

APPROVAL SHEET

MODEL NO.: _____

CUSTOMER:

CUSTOMER'S APPROVAL:

AUTHORIZED SIGNATURE/STAMP

DATE

MANUFACTURER:

The Fourth Industrial Zone, Luokeng Village, Xiaotie District, Xiaojinkou Town, Huizhou City, Guangdong Province, China

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Submitted by:

Approved by:

Date:

Performance Specification

Model	V _{max} (V dc)	I _{max} (A)	I _{hold} @25°C (A)	I _{trip} @25°C (A)	P _d Typ. (W)	Maximum Time To Trip		Resistance		认证
						Current (A)	Time (Sec)	R _{i min} (Ω)	R _{1max} (Ω)	UL
SMD1812R010SF33V	33.0	30	0.10	0.30	0.8	0.5	1.50	0.750	15.000	√
SMD1812R010SF	30.0	30	0.10	0.30	0.8	0.5	1.50	0.750	15.000	√
SMD1812R010SF60V	60.0	30	0.10	0.30	0.8	0.5	1.50	0.750	15.000	
SMD1812R014SF33V	33.0	30	0.14	0.34	0.8	1.5	0.15	0.650	6.000	√
SMD1812R014SF	60.0	30	0.14	0.34	0.8	1.5	0.15	0.650	6.000	
SMD1812R020SF	30.0	30	0.20	0.40	0.8	8.0	0.02	0.350	5.000	√
SMD1812R020SF33V	33.0	30	0.20	0.40	0.8	8.0	0.02	0.350	5.000	√
SMD1812R020SF60V	60.0	30	0.20	0.40	0.8	8.0	0.02	0.350	5.000	
SMD1812R030SF	30.0	30	0.30	0.60	0.8	8.0	0.10	0.250	3.000	√
SMD1812R030SF33V	33.0	30	0.30	0.60	0.8	8.0	0.10	0.250	3.000	√
SMD1812R030SF60V	60.0	30	0.30	0.60	0.8	8.0	0.10	0.250	3.000	
SMD1812R050SF	15.0	30	0.50	1.00	0.8	8.0	0.15	0.150	1.000	√
SMD1812R050SF24V	24.0	30	0.50	1.00	0.8	8.0	0.15	0.150	1.000	√
SMD1812R050SF30V	30.0	30	0.50	1.00	0.8	8.0	0.15	0.150	1.000	√
SMD1812R050SF33V	33.0	30	0.50	1.00	0.8	8.0	0.15	0.150	1.000	√
SMD1812R050SF60V	60.0	30	0.50	1.00	0.8	8.0	0.15	0.150	1.400	
SMD1812R075SF	13.2	30	0.75	1.50	0.8	8.0	0.20	0.090	0.450	√
SMD1812R075SF24V	24.0	30	0.75	1.50	0.8	8.0	0.20	0.090	0.450	
SMD1812R075SF33V	33.0	30	0.75	1.50	0.8	8.0	0.20	0.090	0.450	
SMD1812R110SF	8.0	35	1.10	2.20	0.8	8.0	0.30	0.045	0.250	√
SMD1812R110SF16V	16.0	35	1.10	2.20	0.8	8.0	0.30	0.050	0.250	
SMD1812R110SF24V	24.0	35	1.10	2.20	0.8	8.0	0.30	0.050	0.250	
SMD1812R110SF33V	33.0	35	1.10	2.20	0.8	8.0	0.30	0.050	0.250	
SMD1812R125SF8V	8.0	35	1.25	2.50	0.8	8.0	0.40	0.050	0.140	√
SMD1812R125SF	16.0	35	1.25	2.50	0.8	8.0	0.40	0.050	0.140	
SMD1812R150SF	8.0	35	1.50	3.00	0.8	8.0	0.50	0.040	0.160	√
SMD1812R150SF16V	16.0	35	1.50	3.00	0.8	8.0	0.50	0.040	0.160	
SMD1812R150SF24V	24.0	35	1.50	3.00	0.8	8.0	0.50	0.040	0.160	
SMD1812R150SF33V	33.0	35	1.50	3.00	0.8	8.0	0.50	0.040	0.160	
SMD1812R160SF	8.0	35	1.60	2.80	0.8	8.0	1.00	0.030	0.130	√
SMD1812R160SF16V	16.0	35	1.60	2.80	0.8	8.0	1.00	0.030	0.130	
SMD1812R200SF	8.0	35	2.00	4.00	0.8	8.0	2.00	0.020	0.100	√
SMD1812R200SF16V	16.0	35	2.00	4.00	0.8	8.0	2.00	0.020	0.100	
SMD1812R200SF24V	24.0	35	2.00	4.00	0.8	8.0	2.00	0.020	0.100	
SMD1812R200SF30V	30.0	35	2.00	4.00	0.8	8.0	2.00	0.020	0.100	
SMD1812R260SF	8.0	35	2.60	5.00	0.8	8.0	2.50	0.010	0.050	√
SMD1812R260SF16V	16.0	35	2.60	5.00	0.8	8.0	2.50	0.010	0.050	
SMD1812R260SF24V	24.0	35	2.60	5.00	0.8	8.0	2.50	0.010	0.050	
SMD1812R300SF	8.0	35	3.00	5.00	0.8	8.0	4.00	0.010	0.040	
SMD1812R300SF16V	16.0	35	3.00	5.00	0.8	8.0	4.00	0.010	0.040	

