



**Product Features:** Small surface mountable, Solid state, Faster time to trip than standard SMD devices, Lower resistance than standard SMD devices

**Operation Current:** 0.10A~3.00A

**Maximum Voltage:** 6V<sub>DC</sub>~60V<sub>DC</sub>

**Temperature Range :** -40°C to 85°C

**Applications:** All high-density boards



**Electrical Characteristics (23°C)**

Part Number	Hold Current I <sub>H</sub> , A	Trip Current I <sub>T</sub> , A	Rated Voltage V <sub>MAX</sub> , V <sub>DC</sub>	Max Current I <sub>MAX</sub> , A	Typical Power Pd, W	Max Time to Trip		Resistance	
						Current A	Time Sec	R <sub>MIN</sub> Ohms	R <sub>1MAX</sub> Ohms
F1812L010-60	0.10	0.30	60.0	100	0.8	8.0	0.020	1.600	15.000
F1812L014-60	0.14	0.30	60.0	100	0.8	8.0	0.008	1.200	6.500
F1812L020-30	0.20	0.40	30.0	100	0.8	8.0	0.020	0.800	5.000
F1812L020-60	0.20	0.40	60.0	100	0.8	8.0	0.020	0.800	5.000
F1812L030-30	0.30	0.60	30.0	100	0.8	8.0	0.100	0.200	1.750
F1812L035-16	0.35	0.70	16.0	100	0.8	8.0	0.100	0.320	1.500
F1812L035-30	0.35	0.70	30.0	100	0.8	8.0	0.100	0.320	1.500
F1812L050-16	0.50	1.00	16.0	100	0.8	8.0	0.150	0.150	1.000
F1812L050-30	0.50	1.00	30.0	100	0.8	8.0	0.150	0.150	1.000
F1812L075-16	0.75	1.50	16.0	100	0.8	8.0	0.200	0.110	0.450
F1812L075-24	0.75	1.50	24.0	100	1.0	8.0	0.200	0.110	0.290
F1812L075-33	0.75	1.50	33.0	100	1.0	8.0	0.200	0.110	0.400
F1812L110-08	1.10	2.20	8.0	100	0.8	8.0	0.300	0.040	0.210
F1812L110-16	1.10	2.20	16.0	100	0.8	8.0	0.500	0.060	0.180
F1812L110-24	1.10	2.20	24.0	100	1.0	8.0	0.500	0.060	0.200
F1812L110-33	1.10	2.20	33.0	100	0.8	8.0	0.500	0.060	0.200
F1812L125-06	1.25	2.50	6.0	100	0.8	8.0	0.400	0.050	0.140
F1812L125-16	1.25	2.50	16.0	100	0.8	8.0	0.400	0.050	0.140
F1812L150-08	1.50	3.00	8.0	100	0.8	8.0	0.500	0.040	0.110
F1812L150-12	1.50	3.00	12.0	100	1.0	8.0	0.500	0.040	0.110
F1812L150-24	1.50	3.00	24.0	100	1.0	8.0	1.500	0.040	0.120
F1812L160-08	1.60	3.20	8.0	100	0.8	8.0	0.500	0.030	0.100
F1812L160-12	1.60	3.20	12.0	100	1.0	8.0	1.000	0.030	0.100
F1812L160-16	1.60	3.20	16.0	100	1.0	8.0	1.000	0.030	0.100
F1812L160-24	1.60	3.20	24.0	100	1.0	8.0	1.00	0.030	0.100
F1812L200-08	2.00	3.50	8.0	100	1.0	8.0	2.000	0.020	0.070
F1812L200-16	2.00	3.50	16.0	100	1.0	8.0	5.000	0.020	0.085
F1812L260-08	2.60	5.00	8.0	100	1.0	8.0	2.500	0.015	0.047
F1812L260-13	2.60	5.00	13.2	100	1.3	8.0	5.000	0.015	0.050
F1812L260-16	2.60	5.00	16.0	100	1.3	8.0	5.000	0.015	0.050
F1812L300-06	3.00	5.00	6.0	100	1.0	8.0	4.000	0.012	0.040

I<sub>H</sub>=Hold current-maximum current at which the device will not trip at 23°C still air.

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

V<sub>MAX</sub>=Maximum voltage device can withstand without damage at it 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>).

Pd=Typical power dissipated-type amount of power dissipated by the device when in the tripped state in 23°C still air environment.

R<sub>MIN</sub>=Minimum device resistance at 23°C prior to tripping.

