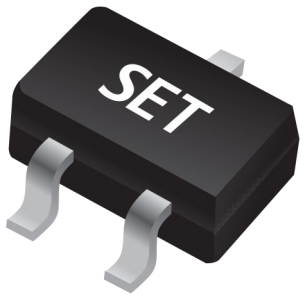
ESD Protection Diodes

Bi-directional ESD and Transient Voltage Protection Diodes Array

SDxxxxT23GM SOT23

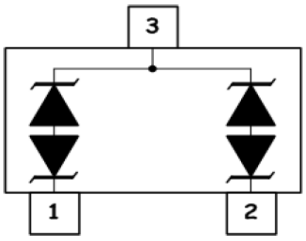


Description

The SDxxxxT23GM 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).

Pinout and Functional Block Diagram



Applications

- Cell Phone Handsets and Accessories
- Microprocessor based equipment
- Personal Digital Assistants (PDA's)
- Notebooks, Desktops, and Servers
- Portable Instrumentation
- Networking and Telecom
- Serial and Parallel Ports.
- Peripherals

Features

- IEC61000-4-2 (ESD) ± 30 kV (Air), ± 30 kV (Contact)
- IEC61000-4-4 (EFT) 40 A (5 / 50 ns)
- Peak Power Dissipation: 500 W@8 / 20 μs
- Protects Two Bidirectional Lines
- Working Voltages : 3.3 V , 5 V
- Low Clamping Voltage
- Low Leakage Current
- High Temperature Soldering Guaranteed: 260 °C / 10 sec
- Device Meets MSL 1 Requirements
- Flammability Rating: UL 94 V-0
- Halogen Free and RoHS Compliant

Order Information

Type	Package	Marking Code	Delivery Form	Delivery Quantity
SDxxxxT23GM	SOT23	Refer to next page	7" T&R	3000 PCS

Limiting Values

(T_A = 25 °C, unless otherwise specified)

Symbol	Parameter	Conditions	Min	Max	Unit
V_{ESD}	Electrostatic Discharge Voltage	IEC 61000-4-2; Contact Discharge	-	30	kV
		IEC 61000-4-2; Air Discharge	-	30	kV
P_{PP}	Peak Pulse Power (8 / 20 μs)	-	-	500	W
T_A	Operating Temperature Range	-	-55	150	℃
T_{stg}	Storage Temperature Range	-	-55	150	℃

Electrical Characteristics

(T_A = 25 °C, unless otherwise specified)

Part Number	Device Marking Code	V_{RWM} (V) (max.)	V_B (V) (min.)	I_T (mA)	V_C@1A (V) (max.)	V_C (V) (max.)	V_C (@A)	I_R (μA) (max.)	C_J (pF) (max.)
SD0334T23GM	3CM	3.3	3.6	1	6.5	18.0	34	1.0	75
SD0523T23GM	5CM	5.0	5.6	1	9.8	22	23	1.0	65

Performance Curve for Reference

(T_A=25 °C unless otherwise noted)

