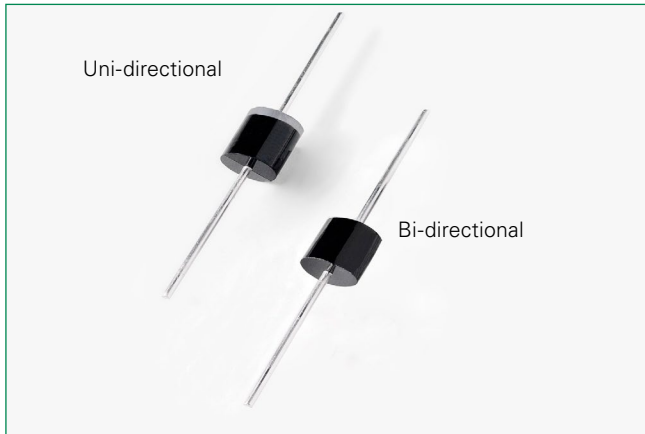


SLD Series

Axial Leaded - 2200W



Web Resources



Download ECAD models, order samples, and find technical resources at www.littelfuse.com/sld

Agency Approvals

Agency	Agency File Number
	E230531

Maximum Ratings and Thermal Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation 10ms x 150ms Test Waveform	P_{PPM}	2200	W
Peak Pulse Power Dissipation 10μs x 1000μs Test Waveform	P_{PPM}	5000	W
Steady State Power Dissipation on Infinite Heat Sink at $T_L = 75^\circ\text{C}$ (Fig. 6)	P_D	8.0	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 3)	I_{FSM}	600	A
Maximum Instantaneous Forward Voltage at 100A for Unidirectional Only	V_F	3.5	V
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 175	$^\circ\text{C}$
Typical Thermal Resistance Junction to Lead	R_{JL}	8.0	$^\circ\text{C/W}$
Typical Thermal Resistance Junction to Ambient	R_{JA}	40	$^\circ\text{C/W}$

Description

The AEC-Q101 qualified SLD Series is packaged in a highly reliable industry standard P600 axial leaded package and is designed to provide precision overvoltage protection for sensitive electronics.

Features & Benefits

- High reliability application and automotive grade AEC-Q101 qualified with $T_J 175^\circ\text{C}$
- $V_{BR} @ T_J = V_{BR} @ 25^\circ\text{C} \times (1 + \alpha_T \times (T_J - 25))$ (α_T : Temperature Coefficient, typical value is 0.1%)
- Glass passivated chip junction in P600 package
- Meets ISO7637 and ISO16750 load dump test; 2200W peak pulse capability at 10μs x 150ms waveform, repetition rate (duty cycles): 0.01%
- Fast response time: typically less than 1.0ps from 0 Volts to $V_{BR \min}$
- Excellent clamping capability
- Typical failure mode is short from over-specified voltage or current
- Whisker test is conducted based on JEDEC JESD201A per its table 4a and 4c
- IEC-61000-4-2 ESD 30kV(Air), 30kV (Contact)
- ESD protection of data lines in accordance with IEC 61000-4-2
- EFT protection of data lines in accordance with IEC 61000-4-4
- Low incremental surge resistance
- High temperature to reflow soldering guaranteed: $260^\circ\text{C}/10\text{sec} / 0.375"$ (9.5mm) lead length, 5 lbs., (2.3kg) tension
- UL Recognized case material meeting flammability rating V-0.
- Matte tin lead-free plated
- Halogen free and RoHS compliant
- Pb-free E3 means 2nd level interconnect is Pb-free and the terminal finish material is tin(Sn) (IPC/JEDEC J-STD-609A.01)

Applications

Designed to protect sensitive electronics from:

