

## Device Specification (Preliminary)

### ELECTRICAL CHARACTERISTICS



Part Number	I <sub>hold</sub> (A)	I <sub>trip</sub> (A)	V <sub>max</sub> (Vdc)	I <sub>max</sub> (A)	P <sub>d typ</sub> (W)	Maximum Time To Trip		Resistance	
						Current (A)	Time (Sec.)	R <sub>min</sub> (Ω)	R <sub>1max</sub> (Ω)
SMD1812P300SLR/24	3.00	6.00	24	50	2.00	15.00	2.00	0.001	0.030

**Note:** I<sub>hold</sub> = Hold current: maximum current device will pass without tripping in 23 °C still air.

I<sub>trip</sub> = Trip current: minimum current at which the device will trip in 23 °C still air.

V<sub>max</sub> = Maximum voltage device can withstand without damage at rated current (I<sub>max</sub>)

I<sub>max</sub> = Maximum fault current device can withstand without damage at rated voltage (V<sub>max</sub>)

P<sub>d typ</sub> = Typical power dissipated from device when in the tripped state at 23 °C still air.

R<sub>min</sub> = Minimum resistance of device in initial (un-soldered) state.

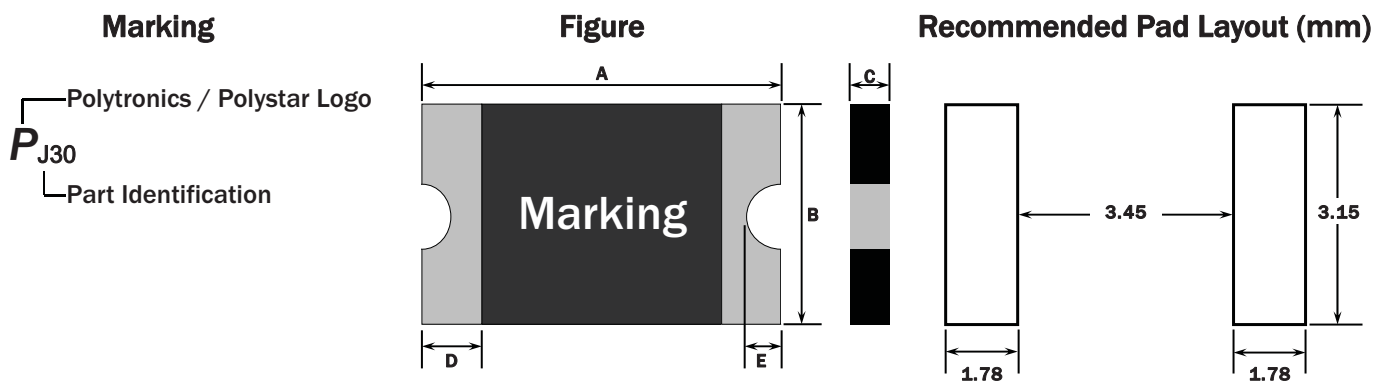
R<sub>1max</sub> = Maximum resistance of device at 23 °C measured one hour after tripping or reflow soldering of 260 °C for 20 sec.

\*Value specified were determined using the PWB with 0.030" \* 1.5oz copper traces.

\*Customer should verify the device performance in their specified conditions.

**Caution: Operation beyond the specified rating may result in damage and possible arcing and flame.**

**Recognitions: Pending**



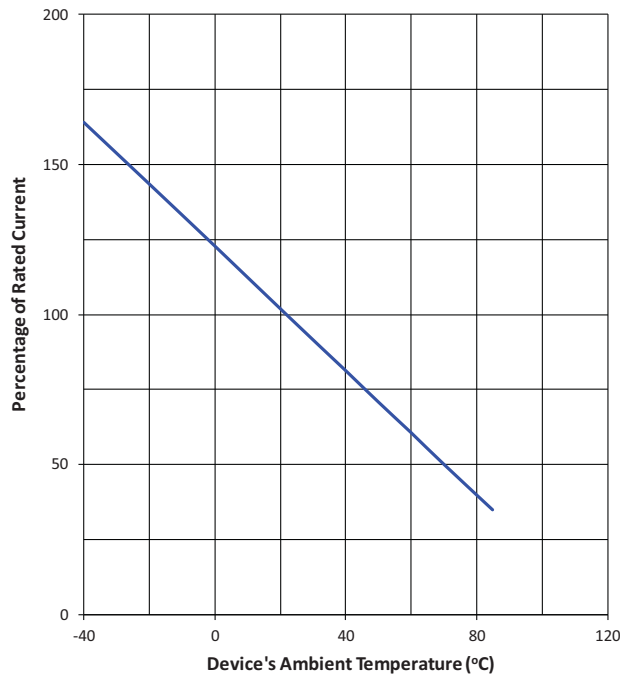
Note: Polystar is Polytronics's manufacturing site in China. The Polystar ID marking shall appear on smallest package.

