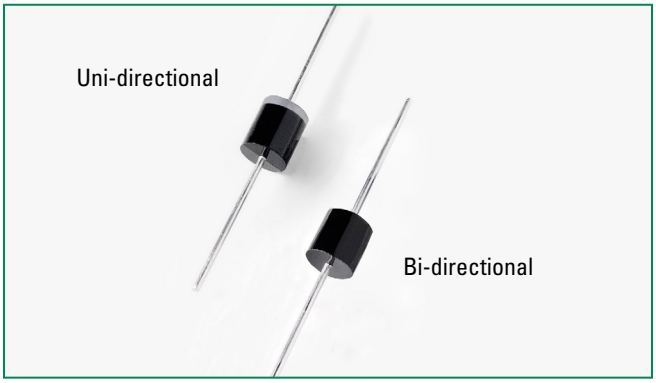
Transient Voltage Suppression Diodes
Axial Leaded – 2200W > SLD series

Littelfuse
Expertise Applied | Answers Delivered

SLD Series

HF RoHS



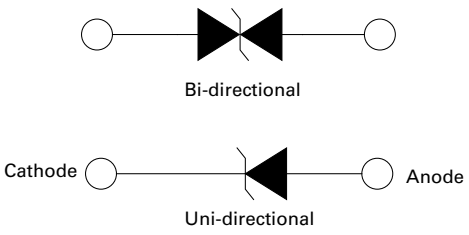
Agency Approvals

AGENCY	AGENCY FILE NUMBER
®	E230531

Maximum Ratings and Thermal Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation 1. 10ms × 150ms Test Waveform	P_{PPM}	2200	W
2. 8/20µs Test Waveform		50000	W
Steady State Power Dissipation on Inifinite Heat Sink at T_L=75°C (Fig. 6)	$P_{M(AV)}$	8.0	W
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 150	°C
Typical Thermal Resistance Junction to Lead	R_{uJL}	8.0	°C/W
Typical Thermal Resistance Junction to Ambient	R_{uJA}	40	°C/W

Functional Diagram



Description

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

Features

- V_{BR} @T_J= V_{BR}@25°C × (1+αT x (T_J - 25))
  (αT: Temperature Coefficient)
- Glass passivated chip junction in P600 package
- ISO 7637-2 Level 4 Impulse 5a; 2200W peak pulse capability at 10ms × 150ms waveform, repetition rate (duty cycles): 0.01 %
- Fast response time: typically less than 1.0ps from 0 Volts to BV 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 15kV(Air), 8kV (Contact)
- ESD protection of data lines in accordance with IEC 61000-4-2 (IEC801-2)
- EFT protection of data lines in accordance with IEC 61000-4-4 (IEC801-4)
- Low incremental surge resistance
- High temperature soldering guaranteed: 260°C/40 seconds / 0.375",(9.5mm) lead length, 5 lbs., (2.3kg) tension
- Plastic package has underwriters laboratory flammability classification 94V-O
- Matte tin lead–free plated
- Halogen free and RoHS compliant

Applications

Designed to protect sensitive electronics from:

- Inductive Load Switching
- Alternator Load Dump

Additional Information

Datasheet | **Resources** | **Samples**

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Transient Voltage Suppression Diodes

Axial Leaded – 2200W > SLD series

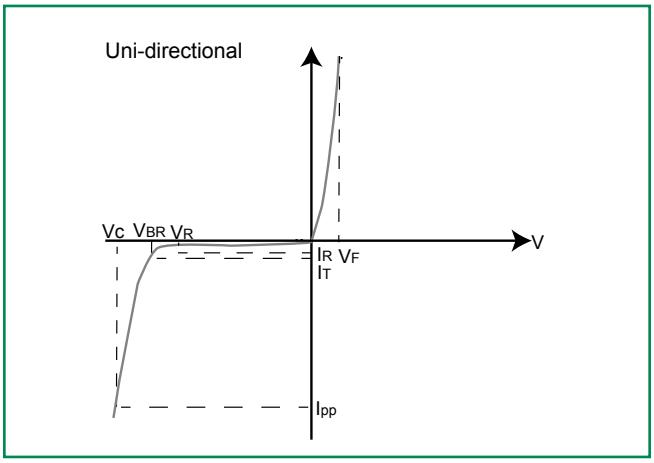
Electrical Characteristics (T_A=25°C unless otherwise noted)