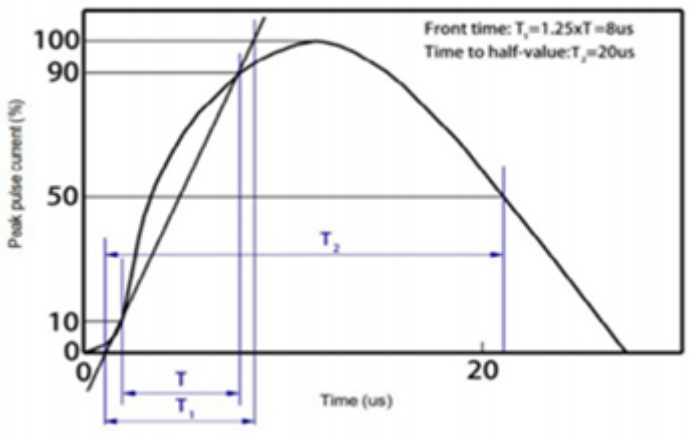


FIGURE 1
8 / 20 μs Waveform Per IEC61000-4-5

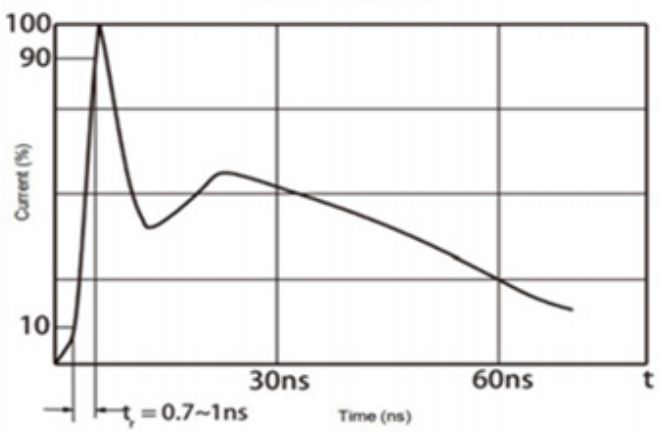


FIGURE 2
Contact Discharge Current Waveform Per IEC 61000-4-2

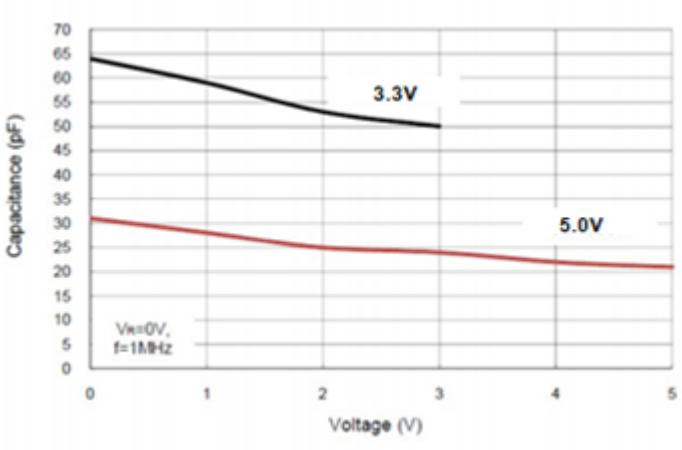


FIGURE 3
Voltage VS. Capacitance

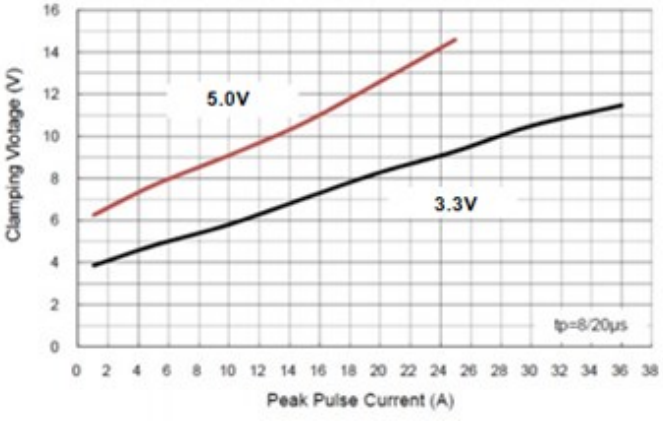
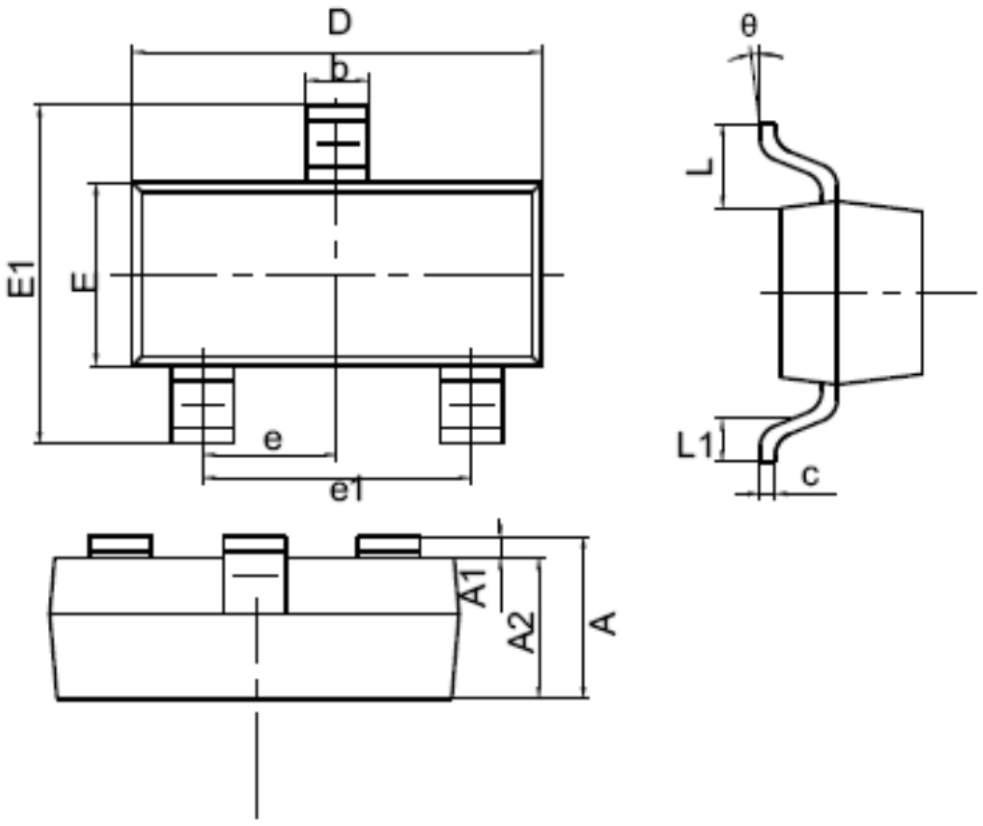


