Type R1812
Resettable Fuse (PTC's)
Surface Mount

www.optifuse.com (619) 593-5050

Application:

All high-density boards **Product Features:**

Small surface mount, Solid State

Faster time to trip than standard SMD devices.

Lower resistance than standard SMD devices.

Operation Current: 100mA ~ 3.0A

Maximum Voltage: 100VDC

Temperature Range: -40ºC to 85ºC

Agency Standards and Listings:

RoHS 2002/95/EC | HF Halogen Free

Electrical Characteristics (23ºC)

Part Number	Hold Current	Trip Current	Rated Voltage	Max Current	Typical Power	Max Time to Trip		Resistance Tolerance	
						Current	Time	RMIN	R1MAX
	IH, A	IT, A	VMAX, Vdc	IMAX, A	Pd, W	Amp	Sec	Ω	Ω
R1812-010	0.10	0.30	60	100	0.8	8.0	0.020	1.600	15.00
R1812-010-R	0.10	0.30	60	100	0.8	8.0	0.020	1.600	15.00
R1812-014	0.14	0.30	60	100	0.8	8.0	0.008	1.200	6.500
R1812-014-R	0.14	0.30	60	100	0.8	8.0	0.008	1.200	6.500
R1812-020	0.20	0.40	30	100	0.8	8.0	0.020	0.800	5.000
R1812-020-R	0.20	0.40	30	100	0.8	8.0	0.020	0.800	5.000
R1812-020-60-R	0.20	0.40	60	100	0.8	8.0	0.020	0.800	5.000
R1812-030-R	0.30	0.60	30	100	0.8	8.0	0.100	0.200	1.750
R1812-035	0.35	0.70	16	100	0.8	8.0	0.100	0.320	1.500
R1812-035-R	0.35	0.70	16	100	0.8	8.0	0.100	0.320	1.500
R1812-035-30-R	0.35	0.70	30	100	0.8	8.0	0.100	0.320	1.500
R1812-050	0.50	1.00	16	100	0.8	8.0	0.150	0.150	1.000
R1812-050-R	0.50	1.00	16	100	0.8	8.0	0.150	0.150	1.000
R1812-050-30-R	0.50	1.00	30	100	0.8	8.0	0.150	0.150	1.000
R1812-075	0.75	1.50	16	100	0.8	8.0	0.200	0.110	0.450
R1812-075-R	0.75	1.50	16	100	0.8	8.0	0.200	0.110	0.450
R1812-075-24-R	0.75	1.50	24	100	1.0	8.0	0.200	0.110	0.290
R1812-075-33-R	0.75	1.50	33	100	1.0	8.0	0.200	0.110	0.400
R1812-110	1.10	2.20	8	100	0.8	8.0	0.300	0.040	0.210
R1812-110-R	1.10	2.20	8	100	0.8	8.0	0.300	0.040	0.210
R1812-110-16	1.10	2.20	16	100	0.8	8.0	0.500	0.040	0.180
R1812-110-16-R	1.10	2.20	16	100	0.8	8.0	0.500	0.040	0.180
R1812-110-24-R	1.10	2.20	24	100	1.0	8.0	0.500	0.060	0.200

