

TFC1812 Series

Recoverable fuse

TOP-EMC

Surface Mountable PTC Resettable Fuse

Summary

- (a) RoHS Compliant & Halogen Free
- (b) Applications: All high-density boards
- (c) Product Features: Small surface mountable, Solid state, Faster time to trip than standard SMD devices, Lower resistance than standard SMD devices
- (d) Operation Current: 0.1~3A
- (e) Maximum Voltage: 8~60V
- (f) Temperature Range : -40°C to 85°C

Agency Recognition

UL: File No. E211981
C-UL: File No. E211981
TÜV: File No. R50090556

Product Identification

TFC 1812 - 010 - 60
① ② ③ ④

- ① T F C : Surface Mountable PTC Resettable Fuse
- ② Package Size= 1812
- ③ Current Parameter: 010=0.1A
- ④ Voltage Parameter : 60=60V

Electrical Characteristics (25°C)

Model						Maximum		Resistance	
	V _{max}	I _{max}	I _{hold}	I _{trip}	P _d	Time To Trip			
			@25°C	@25°C	Typ.	Curren t	Tim e	R i min	R1 _{max}
	(V dc)	(A)	(A)	(A)	(W)	(A)	(Sec)	(Ω)	(Ω)
TFC1812-010-60	60.0	100	0.10	0.30	0.8	0.5	1.50	0.750	15.000
TFC1812-014-60	60.0	100	0.14	0.34	0.8	1.5	0.15	0.650	6.000
TFC1812-020-60	60.0	100	0.20	0.40	0.8	8.0	0.02	0.350	5.000
TFC1812-035-60	60.0	100	0.30	0.60	0.8	8.0	0.10	0.250	3.000
TFC1812-050-30	30.0	100	0.50	1.00	0.8	8.0	0.15	0.150	1.000
TFC1812-050-60	60.0	100	0.50	1.00	0.8	8.0	0.15	0.150	1.000
TFC1812-075-16	16.0	100	0.75	1.50	0.8	8.0	0.20	0.090	0.450
TFC1812-075-33	33.0	100	0.75	1.50	0.8	8.0	0.20	0.090	0.450
TFC1812-110-16	16.0	100	1.10	2.20	0.8	8.0	0.30	0.050	0.250
TFC1812-110-24	24.0	100	1.10	2.20	0.8	8.0	0.30	0.050	0.250
TFC1812-110-33	33.0	100	1.10	2.20	0.8	8.0	0.30	0.050	0.250
TFC1812-125-16	16.0	100	1.25	2.50	0.8	8.0	0.40	0.050	0.140
TFC1812-150-16	16.0	100	1.50	3.00	0.8	8.0	0.50	0.040	0.160
TFC1812-150-24	24.0	100	1.50	3.00	0.8	8.0	0.50	0.040	0.160
TFC1812-160-08	8.0	100	1.60	2.80	0.8	8.0	1.00	0.030	0.130
TFC1812-160-16	16.0	100	1.60	2.80	0.8	8.0	1.00	0.030	0.130
TFC1812-200-16	16.0	100	2.00	4.00	0.8	8.0	2.00	0.020	0.100
TFC1812-200-24	24.0	100	2.00	4.00	0.8	8.0	2.00	0.020	0.100
TFC1812-250-08	8.0	100	2.50	5.00	0.8	8.0	5.00	0.015	0.075
TFC1812-250-16	16.0	100	2.50	5.00	0.8	8.0	5.00	0.015	0.075
TFC1812-260-16	16.0	100	2.60	5.00	0.8	8.0	2.50	0.015	0.050
TFC1812-300-08	8.0	100	3.00	5.00	0.8	8.0	4.00	0.012	0.040
TFC1812-300-12	12.0	100	3.00	5.00	0.8	8.0	4.00	0.012	0.040

V_{max} = Maximum operating 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}).

I_{hold} = Hold Current. Maximum current device will not trip in 25°C still air.

I_{trip} = Trip Current. Minimum current at which the device will always trip in 25°C still air.