### PHYSICAL DIMENSIONS (mm)

Part Number	A		B		C		D		E	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
SMD1812P300SLR/24	4.37	4.73	3.07	3.41	1.50	2.50	0.30	1.20	0.15	0.65

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### Thermal Derating Curve

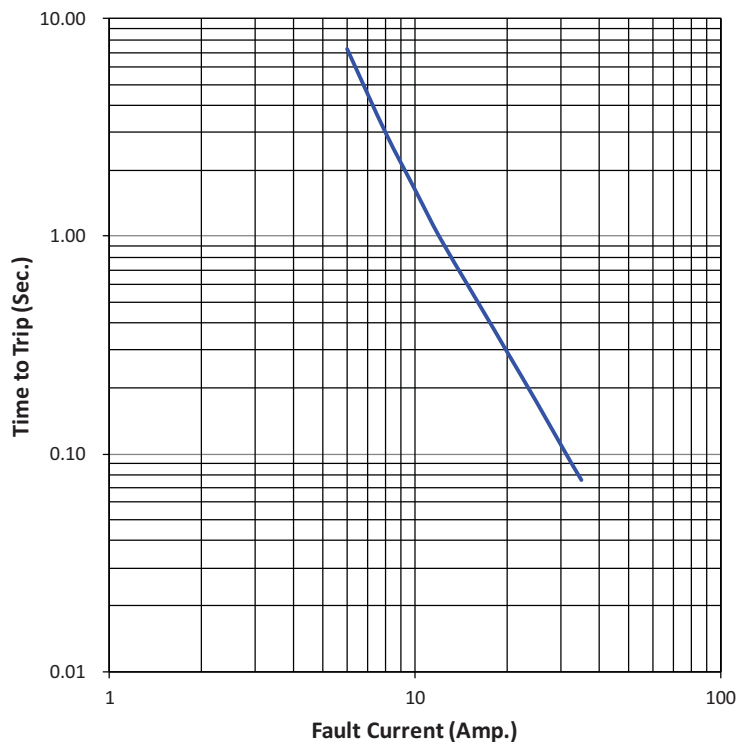


### Thermal Derating Chart

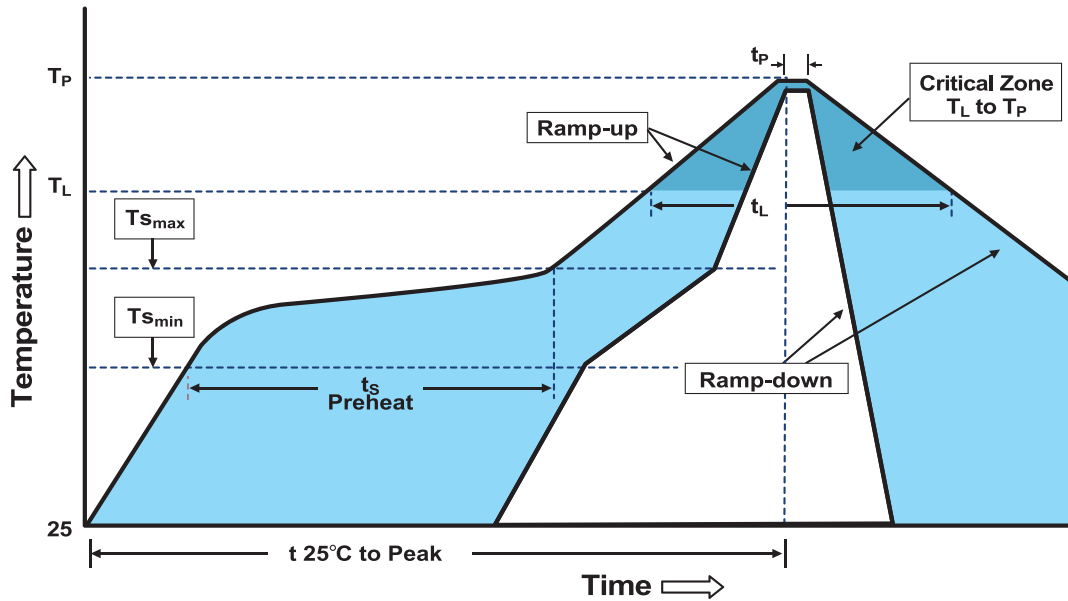
#### Recommended Hold Current (A) at Ambient Temperature (°C)

