tp=8 / 20  $\mu$ s)
- Protects One I/O Line (Unidirectional)
- Low Clamping Voltage
- Low Leakage Current
- High Temperature to Reflow Soldering Guaranteed: 260  $^{\circ}$ C / 10 sec
- Flammability Rating: UL 94 V-0
- Halogen Free and RoHS Compliant

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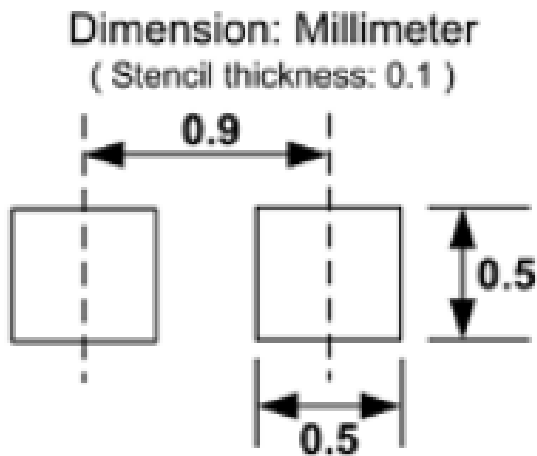
## Package Dimensions - DFN1006



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
D	0.55	0.65	0.022	0.026
E	0.95	1.05	0.037	0.041
L1	0.20	0.30	0.008	0.012
L2	0.20	0.30	0.008	0.012
A	0.45	0.55	0.018	0.022
b	0.45	0.55	0.018	0.022
e	0.64 BSC		0.025 BSC	

## Recommended Solder Pad Footprint

(Ratings at 25 °C ambient temperature unless otherwise specified.)



## Soldering Footprint

# ESD Protection Diodes

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## Electrical Characteristics

(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	-	350	W
T <sub>A</sub>	Operating Temperature Range	-	-55	125	°C
T <sub>stg</sub>	Storage Temperature Range	-	-55	150	°C

## Electrical Characteristics

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

Part Number	Device Marking Code	V <sub>RWM</sub>	I <sub>R</sub>	V <sub>B</sub>	I <sub>T</sub>	V <sub>C</sub>		V <sub>C</sub>		C <sub>J</sub>
		(V)	(μA)	(V)	(mA)	(V)		(V)		(pF)
		Max	Max	Min		Max	@A	Max	@A	Max
SD0320F10G1	03W	3.3	5	4.0	1	6.5	1.0	14	25	450
SD0520F10G1	05W	5	2	6.0	1	9.8	5.0	15	25	250
SD0820F10G1	08W	8	1	8.5	1	10.5	5.0	18	20	200
SD1211F10G1	12W	12	1	13.3	1	19	5.0	32	11	130
SD1510F10G1	15W	15	1	16.7	1	24	5.0	38	10	120
SD1809F10G1	18W	18	1	20.0	1	29	5.0	45	9	100
SD2407F10G1	24W	24	1	26.7	1	43	1.0	52	7	80
SD3605F10G1	36W	36	1	40	1	60	1.0	75	5	60

# ESD Protection Diodes

Unidirectional ESD and Transient Voltage Protection

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## Performance Curve for Reference

