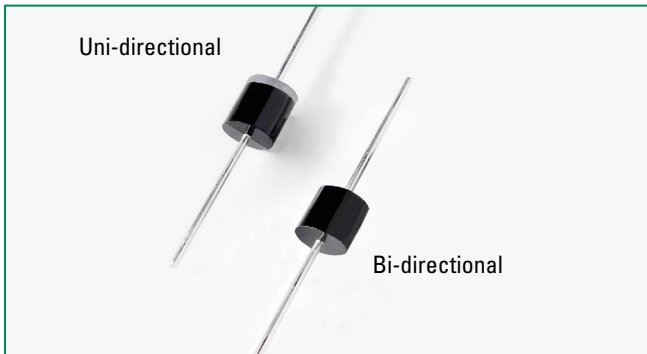



### SLD Series

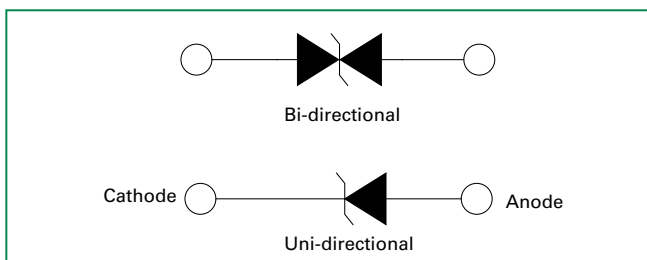


Agency Approvals	
AGENCY	AGENCY FILE NUMBER
	E230531

### Maximum Ratings and Thermal Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation 10µs x 150ms Test Waveform	P <sub>PPM</sub>	2200	W
Peak Pulse Power Dissipation 10µs x 1000µs Test Waveform	P <sub>PPM</sub>	5000	W
Steady State Power Dissipation on Infinite Heat Sink at T <sub>L</sub> =75°C (Fig. 6)	P <sub>M(AV)</sub>	8.0	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 3)	I <sub>FSM</sub>	600	A
Maximum Instantaneous Forward Voltage at 100A for Unidirectional Only	V <sub>F</sub>	3.5	V
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to 175	°C
Typical Thermal Resistance Junction to Lead	R <sub>θJL</sub>	8.0	°C/W
Typical Thermal Resistance Junction to Ambient	R <sub>θJA</sub>	40	°C/W

### Functional Diagram



### 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

- Hi reliability application and automotive grade AEC-Q101 qualified with T<sub>J</sub> 175°C
- V<sub>BR</sub> @T<sub>J</sub>=V<sub>BR</sub>@25°C x 1+0.1% x (T<sub>J</sub>-25) (0.1%:Typical Temperature Coefficient)
- Glass passivated chip junction in P600 package
- Meet 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 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/10 seconds / 0.375”(9.5mm) lead length, 5 lbs., (2.3kg) tension
- Plastic package has underwriters laboratory flammability classification 94V-0
- Matte tin lead-free plated
- Halogen free and RoHS compliant
- 2nd level interconnect is Pb-free per IPC/JEDEC J-STD-609A.01

### Applications

- Designed to protect sensitive electronics from:
- Inductive Load Switching
  - Alternator Load Dump