- Inductive Load Switching
- Alternator Load Dump

Functional Diagram



Bi-directional




Uni-directional

SLD Series

Axial Leaded - 2200W

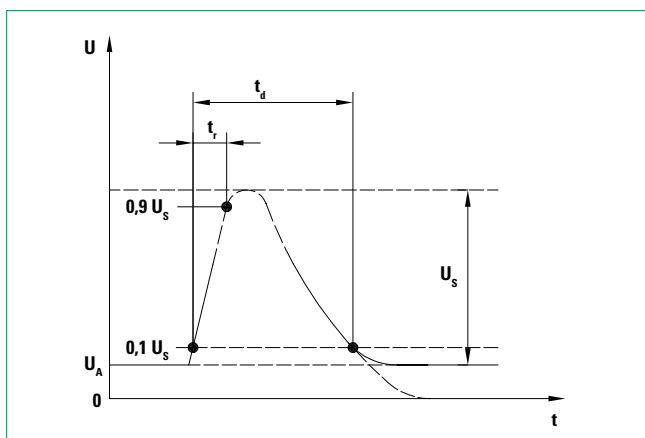
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Part Number (Uni)	Part Number (Bi)	Breakdown Voltage V_{BR} @ I_T (V)		Test Current I_T (mA)	Reverse Stand off Voltage V_R (Volts)	Maximum Reverse Leakage @ V_R I_R (μA)	Maximum Peak Pulse Current I_{PP} (A)	Maximum Clamping Voltage @ I_{PP} V_C (V)	Agency Approval 
		MIN	MAX						
SLD10U-017	SLD10-018	11.8	13.0	5.0	10	10	300.0	17.0	x
SLD11U-017	SLD11-018	12.2	13.5	5.0	11	10	280.2	18.2	x
SLD12U-017	SLD12-018	13.3	14.7	5.0	12	10	256.3	19.9	x
SLD13U-017	SLD13-018	14.4	15.9	5.0	13	10	237.2	21.5	x
SLD14U-017	SLD14-018	15.6	17.2	5.0	14	10	219.8	23.2	x
SLD15U-017	SLD15-018	16.7	18.5	5.0	15	10	209.0	24.4	x
SLD16U-017	SLD16-018	18.0	19.3	5.0	16	10	196.2	26.0	x
SLD17U-017	SLD17-018	18.9	20.9	5.0	17	10	184.8	27.6	x
SLD18U-017	SLD18-018	20.0	22.1	5.0	18	10	174.7	29.2	x
SLD20U-017	SLD20-018	22.2	24.5	5.0	20	10	157.4	32.4	x
SLD22U-017	SLD22-018	24.4	26.9	5.0	22	10	143.7	35.5	x
SLD24U-017	SLD24-018	26.7	29.5	5.0	24	10	131.1	38.9	x
SLD26U-017	SLD26-018	28.9	31.9	5.0	26	10	121.1	42.1	x
SLD28U-017	SLD28-018	31.1	34.4	5.0	28	10	112.3	45.4	x
SLD30U-017	SLD30-018	33.3	36.8	5.0	30	10	105.4	48.4	x
SLD33U-017	SLD33-018	36.7	40.6	5.0	33	10	95.7	53.3	x
SLD36U-017	SLD36-018	40.0	44.2	5.0	36	10	87.8	58.1	x
SLD40U-017	SLD40-018	44.4	49.1	5.0	40	10	79.1	64.5	x
SLD43U-017	SLD43-018	49.0	54.2	5.0	43	10	73.5	69.4	x
SLD45U-017	SLD45-018	50.0	55.3	5.0	45	10	70.2	72.7	x
SLD48U-017	SLD48-018	53.3	58.9	5.0	48	10	65.9	77.4	x
SLD51U-017	SLD51-018	56.7	62.7	5.0	51	10	61.9	82.4	x
SLD54U-017	SLD54-018	60.0	66.3	5.0	54	10	58.6	87.1	x
SLD58U-017	SLD58-018	64.4	71.2	5.0	58	10	54.5	93.6	x
SLD60U-017	SLD60-018	68.4	75.6	5.0	60	10	52.7	96.8	x

Notes:

1. VBR measured after I_T applied for 300 μs , I_T = square wave pulse or equivalent.
2. Surge current waveform per 10 μs x 1000 μs exponential wave and derated per Fig. 4.
3. All terms and symbols are consistent with ANSI/IEEE C62.35

Load Dump Test Wave Form



Parameter	12V system	24V system
U_s	65v to 87V	123V to 174V
R_i	0.5 Ω to 4 Ω	1 Ω to 8 Ω
t_d	40 ms to 400 ms	100 ms to 350 ms
t_r	$(10^{-0.5})$ ms	

