ASD05C THRU ASD36C

1-Line Bi-directional TVS Diode

Description

The ASDXXC 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 ASDXXC complies with the IEC 61000 -4-2 (ESD) standard with ±15kV air and ±8kV contact discharge. The ASDXXC 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 (8/20us)
- Protects one data or power line
- Ultra low leakage: nA level
- Operating voltage: 5V, 8V, 12V, 15V, 24V, 36V
- Ultra low clamping voltage
- Complies with following standards:
  - – IEC 61000-4-2 (ESD) immunity test
    - Air discharge: ±30kV
    - Contact discharge: ±30kV
  - – IEC61000-4-4 (EFT) 40A (5/50ns)
- RoHS Compliant

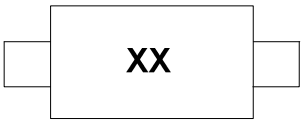
Mechanical Characteristics

- Package: SOD-323
- Lead Finish: Matte Tin
- 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

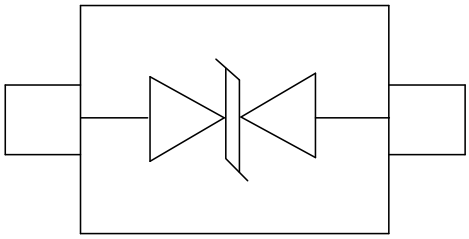
- Cellular Handsets and Accessories
- Personal Digital Assistants
- Notebooks and Handhelds
- Portable Instrumentation
- Peripherals
- Pagers Peripherals
- Desktop and Servers

Marking Information



Part Number	Marking
ASD05C	05
ASD08C	08
ASD12C	12
ASD15C	15
ASD24C	24
ASD36C	36

Dimensions and Pin Configuration



SOD-323

Ordering Information

Part Number	Packaging	Reel Size
ASD05C	3000/Tape & Reel	7 inch
ASD08C	3000/Tape & Reel	7 inch
ASD12C	3000/Tape & Reel	7 inch
ASD15C	3000/Tape & Reel	7 inch
ASD24C	3000/Tape & Reel	7 inch
ASD36C	3000/Tape & Reel	7 inch

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	Ppk	500	W
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°C unless otherwise specified)

ASD05C

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			1	μA	V_{RWM} = 5V
Clamping Voltage	V_C			9.5	V	I_{PP} = 5A (8 x 20μs pulse)
Clamping Voltage	V_C			14	V	I_{PP} = 36A (8 x 20μs pulse)
Peak Pulse Current	Ipp			36	A	tp = 8/20μs
Junction Capacitance	C_J			200	pF	VR = 0V, f = 1MHz

ASD08C

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			8	V	
Breakdown Voltage	V_{BR}	8.5			V	I_T = 1mA
Reverse Leakage Current	I_R			1	μA	V_{RWM} = 8V
Clamping Voltage	V_C			11	V	I_{PP} = 5A (8 x 20μs pulse)
Clamping Voltage	V_C			15	V	I_{PP} = 34A (8 x 20μs pulse)
Peak Pulse Current	Ipp			34	A	tp = 8/20μs
Junction Capacitance	C_J			180	pF	VR = 0V, f = 1MHz

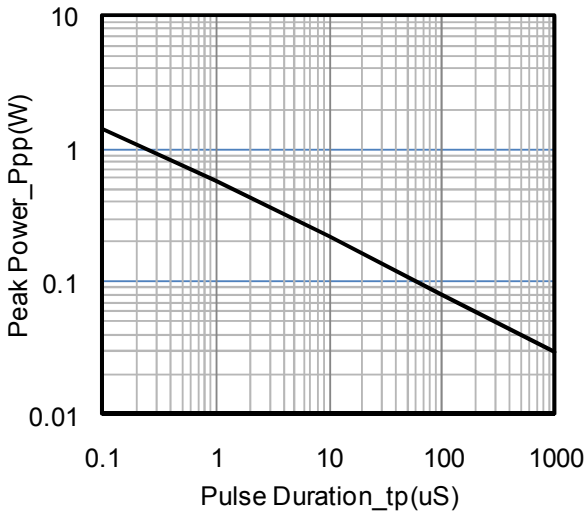
ASD12C						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			12	V	
Breakdown Voltage	V_{BR}	13.3			V	I_T = 1mA
Reverse Leakage Current	I_R			0.5	μA	V_{RWM} = 12V
Clamping Voltage	V_C			19	V	I_{PP} = 5A (8 x 20μs pulse)
Clamping Voltage	V_C			28	V	I_{PP} = 18A (8 x 20μs pulse)
Peak Pulse Current	Ipp			18	A	tp = 8/20μs
Junction Capacitance	C_J			100	pF	VR = 0V, f = 1MHz

ASD15C						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			15	V	
Breakdown Voltage	V_{BR}	16.7			V	I_T = 1mA
Reverse Leakage Current	I_R			0.1	μA	V_{RWM} = 15V
Clamping Voltage	V_C		20		V	I_{PP} = 1A (8 x 20μs pulse)
Clamping Voltage	V_C		30		V	I_{PP} = 12A (8 x 20μs pulse)
Peak Pulse Current	I_{PP}			12	A	tp=8/20μs
Junction Capacitance	C_J			100	pF	VR = 0V, f = 1MHz