### Additional Information



**Datasheet**




**Resources**



**Samples**

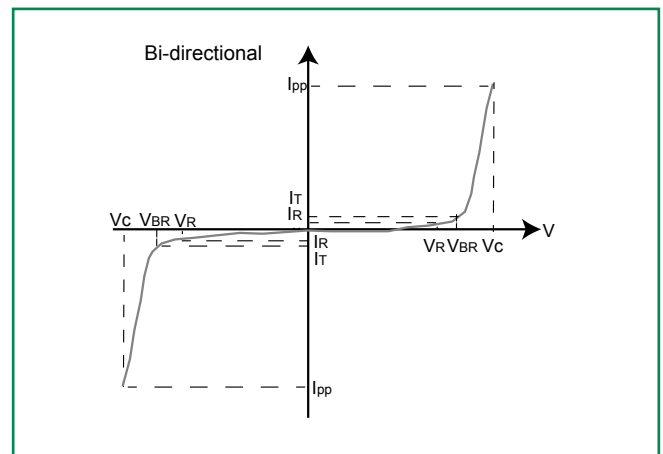
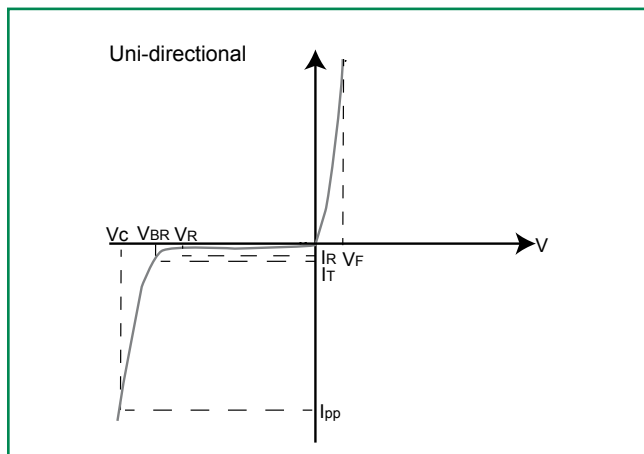
### Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

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 @ $V_R$ $I_R$ ( $\mu\text{A}$ )	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	25.0	30.0	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	
SLD43U-017	SLD43-018	49.0	54.2	5.0	43	10	73.5	69.4	
SLD60U-017	SLD60-018	68.4	75.6	5.0	60	10	52.7	96.8	

Notes:

- $V_{BR}$  measured after  $I_T$  applied for 300 $\mu\text{s}$ ,  $I_T$  = square wave pulse or equivalent.
- Surge current waveform per 10 $\mu\text{s}$  x 1000 $\mu\text{s}$  exponential wave and derated per Fig. 4.
- 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 through the TVS at a specified test current ( $I_T$ )

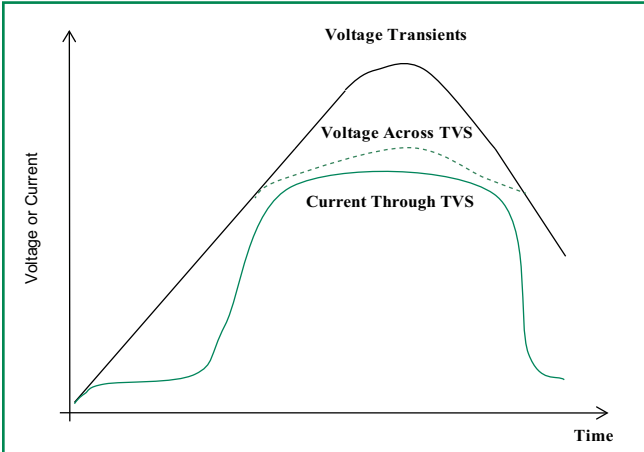
**$V_C$  Clamping Voltage** – Peak voltage measured across the suppressor at a specified  $I_{ppm}$  (peak impulse current)

**$I_R$  Reverse Leakage Current** – Current measured at  $V_R$

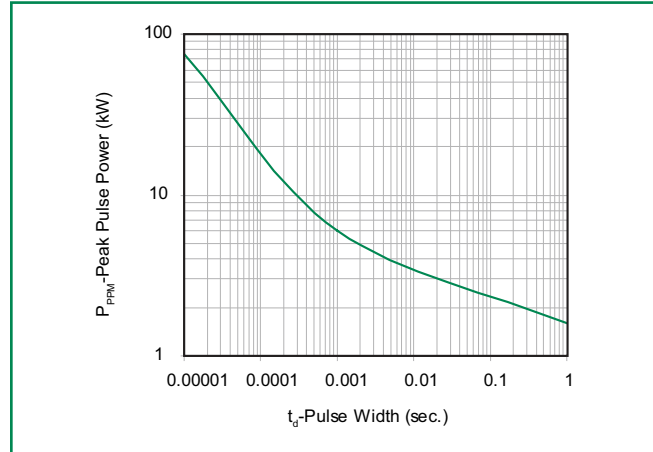
**$V_F$  Forward Voltage Drop for Uni-directional**

