SEA & LAND ELECTRONIC CORP.
www.sealand-pptc.com

ALPHA-TOP TECHNOLOGY CORP.
www.alpha-top.cn

APPROVAL SHEET

MODEL NO.：	SMD1210 Series

CUSTOMER：

CUSTOMER'S APPROVAL：

AUTHORIZED SIGNATURE/STAMP：

DATE

MANUFACTURER:

HEAD OFFICE:

13F.,No.120-10,Sec.3,Zhongshan Rd.,Zhonghe Dist.,New Taipei City 23544,Taiwan
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Submitted by:	Chen
Approved by:	YC Lin
DATE:	24-Mar-26

SEA & LAND ELECTRONIC CORP.

Features

- Surface Mount Devices
- Lead free device
- Size 3.2*2.5mm/0.12*0.10 inch
- Surface Mount packaging for automated assembly

Applications

Almost anywhere there is a low voltage power supply, up to 30V and a load to be protected, including:

- Computer mother board, Modem.
- Telecommunication equipments.

SMD1210 Series

Alpha-Top (Sea&Land Alliance)

Performance Specification

Model	Marking	V_{max}	I_{max}	I_{hold} @25°C	I_{trip} @25°C	P_d Typ.	Maximum Time To Trip Current	Maximum Time To Trip Time	Resistance Ri_{min}	Resistance R1max	Agency Approval UL	Agency Approval CQC
		(Vdc)	(A)	(A)	(A)	(W)	(A)	(Sec)	(Ω)	(Ω)		
SMD1210-005	α A	30	100	0.05	0.15	0.6	0.25	1.50	2.800	50.000	√	√
SMD1210-005-60V	α A	60	100	0.05	0.15	0.6	0.25	1.50	2.800	50.000	√	√
SMD1210-005-72V	α A	72	100	0.05	0.15	0.6	0.25	1.50	2.800	50.000		
SMD1210-010	α B	30	100	0.10	0.30	0.6	0.50	0.60	0.800	15.000	√	√
SMD1210-010-60V	α B	60	100	0.10	0.30	0.6	0.50	0.60	0.800	15.000	√	√
SMD1210-020-24V	α C	24	100	0.20	0.40	0.6	8.0	0.02	0.400	5.000	√	
SMD1210-020	α C	30	100	0.20	0.40	0.6	8.0	0.02	0.400	5.000	√	√
SMD1210-020-60V	α C	60	100	0.20	0.40	0.6	8.0	0.02	0.400	5.000	√	√
SMD1210-025	α C	30	100	0.25	0.50	0.6	8.0	0.02	0.400	4.500		√
SMD1210-025-60V	α C	60	100	0.25	0.50	0.6	8.0	0.02	0.400	4.500		√
SMD1210-035	α D	6	100	0.35	0.75	0.6	8.0	0.20	0.200	1.300	√	√
SMD1210-035-13.2V	α D	13.2	100	0.35	0.75	0.6	8.0	0.20	0.200	1.300	√	√
SMD1210-035-16V	α D	16	100	0.35	0.75	0.6	8.0	0.20	0.200	1.300	√	√
SMD1210-035-24V	α D	24	100	0.35	0.75	0.6	8.0	0.20	0.200	1.300	√	√
SMD1210-035-33V	α D	33	100	0.35	0.75	0.6	8.0	0.20	0.200	1.300	√	√
