

### Description

The ASDXX 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 ASDXX complies with the IEC 61000-4-2 (ESD) with  $\pm 30\text{kV}$  air and  $\pm 30\text{kV}$  contact discharge. The ASDXX 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, 15V, 24V, 36V, 40V
- Ultra low clamping voltage
- 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

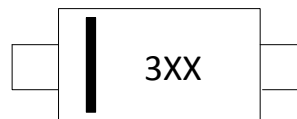
### Mechanical Characteristics

- 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

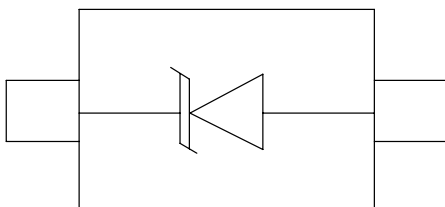
### Marking Information



Bar denotes cathode

Part Number	Marking
ASD33	333
ASD05	305
ASD08	308
ASD12	312
ASD15	315
ASD24	324
ASD36	336
ASD40	340

### Dimensions and Pin Configuration



SOD-323

### Ordering Information

Part Number	Packaging	Reel Size
ASD33	3000/Tape & Reel	7 inch
ASD05	3000/Tape & Reel	7 inch
ASD08	3000/Tape & Reel	7 inch
ASD12	3000/Tape & Reel	7 inch
ASD15	3000/Tape & Reel	7 inch
ASD24	3000/Tape & Reel	7 inch
ASD36	3000/Tape & Reel	7 inch
ASD40	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 $\mu\text{s}$ )	Ppk	500	W
ESD per IEC 61000-4-2 (Air)	VESD	$\pm 30$	kV
ESD per IEC 61000-4-2 (Contact)		$\pm 30$	
Operating Temperature Range	TJ	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	Tstg	-55 to +150	$^{\circ}\text{C}$

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

ASD33						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	VRWM			3.3	V	
Breakdown Voltage	VBR	3.8			V	$I_T = 1\text{mA}$
Reverse Leakage Current	$I_R$			0.2	$\mu\text{A}$	VRWM = 3.3V
Forward Voltage	VF		0.8	1.2	V	$I_F = 10\text{mA}$
Clamping Voltage	VC			5	V	$I_{PP} = 1\text{A}$ (8 x 20 $\mu\text{s}$ pulse)
Clamping Voltage	VC			12.5	V	$I_{PP} = 40\text{A}$ (8 x 20 $\mu\text{s}$ pulse)
Peak Pulse Current	Ipp			40	A	$t_p = 8/20\mu\text{s}$
Junction Capacitance	CJ			400	pF	VR = 0V, f = 1MHz

<b>ASD05</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	VRWM			5	V	
Breakdown Voltage	VBR	6			V	IT = 1mA
Reverse Leakage Current	IR			0.2	µA	VRWM = 5V
Forward Voltage	VF		0.8	1.2	V	IF = 10mA
Clamping Voltage	VC			9.5	V	I <sub>PP</sub> = 5A (8 x 20µs pulse)
Clamping Voltage	VC			14	V	I <sub>PP</sub> = 36A (8 x 20µs pulse)
Peak Pulse Current	I <sub>pp</sub>			34	A	tp = 8/20µs
Junction Capacitance	CJ			300	pF	VR = 0V, f = 1MHz

<b>ASD08</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	VRWM			8	V	
Breakdown Voltage	VBR	8.5			V	IT = 1mA
Reverse Leakage Current	IR			0.2	µA	VRWM = 9V
Forward Voltage	VF		0.8	1.2	V	IF = 10mA
Clamping Voltage	VC			12	V	I <sub>PP</sub> = 5A (8 x 20µs pulse)
Clamping Voltage	VC			18	V	I <sub>PP</sub> = 28A (8 x 20µs pulse)
Peak Pulse Current	I <sub>pp</sub>			34	A	tp = 8/20µs
Junction Capacitance	CJ			250	pF	VR = 0V, f = 1MHz