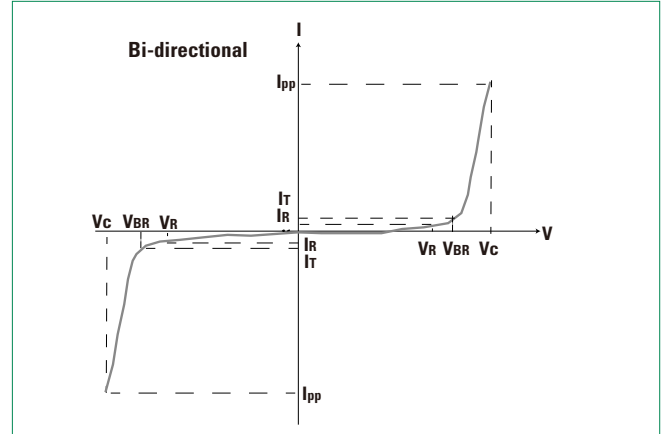
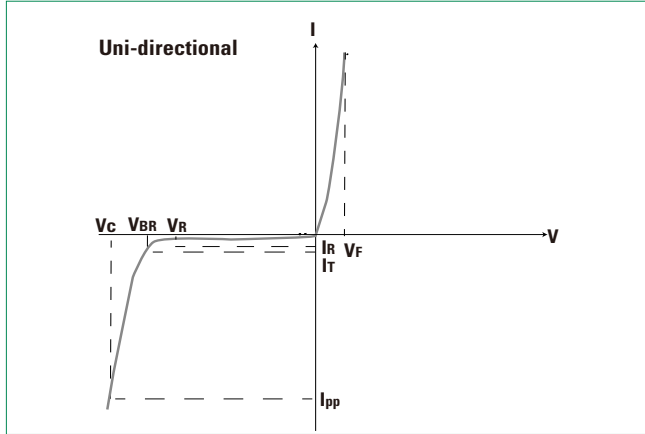
Note

LF use $t_d=400\text{ms}$ for 12V system test; $t_d=350\text{ms}$ for 24V system

SLD Series

Axial Leaded - 2200W

I-V Curve Characteristics



P_{PPM} Peak Pulse Power Dissipation ($I_{PP} \times V_C$) - Max power dissipation
 V_R Stand-off Voltage - Maximum voltage that can be applied to the TVS without operation
 V_{BR} Breakdown Voltage - Maximum voltage that flows through the TVS at a specified test current (I_T)
 V_C Clamping Voltage - Peak voltage measured across the TVS at a specified I_{ppm} (peak impulse current)
 I_R Reverse Leakage Current - Current measured at V_R
 V_F Forward Voltage Drop for Uni-directional

Ratings and Characteristic Curves (TA=25°C unless otherwise noted)

