SMD1812 E Series Surface Mount PTC Devices

Performance Specification

Model	Marking	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)	$R1_{max}$ (Ω)	UL
SMD1812E010SF30V	E010	30.0	30	0.10	0.30	0.8	0.5	1.50	0.750	15.000	√
SMD1812E010SF33V	E010	33.0	30	0.10	0.30	0.8	0.5	1.50	0.750	15.000	
SMD1812E010SF60V	E010	60.0	30	0.10	0.30	0.8	0.5	1.50	0.750	15.000	√
SMD1812E014SF33V	E014	33.0	30	0.14	0.34	0.8	1.5	0.15	0.650	6.000	√
SMD1812E014SF60V	E014	60.0	30	0.14	0.34	0.8	1.5	0.15	0.650	6.000	√
SMD1812E020SF30V	E020	30.0	30	0.20	0.40	0.8	8.0	0.02	0.350	5.000	
SMD1812E020SF33V	E020	33.0	30	0.20	0.40	0.8	8.0	0.02	0.350	5.000	
SMD1812E020SF60V	E020	60.0	30	0.20	0.40	0.8	8.0	0.02	0.350	5.000	
SMD1812E030SF30V	E030	30.0	30	0.30	0.60	0.8	8.0	0.10	0.250	3.000	√
SMD1812E030SF33V	E030	33.0	30	0.30	0.60	0.8	8.0	0.10	0.250	3.000	
SMD1812E030SF60V	E030	60.0	30	0.30	0.60	0.8	8.0	0.10	0.250	3.000	
SMD1812E050SF15V	E050	15.0	30	0.50	1.00	0.8	8.0	0.15	0.150	1.000	√
SMD1812E050SF24V	E050	24.0	30	0.50	1.00	0.8	8.0	0.15	0.150	1.000	
SMD1812E050SF30V	E050	30.0	30	0.50	1.00	0.8	8.0	0.15	0.150	1.000	
SMD1812E050SF33V	E050	33.0	30	0.50	1.00	0.8	8.0	0.15	0.150	1.000	
SMD1812E050SF60V	E050	60.0	30	0.50	1.00	0.8	8.0	0.15	0.150	1.400	
SMD1812E075SF13.2V	E075	13.2	30	0.75	1.50	0.8	8.0	0.20	0.090	0.450	√
SMD1812E075SF24V	E075	24.0	30	0.75	1.50	0.8	8.0	0.20	0.090	0.450	√
SMD1812E075SF33V	E075	33.0	30	0.75	1.50	0.8	8.0	0.20	0.090	0.450	
SMD1812E110SF8V	E110	8.0	35	1.10	2.20	0.8	8.0	0.30	0.045	0.250	√
SMD1812E110SF16V	E110	16.0	35	1.10	2.20	0.8	8.0	0.30	0.050	0.250	√
SMD1812E110SF24V	E110	24.0	35	1.10	2.20	0.8	8.0	0.30	0.050	0.250	
SMD1812E110SF33V	E110	33.0	35	1.10	2.20	0.8	8.0	0.30	0.050	0.250	
SMD1812E125SF8V	E125	8.0	35	1.25	2.50	0.8	8.0	0.40	0.050	0.140	
SMD1812E125SF16V	E125	16.0	35	1.25	2.50	0.8	8.0	0.40	0.050	0.140	√
SMD1812E150SF8V	E150	8.0	35	1.50	3.00	0.8	8.0	0.50	0.040	0.160	√
SMD1812E150SF16V	E150	16.0	35	1.50	3.00	0.8	8.0	0.50	0.040	0.160	√
SMD1812E150SF24V	E150	24.0	35	1.50	3.00	0.8	8.0	0.50	0.040	0.160	
SMD1812E150SF33V	E150	33.0	35	1.50	3.00	0.8	8.0	0.50	0.040	0.160	
SMD1812E160SF8V	E160	8.0	35	1.60	2.80	0.8	8.0	1.00	0.030	0.130	√
SMD1812E160SF16V	E160	16.0	35	1.60	2.80	0.8	8.0	1.00	0.030	0.130	
SMD1812E200SF8V	E200	8.0	35	2.00	4.00	0.8	8.0	2.00	0.020	0.100	√
SMD1812E200SF16V	E200	16.0	35	2.00	4.00	0.8	8.0	2.00	0.020	0.100	
SMD1812E200SF24V	E200	24.0	35	2.00	4.00	0.8	8.0	2.00	0.020	0.100	
SMD1812E200SF30V	E200	30.0	35	2.00	4.00	0.8	8.0	2.00	0.020	0.100	
SMD1812E260SF8V	E260	8.0	35	2.60	5.00	0.8	8.0	2.50	0.010	0.050	√
SMD1812E260SF16V	E260	16.0	35	2.60	5.00	0.8	8.0	2.50	0.010	0.050	
SMD1812E260SF24V	E260	24.0	35	2.60	5.00	0.8	8.0	2.50	0.010	0.050	
SMD1812E300SF8V	E300	8.0	35	3.00	5.00	0.8	8.0	4.00	0.010	0.040	√
SMD1812E300SF16V	E300	16.0	35	3.00	5.00	0.8	8.0	4.00	0.010	0.040	

SMD1812E350SF6V	E350	6.0	35	3.50	6.00	2.0	10.0	4.00	0.008	0.030	
SMD1812E350SF16V	E350	16.0	35	3.50	6.00	2.0	10.0	4.00	0.008	0.030	
SMD1812E400SF6V	E400	6.0	35	4.00	7.00	2.0	10.0	4.00	0.005	0.025	
SMD1812E400SF12V	E400	12.0	35	4.00	7.00	2.0	10.0	4.00	0.005	0.025	
SMD1812E400SF16V	E400	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 (Imax).

