

**1-Line Bi-directional TVS Diode**

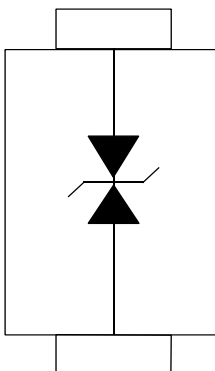
**Description**

The PSDXXC is designed to replace multilayer varistors (MLVs) in portable applications such as cell phones, notebook computers and PDA's, using monolithic silicon technology to provide fast response time and ultra low ESD clamping voltage, making this device an ideal solution for protecting sensitive semiconductor components from damage. The PSDXXC complies with the IEC 61000-4-2 (ESD) with  $\pm 15\text{kV}$  air and  $\pm 8\text{kV}$  contact discharge. The PSDXXC is assembled into a lead-free SOD-323 package and will protect one unidirectional line. These devices will fit on the same PCB pad area as an 0805 MLV device.

**Features**

- 500W peak pulse power (8/20 $\mu\text{s}$ )
- Protects one data or power line
- Ultra low leakage: nA level
- Operating voltage: 3.3V,5V,12V,24V,36V,40V
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge:  $\pm 30\text{kV}$
    - Contact discharge:  $\pm 30\text{kV}$
- RoHS Compliant

**Dimensions and Pin Configuration**



Circuit and Pin Schematic

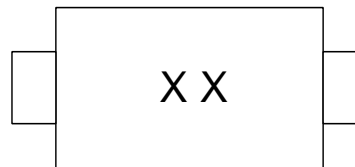
**Mechanical Characteristics**

- Package: SOD-323
- Lead Finish: Matte Tin
- Case Material: "Green" Molding Compound.
- 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
- Peripherals
- Pagers Peripherals
- Desktop and Servers

**Marking Information**



Part Number	Marking
PSD33C	33
PSD05C	05
PSD12C	12
PSD24C	24
PSD36C	36
PSD40C	40

**Ordering Information**

Part Number	Packaging	Reel Size
PSD33C	3000/Tape & Reel	7 inch
PSD05C	3000/Tape & Reel	7 inch
PSD12C	3000/Tape & Reel	7 inch
PSD24C	3000/Tape & Reel	7 inch
PSD36C	3000/Tape & Reel	7 inch
PSD40C	3000/Tape & Reel	7 inch

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

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 $\mu\text{s}$ )	$P_{PK}$	500	W
ESD per IEC 61000-4-2 (Air)	$V_{ESD}$	$\pm 30$	kV
ESD per IEC 61000-4-2 (Contact)		$\pm 30$	kV
Operating Temperature Range	$T_J$	-55 to +125	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 to +150	$^\circ\text{C}$

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

PSD33C						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	$V_{RWM}$			3.3	V	
Breakdown Voltage	$V_{BR}$	3.8			V	$I_T = 1\text{mA}$
Reverse Leakage Current	$I_R$			0.2	$\mu\text{A}$	$V_{RWM} = 3.3\text{V}$
Clamping Voltage	$V_C$			5	V	$I_{PP} = 1\text{A}$ (8/20 $\mu\text{s}$ pulse)
Clamping Voltage	$V_C$			12	V	$I_{PP} = 40\text{A}$ (8/20 $\mu\text{s}$ pulse)
Peak Pulse Current	$I_{PP}$			40	A	$t_p = 8/20\mu\text{s}$
Junction Capacitance	$C_J$			200	pF	$V_R = 0\text{V}$ , $f = 1\text{MHz}$

PSD05C						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	$V_{RWM}$			5	V	
Breakdown Voltage	$V_{BR}$	6			V	$I_T = 1\text{mA}$
Reverse Leakage Current	$I_R$			0.5	$\mu\text{A}$	$V_{RWM} = 5\text{V}$
Clamping Voltage	$V_C$			9.5	V	$I_{PP} = 1\text{A}$ (8/20 $\mu\text{s}$ pulse)
Clamping Voltage	$V_C$			15	V	$I_{PP} = 34\text{A}$ (8/20 $\mu\text{s}$ pulse)
Peak Pulse Current	$I_{PP}$			34	A	$t_p = 8/20\mu\text{s}$
Junction Capacitance	$C_J$			200	pF	$V_R = 0\text{V}$ , $f = 1\text{MHz}$