Figure 1 - TVS Transients Clamping Waveform

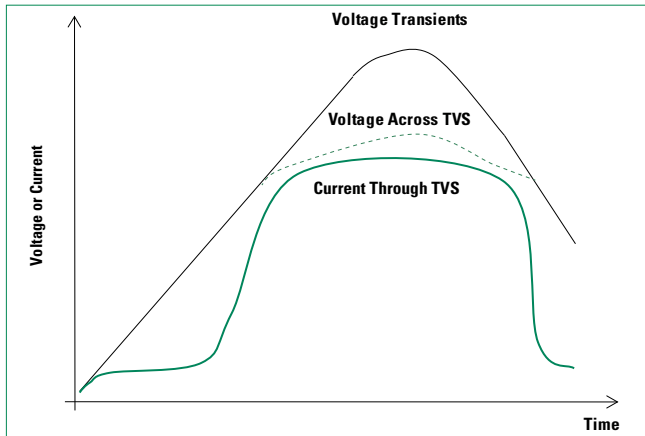


Figure 2 - Peak Pulse Power Rating Curve

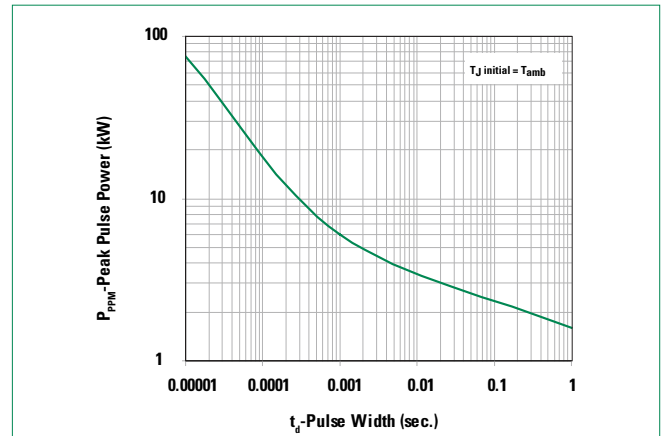


Figure 3 - Peak Pulse Power Derating Curve

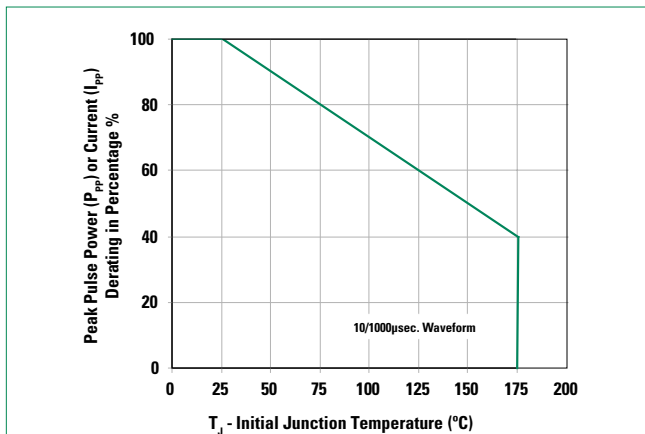
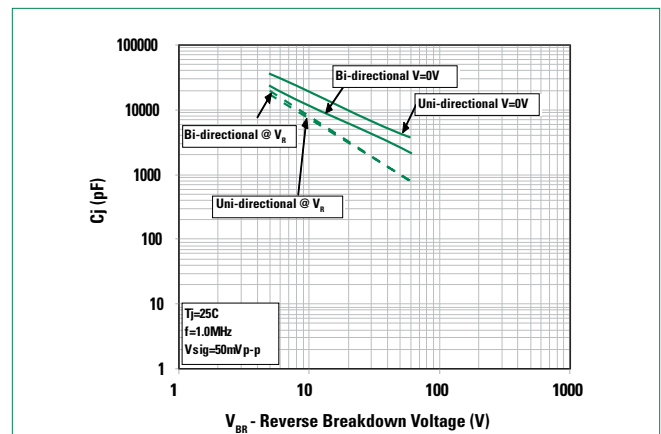


Figure 4 - Typical Junction Capacitance



SLD Series

Axial Leaded - 2200W

Figure 5 - Maximum Non-Repetitive Peak Forward Surge Current

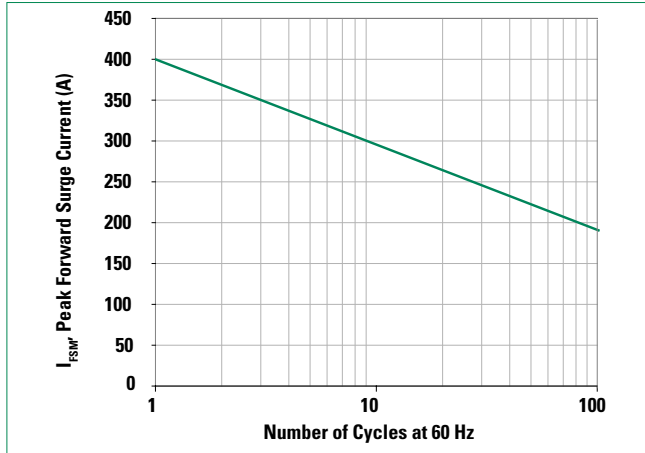
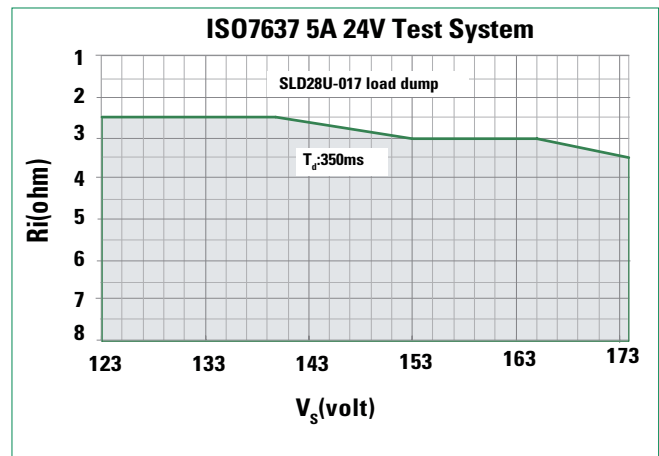
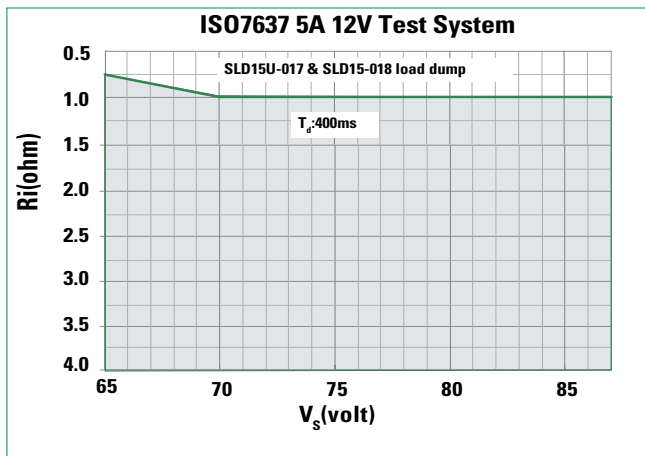


