Description

The SDXXTH is an uni-directional TVS diode, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive data and power line. The SDXXTH complies with the IEC 61000-4-2 (ESD) with ±30kV air and ±30kV contact discharge. It is assembled into a small lead-free SOD-523 package. The small size and high ESD surge protection make SDXXTH an ideal choice to protect cell phone, digital cameras, audio players and many other portable applications.

Features

- Protects one date or power line
- Working voltage: 3.3～36 V
- 2-pin SOD-523 package
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge: ±30kV
    - Contact discharge: ±30kV
- RoHS Compliant

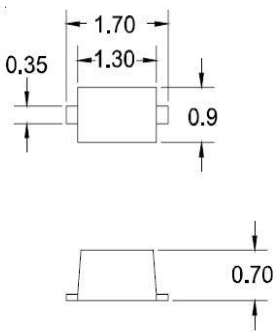
Mechanical Characteristics

- Package: SOD-523
- Case Material: “Green” Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram Below
- Marking Information: See Below

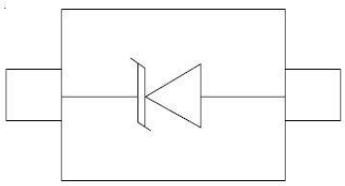
Applications

- Cellular Handsets and Accessories
- Personal Digital Assistants
- Notebooks and Handhelds
- Portable Instrumentation
- Digital Cameras
- Peripherals
- Audio Players
- Keypads, Side Keys, LCD Displays

Dimensions & Symbol（Unit: mm Max）



Maximum Dimensions (mm)



SOD-523 (Top View)

Package Dimensions

Circuit and Pin Schematic

Ordering Information

Part Number	Packaging	Reel Size
SDXXTH	3000/Tape & Reel	7 inch

Absolute Maximum Ratings (T_A=25ºC, RH=45%-75%, unless otherwise noted)

SD03TH			
Parameter	**Symbol**	**Value**	**Unit**
Peak Pulse Power (8/20μs)	Ppk	300	W
Peak Pulse Current (8/20μs)	Ipp	27	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	V_{ESD}	±30 ±30	kV
Operating Temperature Range	T_J	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

SD05TH			
Parameter	**Symbol**	**Value**	**Unit**
Peak Pulse Power (8/20μs)	Ppk	300	W
Peak Pulse Current (8/20μs)	Ipp	22	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	V_{ESD}	±30 ±30	kV
Operating Temperature Range	T_J	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

SD07TH			
Parameter	**Symbol**	**Value**	**Unit**
Peak Pulse Power (8/20μs)	Ppk	300	W
Peak Pulse Current (8/20μs)	Ipp	18	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	V_{ESD}	±30 ±30	kV
Operating Temperature Range	T_J	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

SD12TH			
Parameter	**Symbol**	**Value**	**Unit**
Peak Pulse Power (8/20μs)	Ppk	300	W
Peak Pulse Current (8/20μs)	Ipp	13	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	V_{ESD}	±30 ±30	kV
Operating Temperature Range	T_J	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

SD24TH			
Parameter	**Symbol**	**Value**	**Unit**
Peak Pulse Power (8/20μs)	Ppk	300	W
Peak Pulse Current (8/20μs)	Ipp	5	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	V_{ESD}	±30 ±30	kV
Operating Temperature Range	T_J	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

SD36TH			
Parameter	**Symbol**	**Value**	**Unit**
Peak Pulse Power (8/20μs)	Ppk	300	W
Peak Pulse Current (8/20μs)	Ipp	4	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	V_{ESD}	±30 ±30	kV
Operating Temperature Range	T_J	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

Electrical Characteristics (T_A=25℃)

SD03TH						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			3.3	V	
Breakdown Voltage	V_{BR}	4.8			V	IT = 1mA
Reverse Leakage Current	I_R			45	uA	VRWM = 3.3V
Clamping Voltage	V_C		7		V	IPP = 1A (8 x 20uS pulse)
Clamping Voltage	V_C			15	V	IPP = 27A (8 x 20uS pulse)
Junction Capacitance	C_J		150		pF	VR = 0V, f = 1MHz

SD05TH						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			5	V	
Breakdown Voltage	V_{BR}	6			V	IT = 1mA
Reverse Leakage Current	I_R			10	uA	VRWM = 5V
Clamping Voltage	V_C		9.8		V	IPP = 1A (8 x 20uS pulse)
Clamping Voltage	V_C			19	V	IPP = 22A (8 x 20uS pulse)
Junction Capacitance	C_J		160		pF	VR = 0V, f = 1MHz

