

### Description

The ASLXX is a low capacitance TVS diode array, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting sensitive semiconductor components from damage. The ASLXX complies with the IEC 61000-4-2 (ESD) with  $\pm 30\text{kV}$  air and  $\pm 30\text{kV}$  contact discharge. It is assembled into a lead-free SOT-23 package. It is designed to protect components which are connected to high speed interfaces and transmission lines from voltage surges.

### Features

- 300W peak pulse power (8/20 $\mu\text{s}$ )
- Two devices protect one line
- Ultra low leakage: nA level
- Operating voltage: 5V, 12V, 24V, 36V
- Low capacitance for high-speed data line
- 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

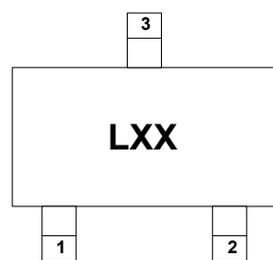
- Package: SOT-23
- Lead Finish: Matte Tin
- Case Material: "Green" Molding Compound.
- Terminal Connections: See Diagram Below
- Marking Information: See Below

### Applications

- Cellular Handsets and Accessories
- Notebooks and Handhelds
- Portable Instrumentation
- Set Top Box
- Industrial Controls
- Server and Desktop PC
- High-Speed data line
- LAN/WAN equipment

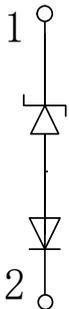
### Marking Information

LXX = Device Marking

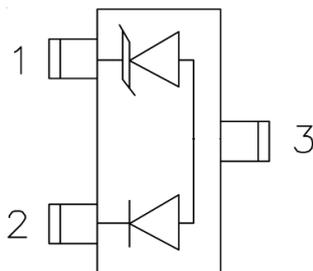


Part Number	Marking
ASL05	L05
ASL12	L12
ASL24	L24
ASL36	L36

### Dimensions and Pin Configuration



Circuit Diagram



Pin Schematic

### Ordering Information

Part Number	Packaging	Reel Size
ASL05	3000/Tape & Reel	7 inch
ASL12	3000/Tape & Reel	7 inch
ASL24	3000/Tape & Reel	7 inch
ASL36	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	300	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)**

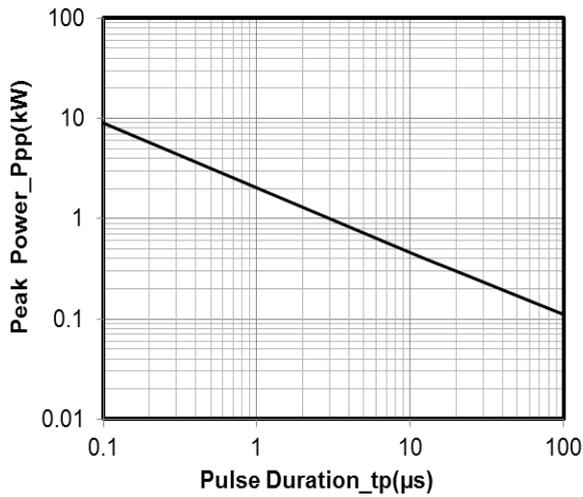
ASL05						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	VRWM			5	V	
Breakdown Voltage	VBR	6			V	$I_T = 1\text{mA}$
Reverse Leakage Current	$I_R$			0.5	$\mu\text{A}$	VRWM = 5V
Clamping Voltage	VC			9.8	V	IPP = 1A (8 x 20 $\mu\text{s}$ pulse)
Clamping Voltage	VC			11	V	IPP = 5A (8 x 20 $\mu\text{s}$ pulse)
Peak Pulse Current	IPP			17	A	$t_p = 8/20\mu\text{s}$
Junction Capacitance	CJ			5	pF	VR = 0V, f = 1MHz, Pin 1 to Pin 2

<b>ASL12</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			0.5	μA	VRWM = 12V
Clamping Voltage	VC			19	V	I <sub>PP</sub> = 1A (8 x 20μs pulse)
Clamping Voltage	VC			24	V	I <sub>PP</sub> = 5A (8 x 20μs pulse)
Peak Pulse Current	I <sub>PP</sub>			12	A	t <sub>p</sub> = 8/20μs
Junction Capacitance	C <sub>J</sub>			5	pF	VR = 0V, f = 1MHz, Pin 1 to Pin 2