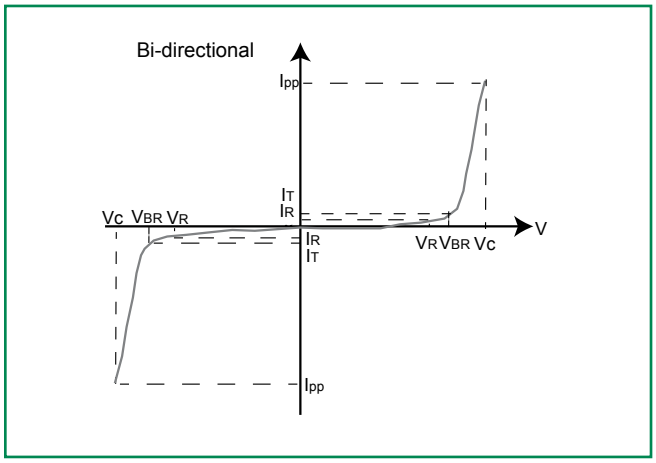
Part Number (Uni)	Part Number (Bi)	Breakdown Voltage V_{BR} @ I_T (V)		Test Current I_T (mA)	Reverse Stand off Voltage V_R (Volts)	Maximum Reverse Leakage @ V_R I_R (µA)	Maximum Peak Pulse Current I_{pp} (A)	Maximum Clamping Voltage @ I_{PP} V_C (V)	Agency Approval
		MIN	MAX						
SLD10U-017	SLD10-018	11.8	13.0	5.0	10	10	115	19.0	x
SLD11U-017	SLD11-018	12.2	13.5	5.0	11	10	105	20.7	x
SLD12U-017	SLD12-018	13.3	14.7	5.0	12	10	99	22.0	x
SLD13U-017	SLD13-018	14.4	15.9	5.0	13	10	96	22.6	x
SLD14U-017	SLD14-018	15.6	17.2	5.0	14	10	84	25.9	x
SLD15U-017	SLD15-018	16.7	18.5	5.0	15	10	80	27.0	x
SLD16U-017	SLD16-018	18.0	19.3	1.0	16	10	76	28.6	x
SLD17U-017	SLD17-018	18.9	20.9	5.0	17	10	74	29.7	x
SLD18U-017	SLD18-018	20.0	22.1	5.0	18	10	70	31.1	x
SLD20U-017	SLD20-018	22.2	24.5	5.0	20	10	64	34.1	x
SLD22U-017	SLD22-018	24.4	26.9	5.0	22	10	61	35.5	x
SLD24U-017	SLD24-018	25.0	30.0	1.0	24	10	61	36.0	x
SLD26U-017	SLD26-018	28.9	31.9	5.0	26	10	48	44.1	x
SLD28U-017	SLD28-018	31.1	34.4	5.0	28	10	44	47.4	x
SLD30U-017	SLD30-018	33.3	36.8	5.0	30	10	42	50.4	x
SLD33U-017	SLD33-018	36.7	40.6	5.0	33	10	38	55.3	x
SLD36U-017	SLD36-018	40.0	44.2	5.0	36	10	35	60.1	x

Notes:

1. V_{BR} measured after I_T applied for 300µs, I_T= square wave pulse or equivalent.
2. Surge current waveform per 10mS x 150mS exponential wave and derated per Fig. 3.
3. All terms and symbols are consistent with ANSI/IEEE C62.35.

I-V Curve Characteristics





P_{PPM} Peak Pulse Power Dissipation – 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 though the TVS at a specified test current (I_T)

V_C Clamping Voltage – Peak voltage measured across the suppressor at a specified Ippm (peak impulse current)