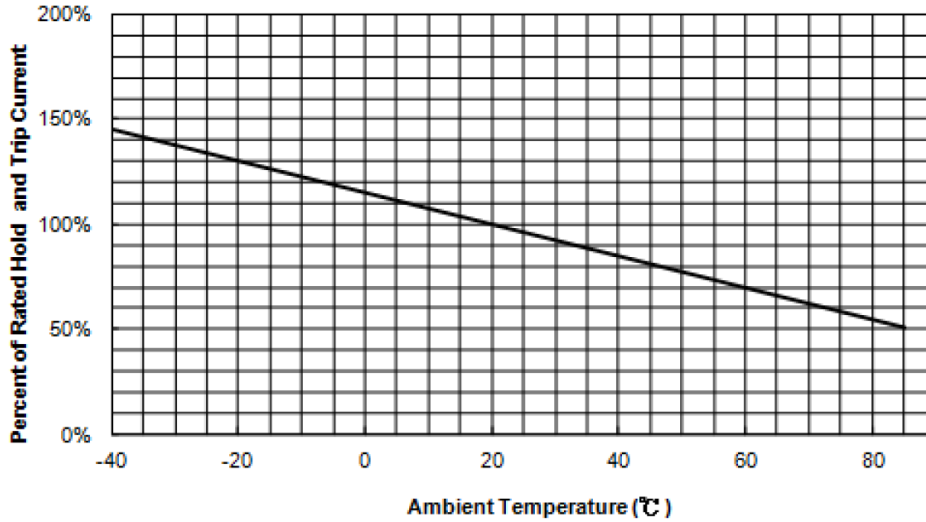
R<sub>1MAX</sub>=Maximum device resistance at 23°C measured 1 hour after tripping or reflow soldering of 260°C for 20 seconds.

Termination pad characteristics

Termination pad materials: Pure Tin

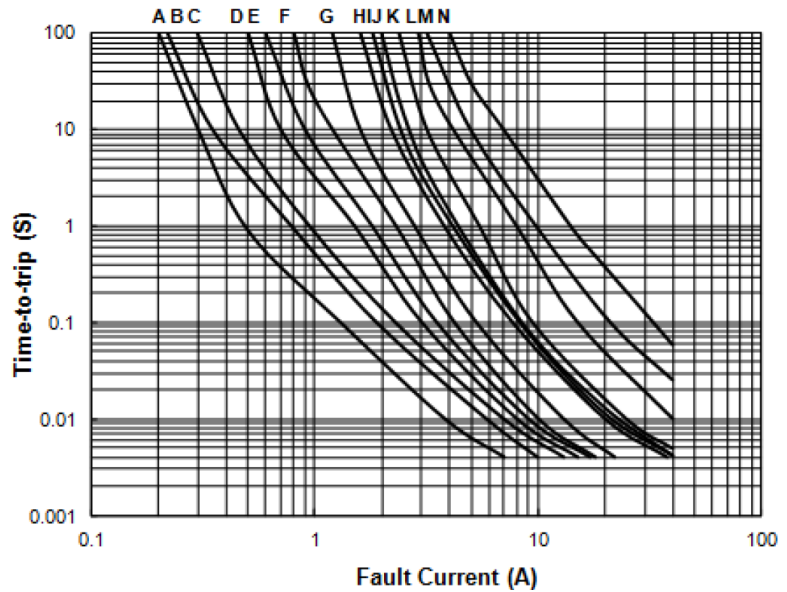


### Thermal Derating Curve



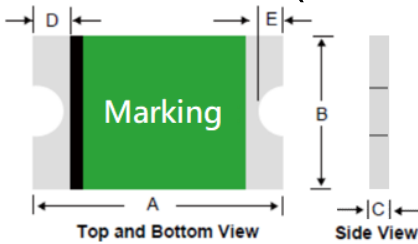
### Typical Time-To-Trip at 23°C

- A = F1812L010-60
- B = F1812L014-60
- C = F1812L020-30 / F1812L020-60
- D = F1812L030-30
- E = F1812L035-16 / F1812L035-30
- F = F1812L050-16 / F1812L050-30
- G = F1812L075-16 / F1812L075-24 / F1812L075-33
- H = F1812L110-08 / F1812L110-16 / F1812L110-24 / F1812L110-33
- I = F1812L125-06 / F1812L125-16
- J = F1812L150-08 / F1812L150-12 / F1812L150-24
- K = F1812L160-08 / F1812L160-12 / F1812L160-16 / F1812L160-24
- L = F1812L200-08 / F1812L200-16
- M = F1812L260-08 / F1812L260-13 / F1812L260-16
- N = F1812L300-06