Figure 6 - SOA Chart



Soldering Parameters

Flow/Wave Soldering (Solder Dipping)

Peak Temperature :	265°C
Dipping Time :	10 seconds
Soldering :	1 time

Physical Specifications

Weight	0.07oz., 2.1g
Case	P600 molded plastic body over passivated junction.
Polarity	Color band denotes cathode for unidirectional components
Terminal	Matte Tin axial leads, solderable per JESD22-B102.

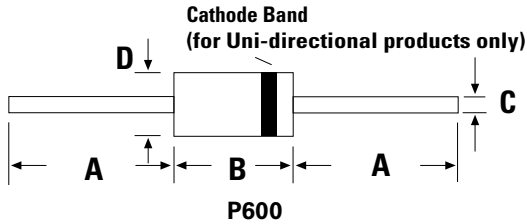
Environmental Specifications

High Temp. Storage	JESD22-A103
HTRB	JESD22-A108
Temperature Cycling	JESD22-A104
H3TRB	JESD22-A101
RSH	JESD22-B106

SLD Series

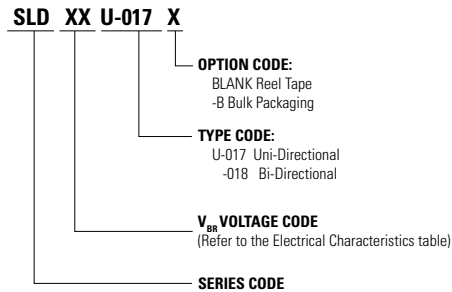
Axial Leaded - 2200W

Dimensions

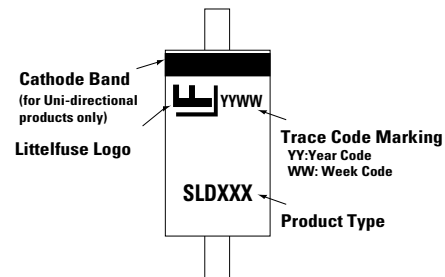


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	1.000	-	25.40	-
B	0.340	0.360	8.60	9.10
C	0.048	0.054	1.22	1.36
D	0.340	0.360	8.60	9.10

Part Numbering System



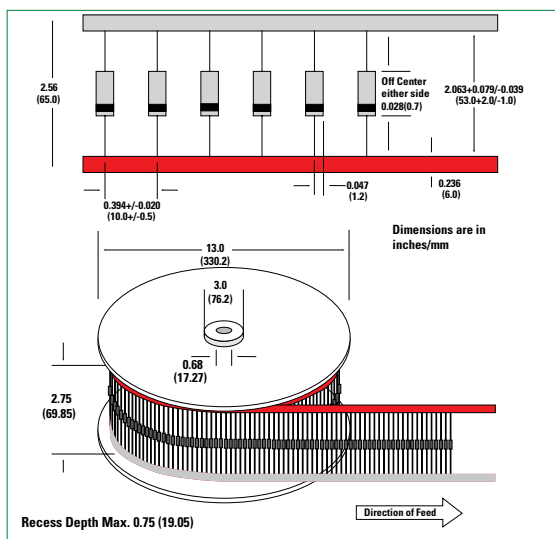
Part Marking System



Packing Options

Part Number	Component Package	Quantity	Packaging Option	Packaging Specification
SLDxxXXX	P600	800	Tape & Reel	EIA STD RS-296
SLDxxXX-B	P600	100	BOX	Littelfuse Spec.

Tape and Reel Specification



Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at <http://www.littelfuse.com/disclaimer-electronics>.