FIGURE 4
Clamping Voltage VS. Peak Pulse Current

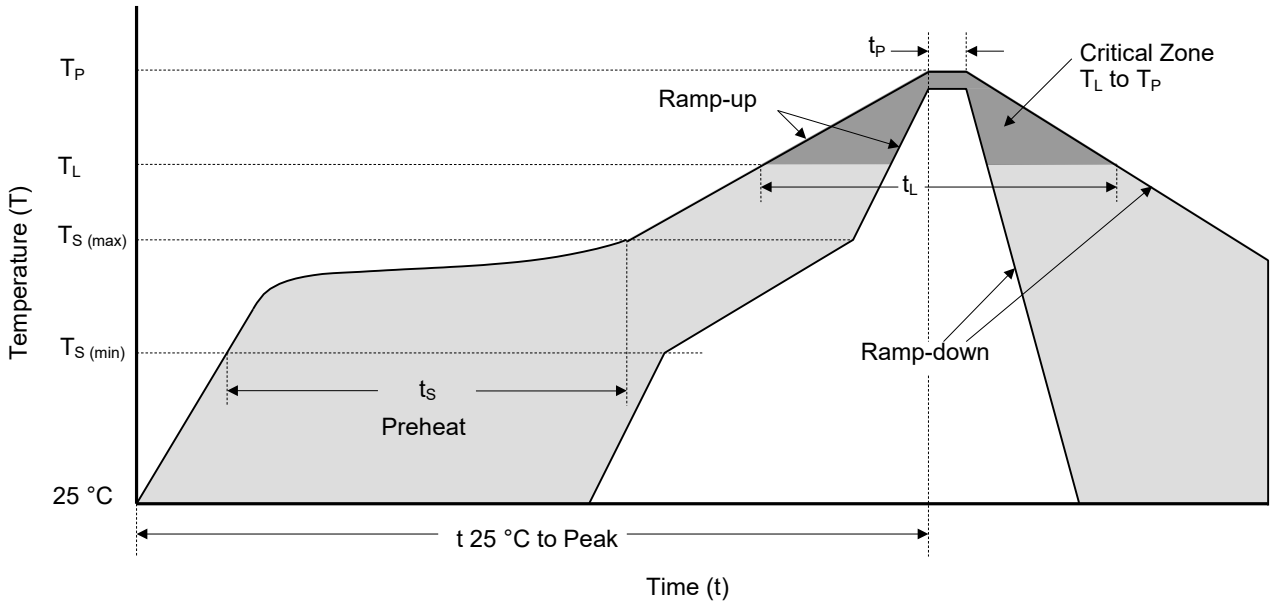
Package Dimensions - SOT23



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 Ref.		0.037 Ref.	
e1	1.800	2.000	0.071	0.079
L	0.550 Ref.		0.022 Ref.	
L1	0.300	0.500	0.012	0.020
θ	0 °	8 °	0 °	8 °

ESD TVS

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 (TL) 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)		$260^{+0/-5}$ °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

ESD TVS

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

1. 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.