SMD1210-050-6V	α F	6	100	0.50	1.00	0.6	8.0	0.10	0.180	0.900	√	√
SMD1210-050	α F	13.2	100	0.50	1.00	0.6	8.0	0.10	0.180	0.900	√	√
SMD1210-050-16V	α F	16	100	0.50	1.00	0.6	8.0	0.10	0.180	0.900	√	√
SMD1210-050-24V	α F	24	100	0.50	1.00	0.6	8.0	0.10	0.180	0.900	√	√
SMD1210-050-30V	α F	30	100	0.50	1.00	0.6	8.0	0.10	0.180	0.900		√
SMD1210-050-33V	α F	33	100	0.50	1.00	0.6	8.0	0.10	0.180	0.900	√	√
SMD1210-050-40V	α F	40	100	0.50	1.00	0.6	8.0	0.10	0.180	0.900		
SMD1210-050-48V	α F	48	100	0.50	1.00	0.6	8.0	0.10	0.180	0.900		
SMD1210-075	α G	6	100	0.75	1.50	0.6	8.0	0.10	0.070	0.400	√	√
SMD1210-075-13.2V	α G	13.2	100	0.75	1.50	0.6	8.0	0.10	0.070	0.400		√
SMD1210-075-16V	α G	16	100	0.75	1.50	0.6	8.0	0.10	0.070	0.400		√
SMD1210-075-24V	α G	24	100	0.75	1.50	0.6	8.0	0.10	0.070	0.400		√
SMD1210-075-30V	α G	30	100	0.75	1.50	0.6	8.0	0.10	0.070	0.400		
SMD1210-075-33V	α G	33	100	0.75	1.50	0.6	8.0	0.10	0.070	0.400		√
SMD1210-100	α H	6	100	1.00	2.00	0.6	8.0	0.30	0.050	0.230		√
SMD1210-100-13.2V	α H	13.2	100	1.00	2.00	0.6	8.0	0.30	0.050	0.230		√
SMD1210-100-16V	α H	16	100	1.00	2.00	0.6	8.0	0.30	0.050	0.230		√
SMD1210-100-24V	α H	24	100	1.00	2.00	0.6	8.0	0.30	0.050	0.230		√
SMD1210-110	α H	6	100	1.10	2.20	0.6	8.0	0.30	0.050	0.210	√	√
SMD1210-110-13.2V	α H	13.2	100	1.10	2.20	0.6	8.0	0.30	0.050	0.210		√
SMD1210-110-16V	α H	16	100	1.10	2.20	0.6	8.0	0.30	0.050	0.210		√
SMD1210-110-24V	α H	24	100	1.10	2.20	0.6	8.0	0.30	0.050	0.210		√
SMD1210-150	α L	6	100	1.50	3.00	0.6	8.0	0.50	0.030	0.110	√	√
SMD1210-150-13.2V	α L	13.2	100	1.50	3.00	0.6	8.0	0.50	0.030	0.110		√
SMD1210-150-16V	α L	16	100	1.50	3.00	0.6	8.0	0.50	0.030	0.110		√
SMD1210-175	α N	6	100	1.75	3.50	0.8	8.0	0.60	0.020	0.080		√
SMD1210-175-12V	α N	12	100	1.75	3.50	0.8	8.0	0.60	0.020	0.080		
SMD1210-175-13.2V	α N	13.2	100	1.75	3.50	0.8	8.0	0.60	0.020	0.080		√
SMD1210-200	α S	6	100	2.00	4.00	0.8	8.0	1.00	0.015	0.070	√	√
SMD1210-200-8V	α S	8	100	2.00	4.00	0.8	8.0	1.00	0.015	0.070	√	
SMD1210-200-12V	α S	12	100	2.00	4.00	0.8	8.0	1.00	0.015	0.070	√	
SMD1210-200-16V	α S	16	100	2.00	4.00	0.8	8.0	1.00	0.015	0.070	√	

