

SMD1812 Series Surface Mount PTC Devices

Description

The 1812 series provides surface mount resettable overcurrent protection with holding current from 0.1A to 4.0A. This series offers complete portfolio in terms of holding current and working voltage, and is suitable for wide range of applications.



Features

- ◆ Low profile
- ◆ High Conductance
- ◆ RoHS compliant and lead-free
- ◆ Halogen-Free
- ◆ Compatible with high temperature solders
- ◆ For surface mounted applications to optimize layout space

Applications

- ◆ USB hubs, ports and peripherals
- ◆ Set-top-box and HDMI
- ◆ Game console port protection
- ◆ Motherboard USB & IEEE 1394 protection
- ◆ Optical disk drives
- ◆ General electronics

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

Part Number	I_H (A)	I_T (A)	U_{Max} (V)	I_{Max} (A)	P_{DTYP} (W)	Time-To-trip		R_{Min} (Ω)	R_{1Max} (Ω)
						$I_{Trip}(A)$	$T_{Max}(S)$		
SMD1812R010SF33	0.10	0.30	33.0	30	0.8	0.5	1.50	0.750	15.000
SMD1812R010SF	0.10	0.30	30.0	30	0.8	0.5	1.50	0.750	15.000
SMD1812R010SF60	0.10	0.30	60.0	30	0.8	0.5	1.50	0.750	15.000
SMD1812R014SF33	0.14	0.34	33.0	30	0.8	1.5	0.15	0.650	6.000
SMD1812R014SF	0.14	0.34	60.0	30	0.8	1.5	0.15	0.650	6.000
SMD1812R020SF	0.20	0.40	30.0	30	0.8	8.0	0.02	0.350	5.000
SMD1812R020SF33	0.20	0.40	33.0	30	0.8	8.0	0.02	0.350	5.000
SMD1812R020SF60	0.20	0.40	60.0	30	0.8	8.0	0.02	0.350	5.000
SMD1812R030SF	0.30	0.60	30.0	30	0.8	8.0	0.10	0.250	3.000
SMD1812R030SF33	0.30	0.60	33.0	30	0.8	8.0	0.10	0.250	3.000
SMD1812R030SF60	0.30	0.60	60.0	30	0.8	8.0	0.10	0.250	3.000
SMD1812R050SF	0.50	1.00	15.0	30	0.8	8.0	0.15	0.150	1.000
SMD1812R050SF33	0.50	1.00	33.0	30	0.8	8.0	0.15	0.150	1.000
SMD1812R050SF60	0.50	1.00	60.0	30	0.8	8.0	0.15	0.150	1.400
SMD1812R075SF	0.75	1.50	13.2	30	0.8	8.0	0.20	0.090	0.450
SMD1812R075SF24	0.75	1.50	24.0	30	0.8	8.0	0.20	0.090	0.450
SMD1812R075SF33	0.75	1.50	33.0	30	0.8	8.0	0.20	0.090	0.450
SMD1812R110SF	1.10	2.20	8.0	35	0.8	8.0	0.30	0.045	0.250
SMD1812R110SF16	1.10	2.20	16.0	35	0.8	8.0	0.30	0.050	0.250
SMD1812R110SF24	1.10	2.20	24.0	35	0.8	8.0	0.30	0.050	0.250
SMD1812R110SF33	1.10	2.20	33.0	35	0.8	8.0	0.30	0.050	0.250
SMD1812R125SF8	1.25	2.50	8.0	35	0.8	8.0	0.40	0.050	0.140
SMD1812R125SF	1.25	2.50	16.0	35	0.8	8.0	0.40	0.050	0.140
SMD1812R150SF	1.50	3.00	8.0	35	0.8	8.0	0.50	0.040	0.160
SMD1812R150SF16	1.50	3.00	16.0	35	0.8	8.0	0.50	0.040	0.160
SMD1812R150SF24	1.50	3.00	24.0	35	0.8	8.0	0.50	0.040	0.160
SMD1812R150SF33	1.50	3.00	33.0	35	0.8	8.0	0.50	0.040	0.160

