

SLD263 Uni-directional Series

Surface Mount - 7000 W - TO-263



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

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation 1. 10 ms/150 ms test waveform	P_{PPM}	1400	W
2. 10 μs /1000 μs test waveform		7000	W
Power Dissipation on Infinite Heatsink at $T_C = 25^\circ\text{C}$	P_D	9	W
Maximum Instantaneous Forward Voltage at 100 A for Un-directional Only	V_F	1.8	V
Peak Forward Surge Current 8.3 ms Single Half Sine-wave	I_{FSM}	650	A
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$
Typical Thermal Resistance Junction to Case	$R_{\theta JC}$	1.3	$^\circ\text{C/W}$

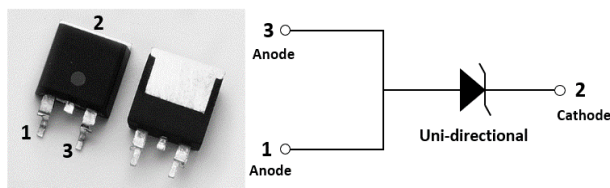
Description

The SLD263 uni-directional TVS diode series is housed in a TO-263 package with lead modifications. It is designed to protect sensitive electronics against ESD, EFT, 10/1000 surge events and inductive load switching voltage transient events for severe automotive load dump applications.

Features & Benefits

- AEC-Q101 qualified and PPAP capable
- Meet ISO7637-2 5a/5b protection, ISO16750 and JASO D-001 load dump test (refer to APP note for details)
- $V_{BR} @ T_J = V_{BR} @ 25^\circ\text{C} \times (1 + \alpha T \times (T_J - 25))$ (α : temperature coefficient, typical value is 0.1 %)
- Glass passivated chip junction in modified TO-263 package
- ESD protection of data lines in accordance with IEC 61000-4-2, 30 kV(Air), 30 kV (Contact)
- EFT protection of data lines in accordance with IEC 61000-4-4
- Fast response time: typically less than 1.0 ps from 0 volts to $V_{BR \min}$
- Excellent clamping capability
- Low incremental surge resistance
- UL recognized compound meeting flammability rating UL94 V-0
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 $^\circ\text{C}$
- For surface mounted applications to optimize board space
- Low profile package
- High temperature reflow soldering guaranteed: 260 $^\circ\text{C}$ /10 sec at terminals
- 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)

Functional Diagram



Applications

Designed to protect sensitive electronics from:

- Inductive load switching
- Alternator load dump

SLD263 Uni-directional Series

Surface Mount - 7000 W - TO-263

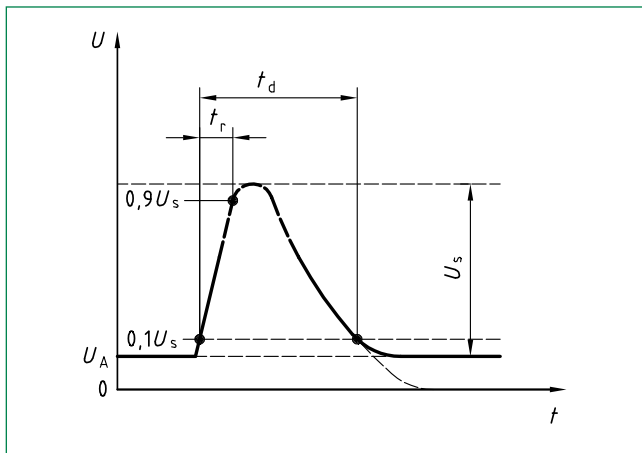
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Part Number (Uni)	Marking	Breakdown Voltage V_{BR} @ I_T (V)		Test Current I_T (mA)	Reverse Stand off Voltage V_R (V)	Maximum Reverse Leakage I_R @ V_R (μA)	$T_J = 150^\circ\text{C}$ Max. Reverse Leakage I_R @ V_R (μA)	Maximum Peak Pulse Surge Current I_{PP} (A)	Maximum Clamping Voltage V_C @ I_{PP} (V)
		Min	Max						
SLD263-22A	263-22A	24.4	26.9	5	22	2	50	197	35.5
SLD263-24A	263-24A	26.7	29.5	5	24	2	50	180	38.9

Notes:

- V_{BR} measured after I_T applied for 300 μs , I_T = square wave pulse or equivalent.
- Surge current waveform per 10 μs /1000 μs exponential wave and derated per Fig. 2
- All terms and symbols are consistent with ANSI/IEEE C62.35.

