

## SMD 1812 Polymer PTCs



### FEATURES

- Fast response to overcurrent
- Low resistance for minimal voltage drop
- Compact design and low profile
- Compatible with high temperature solders
- Material categorization:  
for definitions of compliance please see  
[www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### QUICK REFERENCE DATA

PARAMETER <sup>(1)</sup>	VALUE	UNIT
Hold current ( $I_{hold}$ ) <sup>(2)(3)</sup>	0.14 to 1.5	A
Trip current ( $I_{trip}$ ) <sup>(2)(3)</sup>	0.35 to 3	A
Maximum voltage ( $V_{max.}$ ) <sup>(2)(3)</sup>	12 to 60	V <sub>DC</sub>
Maximum current ( $I_{max.}$ ) <sup>(2)(3)</sup>	10 to 100	A
Power dissipation ( $P_D$ typ.) <sup>(3)</sup>	0.8	W
Minimum initial resistance ( $R_{min.}$ ) <sup>(2)(3)</sup>	0.04 to 1.5	$\Omega$
Maximum resistance after tripping and 1 h cool down ( $R_1$ max.) <sup>(2)(3)</sup>	0.11 to 6	$\Omega$
Operating temperature	-40 to +85	°C
Storage temperature	-40 to +85	°C
Maximum surface temperature in tripped state	125	°C

#### Notes

- <sup>(1)</sup> Definitions, measurements, and tests are made in accordance with standard IEC 62319-1 "Polymeric thermistors - Directly heated positive step function temperature coefficient"
- <sup>(2)</sup> Other values available on request
- <sup>(3)</sup> All the parameters are characterized at 25 °C still air

### APPLICATIONS

Overcurrent protection in:

- USB ports
- HDMI source
- PC motherboards - plug and play
- Mobile phones - battery and port
- PDAs / digital cameras
- Mobile internet devices
- IC VCC
- Battery protection
- Home automation sensors

### DESCRIPTION

These polymer-based thermistors have a positive temperature coefficient and are primarily intended for resettable overcurrent protection. The terminals are 100 % matte tin plated. The part is laser marked with an identification letter.

### PACKAGING

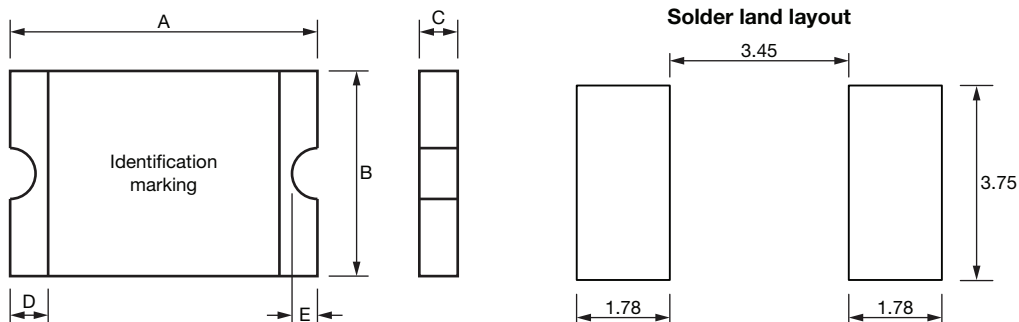
Available in 8 mm tape on 178 mm reel, sealed in a plastic bag.