Part Number	Ambient Operation Temperature								
	-40 °C	-20 °C	0 °C	23 °C	40 °C	50 °C	60 °C	70 °C	85 °C
SMD1812P300SLR/24	4.95	4.35	3.75	3.00	2.45	2.15	1.85	1.55	1.05

### Average Time-Current Curve



**Soldering Parameters**



Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (T <sub>smax</sub> to T <sub>P</sub> )	3°C/second max.
Preheat	
-Temperature Min (T <sub>smin</sub> )	150°C
-Temperature Max (T <sub>smax</sub> )	200°C
-Time (T <sub>smin</sub> to T <sub>smax</sub> )	60-180 seconds
Time maintained above:	
-Temperature (T <sub>L</sub> )	217°C
-Time (t <sub>L</sub> )	60-150 seconds
Peak Temperature (T <sub>P</sub> )	260°C
Time within 5°C of actual Peak Temperature (t <sub>p</sub> )	20-40 seconds
Ramp-Down Rate	6 °C /second max.
Time 25°C to Peak Temperature	8 minutes max.
Storage Condition	0°C ~35°C, ≤ 70%RH

- Recommended reflow methods: IR, vapor phase oven, hot air oven, N<sub>2</sub> environment for lead-free
- Recommended maximum paste thickness is 0.25mm (0.010 inch)
- Devices can be cleaned using standard industry methods and solvents.

**Note 1:** All temperature refer to topside of the package, measured on the package body surface.

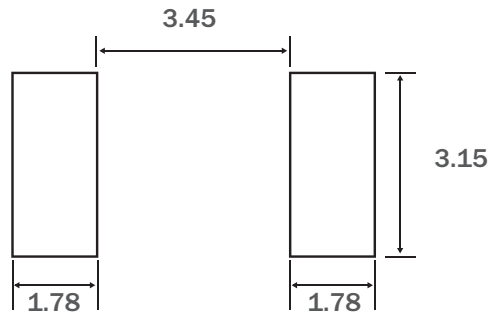
**Note 2:** If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

**Environmental Specifications**

Operating Temperature	-40°C to +85 °C
Maximum Device Surface Temperature in Tripped State	125°C
Moisture Sesity Level	Level 1, J-STD-020C

**Packaging Quantity and Marking**

Recommended Pad Layout (mm.)



Part Number	Marking	Quantity
SMD1812P300SLR/24	J30	800

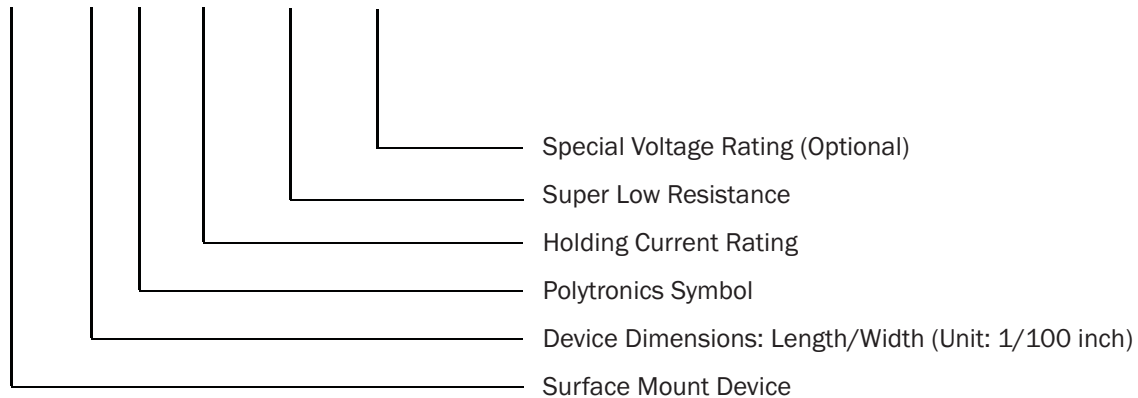
© 12 mm tape on 7 inch reel per EIA-481 (equivalent to IEC286, part 3)

**Physical Specifications**

Terminal Material	Solder-Plated Copper (Solder Material: Matte Tin (Sn))
Lead Solderability	Meets EIA Specification RS186-9E, ANSI/J-STD-002 Category 3.