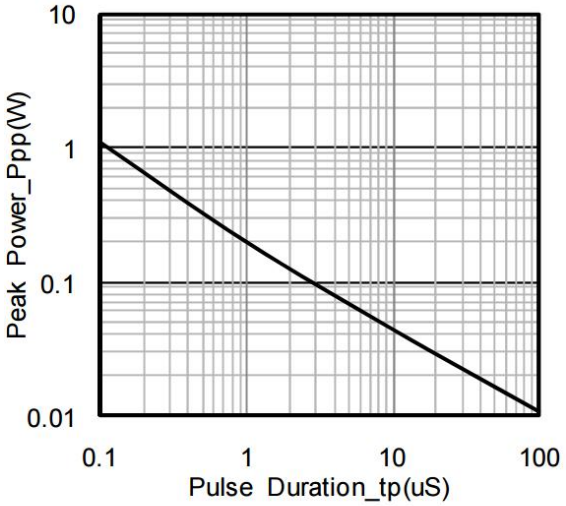
SD07TH						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			7	V	
Breakdown Voltage	V_{BR}	7.5			V	IT = 1mA
Reverse Leakage Current	I_R			1	uA	VRWM = 7V
Clamping Voltage	V_C		12		V	IPP = 1A (8 x 20uS pulse)
Clamping Voltage	V_C			20	V	IPP =18A (8 x 20uS pulse)
Junction Capacitance	C_J		160		pF	VR = 0V, f = 1MHz

SD12TH						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			12	V	
Breakdown Voltage	V_{BR}	13.3			V	IT = 1mA
Reverse Leakage Current	I_R			0.2	uA	VRWM = 12V
Clamping Voltage	V_C		16		V	IPP = 1A (8 x 20uS pulse)
Clamping Voltage	V_C			30	V	IPP =13A (8 x 20uS pulse)
Junction Capacitance	C_J		65		pF	VR = 0V, f = 1MHz

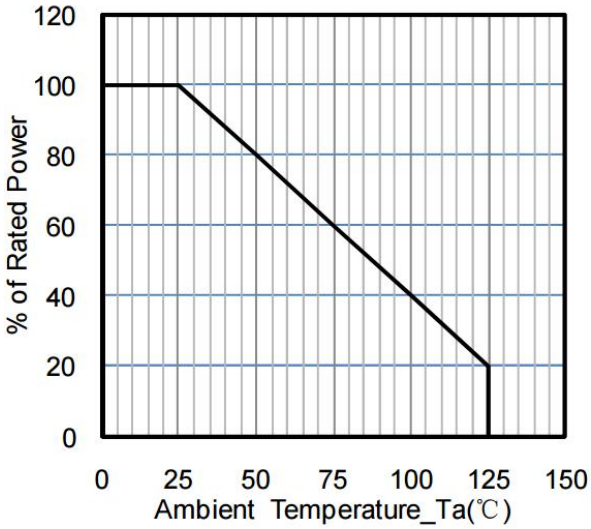
SD24TH						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			24	V	
Breakdown Voltage	V_{BR}	27			V	IT = 1mA
Reverse Leakage Current	I_R			10	uA	VRWM = 24V
Clamping Voltage	V_C		40		V	IPP = 1A (8 x 20uS pulse)
Clamping Voltage	V_C			60	V	IPP = 5A (8 x 20uS pulse)
Junction Capacitance	C_J		40		pF	VR = 0V, f = 1MHz

SD36TH						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			36	V	
Breakdown Voltage	V_{BR}	38			V	IT = 1mA
Reverse Leakage Current	I_R			0.2	uA	VRWM = 36V
Clamping Voltage	V_C		50		V	IPP = 1A (8 x 20uS pulse)
Clamping Voltage	V_C			75	V	IPP =4A (8 x 20uS pulse)
Junction Capacitance	C_J		30		pF	VR = 0V, f = 1MHz

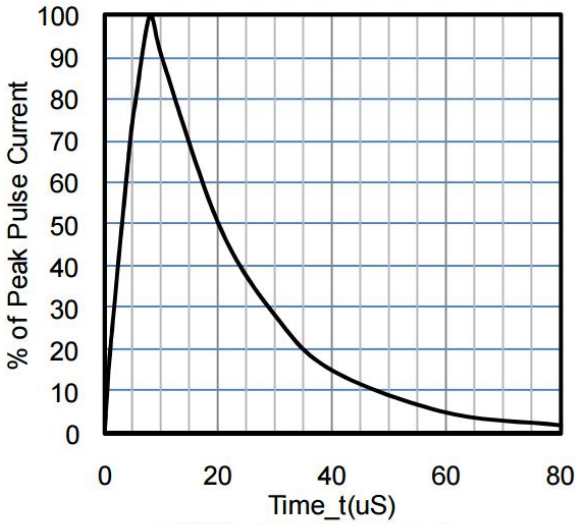
Typical Performance Characteristics (T_A=25°C unless otherwise Specified)