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R1812-125	1.25	2.50	6	100	0.8	8.0	0.400	0.050	0.140
R1812-125-R	1.25	2.50	6	100	0.8	8.0	0.400	0.050	0.140
R1812-125-16-R	1.25	2.50	16	100	0.8	8.0	0.400	0.050	0.140
R1812-150	1.50	3.00	8	100	0.8	8.0	0.500	0.040	0.110
R1812-150-R	1.50	3.00	8	100	0.8	8.0	0.500	0.040	0.110
R1812-150-12-R	1.50	3.00	12	100	1.0	8.0	1.500	0.040	0.110
R1812-150-24-R	1.50	3.00	24	100	1.0	8.0	0.500	0.040	0.120
R1812-160	1.60	3.20	8	100	0.8	8.0	0.500	0.030	0.100
R1812-160-R	1.60	3.20	8	100	0.8	8.0	0.500	0.030	0.100
R1812-160-12-R	1.60	3.20	12	100	1.0	8.0	1.000	0.030	0.100
R1812-160-16-R	1.60	3.20	16	100	1.0	8.0	1.000	0.030	0.100
R1812-200-R	2.00	3.50	8	100	1.0	8.0	2.000	0.020	0.070
R1812-200-16-R	2.00	3.50	16	100	1.0	8.0	5.000	0.020	0.085
R1812-260-R	2.60	5.00	8	100	1.0	8.0	2.500	0.015	0.047
R1812-260-13-R	2.60	5.00	13.2	100	1.3	8.0	5.000	0.015	0.050
R1812-260-16-R	2.60	5.00	16	100	1.3	8.0	5.000	0.015	0.050
R1812-300-R	3.00	5.00	6	100	1.0	8.0	4.000	0.012	0.040

I_H = Hold Current – Maximum current at which the device will not trip at 23ºC still air.
I_T = Trip Current – Minimum current at which the device will always trip at 23ºC still air.
V_{MAX} = Maximum voltage device can withstand without damage at it's rated current.
I_{MAX} = Maximum fault current device can withstand without damage at rated voltage (V max).
Pd = Typical power dissipated from device when in the tripped state in 23ºC still air environment.
R_{MIN} = Minimum device resistance at 23ºC.
$R1_{MAX}$ = Maximum device resistance at 23ºC, 1 hour after tripping.

Physical Specifications:

Termination Pad Characteristics: Pure Tin

R1812: Product Dimensions (millimeters)

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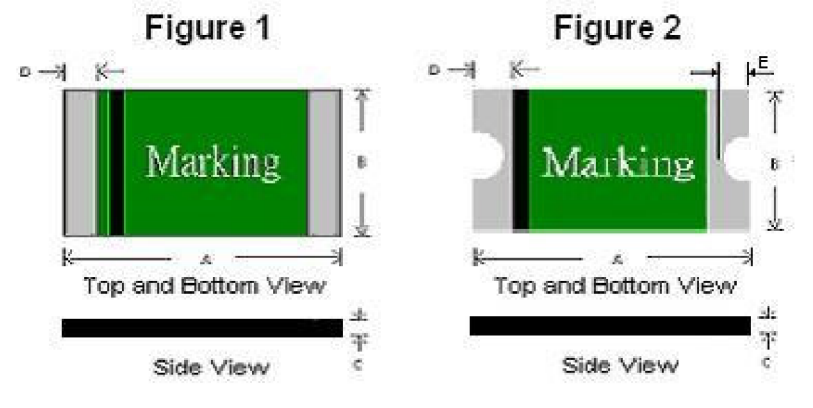

Part Number	Figure	A		B		C		D		E	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
R1812-010	1	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	-	-
R1812-010-R	2	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	0.25	0.65
R1812-014	1	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	-	-
R1812-014-R	2	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	0.25	0.65
R1812-020	1	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	-	-
R1812-020-R	2	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	0.25	0.65
R1812-020-60-R	2	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	0.25	0.65
R1812-030-R	2	4.37	4.73	3.07	3.41	0.40	0.70	0.30	0.95	0.25	0.65
R1812-035	1	4.37	4.73	3.07	3.41	0.40	0.70	0.30	0.95	-	-
R1812-035-R	2	4.37	4.73	3.07	3.41	0.40	0.70	0.30	0.95	0.25	0.65
R1812-035-30-R	2	4.37	4.73	3.07	3.41	0.40	0.70	0.30	0.95	0.25	0.65
R1812-050	1	4.37	4.73	3.07	3.41	0.35	0.65	0.30	0.95	-	-
R1812-050-R	2	4.37	4.73	3.07	3.41	0.35	0.65	0.30	0.95	0.25	0.65
R1812-050-30-R	2	4.37	4.73	3.07	3.41	0.45	0.75	0.30	0.95	0.25	0.65
R1812-075	1	4.37	4.73	3.07	3.41	0.35	0.65	0.30	0.95	-	-
R1812-075-R	2	4.37	4.73	3.07	3.41	0.35	0.65	0.30	0.95	0.25	0.65
R1812-075-24-R	2	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65
R1812-075-33-R	2	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65
R1812-110	1	4.37	4.73	3.07	3.41	0.25	0.55	0.30	0.95	-	-
R1812-110-R	2	4.37	4.73	3.07	3.41	0.25	0.55	0.30	0.95	0.25	0.65
R1812-110-16	1	4.37	4.73	3.07	3.41	0.25	0.90	0.30	0.95	-	-
R1812-110-16-R	2	4.37	4.73	3.07	3.41	0.25	0.90	0.30	0.95	0.25	0.65