**Part Number System**

**SMD 1812 P** □□□ **SLR** / □□

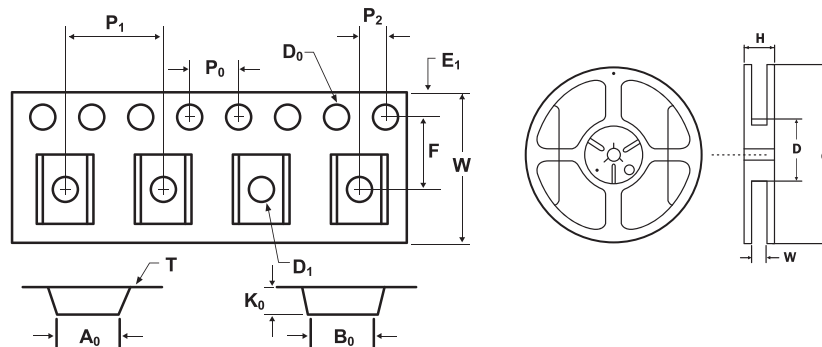


**Tape Specifications: EIA-481 (mm.)**

W	12.00 ± 0.30
F	5.50 ± 0.05
E <sub>1</sub>	1.75 ± 0.10
D <sub>0</sub>	1.50 + 0.10 / - 0
D <sub>1</sub>	1.50 + 0.10 / - 0
P <sub>0</sub>	4.00 ± 0.10
P <sub>1</sub>	8.00 ± 0.10
P <sub>2</sub>	2.00 ± 0.05
A <sub>0</sub>	3.55 ± 0.10
B <sub>0</sub>	4.88 ± 0.10
T	0.30 ± 0.05
K <sub>0</sub>	2.45 ± 0.10
Leader min.	390
Trailer min.	160

**Reel Dimensions: EIA-481 (mm.)**

C	Ø178.0 ± 1.0
D	Ø60.2 ± 0.5
H	16.0 ± 0.5
W	13.2 ± 1.5



**WARNING**

**Mechanical Stress**

- PPTC devices will undergo a thermal expansion during fault condition. If PPTC devices are installed or placed in an application where the space between PPTC devices and the surrounding materials (e.g., covering materials, packaging materials, encapsulate materials and the like) is insufficient, it will cause an inhibiting effect upon the thermal expansion. Pressing, twisting, bending and other kinds of mechanical stress will also adversely affect the performance of the PPTC devices, and shall not be used or applied.

**Chemical Pollutants**

- Silicone-based oils, oils, solvents, gels, electrolytes, fuels, acids, and the like will adversely affect the properties of PPTC devices, and shall not be used or applied.

**Electronic and Thermal Effect**

- PPTC devices are secondary protection devices and are used solely for sporadic, accidental over-current or over-temperature error condition, and shall NOT be used if or when constant or repeated fault conditions (such fault conditions may be caused by, among others, incorrect pin-connection of a connector) or over-extensive trip events may occur.
- PPTC devices are different from fuses and, when a fault condition occurs, will go into high-resistance state and do not open circuit, in which case the voltage at such PPTC devices may reach a hazardous level.
- Operation over the maximum rating or other forms of improper use may cause failure, arcing, flame and/or other damage to the PPTC devices.
- Conductive material contamination, such as metal particle, may induce shortage, flame or arcing.
- Due to the inductance, the operation circuits may generate a circuit voltage (Ldi/dt) above the rated voltage of PPTC devices, which shall not be used under such circumstances.

**General**

- Customers shall evaluate and test the properties of PPTC devices independently to verify and ensure that their individual applications will be met.
- The performance of PPTC devices will be adversely affected if they are improperly used under electronic, thermal and/or mechanical procedures and/or conditions non-conformant to those recommended by manufacturer.
- Customers shall be responsible for determining whether it is necessary to have back-up, failsafe and/or fool-proof protection to avoid or minimize damage that may result from extra-ordinary, irregular function or failure of PPTC devices.
- Any and all responsibilities and liabilities are disclaimed if any item under this notice of warning is not complied with.
- Polytronics shall not be liable for any claims or damages arising out of products used in automotive applications, unless otherwise agreed by Polytronics.

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