Ihold = Hold Current. Maximum current device will not trip in 25°C still air.

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

Vmax = Maximum operating voltage device can withstand without damage at rated current (Imax).

Imax = Maximum fault current device can withstand without damage at rated voltage (Vmax).

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

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

$R1_{max}$ = 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
Passive aging	+85°C, 1000 hrs.
Humidity aging	+85°C, 85% R.H. , 168 hours
Thermal shock	+85°C to -40°C, 20 times
Resistance to solvent	MIL-STD-202,Method 215
Vibration	MIL-STD-202,Method 201
Ambient operating conditions : - 40 °C to +85 °C	
Maximum surface temperature of the device in the tripped state is 125 °C	
In case of special use,please contact our engineer	

AGENCY APPROVALS : **E201504(Alpha-Top)/E319080(Sea&Land)**

CQC25001473187

Regulation/Standard:

2015/863/EU

EN14582

I_{hold} Versus Temperature

Model	Maximum ambient operating temperature (T_{mao}) vs. hold current (I_{hold})								
	-40°C	-20°C	0°C	25°C	40°C	50°C	60°C	70°C	85°C
SMD1210-005	0.08	0.07	0.06	0.05	0.04	0.04	0.03	0.03	0.02
SMD1210-010	0.16	0.14	0.12	0.10	0.08	0.07	0.06	0.05	0.03
SMD1210-020	0.29	0.26	0.22	0.20	0.16	0.14	0.13	0.11	0.08
SMD1210-025	0.34	0.31	0.28	0.25	0.21	0.19	0.17	0.15	0.12
SMD1210-035	0.47	0.45	0.40	0.35	0.33	0.28	0.24	0.21	0.18
SMD1210-050	0.76	0.67	0.58	0.50	0.43	0.40	0.36	0.32	0.28
SMD1210-075	1.00	0.97	0.86	0.75	0.64	0.59	0.54	0.48	0.40
SMD1210-100	1.54	1.35	1.18	1.00	0.76	0.67	0.53	0.45	0.31
SMD1210-110	1.69	1.48	1.29	1.10	0.88	0.76	0.65	0.57	0.43
SMD1210-150	2.13	1.92	1.71	1.50	1.26	1.14	1.01	0.89	0.71
SMD1210-175	2.54	2.30	2.02	1.75	1.47	1.33	1.18	1.05	0.86
SMD1210-200	2.90	2.63	2.31	2.00	1.68	1.52	1.35	1.20	0.98

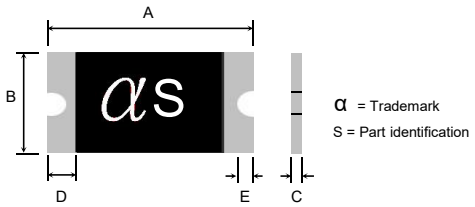
Construction And Dimension (Unit:mm)

Model	A		B		C		D	E
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Min.
SMD1210-005	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-005-60V	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-005-72V	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-010	3.00	3.43	2.35	2.80	0.40	0.90	0.30	0.10
SMD1210-010-60V	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-020-24V	3.00	3.43	2.35	2.80	0.40	0.90	0.30	0.10
SMD1210-020	3.00	3.43	2.35	2.80	0.40	0.90	0.30	0.10
SMD1210-020-60V	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-025	3.00	3.43	2.35	2.80	0.40	0.90	0.30	0.10
SMD1210-025-60V	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-035	3.00	3.43	2.35	2.80	0.40	0.90	0.30	0.10
SMD1210-035-13.2V	3.00	3.43	2.35	2.80	0.40	0.90	0.30	0.10
SMD1210-035-16V	3.00	3.43	2.35	2.80	0.40	0.90	0.30	0.10
SMD1210-035-24V	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-035-33V	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-050-6V	3.00	3.43	2.35	2.80	0.40	0.90	0.30	0.10
SMD1210-050	3.00	3.43	2.35	2.80	0.40	0.90	0.30	0.10
SMD1210-050-16V	3.00	3.43	2.35	2.80	0.40	0.90	0.30	0.10
SMD1210-050-24V	3.00	3.43	2.35	2.80	0.40	0.90	0.30	0.10
SMD1210-050-30V	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-050-33V	3.00	3.43	2.35	2.80	0.60	1.30	0.30	0.10
SMD1210-050-40V	3.00	3.43	2.35	2.80	0.60	1.30	0.30	0.10
SMD1210-050-48V	3.00	3.43	2.35	2.80	0.60	1.30	0.30	0.10
SMD1210-075	3.00	3.43	2.35	2.80	0.40	0.90	0.30	0.10
SMD1210-075-13.2V	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-075-16V	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-075-24V	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-075-30V	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-075-33V	3.00	3.43	2.35	2.80	0.60	1.50	0.30	0.10
SMD1210-100	3.00	3.43	2.35	2.80	0.40	0.90	0.30	0.10
SMD1210-100-13.2V	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-100-16V	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-100-24V	3.00	3.43	2.35	2.80	0.60	1.50	0.30	0.10

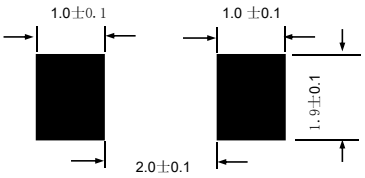
Construction And Dimension (Unit:mm)