<b>ASD12</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	VRWM			12	V	
Breakdown Voltage	VBR	13.3			V	IT = 1mA
Reverse Leakage Current	IR			0.2	μA	VRWM = 12V
Forward Voltage	VF		0.8	1.2	V	IF = 10mA
Clamping Voltage	VC			19	V	I <sub>PP</sub> = 5A (8 x 20μs pulse)
Clamping Voltage	VC			25	V	I <sub>PP</sub> = 20A (8 x 20μs pulse)
Peak Pulse Current	I <sub>pp</sub>			20	A	t <sub>p</sub> = 8/20μs
Junction Capacitance	C <sub>J</sub>			150	pF	VR = 0V, f = 1MHz

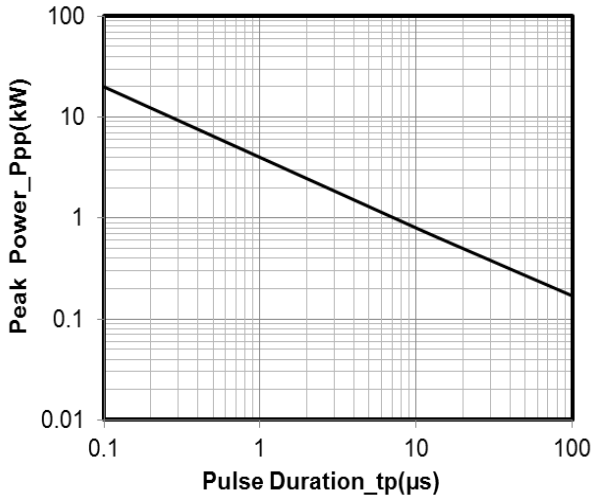
<b>ASD15</b>						
<b>Parameter</b>	<b>Symbol</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>	<b>Unit</b>	<b>Test Condition</b>
Reverse Working Voltage	VRWM			15	V	
Breakdown Voltage	VBR	16.8			V	IT = 1mA
Reverse Leakage Current	IR			0.2	μA	VRWM = 15V
Forward Voltage	VF		0.8	1.2	V	IF = 10mA
Clamping Voltage	VC			20	V	I <sub>PP</sub> = 1A (8 x 20μs pulse)
Clamping Voltage	VC			30	V	I <sub>PP</sub> = 17A (8 x 20μs pulse)
Peak Pulse Current	I <sub>pp</sub>			17	A	t <sub>p</sub> = 8/20μs
Junction Capacitance	C <sub>J</sub>			120	pF	VR = 0V, f = 1MHz

<b>ASD24</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	VRWM			24	V	
Breakdown Voltage	VBR	27			V	IT = 1mA
Reverse Leakage Current	IR			0.2	μA	VRWM = 24V
Forward Voltage	VF		0.8	1.2	V	IF = 10mA
Clamping Voltage	VC			40	V	I <sub>PP</sub> = 1A (8 x 20μs pulse)
Clamping Voltage	VC			50	V	I <sub>PP</sub> = 10A (8 x 20μs pulse)
Peak Pulse Current	I <sub>pp</sub>			10	A	tp = 8/20μs
Junction Capacitance	CJ			100	pF	VR = 0V, f = 1MHz

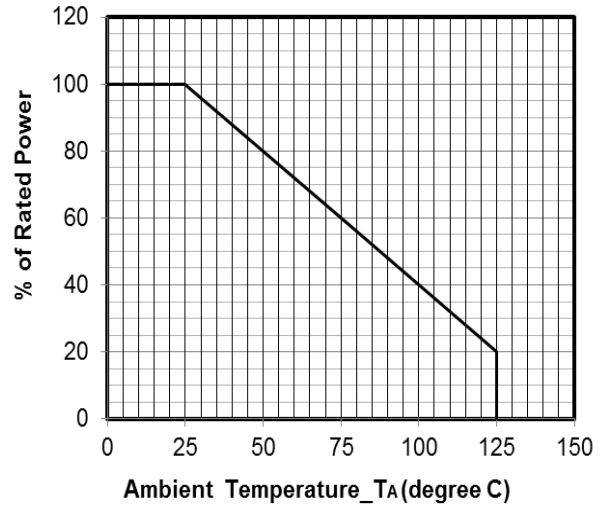
<b>ASD36</b>						
<b>Parameter</b>	<b>Symbol</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>	<b>Unit</b>	<b>Test Condition</b>
Reverse Working Voltage	VRWM			36	V	
Breakdown Voltage	VBR	38			V	IT = 1mA
Reverse Leakage Current	IR			0.2	μA	VRWM = 36V
Forward Voltage	VF		0.8	1.2	V	IF = 10mA
Clamping Voltage	VC			45	V	I <sub>PP</sub> = 1A (8 x 20μs pulse)
Peak Pulse Current	I <sub>pp</sub>			8	A	tp = 8/20μs
Junction Capacitance	CJ			70	pF	VR = 0V, f = 1MHz