**Product Dimensions (Millimeters)**



Part Number	A		B		C		D		E	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
F1812L010-60	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	0.25	0.65
F1812L014-60	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	0.25	0.65
F1812L020-30	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	0.25	0.65
F1812L020-60	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	0.25	0.65
F1812L030-30	4.37	4.73	3.07	3.41	0.40	0.70	0.30	0.95	0.25	0.65
F1812L035-16	4.37	4.73	3.07	3.41	0.40	0.70	0.30	0.95	0.25	0.65
F1812L035-30	4.37	4.73	3.07	3.41	0.40	0.70	0.30	0.95	0.25	0.65
F1812L050-16	4.37	4.73	3.07	3.41	0.35	0.65	0.30	0.95	0.25	0.65
F1812L050-30	4.37	4.73	3.07	3.41	0.45	0.75	0.30	0.95	0.25	0.65
F1812L075-16	4.37	4.73	3.07	3.41	0.35	0.65	0.30	0.95	0.25	0.65
F1812L075-24	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65
F1812L075-33	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65
F1812L110-08	4.37	4.73	3.07	3.41	0.25	0.55	0.30	0.95	0.25	0.65
F1812L110-16	4.37	4.73	3.07	3.41	0.25	0.90	0.30	0.95	0.25	0.65
F1812L110-24	4.37	4.73	3.07	3.41	0.80	1.30	0.25	0.95	0.25	0.65
F1812L110-33	4.37	4.73	3.07	3.41	0.80	1.30	0.25	0.95	0.25	0.65
F1812L125-06	4.37	4.73	3.07	3.41	0.25	0.55	0.30	0.95	0.25	0.65
F1812L125-16	4.37	4.73	3.07	3.41	0.50	1.00	0.30	0.95	0.25	0.65
F1812L150-08	4.37	4.73	3.07	3.41	0.25	0.55	0.30	0.95	0.25	0.65
F1812L150-12	4.37	4.73	3.07	3.41	0.60	1.10	0.25	0.95	0.25	0.65
F1812L150-24	4.37	4.73	3.07	3.41	0.60	1.55	0.25	0.95	0.25	0.65
F1812L160-08	4.37	4.73	3.07	3.41	0.25	0.90	0.30	0.95	0.25	0.65
F1812L160-12	4.37	4.73	3.07	3.41	0.60	1.35	0.25	0.95	0.25	0.65
F1812L160-16	4.37	4.73	3.07	3.41	0.60	1.35	0.25	0.95	0.25	0.65
F1812L160-24	4.37	4.73	3.07	3.41	0.55	1.20	0.25	0.95	0.25	0.65
F1812L200-08	4.37	4.73	3.07	3.41	0.55	1.20	0.25	0.95	0.25	0.65
F1812L200-16	4.37	4.73	3.07	3.41	0.60	1.55	0.25	0.95	0.25	0.65
F1812L260-08	4.37	4.73	3.07	3.41	0.55	1.20	0.25	0.95	0.25	0.65
F1812L260-13	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65
F1812L260-16	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65
F1812L300-06	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65



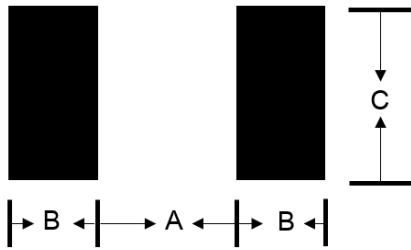
## Material Specification

Terminal pad material: Pure Tin

Soldering characteristics: Meets EIA specification RS 186-9E, ANSI/J-std-002 Category 3

## Pad Layouts, Solder Reflow and Rework Recommendations

The dimension in the table below provide the recommended pad layout for each F1812L device



Pad dimensions (millimeters)			
Device	A Nominal	B Nominal	C Nominal
F1812L	3.45	1.78	3.50

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/Classification 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.

Note 1: All temperatures refer to of the package,  
measured on the package body surface.

### 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.

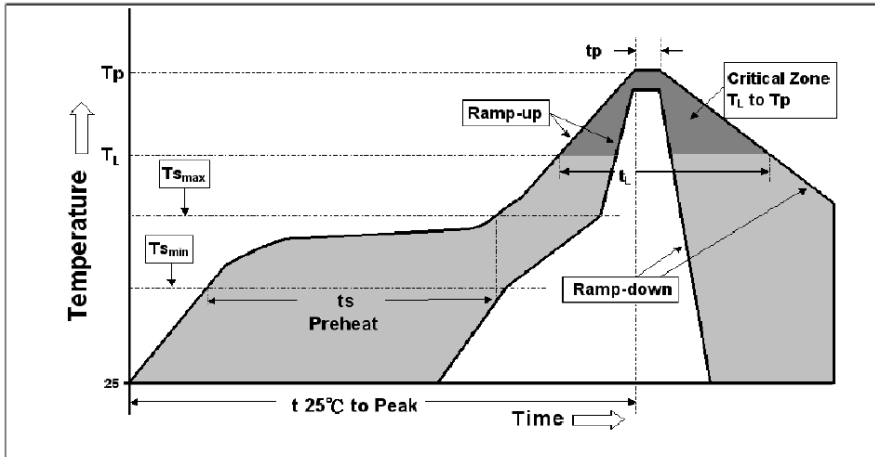
1. Recommended max paste thickness is 0.25mm. (Nominal)
2. Devices can be cleaned using standard methods and aqueous solvent.
3. Rework use standard industry practices.
4. Storage Environment: < 30°C / 60%RH

### 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.



## Reflow Profile



NOTE: Specification subject to change without notice.

## Warning

- Each product should be carefully evaluated and tested for their suitability of application.
- Operation beyond the specified maximum rating 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, including some inert material such as silicone based oil, lubricant and etc. Prolonged contact will damage the device performance.
- Additional protection mechanism are strongly recommended to be used in conjunction with the PPTC device for protection against abnormal or failure conditions.
- Avoid use of PPTC device in a constrained space such as potting material, housing and containers where have limited space to accommodate device thermal expansion and/or contraction