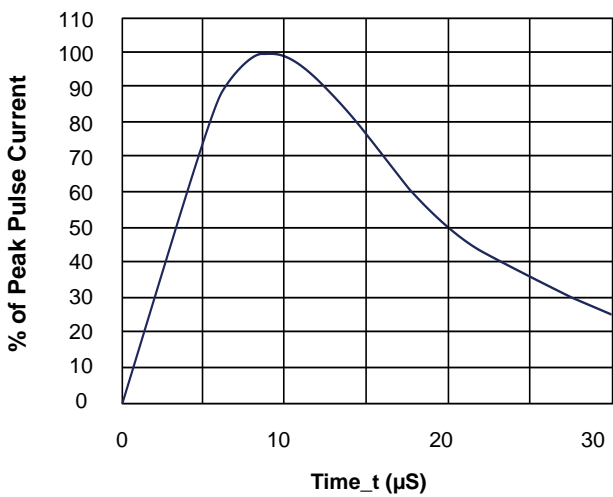
<b>PSD12C</b>						
<b>Parameter</b>	<b>Symbol</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>	<b>Unit</b>	<b>Test Condition</b>
Reverse Working Voltage	$V_{RWM}$			12	V	
Breakdown Voltage	$V_{BR}$	13.3			V	$I_T = 1mA$
Reverse Leakage Current	$I_R$			0.2	$\mu A$	$V_{RWM} = 12V$
Clamping Voltage	$V_C$			19	V	$I_{PP} = 1A$ (8/20 $\mu s$ pulse)
Clamping Voltage	$V_C$			28	V	$I_{PP} = 18A$ (8/20 $\mu s$ pulse)
Peak Pulse Current	$I_{PP}$			18	A	$t_p = 8/20\mu s$
Junction Capacitance	$C_J$			100	pF	$V_R = 0V, f = 1MHz$

<b>PSD24C</b>						
<b>Parameter</b>	<b>Symbol</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>	<b>Unit</b>	<b>Test Condition</b>
Reverse Working Voltage	$V_{RWM}$			24	V	
Breakdown Voltage	$V_{BR}$	27			V	$I_T = 1mA$
Reverse Leakage Current	$I_R$			0.2	$\mu A$	$V_{RWM} = 24V$
Clamping Voltage	$V_C$			40	V	$I_{PP} = 1A$ (8/20 $\mu s$ pulse)
Clamping Voltage	$V_C$			62	V	$I_{PP} = 8A$ (8/20 $\mu s$ pulse)
Peak Pulse Current	$I_{PP}$			8	A	$t_p = 8/20\mu s$
Junction Capacitance	$C_J$			50	pF	$V_R = 0V, f = 1MHz$

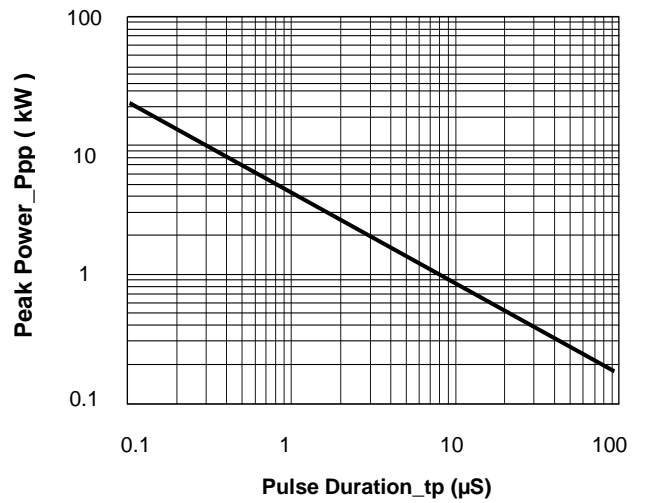
<b>PSD36C</b>						
<b>Parameter</b>	<b>Symbol</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>	<b>Unit</b>	<b>Test Condition</b>
Reverse Working Voltage	$V_{RWM}$			36	V	
Breakdown Voltage	$V_{BR}$	38			V	$I_T = 1mA$
Reverse Leakage Current	$I_R$			0.2	$\mu A$	$V_{RWM} = 36V$
Clamping Voltage	$V_C$			40	V	$I_{PP} = 1A$ (8/20 $\mu s$ pulse)
Clamping Voltage	$V_C$			70	V	$I_{PP} = 6A$ (8/20 $\mu s$ pulse)
Peak Pulse Current	$I_{PP}$			6	A	$t_p = 8/20\mu s$
Junction Capacitance	$C_J$			30	pF	$V_R = 0V, f = 1MHz$