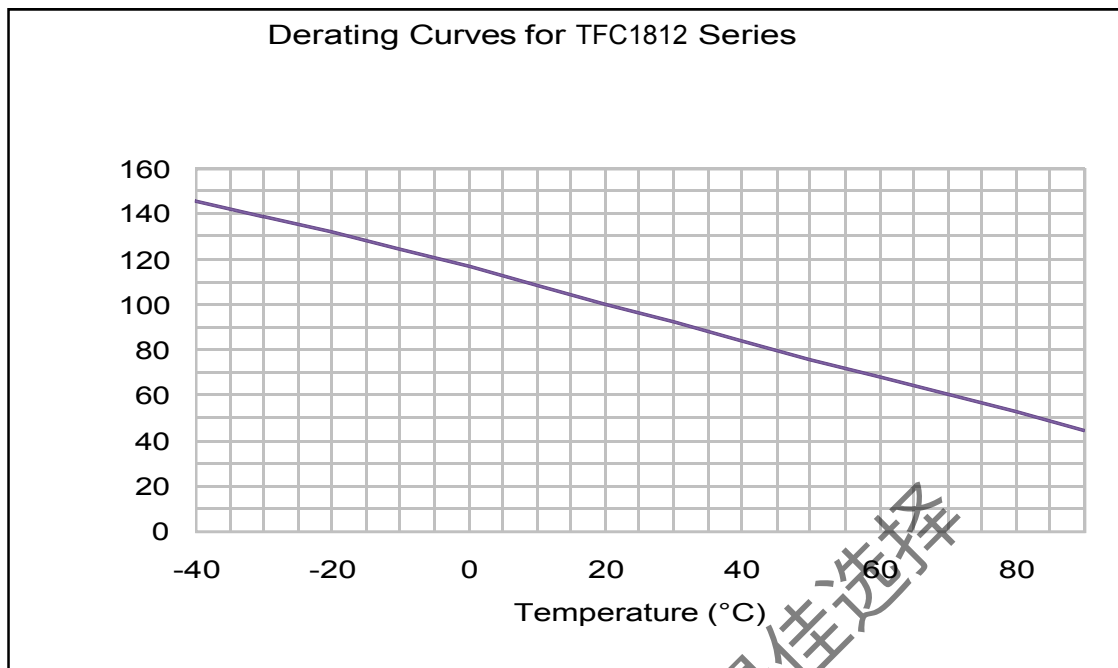
P_d = Power dissipation when device is in the tripped state in 25°C still air environment at rated voltage.

R_{i min}/max = Minimum/Maximum device resistance prior to tripping at 25°C.

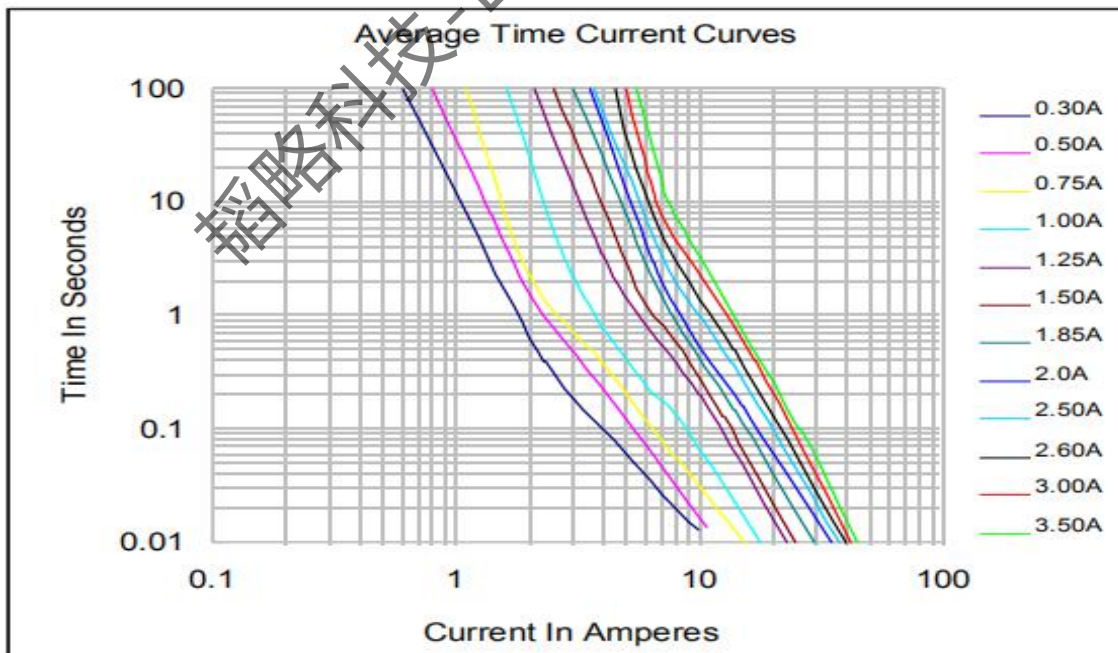
R_{1max} = Maximum device resistance is measured one hour post reflow.

CAUTION : Operation beyond the specified ratings may result in damage and possible arcing and flame.