Load Dump Test Wave Form



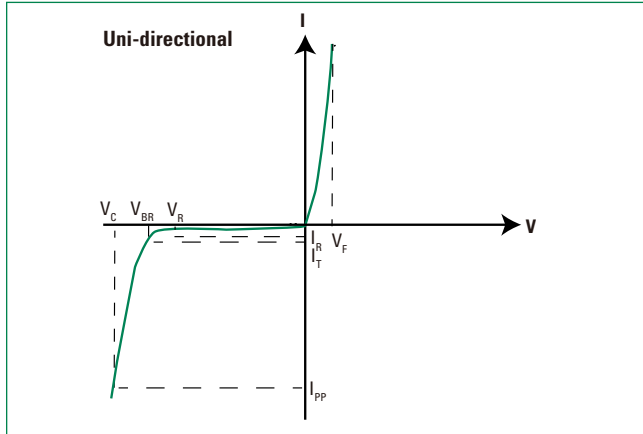
Note: LF use $t_d = 400$ ms for 12 V system test; $t_d = 350$ ms for 24 V system

Parameter	12 V system	24 V system
U_s	65 V to 87 V	123 V to 174 V
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	

SLD263 Uni-directional Series

Surface Mount - 7000 W - TO-263

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 though the TVS at a specified test current (I_R)
- 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 ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Figure 1 - Peak Pulse Power Rating Curve