Note: All specifications subject to change without notice.

R1812-110-24-R	2	4.37	4.73	3.07	3.41	0.80	1.30	0.25	0.95	0.25	0.65
R1812-125	1	4.37	4.73	3.07	3.41	0.25	0.55	0.30	0.95	-	-
R1812-125-R	2	4.37	4.73	3.07	3.41	0.25	0.55	0.30	0.95	0.25	0.65
R1812-125-16-R	2	4.37	4.73	3.07	3.41	0.50	1.00	0.30	0.95	0.25	0.65
R1812-150	1	4.37	4.73	3.07	3.41	0.25	0.55	0.30	0.95	-	-
R1812-150-R	2	4.37	4.73	3.07	3.41	0.25	0.55	0.30	0.95	0.25	0.65
R1812-150-12-R	2	4.37	4.73	3.07	3.41	0.60	1.10	0.25	0.95	0.25	0.65
R1812-150-24-R	2	4.37	4.73	3.07	3.41	0.60	1.55	0.25	0.95	0.25	0.65
R1812-160	1	4.37	4.73	3.07	3.41	0.25	0.90	0.30	0.95	-	-
R1812-160-R	2	4.37	4.73	3.07	3.41	0.25	0.90	0.30	0.95	0.25	0.65
R1812-160-12-R	2	4.37	4.73	3.07	3.41	0.60	1.35	0.25	0.95	0.25	0.65
R1812-160-16-R	2	4.37	4.73	3.07	3.41	0.60	1.35	0.25	0.95	0.25	0.65
R1812-200-R	2	4.37	4.73	3.07	3.41	0.40	0.90	0.25	0.95	0.25	0.65
R1812-200-16-R	2	4.37	4.73	3.07	3.41	0.60	1.55	0.25	0.95	0.25	0.65
R1812-260-R	2	4.37	4.73	3.07	3.41	0.55	1.20	0.25	0.95	0.25	0.65
R1812-260-13-R	2	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65
R1812-260-16-R	2	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65
R1812-300-R	2	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65