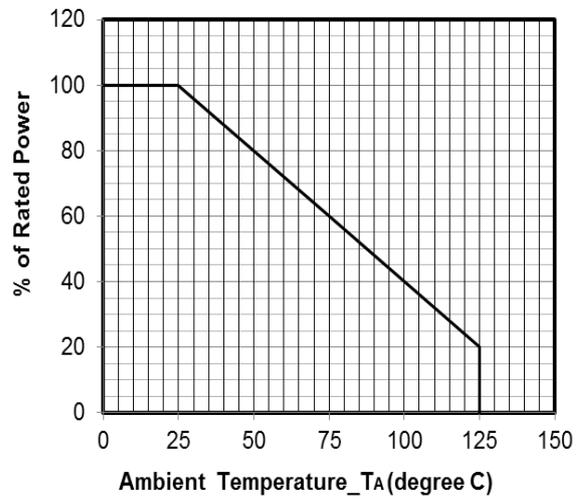
<b>ASL24</b>						
<b>Parameter</b>	<b>Symbol</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>	<b>Unit</b>	<b>Test Condition</b>
Reverse Working Voltage	VRWM			24	V	
Breakdown Voltage	VBR	27			V	IT = 1mA
Reverse Leakage Current	IR			0.5	μA	VRWM = 24V
Clamping Voltage	VC			40	V	I <sub>PP</sub> = 1A (8 x 20μs pulse)
Clamping Voltage	VC			60	V	I <sub>PP</sub> = 5A (8 x 20μs pulse)
Peak Pulse Current	I <sub>PP</sub>			5	A	t <sub>p</sub> = 8/20μs
Junction Capacitance	C <sub>J</sub>			5	pF	VR = 0V, f = 1MHz, Pin 1 to Pin 2

<b>ASL36</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			0.5	μA	VRWM = 36V
Clamping Voltage	VC			50	V	I <sub>PP</sub> = 1A (8 x 20μs pulse)
Clamping Voltage	VC			75	V	I <sub>PP</sub> = 4A (8 x 20μs pulse)
Peak Pulse Current	I <sub>PP</sub>			4	A	t <sub>p</sub> = 8/20μs
Junction Capacitance	C <sub>J</sub>			5	pF	VR = 0V, f = 1MHz, Pin 1 to Pin 2

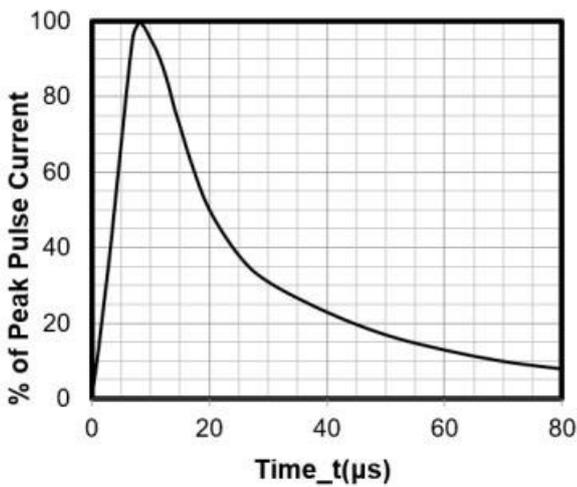
**Typical Performance Characteristics ( $T_A=25^\circ\text{C}$  unless otherwise Specified)**