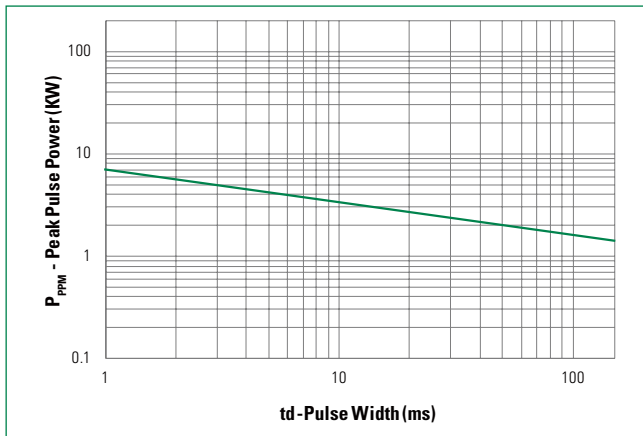


Figure 2 - Peak Pulse Power Derating Curve

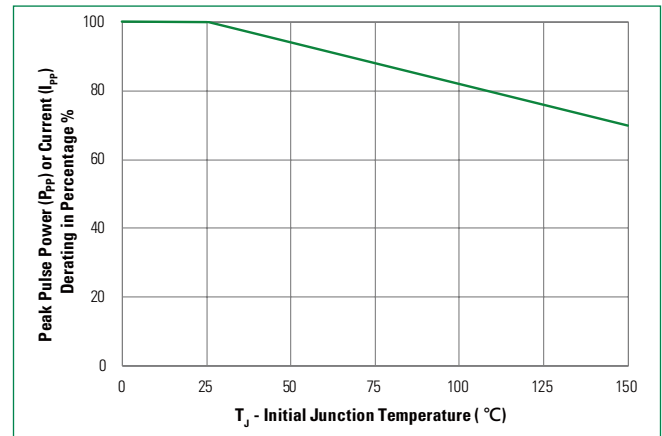


Figure 3 - Typical Transient Thermal Impedance

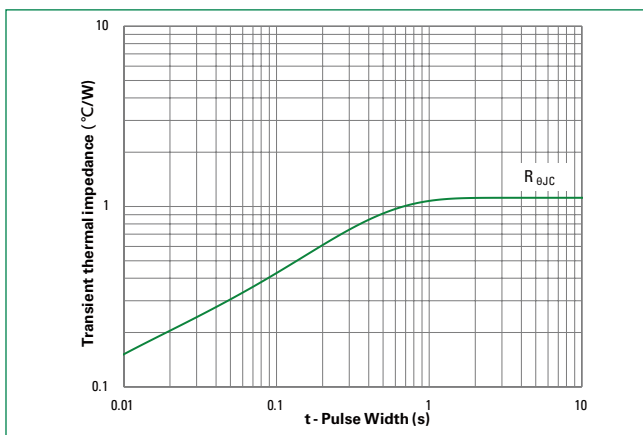
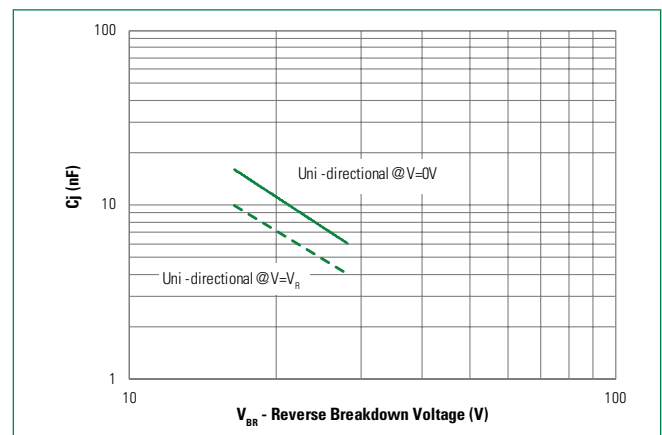


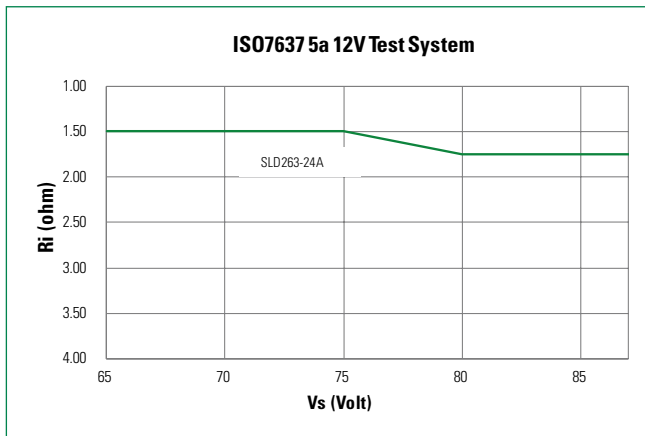
Figure 4 - Typical Junction Capacitance



SLD263 Uni-directional Series

Surface Mount - 7000 W - TO-263

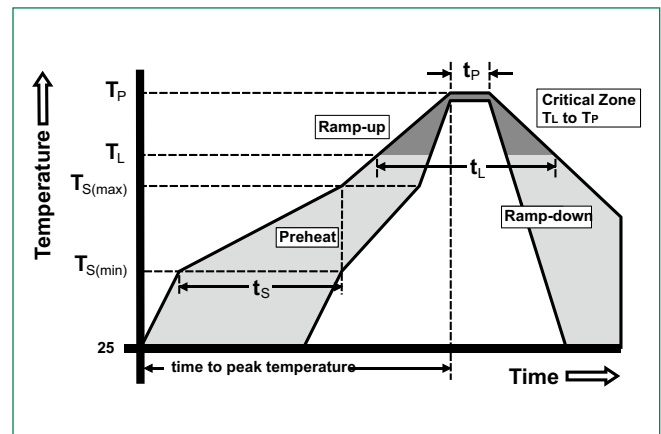
Figure 5 - Typical SOA Chart



Note: SOA (Safe Operation Area) refer to the area which below the curve line and refer to APP note for details.

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 – 120 seconds
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_L)	60 – 150 seconds
Peak Temperature (T_p)		260 ^{+0/-5} °C
Time Within 5°C of Actual Peak Temperature (t_p)		30 seconds max
Ramp-down Rate		6 °C/second max
Time 25°C to Peak Temperature (T_p)		8 minutes max
Do Not Exceed		260 °C



