1-Line Bi-directional TVS Diode

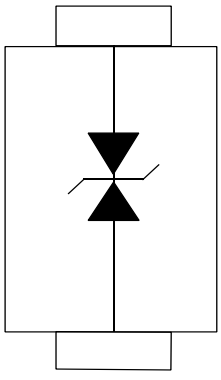
Description

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 ±15kV air and ±8kV 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 (8/20μs)
- 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: ±30kV
    - Contact discharge: ±30kV
- RoHS Compliant

Dimensions and Pin Configuration



Circuit and Pin Schematic

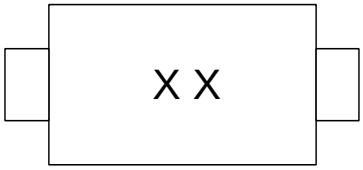
Mechanical Characteristics

- 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°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	P_{PK}	500	W
ESD per IEC 61000−4−2 (Air)	V_{ESD}	±30	kV
ESD per IEC 61000−4−2 (Contact)		±30	kV
Operating Temperature Range	T_J	−55 to +125	°C
Storage Temperature Range	T_{STG}	−55 to +150	°C

Electrical Characteristics (T_A=25°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 = 1mA
Reverse Leakage Current	I_R			0.2	μA	V_{RWM} = 3.3V
Clamping Voltage	V_C			5	V	I_{PP} = 1A (8/20μs pulse)
Clamping Voltage	V_C			12	V	I_{PP} = 40A (8/20μs pulse)
Peak Pulse Current	I_{PP}			40	A	tp = 8/20μs
Junction Capacitance	C_J			200	pF	V_R = 0V, f = 1MHz

PSD05C

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

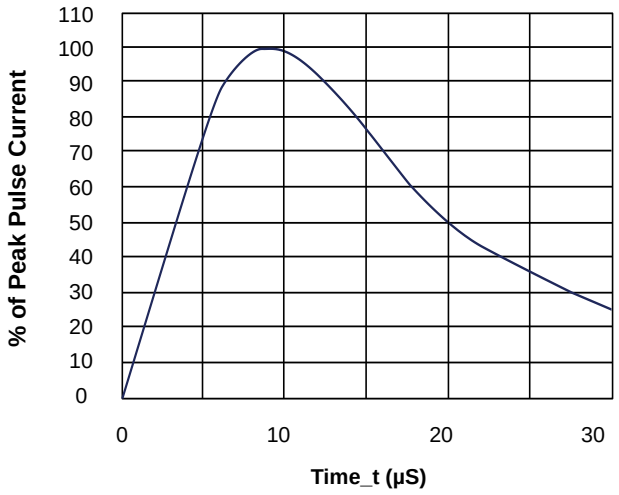
PSD12C						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			12	V	
Breakdown Voltage	V_{BR}	13.3			V	I_T = 1mA
Reverse Leakage Current	I_R			0.2	μA	V_{RWM} = 12V
Clamping Voltage	V_C			19	V	I_{PP} = 1A (8/20μs pulse)
Clamping Voltage	V_C			28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

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

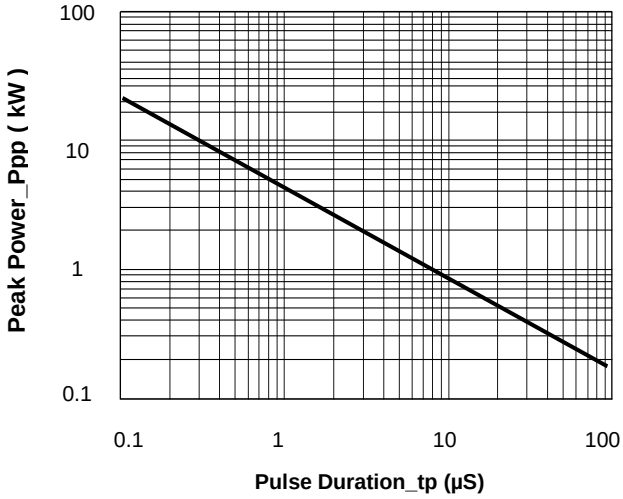
PSD36C						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			36	V	
Breakdown Voltage	V_{BR}	38			V	I_T = 1mA
Reverse Leakage Current	I_R			0.2	μA	V_{RWM} = 36V
Clamping Voltage	V_C			40	V	I_{PP} = 1A (8/20μs pulse)
Clamping Voltage	V_C			70	V	I_{PP} = 6A (8/20μs pulse)
Peak Pulse Current	I_{PP}			6	A	tp = 8/20μs
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	μA	V_{RWM} = 40V
Clamping Voltage	V_C			50	V	I_{PP} = 1A (8/20μs pulse)
Peak Pulse Current	I_{PP}			5	A	tp = 8/20μs
Junction Capacitance	C_J			20	pF	V_R = 0V, f = 1MHz