### Ratings and Characteristic Curves ( $T_A=25^\circ\text{C}$ unless otherwise noted)

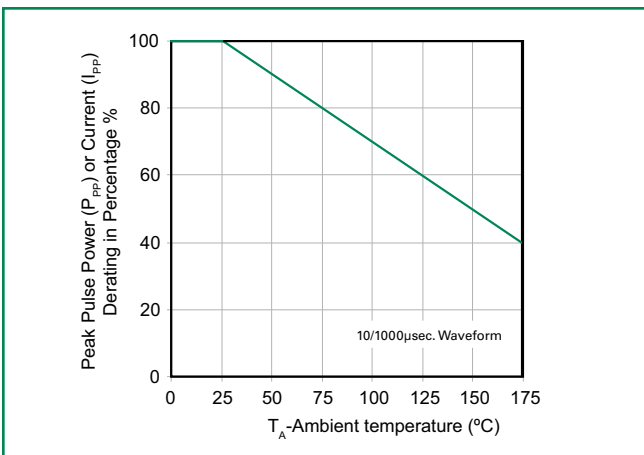
**Figure 1 - TVS Transients Clamping Waveform**



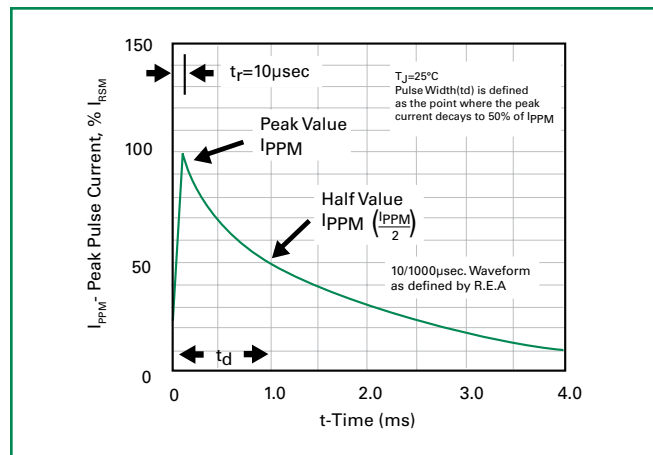
**Figure 2 - Peak Pulse Power Rating Curve**



