Description

The DLSLxx 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 DLSLxx complies with the IEC 61000-4-2 (ESD) standard with ±30kV air and ±30kV 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(8/20μs)
- Two devices protect one line
- Ultra low leakage：nA level
- Operating voltage：3.3V,5V,12V, 15V,24V,36V
- 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

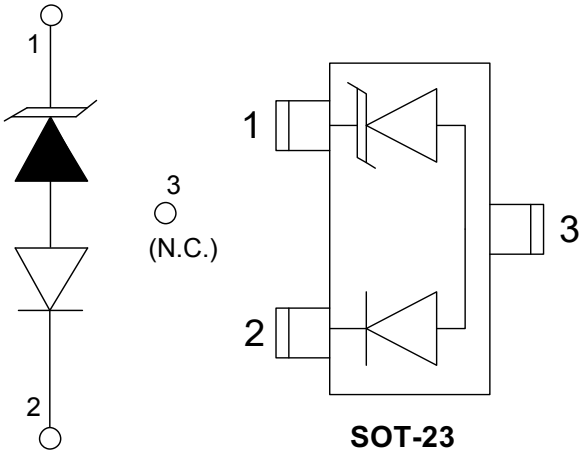
Mechanical Characteristics

- Package: SOT-23
- 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

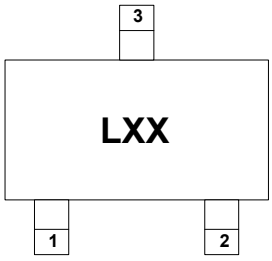
- Cellular Handsets and Accessories
- Notebooks and Handhelds
- Portable Instrumentation
- Set Top Box
- Industrial Controls
- Server and Desktop PC
- High-Speed data line
- LAN/WAN equipment

Dimensions and Pin Configuration



Circuit Diagram　　Pin Schematic

Marking Information



Lxx：Device Marking Code

Ordering Information

Part Number	Marking	Packaging	Reel Size
DLSLxx	Lxx	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	300	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)

DLSL03 (Marking Code: L03)						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			3.3	V	
Breakdown Voltage	V_{BR}	4			V	I_T = 1mA
Reverse Leakage Current	I_R			1.0	uA	V_{RWM} = 3.3V
Clamping Voltage	V_C			7.8	V	I_{PP} = 1A (8 x 20μs pulse)
Clamping Voltage	V_C			9	V	I_{PP} = 5A (8 x 20μs pulse)
Peak Pulse Current	I_{PP}			20	A	t_p = 8/20μs
Junction Capacitance	C_J			5	pF	VR = 0V, f = 1MHz, Pin 1 to Pin 2

DLSL05 (Marking Code: L05)						
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			1.0	uA	V_{RWM} = 5V
Clamping Voltage	V_C			9.8	V	I_{PP} = 1A (8 x 20μs pulse)
Clamping Voltage	V_C			11	V	I_{PP} = 5A (8 x 20μs pulse)
Peak Pulse Current	I_{PP}			17	A	t_p = 8/20μs
Junction Capacitance	C_J			5	pF	VR = 0V, f = 1MHz, Pin 1 to Pin 2

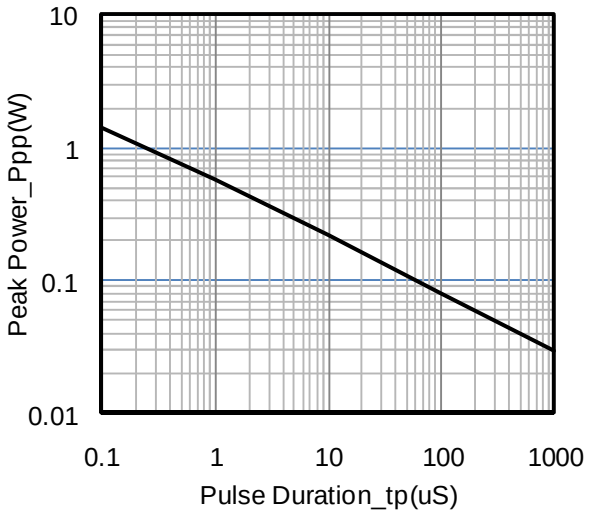
DLSL12 (Marking Code: L12)						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			12	V	
Breakdown Voltage	V_{BR}	13.3			V	I_T = 1mA
Reverse Leakage Current	I_R			0.5	uA	V_{RWM} = 12V
Clamping Voltage	V_C			19	V	I_{PP} = 1A (8 x 20μs pulse)
Clamping Voltage	V_C			24	V	I_{PP} = 5A (8 x 20μs pulse)
Peak Pulse Current	I_{PP}			12	A	t_p = 8/20μs
Junction Capacitance	C_J			5	pF	VR = 0V, f = 1MHz, Pin 1 to Pin 2