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SMD1812 HF Series Surface Mount PTC Devices

SMD1812R350SF	6.0	35	3.50	6.00	2.0	10.0	4.00	0.008	0.030
SMD1812R350SF16V	16.0	35	3.50	6.00	2.0	10.0	4.00	0.008	0.030
SMD1812R400SF	6.0	35	4.00	7.00	2.0	10.0	4.00	0.005	0.025
SMD1812R400SF12V	12.0	35	4.00	7.00	2.0	10.0	4.00	0.005	0.025
SMD1812R400SF16V	16.0	35	4.00	7.00	2.0	10.0	4.00	0.005	0.025

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.

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

Ri min/max = Minimum/Maximum device resistance prior to tripping at 25°C.



R1max = Maximum device resistance is measured one hour post reflow.

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

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		

Agency Approval and Environmental Compliance

Agency	File Number	Regulation	Standard
UL	E486890		2002/95/EC
TUV	pending		EN14582

Thermal Derating Chart

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

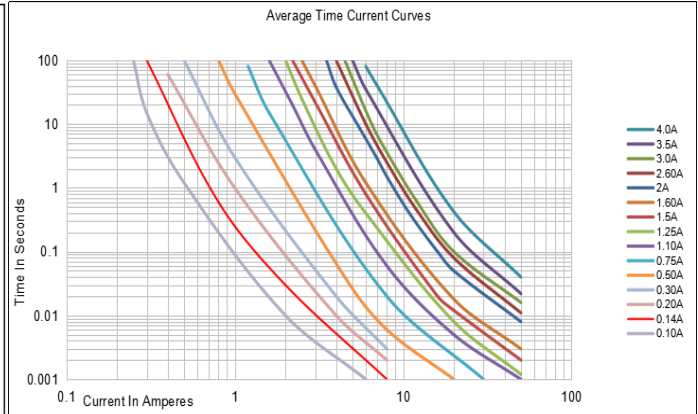
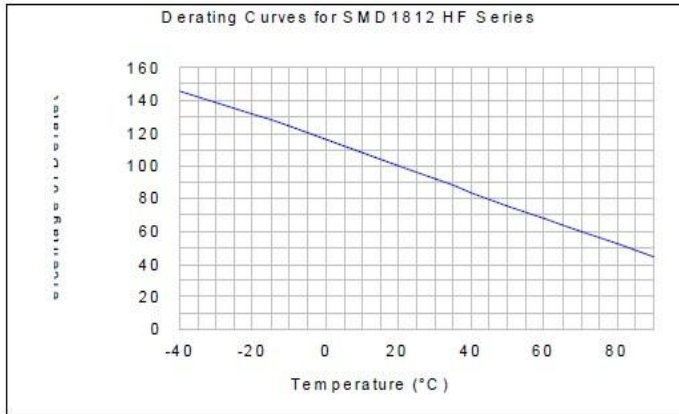
Model	Ambient Operation Temperature								
	-40°C	-20°C	0°C	25°C	40°C	50°C	60°C	70°C	85°C
SMD1812R010SF	0.16	0.14	0.12	0.10	0.08	0.07	0.06	0.05	0.03
SMD1812R014SF	0.23	0.19	0.17	0.14	0.12	0.10	0.09	0.08	0.06
SMD1812R020SF	0.29	0.26	0.23	0.20	0.17	0.15	0.14	0.12	0.10
SMD1812R030SF	0.44	0.39	0.35	0.30	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
SMD182R075SF	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

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SMD1812 HF Series Surface Mount PTC Devices