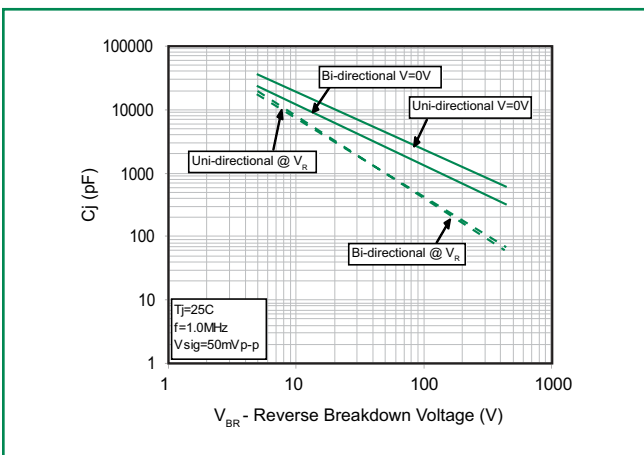
**Figure 3 - Pulse Derating Curve**



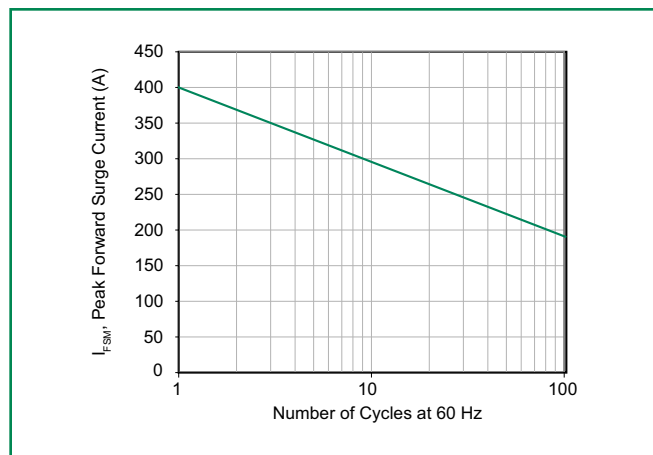
**Figure 4 - Pulse Waveform**



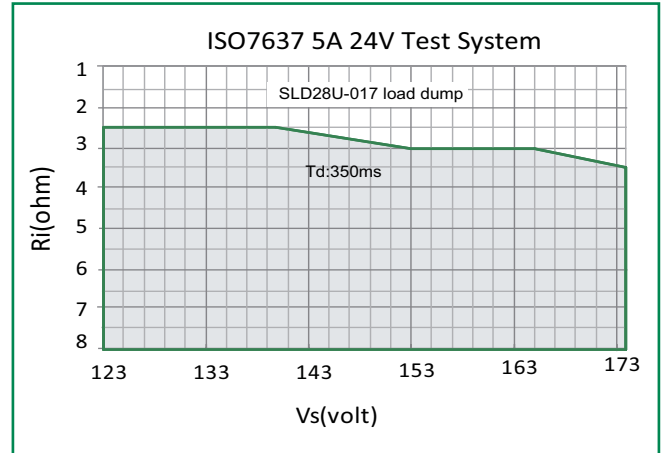
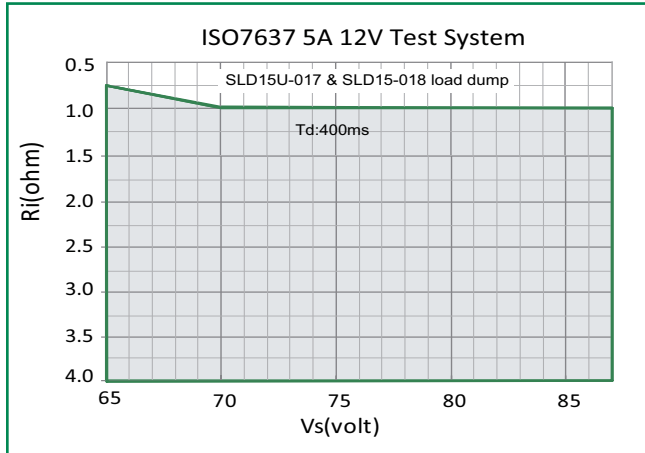
**Figure 5 - Typical Junction Capacitance**



**Figure 6 - Maximum Non-Repetitive Peak Forward Surge Current**

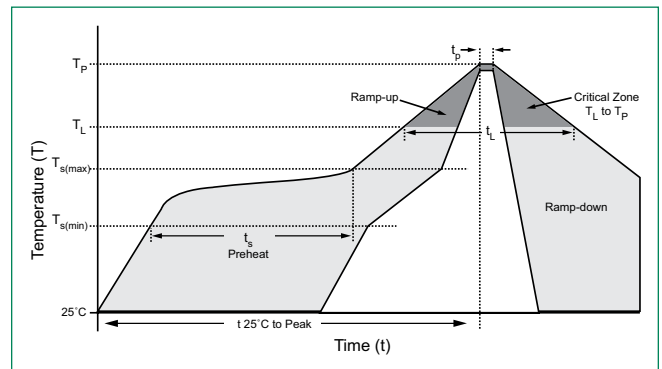


continues on next page.