Model	A		B		C		D	E
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Min.
SMD1210-110	3.00	3.43	2.35	2.80	0.40	0.90	0.30	0.10
SMD1210-110-13.2V	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-110-16V	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-110-24V	3.00	3.43	2.35	2.80	0.60	1.50	0.30	0.10
SMD1210-150	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-150-13.2V	3.00	3.43	2.35	2.80	0.60	1.50	0.30	0.10
SMD1210-150-16V	3.00	3.43	2.35	2.80	0.60	1.50	0.30	0.10
SMD1210-175	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-175-12V	3.00	3.43	2.35	2.80	0.60	1.50	0.30	0.10
SMD1210-175-13.2V	3.00	3.43	2.35	2.80	0.60	1.50	0.30	0.10
SMD1210-200	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-200-8V	3.00	3.43	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-200-12V	3.00	3.43	2.35	2.80	0.60	1.50	0.30	0.10
SMD1210-200-16V	3.00	3.43	2.35	2.80	0.60	1.50	0.30	0.10

Dimensions & Marking



Recommended Pad Layout (mm)



Termination Pad Characteristics

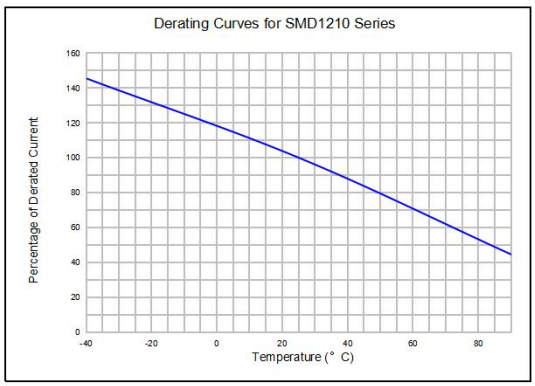
Terminal pad materials： Tin-plated Nickel-Copper

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

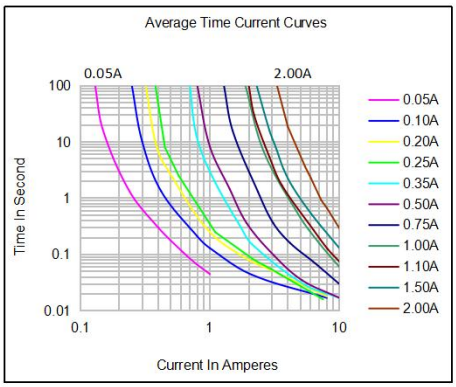
Rework

Use standard industry practices, the removal device must be replaced with a fresh one.

Thermal Derating Curve



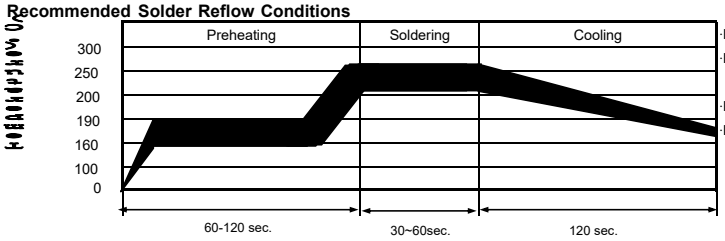
Typical Time-To-Trip At 25°C



WARNING:

· Use PPTC beyond the maximum ratings or improper use may result in device damage and possible electrical arcing and flame.
· PPTC are intended for protection against occasional over current or over temperature fault conditions and should not be used when repeated fault conditions or prolonged trip events are anticipated.
· Device performance can be impacted negatively if devices are handled in a manner inconsistent with recommended electronic, thermal, and mechanical procedures for electronic components.
· Use PPTC with a large inductance in circuit will generate a circuit voltage (L di/dt) above the rated voltage of the PPTC.
· Avoid impact PPTC device its thermal expansion like placed under pressure or installed in limited space.
· Contamination of the PPTC material with certain silicon based oils or some aggressive solvents can adversely impact the performance of the devices. PPTC SMD can be cleaned by standard methods.
· Requests that customers comply with our recommended solder pad layouts and recommended reflow profile. Improper board layouts or reflow profile could negatively impact solderability performance of our devices.