Part Number	I_H (A)	I_T (A)	U_{Max} (V)	I_{Max} (A)	P_{DTYP} (W)	Time-To-trip		R_{Min} (Ω)	R_{1Max} (Ω)
						$I_{Trip}(A)$	$T_{Max}(S)$		
SMD1812R160SF	1.60	2.80	8.0	35	0.8	8.0	1.00	0.030	0.130
SMD1812R200SF	2.00	4.00	8.0	35	0.8	8.0	2.00	0.020	0.100
SMD1812R200SF16	2.00	4.00	16.0	35	0.8	8.0	2.00	0.020	0.100
SMD1812R200SF24	2.00	4.00	24.0	35	0.8	8.0	2.00	0.020	0.100
SMD1812R260SF	2.60	5.00	8.0	35	0.8	8.0	2.50	0.010	0.050
SMD1812R260SF16	2.60	5.00	16.0	35	0.8	8.0	2.50	0.010	0.050
SMD1812R300SF	3.00	5.00	8.0	35	0.8	8.0	4.00	0.010	0.040
SMD1812R300SF16	3.00	5.00	16.0	35	0.8	8.0	4.00	0.010	0.040
SMD1812R350SF	3.50	6.00	6.0	35	2.0	10.0	4.00	0.008	0.030
SMD1812R350SF16	3.50	6.00	16.0	35	2.0	10.0	4.00	0.008	0.030
SMD1812R400SF	4.00	7.00	6.0	35	2.0	10.0	4.00	0.005	0.025

Notes:

I_H = Hold current: maximum current device will pass without tripping in 25°C still air.

I_T = Trip current minimum current at which the device will trip in 25 °C still air.

U_{Max} = Maximum voltage device can withstand without damage at rated current (I_{max}).

I_{max} = Maximum fault current device can withstand without damage at rated voltage (V_{max}).

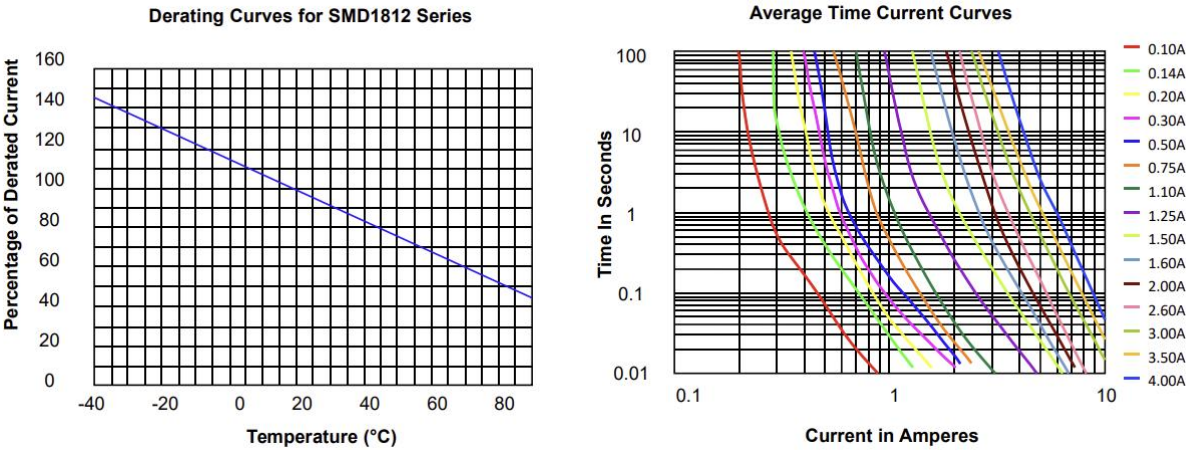
P_{DTYP} = Typical Power dissipated from device when in the tripped state at 25 °C still air.

R_{min} = Minimum resistance of device in initial(un-soldered) state.

R_{Max} =Maximum resistance of device in initial (un-soldered) state.

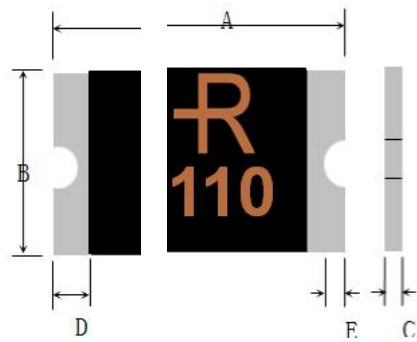
R_{1max} = Maximum resistance of device at 25 °C measured one hour after tripping or reflow soldering of 260 °C for 20 sec.