Peak Pulse Power vs. Pulse Time



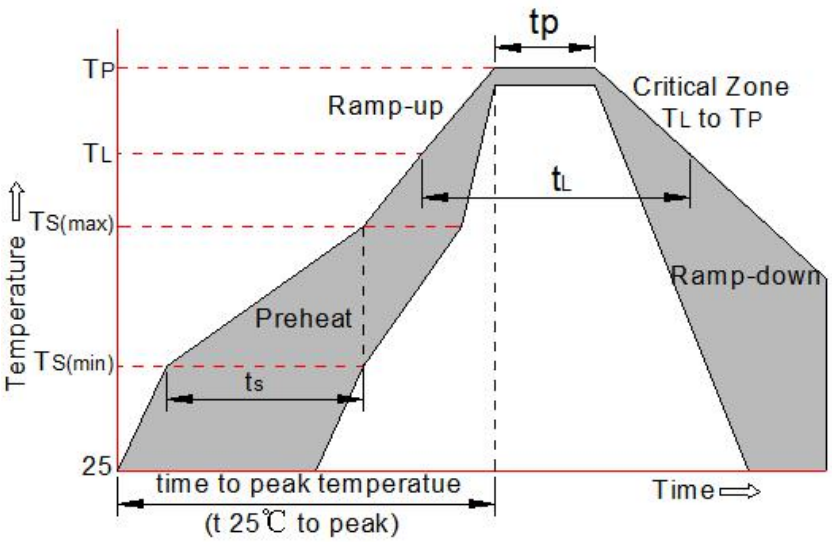
Power Derating Curve



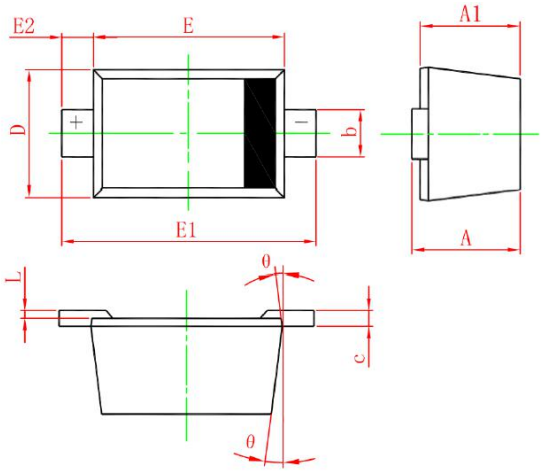
8 X 20uS Pulse Waveform

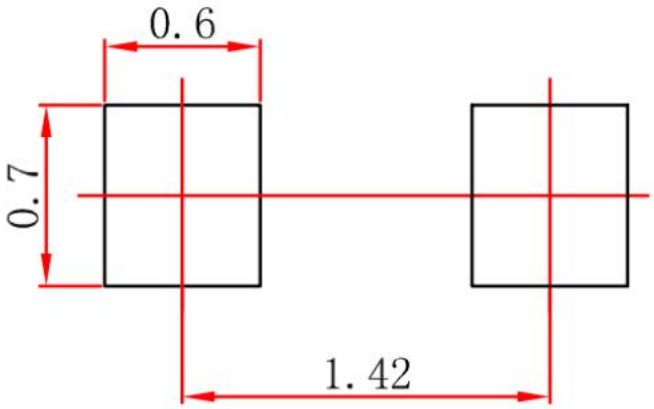
Soldering Parameters

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



Package Mechanical Data



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.51	-	0.77	0.020	-	0.031
A1	0.50	-	0.70	0.020	-	0.028
b	0.25	-	0.35	0.010	-	0.014
c	0.08	-	0.15	0.003	-	0.006
D	0.75	-	0.85	0.030	-	0.033
E	1.10	-	1.30	0.043	-	0.051
E1	1.50	-	1.70	0.059	-	0.067
E2	0.20REF			0.008REF		
L	0.01	-	0.07	0.001	-	0.003
Φ	7° REF			7° REF		

Suggested Land Pattern