SLD263 Uni-directional Series

Surface Mount - 7000 W - TO-263

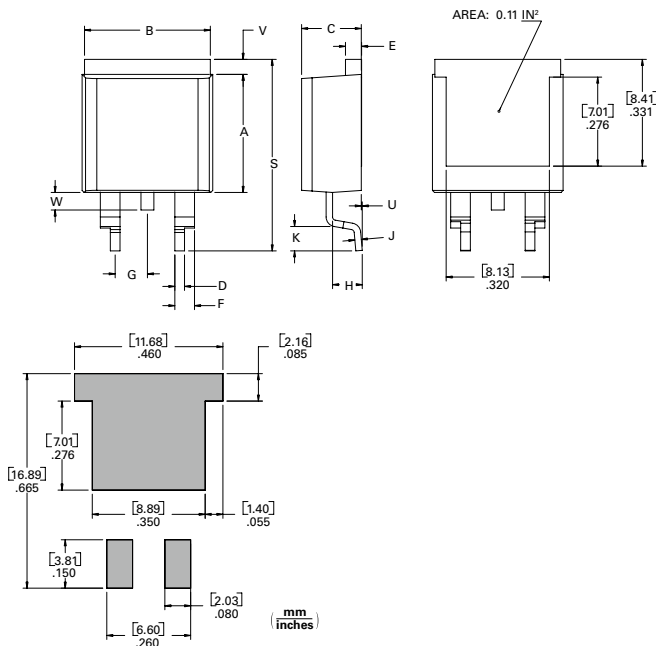
Physical Specifications

Terminal Finish	100 % matte tin-plated
Body Material	UL recognized compound meeting flammability classification UL94 V-0
Lead Material	Copper alloy

Environmental Specifications

High Temperature Storage	JESD22-A103
HTRB	JESD22-A108
Temperature Cycling	JESD22-A104
MSL	JEDEC-J-STD-020, LEVEL 1
H3TRB	JESD22-A101
RSH	JESD22-A111

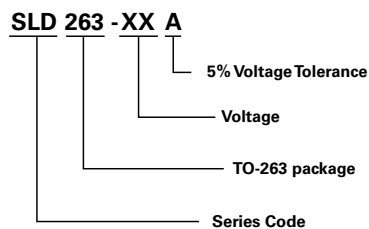
Dimensions



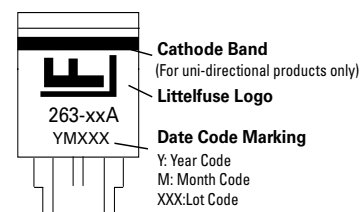
Recommend Soldering Pad Outline

Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.36	0.37	9.14	9.4
B	0.38	0.42	9.65	10.67
C	0.178	0.188	4.52	4.78
D	0.025	0.035	0.64	0.89
E	0.045	0.06	1.14	1.52
F	0.06	0.075	1.52	1.91
G	0.095	0.105	2.41	2.67
H	0.092	0.102	2.34	2.59
J	0.018	0.024	0.46	0.61
K	0.09	0.11	2.29	2.79
S	0.59	0.625	14.99	15.88
V	0.035	0.045	0.89	1.14
U	0.002	0.01	0.05	0.25
W	0.04	0.07	1.016	1.78

Part Numbering System



Part Marking System



SLD263 Uni-directional Series

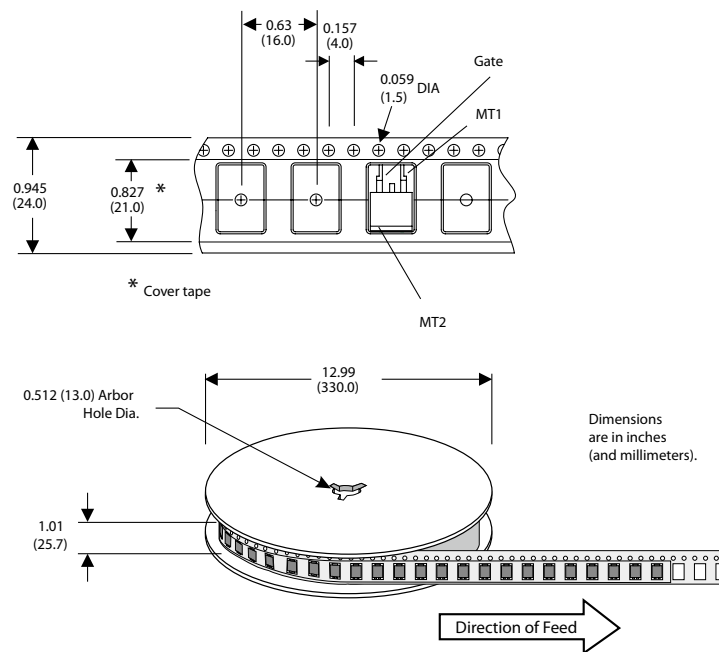
Surface Mount - 7000 W - TO-263

Packaging

Part Number	Component Package	Quantity	Packaging Option
SLD263-xxA	TO-263	500	Embossed Carrier

TO-263 Embossed Carrier Reel Pack (RP) Specifications

Meets all EIA-481-2 Standards



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>.