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



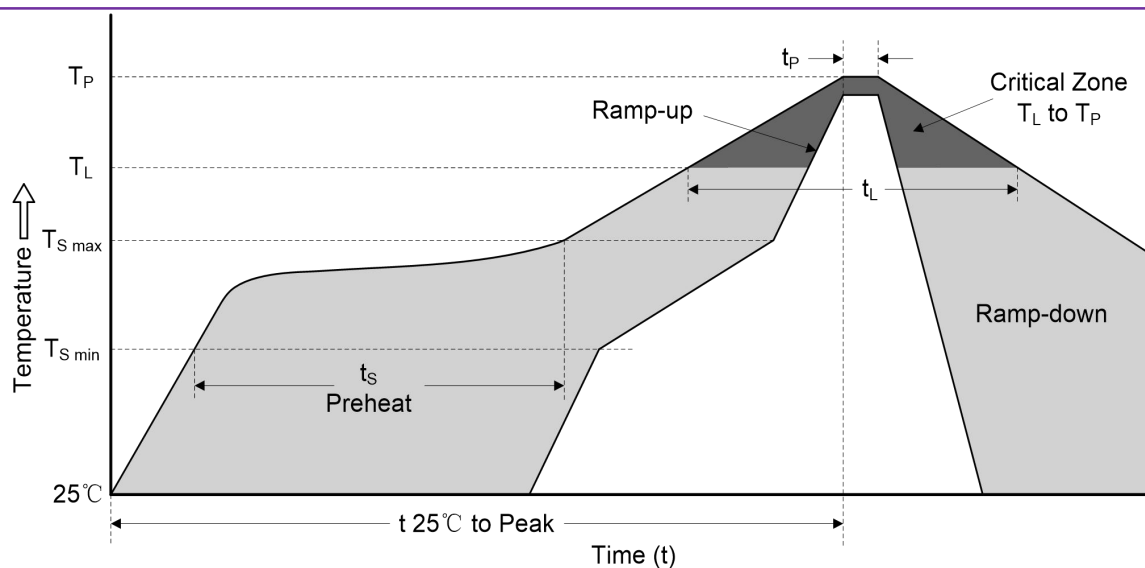
Part Number	Ambient Operation Temperature								
	-40°C	-20°C	0°C	25°C	30°C	40°C	50°C	60°C	70°C
SMD1812R010SF	0.16	0.14	0.12	0.10	0.08	0.07	0.06	0.05	0.03
SMD1812R014SF	0.23	0.19	0.17	0.14	0.12	0.10	0.09	0.08	0.06
SMD1812R020SF	0.29	0.26	0.23	0.20	0.17	0.15	0.14	0.12	0.10
SMD1812R030SF	0.44	0.39	0.35	0.30	0.26	0.23	0.21	0.18	0.15
SMD1812R050SF	0.59	0.57	0.55	0.50	0.45	0.43	0.35	0.30	0.23
SMD1812R075SF	1.10	0.99	0.87	0.75	0.63	0.57	0.49	0.45	0.35
SMD1812R110SF	1.60	1.45	1.28	1.10	0.92	0.83	0.71	0.66	0.52
SMD1812R125SF	2.00	1.75	1.52	1.25	1.00	0.95	0.90	0.75	0.53
SMD1812R150SF	2.10	1.96	1.77	1.50	1.23	1.09	0.95	0.82	0.61
SMD1812R160SF	2.30	2.05	1.88	1.60	1.26	1.12	0.98	0.84	0.63
SMD1812R200SF	2.88	2.61	2.25	2.00	1.80	1.66	1.45	1.09	0.80
SMD1812R260SF	3.90	3.42	2.96	2.60	2.33	2.07	1.94	1.35	1.00
SMD1812R300SF	4.15	3.76	3.46	3.00	2.55	2.28	2.01	1.61	1.33
SMD1812R350SF	4.84	4.39	4.04	3.50	2.98	2.66	2.35	1.88	1.55
SMD1812R400SF	5.80	5.20	4.60	4.00	3.35	3.12	2.75	2.45	2.10

Dimensions (unit:mm)



Part number	A		B		C		D	E
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Min.
SMD1812R010SF	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R010SF33	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R010SF60	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R014SF33	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R014SF	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R020SF	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R020SF33	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R020SF60	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R030SF	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R030SF33	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R030SF60	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R050SF	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812R050SF33	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812R050SF60	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R075SF	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R075SF24	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
SMD1812R075SF33	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
SMD1812R110SF	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812R110SF16	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812R110SF24	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
SMD1812R110SF33	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
SMD1812R125SF	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812R125SF8	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25

Reflow 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 seconds
Average ramp-up rate (T_L to T_P)		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		260°C