<b>ASD40</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	VRWM			40	V	
Breakdown Voltage	VBR	44			V	IT = 1mA
Reverse Leakage Current	IR			0.2	μA	VRWM = 40V
Forward Voltage	VF		0.8	1.2	V	IF = 10mA
Clamping Voltage	VC			50	V	I <sub>PP</sub> = 1A (8 x 20μs pulse)
Peak Pulse Current	I <sub>pp</sub>			6	A	t <sub>p</sub> = 8/20μs
Junction Capacitance	CJ			40	pF	VR = 0V, f = 1MHz

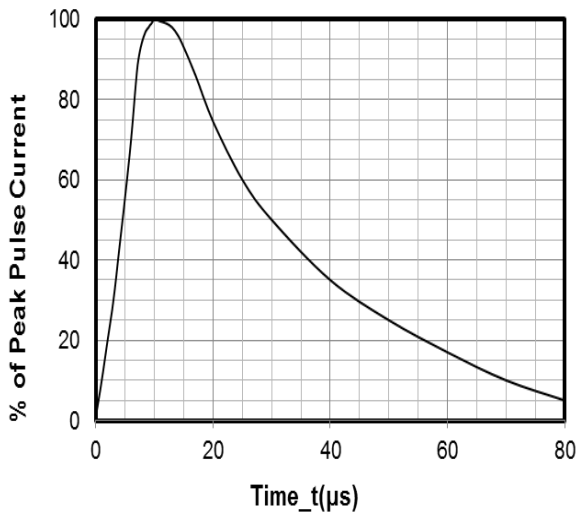
**Typical Performance Characteristics ( $T_A=25^\circ\text{C}$  unless otherwise Specified)**



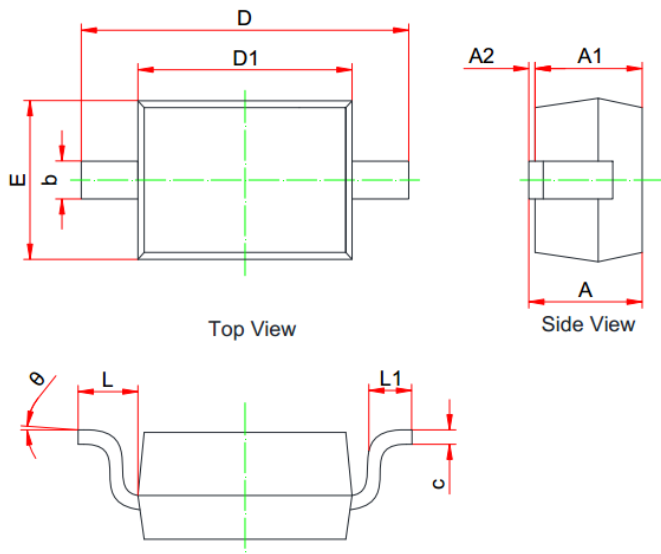
**Peak Pulse Power vs. Pulse Time**



**Power Derating Curve**



**8 X 20μs Pulse Waveform**

**SOD-323 Package Outline Drawing**


	MILLIMETERS		
	MIN	NOM	MAX
A	0.800	--	1.100
A1	0.800	--	0.900
A2	0.000	--	0.100
b	0.250	--	0.400
c	0.080	--	0.177
D1	1.600	1.700	1.800
D	2.300	--	2.800
E	1.150	--	1.400
L	0.475REF		
L1	0.100	--	0.500
Θ	0°	--	8°

**Suggested Land Pattern**

**Unit: mm**
**Contact Information**

Applied Power Microelectronics Co., Ltd.

 Website: <http://www.appliedpowermicro.com>

 Email: [sales@appliedpowermicro.com](mailto:sales@appliedpowermicro.com)

Phone: +86 (0519) 8399 3606