### ELECTRICAL DATA AND ORDERING INFORMATION

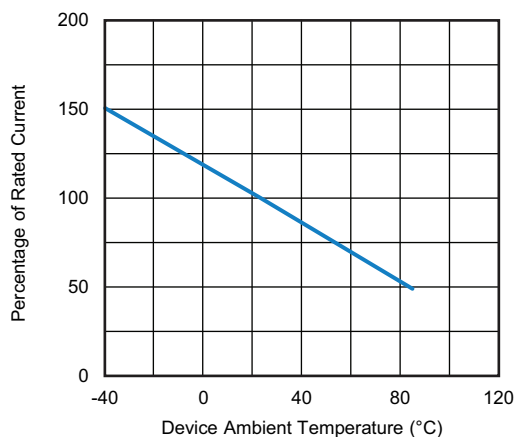
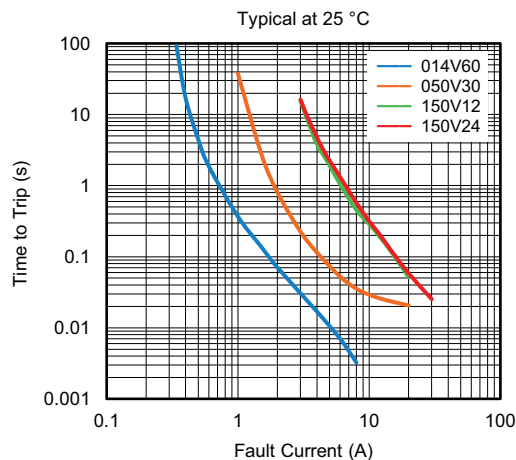
PART NUMBER	$I_{hold}$ (A)	$I_{trip}$ (A)	$V_{max.}$ (V <sub>DC</sub> )	$I_{max.}$ (A)	$P_D$ TYP. (W)	MAX. TIME TO TRIP		RESISTANCE AT 25 °C	
						CURRENT (A)	TIME (s)	$R_{min.}$ ( $\Omega$ )	$R_1$ max. ( $\Omega$ )
PPTC1812E3014V60	0.14	0.34	60	10	0.8	1.50	0.15	1.500	6.000
PPTC1812E3050V30	0.50	1.00	30	100	0.8	8.00	0.15	0.150	1.000
PPTC1812E3150V12	1.50	3.00	12	100	0.8	8.00	0.50	0.040	0.110
PPTC1812E3150V24	1.50	3.00	24	20	0.8	8.00	1.50	0.040	0.120

**PERFORMANCE**

ENVIRONMENTAL SPECIFICATIONS	
Operating temperature	-40 °C to +85 °C
Storage condition	10 °C to 35 °C, ≤ 70 % RH, without condensation
Maximum device surface temperature in tripped state	125 °C
Passive aging	+85 °C, 1000 h ± 5 % typical resistance change
Humidity aging	+85 °C, 85 % RH, 1000 h ± 5 % typical resistance change
Thermal shock	MIL-STD-202 Method 107G +85 °C / -40 °C, 20 times -30 % typical resistance change
Solvent resistance	MIL-STD-202, Method 215 < ± 5 % resistance change
Vibration	MIL-STD-883C, Method 2007.1, Condition A < ± 5 % resistance change
Moisture sensitivity level	Level 1, J-STD-020C

**DIMENSIONS AND MARKING** in millimeters

COMPONENT DIMENSIONS in millimeters											
PART NUMBER	MARKING	A		B		C		D		E	
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
PPTC1812E3014V60	I6	4.37	4.73	3.07	3.41	0.75	1.95	0.30	1.20	0.15	0.65
PPTC1812E3050V30	O3	4.37	4.73	3.07	3.41	0.50	1.00	0.30	1.20	0.15	0.65
PPTC1812E3150V12	T1	4.37	4.73	3.07	3.41	0.75	1.25	0.30	1.20	0.15	0.65
PPTC1812E3150V24	T3	4.37	4.73	3.07	3.41	0.80	1.80	0.30	1.20	0.15	0.65