DLSL15 (Marking Code: L15)						
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			0.5	uA	V_{RWM} = 15V
Clamping Voltage	V_C			22	V	I_{PP} = 1A (8 x 20μs pulse)
Clamping Voltage	V_C			27	V	I_{PP} = 5A (8 x 20μs pulse)
Peak Pulse Current	I_{PP}			10	A	t_p = 8/20μs
Junction Capacitance	C_J			5	pF	VR = 0V, f = 1MHz, Pin 1 to Pin 2

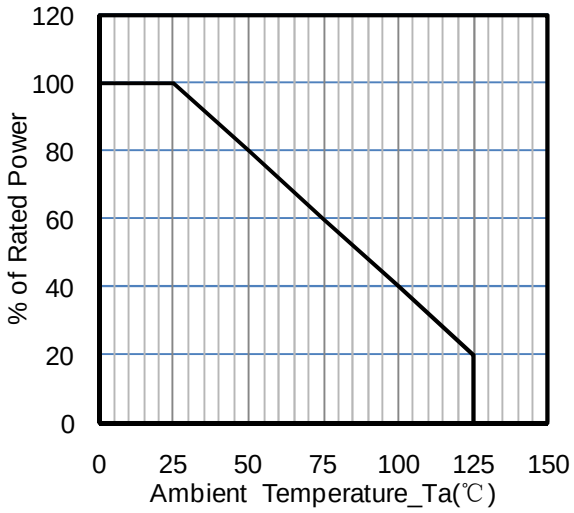
DLSL24 (Marking Code: L24)						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			24	V	
Breakdown Voltage	V_{BR}	27			V	I_T = 1mA
Reverse Leakage Current	I_R			0.5	uA	V_{RWM} = 24V
Clamping Voltage	V_C			40	V	I_{PP} = 1A (8 x 20μs pulse)
Clamping Voltage	V_C			55	V	I_{PP} = 5A (8 x 20μs pulse)
Peak Pulse Current	I_{PP}			5	A	t_p = 8/20μs
Junction Capacitance	C_J			5	pF	VR = 0V, f = 1MHz, Pin 1 to Pin 2

DLSL36 (Marking Code: L36)						
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	uA	V_{RWM} = 36V
Clamping Voltage	V_C			50	V	I_{PP} = 1A (8 x 20μs pulse)
Peak Pulse Current	I_{PP}			4	A	t_p = 8/20μs
Junction Capacitance	C_J			5	pF	VR = 0V, f = 1MHz, Pin 1 to Pin 2

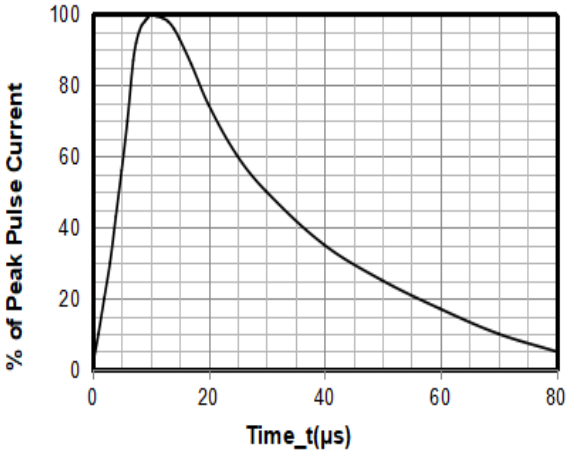
Typical Performance Characteristics (T_A=25℃ unless otherwise Specified)