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

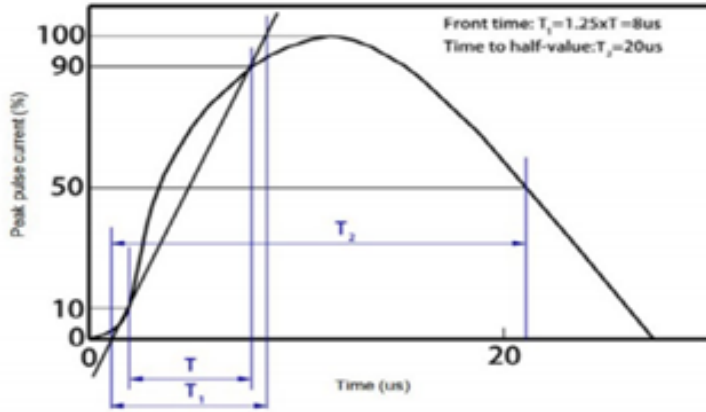


FIGURE 1

8 / 20  $\mu\text{s}$  Waveform Per IEC 61000-4-5

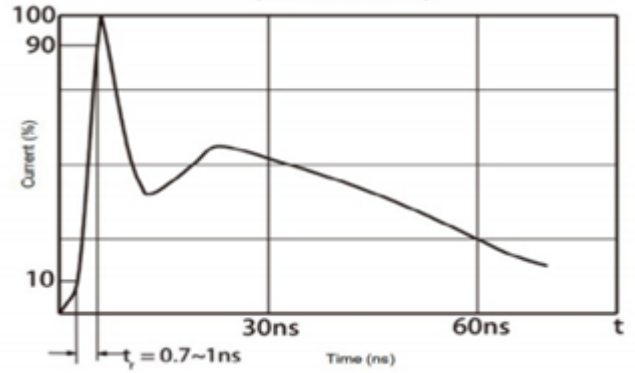


FIGURE 2

Contact Discharge Current Waveform  
Per IEC 61000-4-2

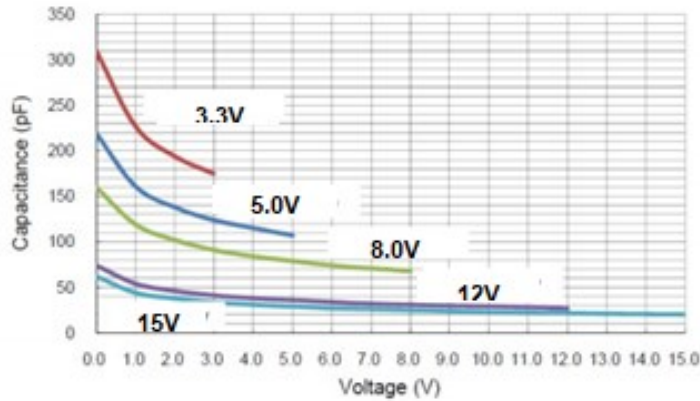


FIGURE 3

Voltage VS. Capacitance

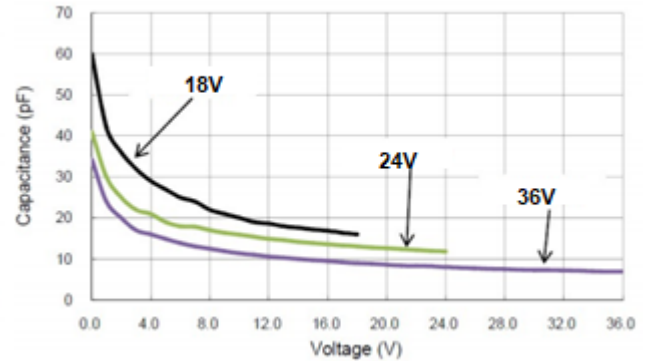


FIGURE 4

Voltage VS. Capacitance

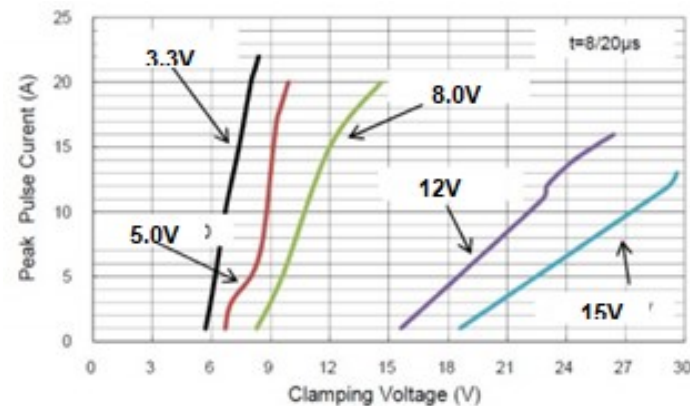


FIGURE 5

Clamping Voltage VS. Peak Pulse Current

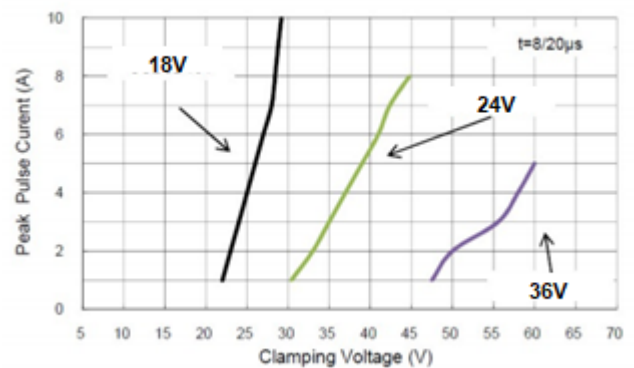


FIGURE 6

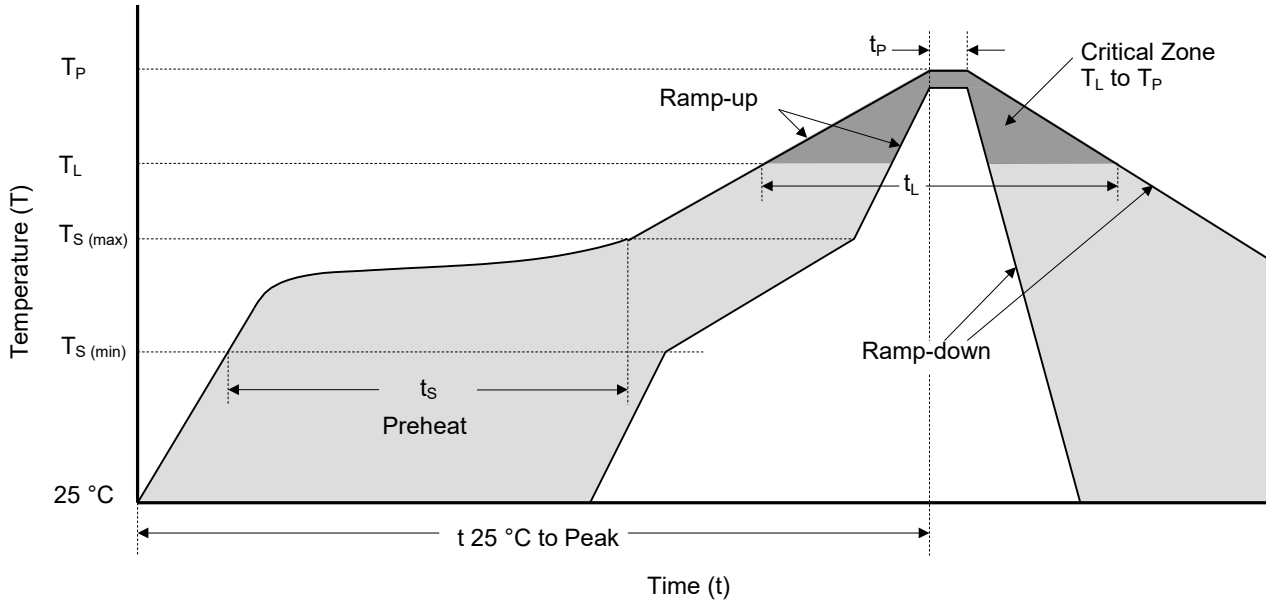
Clamping Voltage VS. Peak Pulse Current

# ESD Protection Diodes

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## 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