I_R Reverse Leakage Current – Current measured at V_R

V_F Forward Voltage Drop for Uni-directional

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

Figure 1 - TVS Transients Clamping Waveform

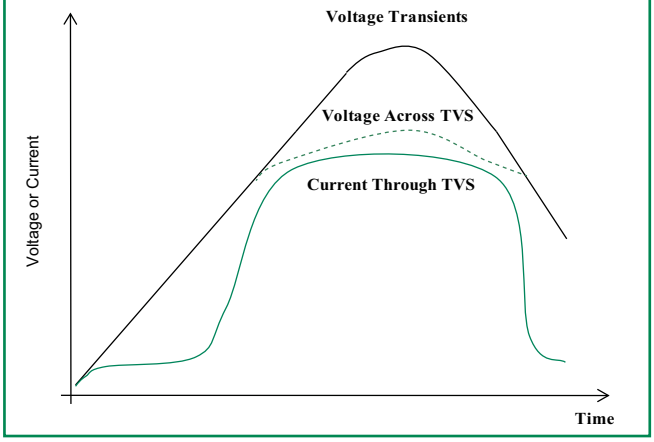


Figure 2 - Peak Pulse Power Rating Curve

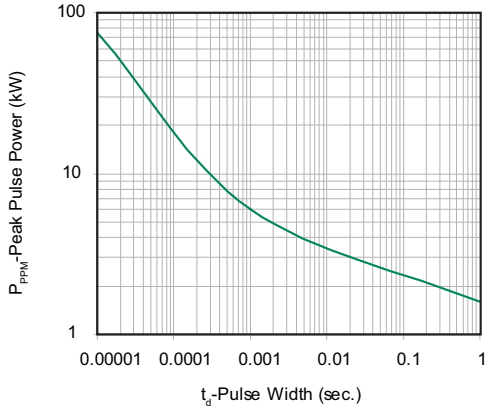


Figure 3 - Pulse Derating Curve

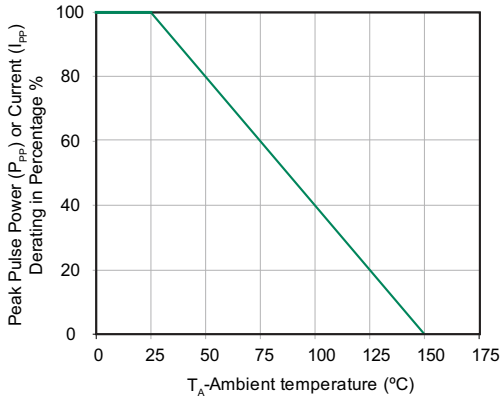


Figure 4 - Pulse Waveform

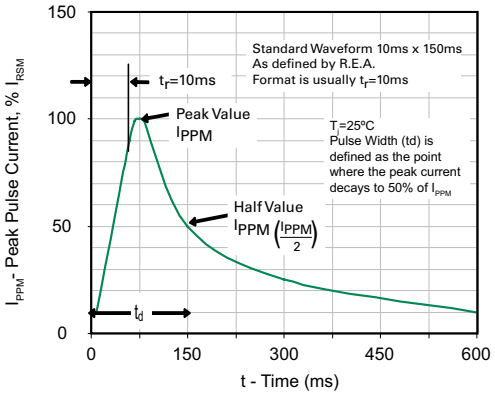


Figure 5 - Typical Junction Capacitance

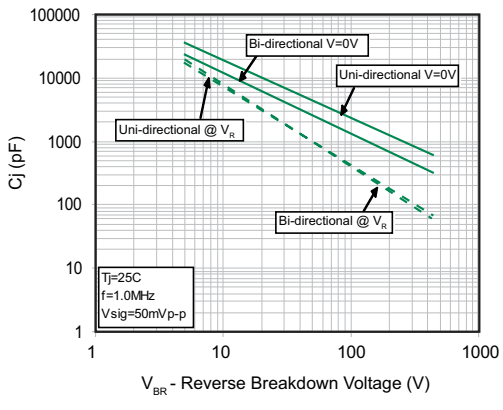
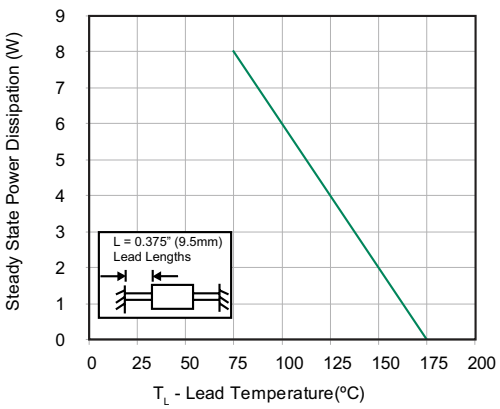