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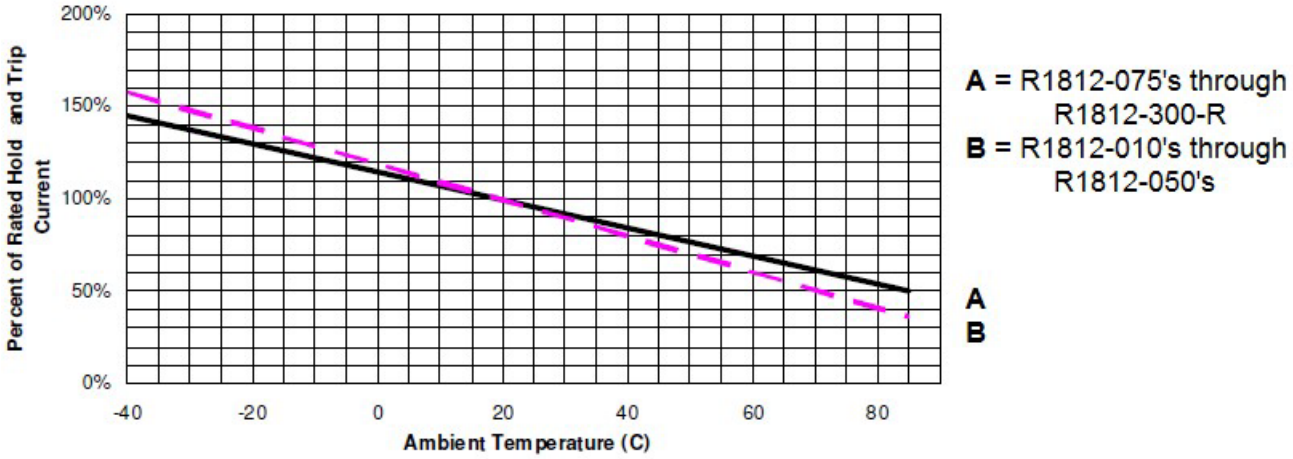
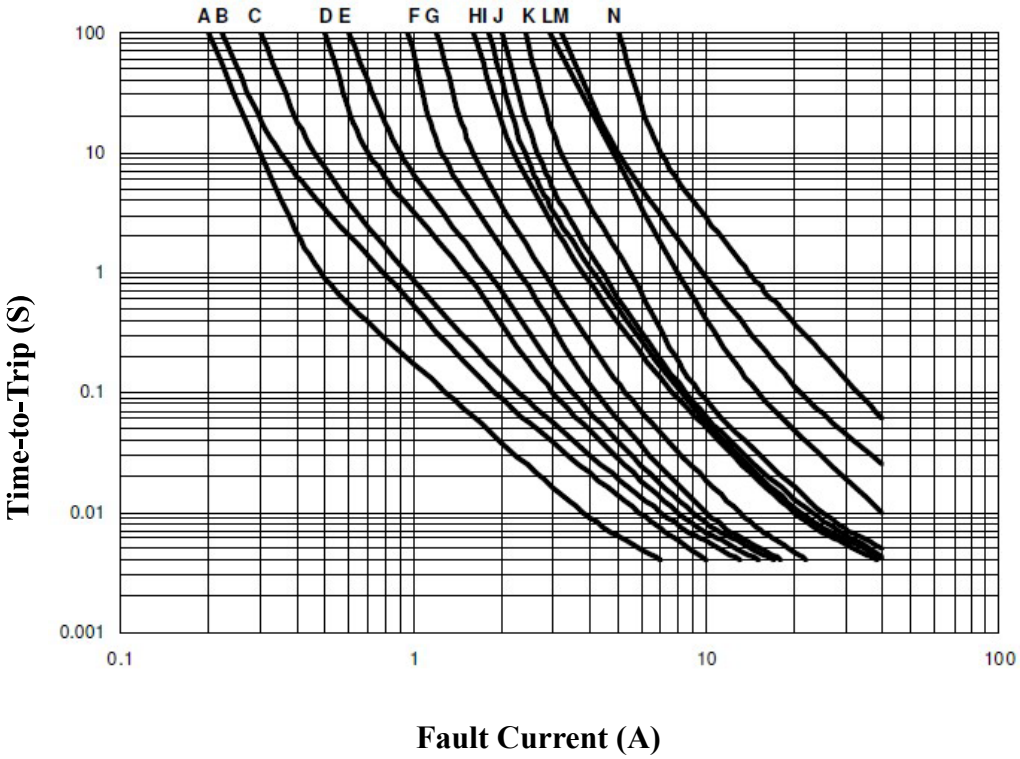
Thermal Derating Curve



Typical Time-To-Trip at 23ºC

A = R1812-010's
B = R1812-014's
C = R1812-020's
D = R1812-030-R
E = R1812-035's
F = R1812-050's
G = R1812-075's
H = R1812-110's
I = R1812-125's
J = R1812-150's
K = R1812-160's L = R1812-200-R M = R1812-260's
N = R1812-300-R