Thermal Derating Curve



Average Time - Current Curve



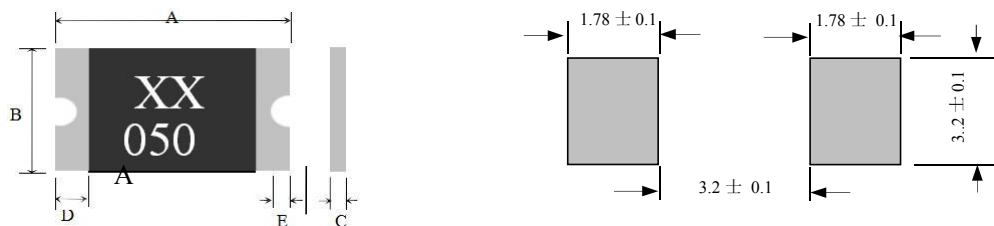
Thermal Derating Chart

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

Model	Ambient Operation Temperature								
	-40°C	-20°C	0°C	25°C	40°C	50°C	60°C	70°C	85°C
TFC1812-010	0.16	0.14	0.12	0.10	0.08	0.07	0.06	0.05	0.03
TFC1812-014	0.23	0.19	0.17	0.14	0.12	0.10	0.09	0.08	0.06
TFC1812-020	0.29	0.26	0.23	0.20	0.17	0.15	0.14	0.12	0.10
TFC1812-030	0.44	0.39	0.35	0.30	0.26	0.23	0.21	0.18	0.15
TFC1812-035	0.50	0.45	0.40	0.35	0.30	0.26	0.24	0.20	0.16
TFC1812-050	0.59	0.57	0.55	0.50	0.45	0.43	0.35	0.30	0.23
TFC1812-075	1.10	0.99	0.87	0.75	0.63	0.57	0.49	0.45	0.35
TFC1812-110	1.60	1.45	1.28	1.10	0.92	0.83	0.71	0.66	0.52
TFC1812-125	2.00	1.75	1.52	1.25	1.00	0.95	0.90	0.75	0.53
TFC1812-150	2.30	2.05	1.77	1.50	1.23	1.09	0.95	0.82	0.61
TFC1812-160	2.10	1.96	1.88	1.60	1.26	1.12	0.98	0.84	0.63
TFC1812-200	2.88	2.61	2.25	2.00	1.80	1.66	1.45	1.09	0.80
TFC1812-250	3.27	3.04	2.88	2.50	2.21	2.07	1.92	1.78	1.57
TFC1812-260	3.90	3.42	2.96	2.60	2.33	2.07	1.94	1.35	1.00
TFC1812-300	4.15	3.76	3.46	3.00	2.55	2.28	2.01	1.61	1.33

韬略科技-EMC方案的最佳选择

Thermal Derating Chart And Recommended PadLayout(mm.)



Model	A		B		C		D	E
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Min.
TFC1812-010-60	4.37	4.73	3.07	3.41	0.50	1.00	0.30	0.25
TFC1812-014-60	4.37	4.73	3.07	3.41	0.50	1.30	0.30	0.25
TFC1812-020-60	4.37	4.73	3.07	3.41	0.50	1.00	0.30	0.25
TFC1812-035-60	4.37	4.73	3.07	3.41	1.00	1.50	0.30	0.25
TFC1812-050-30	4.37	4.73	3.07	3.41	0.40	0.90	0.30	0.25
TFC1812-050-60	4.37	4.73	3.07	3.41	1.10	1.80	0.30	0.25
TFC1812-075-16	4.37	4.73	3.07	3.41	0.40	0.90	0.30	0.25
TFC1812-075-33	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
TFC1812-110-16	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
TFC1812-110-24	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
TFC1812-110-33	4.37	4.73	3.07	3.41	1.10	1.80	0.30	0.25
TFC1812-125-16	4.37	4.73	3.07	3.41	0.65	1.15	0.30	0.25
TFC1812-150-24	4.37	4.73	3.07	3.41	0.40	1.20	0.30	0.25
TFC1812-160-08	4.37	4.73	3.07	3.41	0.40	0.90	0.30	0.25
TFC1812-160-16	4.37	4.73	3.07	3.41	1.10	1.80	0.30	0.25
TFC1812-200-16	4.37	4.73	3.07	3.41	1.10	1.80	0.30	0.25
TFC1812-250-08	4.37	4.73	3.07	3.41	0.35	0.85	0.30	0.25
TFC1812-250-12	4.37	4.73	3.07	3.41	0.65	1.15	0.30	0.25
TFC1812-250-16	4.37	4.73	3.07	3.41	1.00	1.50	0.30	0.25
TFC1812-260-16	4.37	4.73	3.07	3.41	1.00	1.50	0.30	0.25
TFC1812-300-08	4.37	4.73	3.07	3.41	1.00	1.50	0.30	0.25

Termination Pad Characteristics

Terminal pad materials: Tin-plated Nickel-Copper

Terminal pad solder ability: Meets EIA specification RS186-9E and ANSI/J-STD-002 Category 3.