**Figure 7 - SOA Chart**


### 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 <sup>+0/-5</sup> °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



### Flow/Wave Soldering (Solder Dipping)

<b>Peak Temperature :</b>	265°C
<b>Dipping Time :</b>	10 seconds
<b>Soldering :</b>	1 time

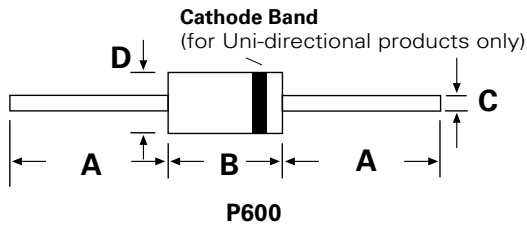
### Physical Specifications

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

### Environmental Specifications

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

### 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	0.052	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:**

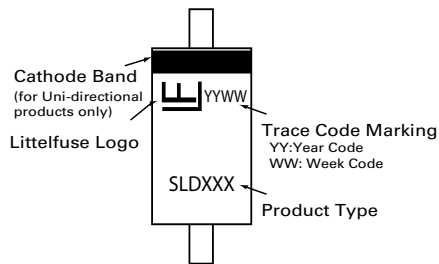
**U-017** Uni-Directional  
**-018** Bi-Directional

**V<sub>BR</sub> VOLTAGE CODE**

(Refer to the Electrical Characteristics table)

**SERIES CODE**

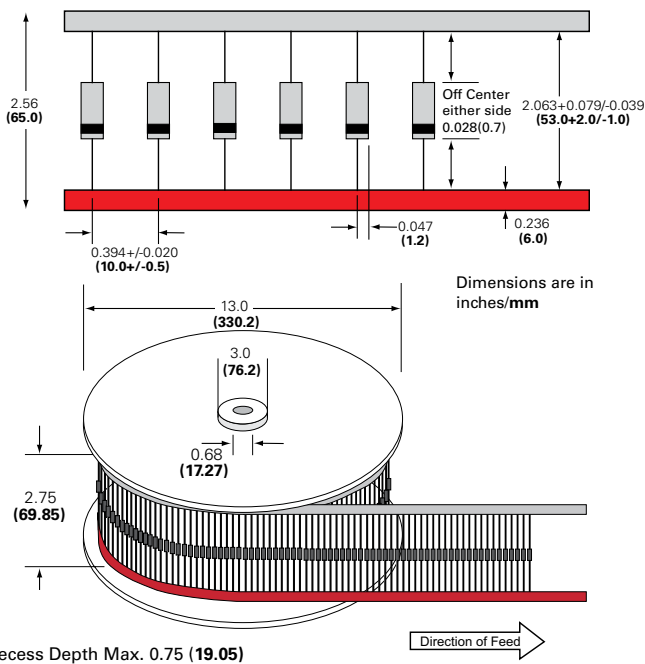
### Part Marking System



### 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



# Mouser Electronics

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[SLD26U-017](#) [SLD26-018-B](#) [SLD18-018](#) [SLD10-018-B](#) [SLD15U-017](#) [SLD17U-017-B](#) [SLD43U-017](#) [SLD30-018](#)  
[SLD28U-017-B](#) [SLD20-018-B](#) [SLD13-018-B](#) [SLD26-018](#) [SLD12-018](#) [SLD36U-017-B](#) [SLD28U-017](#) [SLD11-018-B](#)  
[SLD13-018](#) [SLD20-018](#) [SLD22-018-B](#) [SLD40U-017-B](#) [SLD15U-017-B](#) [SLD12-018-B](#) [SLD60-018](#) [SLD14-018](#)  
[SLD12U-017](#) [SLD30U-017-B](#) [SLD11U-017](#) [SLD18U-017-B](#) [SLD40-018](#) [SLD36U-017](#) [SLD17U-017](#) [SLD28-018](#)  
[SLD22U-017](#) [SLD36-018-B](#) [SLD14U-017-B](#) [SLD26U-017-B](#) [SLD11-018](#) [SLD18-018-B](#) [SLD18U-017](#) [SLD20U-017-B](#)  
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[SLD43-018](#) [SLD30U-017](#) [SLD14U-017](#)