Recommended Solder Reflow Conditions

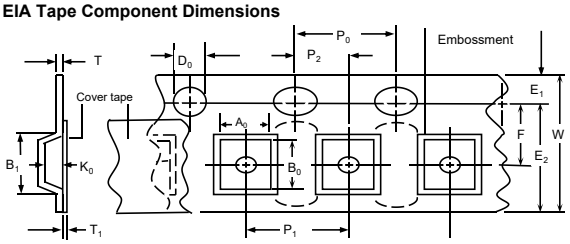


·Recommended reflow methods：IR, vapor phase oven, hot air oven.
·Devices are not designed to be wave soldered to the bottom side of the board.
·Recommended maximum paste thickness is 0.25 mm (0.010 inch).
·Devices can be cleaned using standard method and solvents.
Note：If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

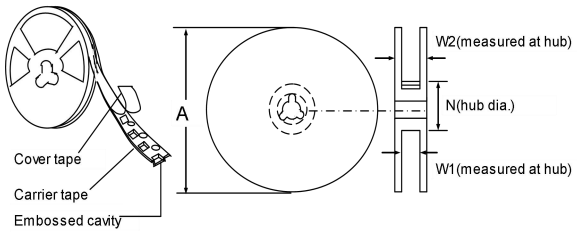
Tape And Reel Specifications (mm)

Governing Specifications	EIA 481-2
W	8.0 ± 0.20
P0	4.0 ± 0.10
P1	4.0 ± 0.10
P2	2.0 ± 0.10
A0	2.82 ± 0.10
B0	3.52± 0.10
B1max.	4.35
D0	1.5 + 0.1, -0.0
F	7.5 ± 0.05
E1	1.75 ± 0.10
E2min.	6.25
Tmax.	0.6
T1max.	0.1
K0	0.90 ± 0.1
Leader min.	390
Trailer min.	160
Reel Dimensions	
A max.	178
N min.	50
W1	8.4 + 1.5, -0.0
W2max.	22.4

EIA Tape Component Dimensions



EIA Reel Dimensions



Storage And Handling

· Storage conditions：40°C max, 70% R.H.
· Devices may not meet specified performance if storage conditions are exceeded.

Order Information

SMD1210	050	Packaging Tape & Reel Quantity
Product name	Hold	050,075 4,000 pcs/reel
Size 3225 mm / 1210 inch	Current	The others 4,500 pcs/reel
SMD：surface mount device	0.50A	

Tape & reel packaging per EIA481-1

Labeling Information

Sea & Land Electronic Corp.
Model:
Part no.:
Spec.:
Lot no.:
Q'ty:
倉儲：密封！溫度：18～33℃/濕度：30～60％ A

Cautions for SMD PTC Use / SMD PTC 使用注意事项

1、 Operation beyond the maximum voltage or current may result in device damage,PTC arcing,resistance increasing，even burning.
请在规格书规定的最大电压和最大电流下使用 ，超出 PTC 最大电压或最大电流规格值的操作 ，可能会导致 PTC 出现电弧， 阻值升高，甚至烧片。

2、 Hold current at all temperatures specified in the SPEC is the conventional performance of PTC obtained by one time reflow welding. PTC can hold 1 hour under current conditions at a given temperature. This current is not the condition of long-term charging or discharging current for this type of PTC.
规格书所规定的各温度下的 Hold current 均是 PTC 经过一次回流焊接得出的常规性能 ，PTC能够在不同温度对应的电流条件下保持 1小时该电流并不是该型号 PTC 能够适用的长期充电或放电电流的条件 。

3、 The above parameters are concluded from one time of reflow soldering processing the PTC. If there is any further heat generated process like injection or dispensing at the customer's premise, the aforementioned parameters will decrease at certain degree. Therefore the verification test to be conducted is necessary .
规格书所规定的电阻以及电气特性 ，均是基于在指定测试板经过一次回流焊之后的测试 。如果客户有二次回流焊或者注塑点胶等其他热工序，会对上述参数有一定程度的衰减 。所以需要验证其适用性 。

4、 The PTC is thermal sensitive device. It is recommended not to design any heat source devices around it to reduce the outside heat source impact. PTC 为热敏元件，对环境温度比较敏感，建议在 PTC 周围不要设计热源元件，尽量减少外部热源的影响 。