Environmental Specifications

Test	Conditions	Resistance change
Passive aging	+85°C, 1000 hrs.	±5% typical
Humidity aging	+85°C, 85% R.H. , 168 hours	±5% typical
Thermal shock	+85°C to -40°C, 20 times	±33% typical
Resistance to solvent	MIL-STD-202,Method 215	No change
Vibration	MIL-STD-202,Method 201	No change
Ambient operating conditions : - 40 °C to +85 °C		
Maximum surface temperature of the device in the tripped state is 125 °C		

Solder Reflow and Rework Recommendations

Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (T _{smax} to T _p)	3 °C/second max.
Preheat :	
Temperature Min (T _{smin})	150 °C
Temperature Max (T _{smax})	200 °C
Time (t _{smin} to t _{smax})	60-180 seconds
Time maintained above:	
Temperature(T _L)	217 °C
Time (t _L)	60-150 seconds
Peak/Classification Temperature(T _p) :	260 °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 :	8 minutes max.

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

Solder reflow

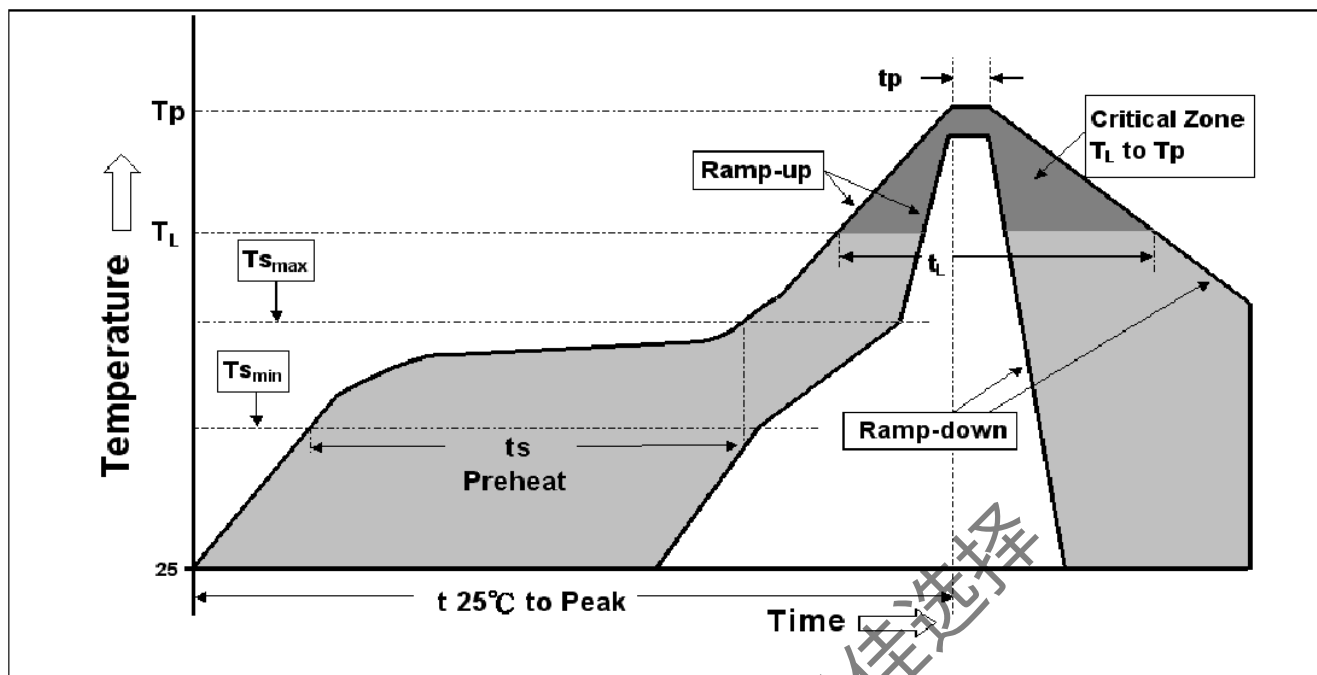
※ Due to "Lead Free" nature, Temperature and Dwelling time for the soldering zone is higher than those for Regular. This may cause damage to other components.

1. Recommended max past thickness > 0.25mm.
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



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.

Contact Information

SHENZHEN TOP-FLIGHT TECHNOLOGY CO.,LTD

4th Floor, C Building, Quansen Industrial Park , Bulong Road, Longhua New District, Shenzhen

Tel: 86-755-82908191 Fax: 86-755-82908701 Email: kang@topleve.com

Website: <http://www.topleve.com>

NOTE : Specification subject to change without notice.