Figure 6 - Steady State Power Derating Curve



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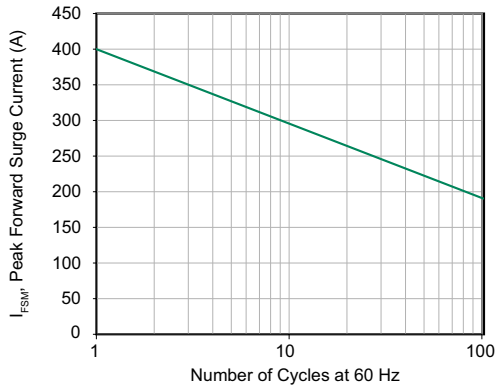
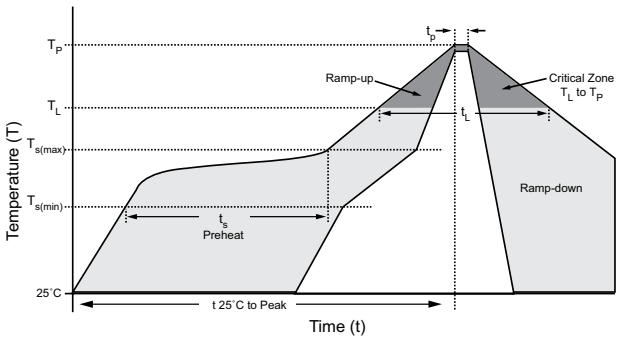
Ratings and Characteristic Curves (T_A=25°C unless otherwise noted) (Continued)

Figure 7 - Maximum Non-Repetitive Peak Forward Surge Current



Soldering Parameters

Reflow Condition		Lead–free assembly
Pre Heat	-Temperature Min ($T_{s(min)}$)	150°C
	-Temperature Max ($T_{s(max)}$)	200°C
	-Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak		3°C/second max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	-Temperature (T_L) (Liquidus)	217°C
	-Time (min to max) (t_s)	60 – 150 seconds
Peak Temperature (T_P)		$260^{+0/-5}$ °C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		280°C



Physical Specifications

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

Flow/Wave Soldering (Solder Dipping)

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

Environmental Specifications

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

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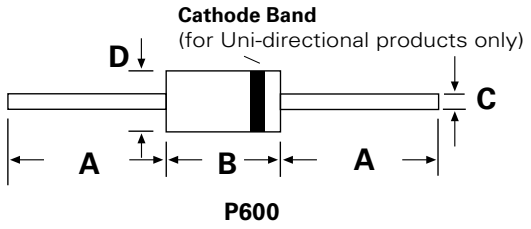
Dimensions



P600

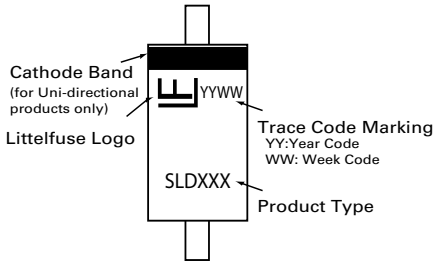
Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	1.000	-	25.40	-
B	0.340	0.360	8.60	9.10
C	0.048	0.052	1.22	1.32
D	0.340	0.360	8.60	9.10

Part Numbering System

SLD XX U-017 X

- **OPTION CODE:**
  - **BLANK** Reel Tape
  - **-B** Bulk Packaging
- **TYPE CODE:**
  - **U-017** Uni-Directional
  - **-018** Bi-Directional
- **V_{BR} VOLTAGE CODE** (Refer to the Electrical Characteristics table)
- **SERIES CODE**

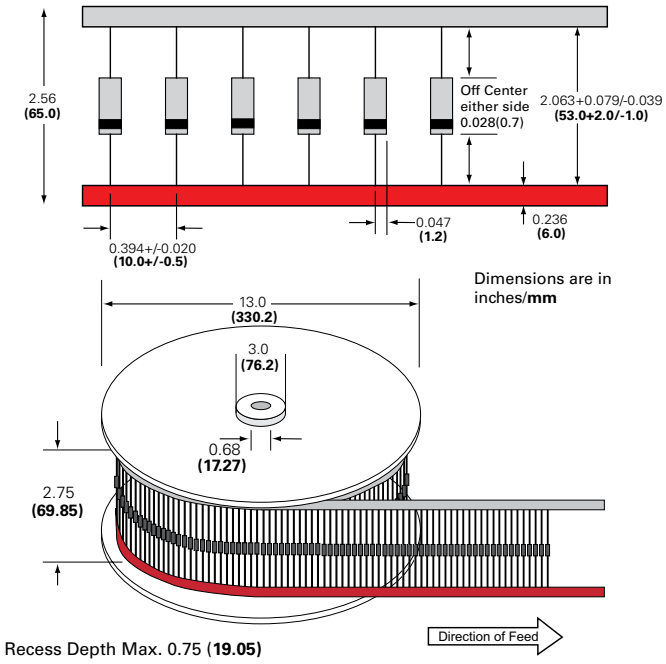
Part Marking System



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



Recess Depth Max. 0.75 (**19.05**)

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