5、 SMD PTC is designed for SMT processing which applies reflow soldering. Please refer to the Sea&Land recommended curve for reference. If the reflow soldering temperature exceeds the recommended value,the PTC might be damaged. Hand welding PTC is prohibited. Heat gun is not allowed to use during the circuit board components or terminals rework .
PTC 贴片产品是为SMT 工艺设计的封装形式，焊接工艺为回流焊 。焊接工艺可参考陆海推荐的回流焊曲线 。如果回流焊温度超过推荐的值，PTC 将有可能受到损伤 。禁止使用手工焊接 PTC，禁止对线路板其他元件或端子返工时使用热风枪 。

6、 When mounting or using PTC, all injection molding materials, curing adhesives, UV glue , silica gel and cleaning agents or solvents must be tested in terms of application parameters e.g. temperature, time, and etc to ensure the consistency between the product and the processing before use.
PTC 贴装或应用过程中,所使用到的各类注塑料 、单组份、双组份固化胶粘剂 、硅胶，需要对注塑料胶料等材料牌号以及应 用参数（如温度、时间等）进行验证，以确保产品及工艺的匹配性，确认不会影响 PTC 性能之后方可使用 。

7、 When mounting or using PTC, it is not recommended to use circuit board washer water or other cleaning agent. If cleaning is required, it is necessary to verify the applicability of various cleaning agents, washboard water and solvents, and confirm that they will not affect the PTC performance . The known chemicals that impacts PTC include but not limited to ethers, benzene homolog, ketones, lipids and derivates that is of strong solubleness and ruinous. Please place the product in open environment for at least 24 hours to volatilize solvents residuals.
PTC 贴装或使用过程中，不建议使用洗板水或其他清洗剂进行清洗 。如必须使用，需要验证各类清洗剂 、洗板水以及溶剂 的适用性，确认不会影响 PTC 性能之后方可使用 。已知对 PTC 有影响的化学药品包括但不仅限于醚类 、苯类、酮类以及脂 类等较强溶解性 、破坏性的有机化合物。清洗后将产品放置于敞开的环境中至少 24 小时，将残留的溶剂进行充分的挥发 。

8、 Please do not smash, clamp, pull, dent or twist by tool during assembling process otherwise it might be a cause of the performance degradation. 装配过程中，避免用暴力砸 、挤、压、拉、扭、刺等方式作用 PTC 本体，以免引起 PTC 性能衰减。

9、 When PTC is welded to the PCM in product application, if injection or gluing is needed, it should be completed in as short a time as possible. If the time slot between mounting and injection or gluing surpasses 1 month,, please keep in airtight environment to avoid long air exposure.
在产品应用中，PTC 焊接至保护板后，如需注塑或打胶，须在尽量短的时间内完成，如贴装与注塑打胶时间间隔超过 1 个 月，则需密闭保存，可避免 PTC 长时间暴露于空气环境中 。

10、 PTC is resettable protection device which shall not be taken for use as switch. Multiple times tripping shall lower the PTC hold current.
PTC 为自恢复保护元件，但并不能当做开关使用，重复多次的保护会降低 PTC 的维持电流。

11、 In charging terminal application, PP type material is recommended to use as inner membrane and TPE and PVC type material is inhibited.
PTC 在充电线端应用中，建议使用 PP 类材料做内膜，禁止使用TPE 类与 PVC 类等材料做内膜。

12、 In the process of PTC processing, if there is soldering iron welding process, it is suggested that the welding position shou ld be more than 1.5mm away from PTC, the welding tool temperature should be lower than 350 ℃, and the contact time between soldering iron and solder joint should not exceed 3sec.
PTC 在加工过程中，如有烙铁焊接工艺，建议焊接位置距离 PTC 1.5mm 以上，焊接工具温度低于 350℃，焊接铁头与焊点 的接触时间不超过 3sec。

13、 SMD PTC humidity sensitivity grade 2a, for sealed packaging. If customers find damaged packaging in stock,they should isolate the product immediately; if there is surplus material, they need to restore the packaging status , and do sealed storage.
SMD PTC 湿敏等级为 2a 级，为密封包装。客户如在库存中发现有包装破损的 ，立即将产品隔离处理；使用时如有余料，需恢复之前包装状态，做密封保存