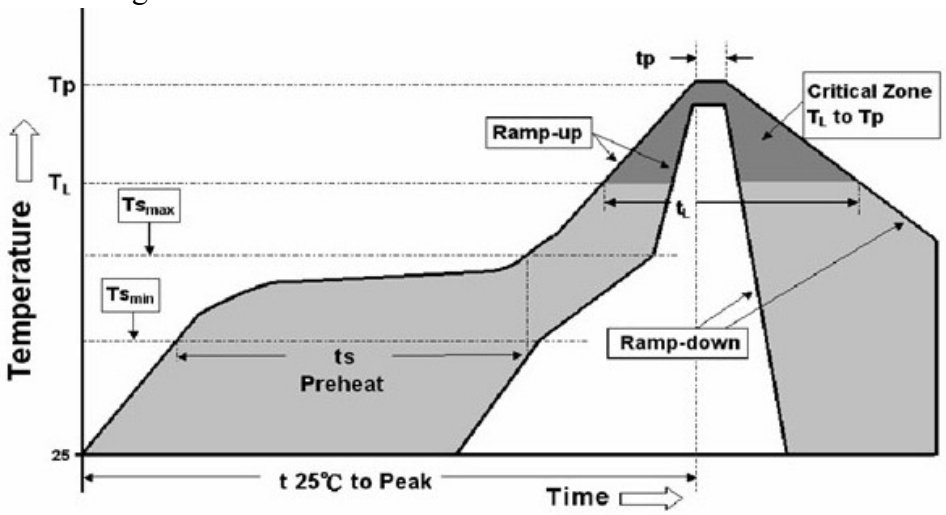
Profile Features	Pb-Free Assembly
Average Ramp-Up Rate (Tsmax to Tp)	3 °C/second max.
Preheat: Temperature Min (Tsmin) Temperature Max (Tsmax) Time (Tsmin to Tsmax)	 150 °C 200 °C 60-180 seconds
Time maintained above: Temperature (T_L) Time (t_L)	 217 °C 60-150 seconds
Peak/Classification Temperature (Tp):	260 °C
Time within 5 °C of actual Peak: Temperature (tp)	 20-40 seconds
Ramp-Down Rate:	6 °C/second max.
Time 25 °C to Peak Temperature:	8 minute max.

Solder reflow

* Due to "Lead Free" nature, Temperature and Dwelling time for the soldering zone is higher than those for Regular. This may cause damage to other components.

1. Recommended maximum paste thickness > 0.25mm.
2. Devices can be cleaned using standard industry methods and aqueous solvents.
3. Rework use standard industry practices.
4. Storage Environment: < 30°C / 60%RH **Caution:**

1. If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.
2. Devices are not designed to be wave soldered to the bottom side of the board.



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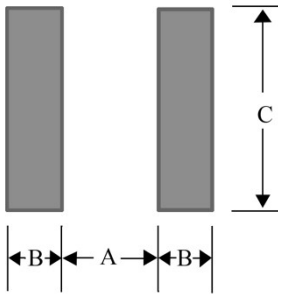
Standard Package

Part Numbers	Reel/Tape
R1812-010 ~ R1812-075-R	2K
R1812-075-24-R ~ R1812-075-33-R	1.5K
R1812-110 ~ R1812-110-16-R	2K
R1812-110-24-R	1.5K
R1812-125 ~ R1812-125-R	2K
R1812-125-16-R	1.5K
R1812-150 ~ R1812-200-R	2K
R1812-200-16-R	1.5K
R1812-260-R	2K
R1812-260-13-R ~ R1812-300-R	1.5K

Pad Layouts – Solder Reflow and Rework Recommendations

The dimensions in the table below provide the recommended pad layout for each R1812 device.



Pad Dimensions (millimeters)
A – Nominal – 3.45 mm
B – Nominal – 1.78 mm
C – Nominal – 3.50 mm

Warning:	-Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame. -PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated. -Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.