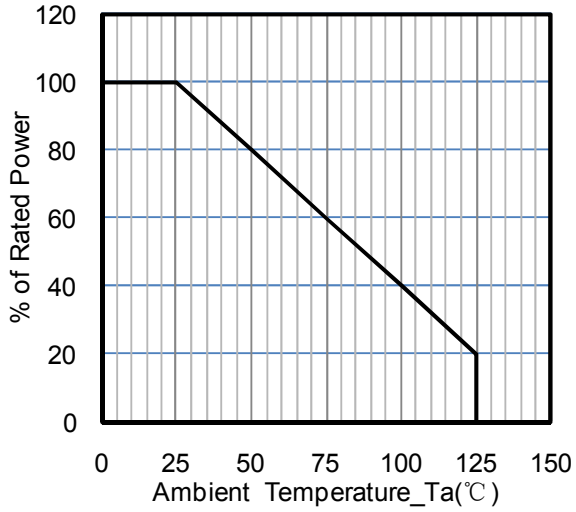
ASD24C						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			24	V	
Breakdown Voltage	V_{BR}	27			V	I_T = 1mA
Reverse Leakage Current	I_R			0.2	μA	V_{RWM} = 24V
Clamping Voltage	V_C			40	V	I_{PP} = 1A (8 x 20μs pulse)
Clamping Voltage	V_C			62	V	I_{PP} = 8A (8 x 20μs pulse)
Peak Pulse Current	Ipp			8	A	tp = 8/20μs
Junction Capacitance	C_J			50	pF	VR = 0V, f = 1MHz

ASD36C						
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 x 20μs pulse)
Clamping Voltage	V_C			80	V	I_{PP} = 6A (8 x 20μs pulse)
Peak Pulse Current	Ipp			6	A	tp = 8/20μs
Junction Capacitance	C_J			30	pF	VR = 0V, f = 1MHz

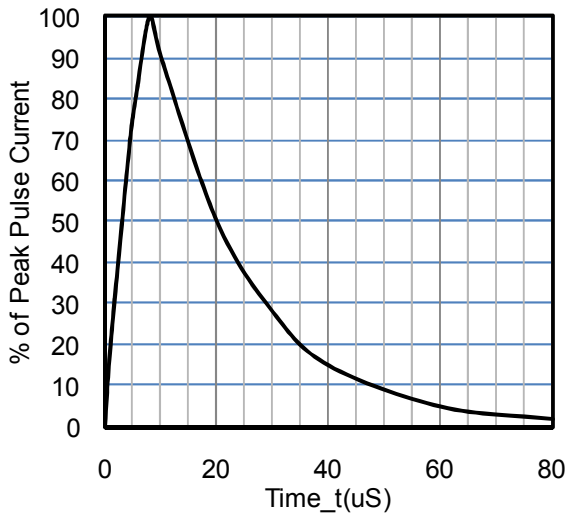
Typical Performance Characteristics (T_A=25°C unless otherwise Specified)



Peak Pulse Power vs. Pulse Time

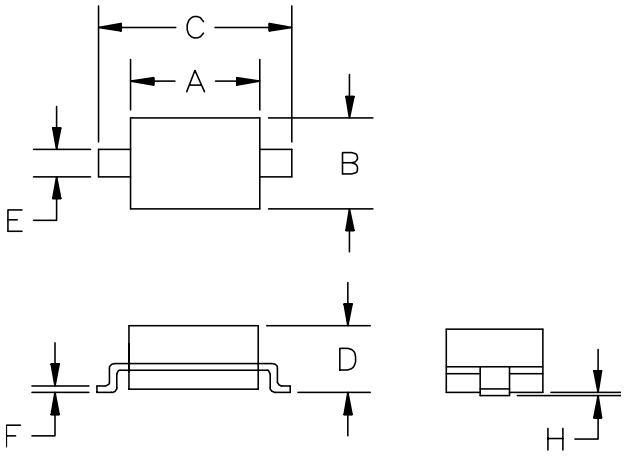


Power Derating Curve



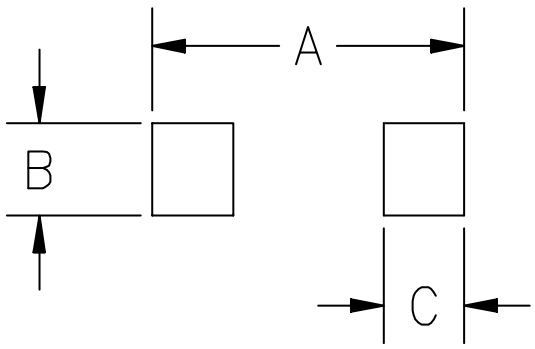
8 X 20uS Pulse Waveform

SOD-323 Package Outline Drawing



SYM	DIMENSIONS			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.50	1.80	0.060	0.071
B	1.20	1.40	0.045	0.054
C	2.30	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