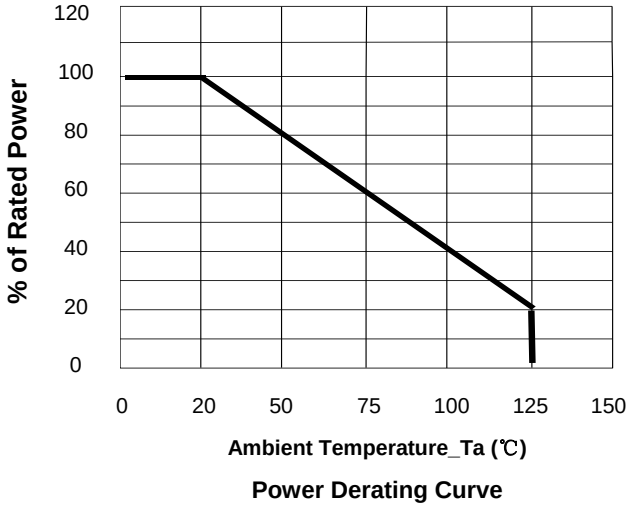
Typical Performance Characteristics (T_A=25°C unless otherwise Specified



8/20μS Pulse Waveform

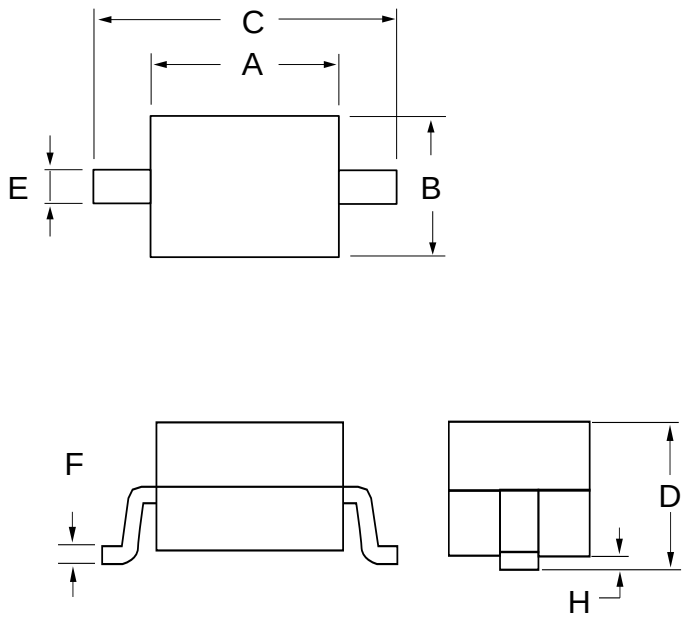


Peak Pulse Power vs. Pulse Time



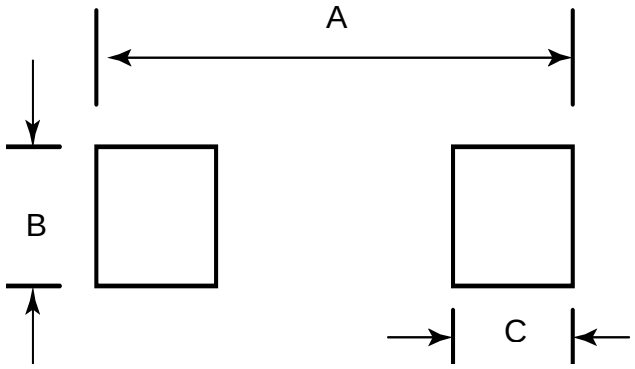
Power Derating Curve

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

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