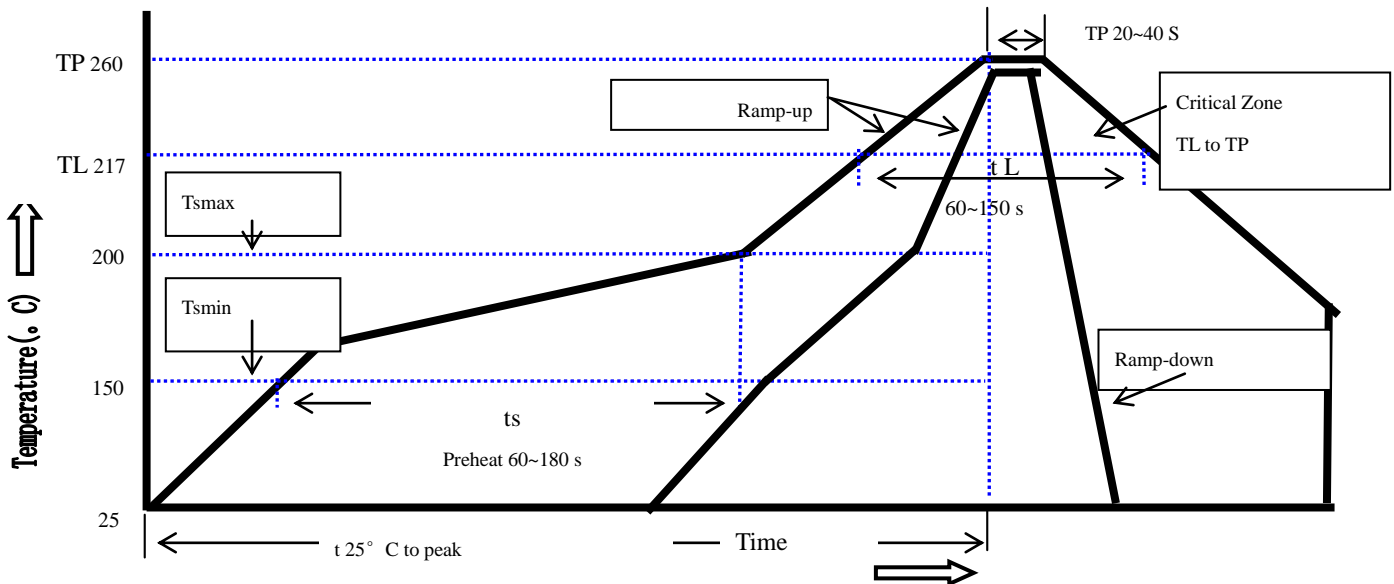
SMD1812R160SF	2.30	2.05	1.88	1.60	1.26	1.12	0.98	0.84	0.63
SMD1812R200SF	2.88	2.61	2.25	2.00	1.80	1.66	1.45	1.09	0.80
SMD1812R260SF	3.90	3.42	2.96	2.60	2.33	2.07	1.94	1.35	1.00
SMD1812R300SF	4.15	3.76	3.46	3.00	2.55	2.28	2.01	1.61	1.33
SMD1812R350SF	4.84	4.39	4.04	3.50	2.98	2.66	2.35	1.88	1.55
SMD1812R400SF	5.80	5.20	4.60	4.00	3.35	3.12	2.75	2.45	2.10

Thermal Derating Curve

Average Time-Current Curve



Soldering Parameters



Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate(Ts max to T p)	3°C/second mac.
Preheat	
-Temperature Min(Ts min)	150°C
-Temperature Max(Ts max)	200°C
-Time(Ts min to Ts max)	60~180 seconds
Time maintained above:	

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SMD1812 HF Series Surface Mount PTC Devices

-Temperature(TL)	217°C
-Time(tL)	60~150 seconds
Peak Temperature(Tp)	260°C
Ramp-Down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max
Storage Condition	0°C~30°C,30%-60%RH

Recommended reflow methods: IR, vapor phase oven, hot air oven, N2 environment for lead-free

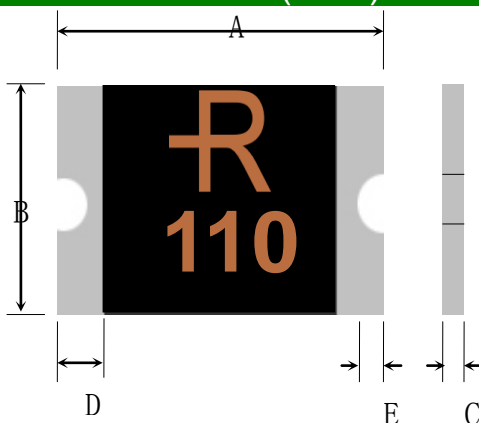
Recommended maximum paste thickness is 0.25mm

Devices can be cleaned using standard industry methods and solvents.