**THERMAL DERATING****TIME TO TRIP CURVE**

**RECOMMENDED HOLD CURRENT** in Amperes

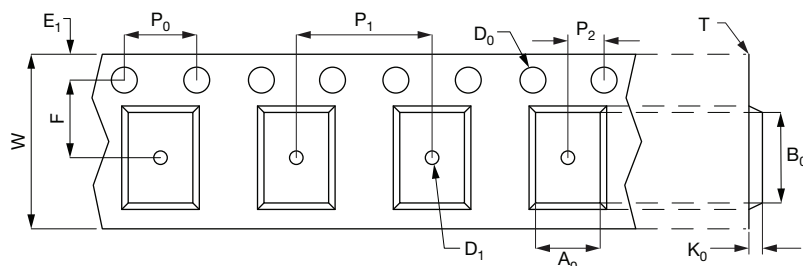
PART NUMBER	-40 °C	-20 °C	0 °C	25 °C	40 °C	50 °C	60 °C	70 °C	85 °C
PPTC1812E3014V60	0.23	0.19	0.17	0.14	0.12	0.10	0.09	0.08	0.06
PPTC1812E3050V30	0.77	0.68	0.59	0.50	0.44	0.40	0.37	0.33	0.29
PPTC1812E3150V12	2.04	1.88	1.68	1.50	1.25	1.10	1.00	0.80	0.60
PPTC1812E3150V24	2.05	1.87	1.67	1.50	1.25	1.08	0.95	0.77	0.60

**Note**

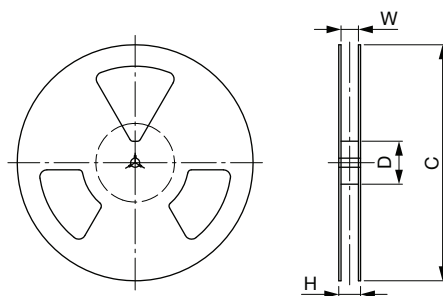
- Recommended hold currents prevail the thermal derating graph; hold and trip currents are depending on mounting

**TAPE AND REEL DIMENSIONS**

Taping on reel according to EIA-481.


**TAPE DIMENSIONS** in millimeters

PART NUMBER	W	F	E <sub>1</sub>	D <sub>0</sub>	D <sub>1</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	A <sub>0</sub>	B <sub>0</sub>	T	K <sub>0</sub>
PPTC1812E3014V60	12.00 ± 0.30	5.50 ± 0.05	1.75 ± 0.10	1.55 ± 0.05	1.50 ± 0.10	4.00 ± 0.10	8.00 ± 0.10	2.00 ± 0.05	3.50 ± 0.10	4.85 ± 0.10	0.25 ± 0.10	1.25 ± 0.10
PPTC1812E3050V30	12.00 ± 0.30	5.50 ± 0.05	1.75 ± 0.10	1.55 ± 0.05	1.55 (min)	4.00 ± 0.10	8.00 ± 0.10	2.00 ± 0.05	3.58 ± 0.10	4.93 ± 0.10	0.25 ± 0.10	0.87 ± 0.10
PPTC1812E3150V12	12.00 ± 0.30	5.50 ± 0.05	1.75 ± 0.10	1.55 ± 0.05	1.50 ± 0.10	4.00 ± 0.10	8.00 ± 0.10	2.00 ± 0.05	3.50 ± 0.10	4.85 ± 0.10	0.25 ± 0.10	1.25 ± 0.10
PPTC1812E3150V24	12.00 ± 0.30	5.50 ± 0.05	1.75 ± 0.10	1.55 ± 0.05	1.50 (min)	4.00 ± 0.08	8.00 ± 0.10	2.00 ± 0.05	3.58 ± 0.10	4.93 ± 0.10	0.25 ± 0.10	2.10 ± 0.10


**REEL DIMENSIONS** in millimeters

C	D	H	W
Ø 178 ± 1.0	Ø 60.2 ± 0.5	11.0 ± 0.5	9.0 ± 1.5

**PACKAGING QUANTITY**

PART NUMBER	QUANTITY
PPTC1812E3014V60	1500
PPTC1812E3050V30	2000
PPTC1812E3150V12	1500
PPTC1812E3150V24	1000



## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.