**Peak Pulse Power vs. Pulse Time**



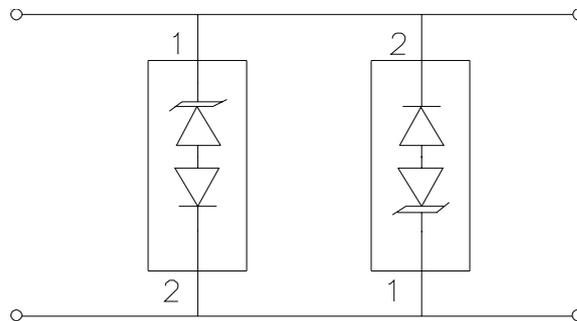
**Power Derating Curve**



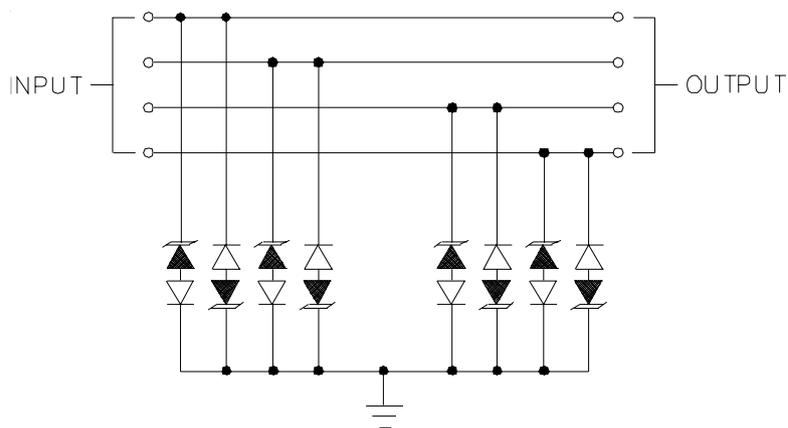
**8 X 20μs Pulse Waveform**

**Device Connection for Protection of One High-Speed Data Line**

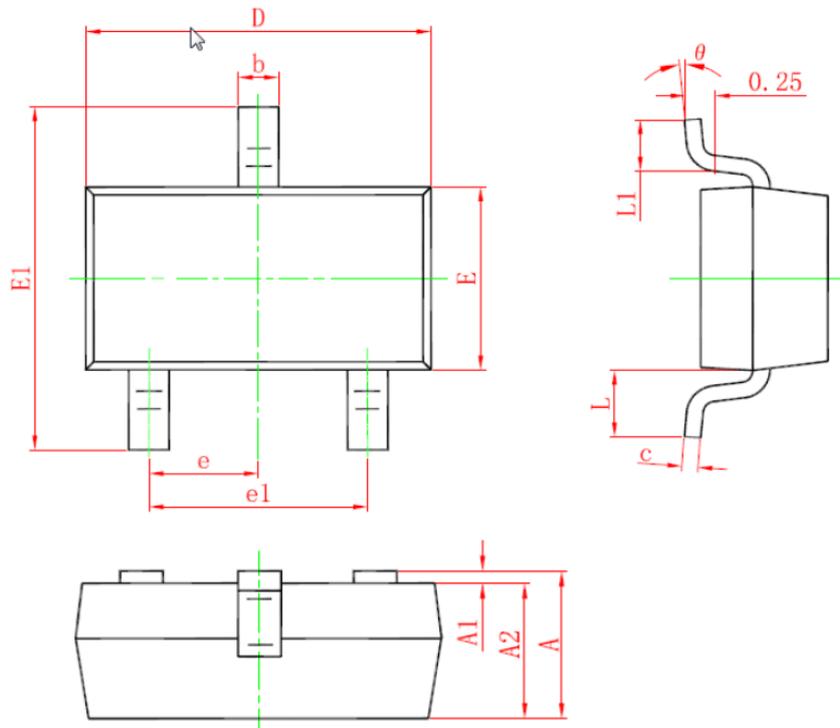
The ASL series devices are designed to protect high speed data lines. The ASLXX utilizes a low capacitance compensation diode in series with, but in opposite polarity to a TVS diode in each line to achieve an effective capacitance of less than 5pF per device. During a transient event, the internal rectifier must be forward biased (TVS is reversed biased). Therefore, each device will only suppress transient events in one polarity. To achieve protection in both positive and negative polarity, a second device is connected in anti-parallel to the first.



**Two Devices : Bidirectional or Unidirectional Line**

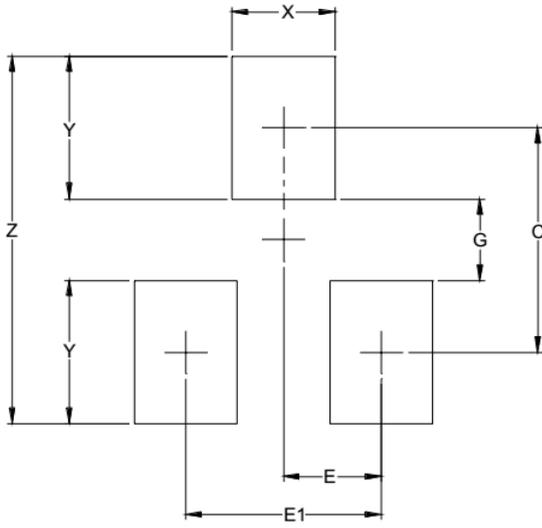


**I/O Line Protection**

**SOT-23 Package Outline Drawing**


SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	--	1.15	0.035	--	0.045
A1	0.00	--	0.10	0.000	--	0.004
A2	0.90	--	1.05	0.035	--	0.041
b	0.30	--	0.50	0.012	--	0.020
c	0.08	--	0.15	0.003	--	0.006
D	2.80	--	3.00	0.110	--	0.118
E	1.20	--	1.40	0.047	--	0.055
E1	2.25	--	2.55	0.089		0.100
e	0.95TYP			0.037TYP		
e1	1.80	--	2.00	0.071	--	0.079
L	0.55REF			0.022REF		
L1	0.30	--	0.50	0.012	--	0.020
$\theta$	0°	--	8°	0°	--	8°

### Suggested Land Pattern



SYM	DIMENSIONS	
	INCHES	MILLIMETERS
C	(.087)	(2.20)
E	.037	0.95
E1	.075	1.90
G	.031	0.80
X	.039	1.00
Y	.055	1.40
Z	.141	3.60

### Contact Information

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日期	版本号	描述	页码
2018.11.05	1.0	原版	
2019.01.08	2.0	更改了原理图，PIN 3从NC变为有电气连接	1, 5