PSD40C						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	$V_{RWM}$			40	V	
Breakdown Voltage	$V_{BR}$	44			V	$I_T = 1mA$
Reverse Leakage Current	$I_R$			0.2	$\mu A$	$V_{RWM} = 40V$
Clamping Voltage	$V_C$			50	V	$I_{PP} = 1A$ (8/20 $\mu s$ pulse)
Peak Pulse Current	$I_{PP}$			5	A	$t_p = 8/20\mu s$
Junction Capacitance	$C_J$			20	pF	$V_R = 0V, f = 1MHz$

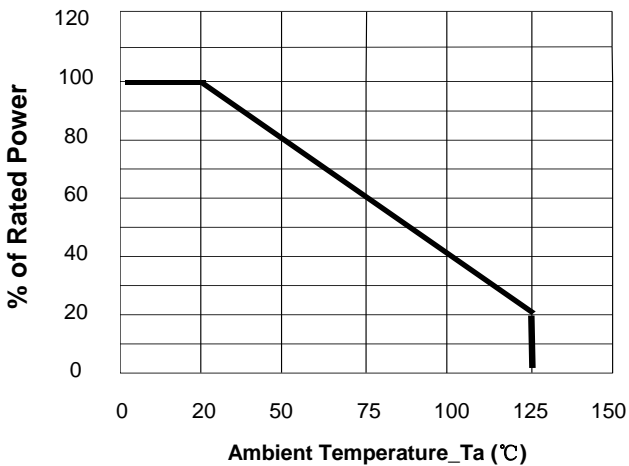
**Typical Performance Characteristics ( $T_A=25^\circ C$  unless otherwise Specified)**



**8/20µS Pulse Waveform**

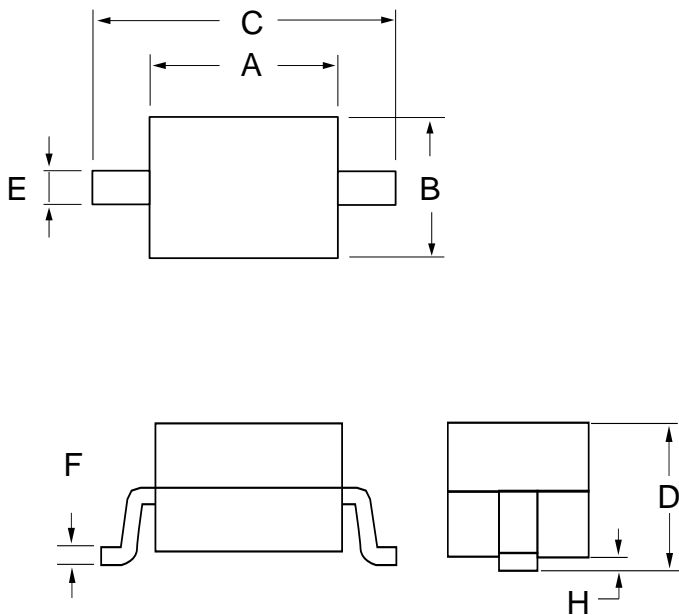


**Peak Pulse Power vs. Pulse Time**



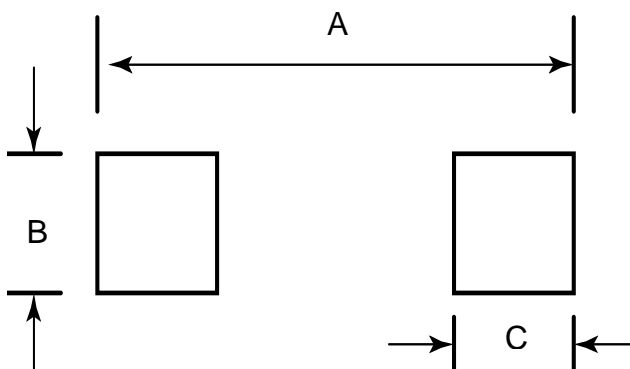
**Power Derating Curve**

**SOD-323 Package Outline Drawing**



SYM	DIMENSIONS				
	MILLIMETERS			INCHES	
	MIN	NOM	MAX	MIN	MAX
A	1.50	1.65	1.80	0.060	0.071
B	1.20	1.30	1.40	0.045	0.054
C	2.30	2.50	2.70	0.090	0.107
D	-	-	1.10	-	0.043
E	0.30	-	0.40	0.012	0.016
F	0.10	-	0.25	0.004	0.010
H	-	-	0.10	-	0.004

**Suggested Land Pattern**



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
A	3.15	0.120
B	0.80	0.031
C	0.80	0.031