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

Note 2: If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

Physical Dimensions(mm.)



Model	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
SMD1812R010SF33V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R010SF60V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R014SF33V	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
SMD1812R020SF33V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R020SF60V	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
SMD1812R030SF33V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R030SF60V	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
SMD1812R050SF24V	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812R050SF30V	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812R050SF33V	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812R050SF60V	4.37	4.73	3.07	3.41	0.60	1.50	0.30	0.25
SMD1812R075SF	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R075SF24V	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
SMD1812R075SF33V	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25

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SMD1812 HF Series Surface Mount PTC Devices

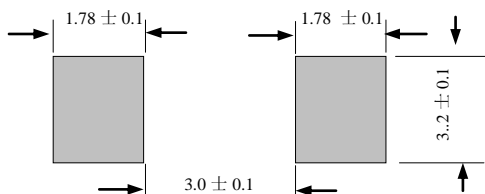
SMD1812R110SF	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812R110SF16V	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812R110SF24V	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
SMD1812R110SF33V	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
SMD1812R125SF	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812R125SF8V	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812R150SF	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R150SF16V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R150SF24V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R150SF33V	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812R160SF	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R160SF16V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R200SF	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R200SF16V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812R200SF24V	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812R200SF30V	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812R260SF	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812R260SF16V	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812R260SF24V	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812R300SF	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812R300SF16V	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812R350SF	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812R350SF16V	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812R400SF	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812R400SF12V	4.37	4.73	3.07	3.41	1.00	1.80	0.30	0.25
SMD1812R400SF16V	4.37	4.73	3.07	3.41	1.00	1.80	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.

Recommended Pad Layout (mm.)



Packaging Quantity

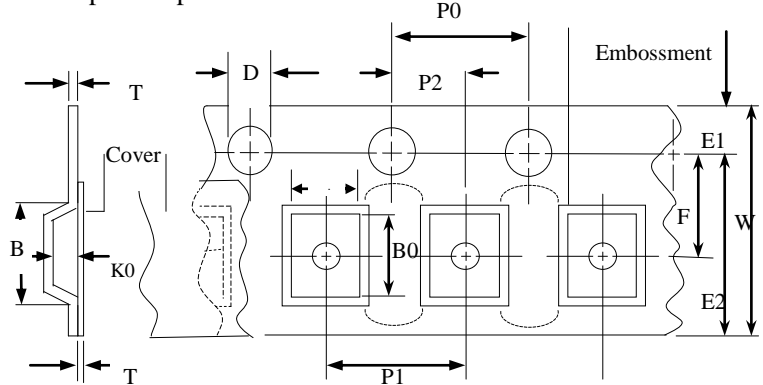
Part Number	Quantity
SMD1812 Series	1,500 pcs/reel

Tape & reel packaging per EIA481-1

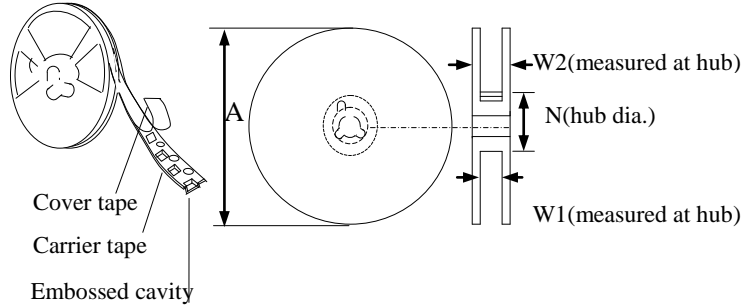
Tape And Reel Specifications (mm)

Governing Specifications		EIA 481-1
W		12 ± 0.3
P0		4.0 ± 0.10
P1		8.0 ± 0.10
P2		2.0 ± 0.05
A0		3.5 ± 0.10
B0		5.1 ± 0.10
B1max.		5.9
D0		1.50 + 0.1, -0
F		5.5 ± 0.05
E1		1.75 ± 0.10
E2min.		10.25
T		0.6
T1max.		0.1
K0		0.9 ± 0.1
Leader min.		390
Trailer min.		160
Reel Dimensions		
A max.		178
N min.		60
W1		12.4 ± 0.5
W2		18.4

EIA Tape Component Dimensions



EIA Reel Dimensions



Storage And Handling

- Storage conditions: 0°C~30°C, 30%~60% R.H.
- Devices may not meet specified performance if storage conditions are exceeded.

Part Number System

SMD 1812 R □□□ S F □□ V