Peak Pulse Power vs. Pulse Time



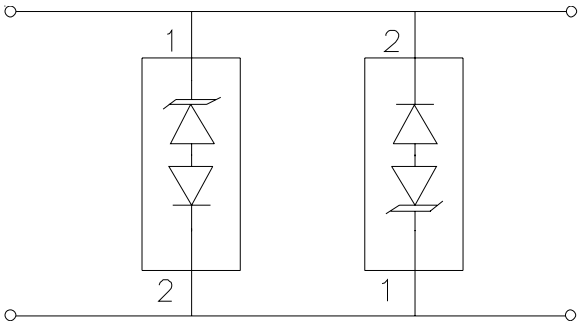
Power Derating Curve



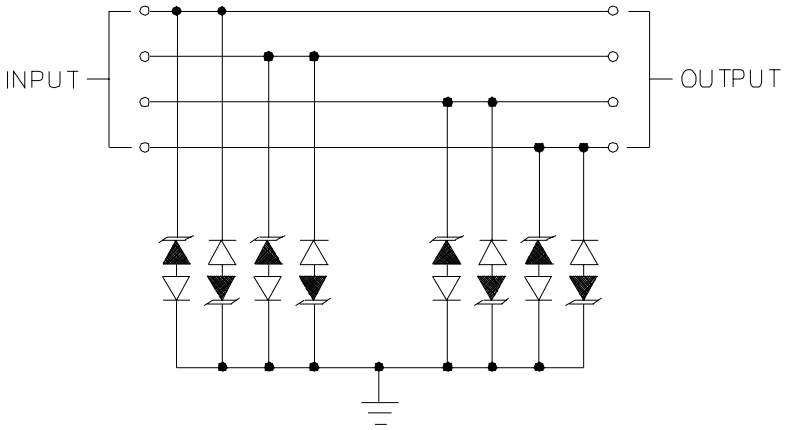
8 X 20us Pulse Waveform

Device Connection for Protection of One High-Speed Data Line

The DLSL series devices are designed to protect high speed data lines. The DLSLxx 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.

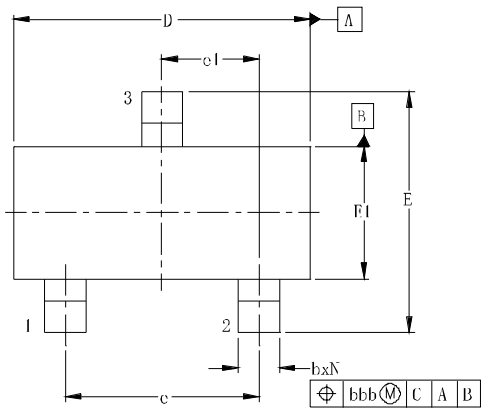


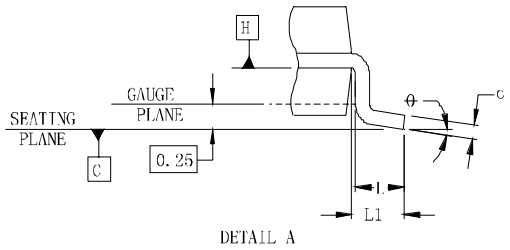
Two Devices : Bidirectional or Unidirectional Line

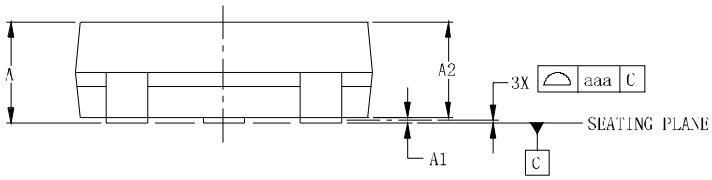


I/O Line Protection

SOT-23 Package Outline Drawing

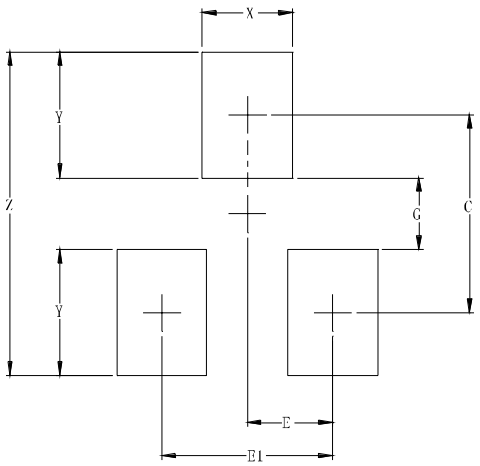






DIMENSIONS						
SYM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.035	-	0.044	0.89	-	1.12
A1	0.000	-	0.004	0.01	-	0.10
A2	0.035	0.037	0.040	0.88	0.95	1.02
b	0.012	-	0.020	0.30	-	0.51
c	0.003	-	0.007	0.08	-	0.18
D	0.110	0.114	0.120	2.80	2.90	3.04
E	0.082	0.093	0.104	2.10	2.37	2.64
E1	0.047	0.051	0.055	1.20	1.30	1.40
e	0.075			1.90BSC		
e1	0.037			0.95BSC		
L	0.015	0.020	0.024	0.40	0.50	0.60
L1	0.022			0.55		
N	3			3		
θ	0°	-	8°	0°	-	8°
aaa	0.004			0.10		
bbb	0.008			0.20		

Suggested Land Pattern



DIMENSIONS		
SYM	INCHES	MILLIMETERS
C	0.087	2.20
E	0.037	0.95
E1	0.075	1.90
G	0.031	0.80
X	0.039	1.00
Y	0.055	1.40
Z	0.141	3.60

Contact Information

Changzhou D-first Electronics CO.,Ltd.
www.first-electronic.com
Email: xhf@first-electronic.cn
Phone: +86（0519）8817 1671