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.

PPTC 使用注意事项：

• PPTC 为热敏元件，对环境温度比较敏感，建议在 PPTC 周围不要设计热源元件，尽量减少外部热源的影响。

• 请在规格书规定的参数下使用，超出电压电流规格值，会导致 PPTC 出现电弧，阻值升高，甚至烧片。

• 规格书的电气特性，均是基于在保电通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，需要验证其适用性。

• PPTC 贴片产品是为 SMT 工艺设计的封装形式，焊接工艺为回流焊；要求客户遵守我们推荐的焊盘布局和回流焊配置文件。不正确的电路板布局或回流配置可能会对 PPTC 的可焊性性能产生负面影响。焊接工艺可参考保电通推荐的回流焊曲线。如果回流焊温度超过推荐的值，PPTC 将有可能受到损伤。使用手工焊及波峰焊接 PPTC 可能会导致产品焊后电阻超出规格。

• 某些注塑料、单组份、双组份固化胶粘剂、硅胶、侵蚀性溶剂污染 PPTC 材料破坏芯片，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 PPTC 性能之后方可使用。PPTC 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。

• PPTC 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 PPTC 性能之后方可使用。已知对 PPTC 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。

• 装配过程中，避免用暴力砸、挤、压、拉、扭、刺等方式作用 PPTC 本体，以免引起 PPTC 性能衰减。

• PPTC 元件是为电路中偶尔出现的过流而设计的，不建议用在连续且持续过流的电路中。

• 保电通 SMD PPTC 湿敏等级为 2 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，否则会影响产品性能导致焊后电阻越规格。

• 产品废弃时，可按照一般电子废弃物处理，具体材料组成可参见 MSDS

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		

SMD1812 E Series Surface Mount PTC Devices

Agency Approval and Environmental Complianc

Agency	File Number
UL	E524436
TUV	pending

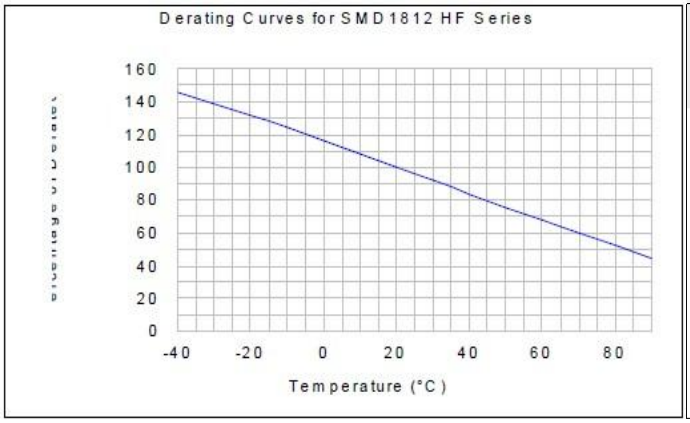
Regulation	Standard
Pb RoHS	LCS210427075AR
HF	pending

Thermal Derading Chart

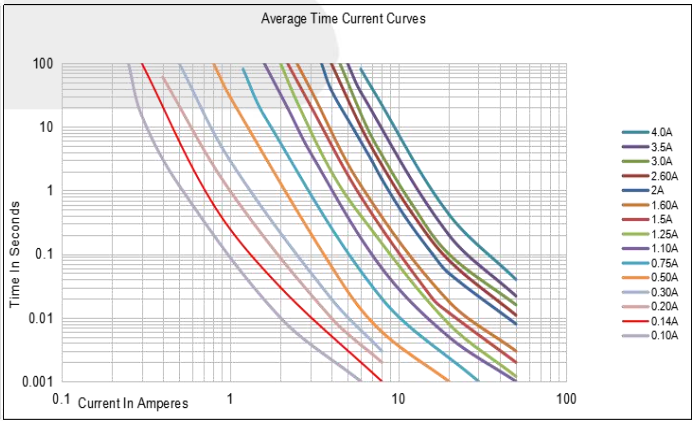
Recommended Hold Current(A) at Ambient Temperature(°C)

Model	Ambient Operation Temperature								
	-40°C	-20°C	0°C	25°C	40°C	50°C	60°C	70°C	85°C
SMD1812E010SF	0.16	0.14	0.12	0.10	0.08	0.07	0.06	0.05	0.03
SMD1812E014SF	0.23	0.19	0.17	0.14	0.12	0.10	0.09	0.08	0.06
SMD1812E020SF	0.29	0.26	0.23	0.20	0.17	0.15	0.14	0.12	0.10
SMD1812E030SF	0.44	0.39	0.35	0.30	0.26	0.23	0.21	0.18	0.15
SMD1812E050SF	0.59	0.57	0.55	0.50	0.45	0.43	0.35	0.30	0.23
SMD182E075SF	1.10	0.99	0.87	0.75	0.63	0.57	0.49	0.45	0.35
SMD1812E110SF	1.60	1.45	1.28	1.10	0.92	0.83	0.71	0.66	0.52
SMD1812E125SF	2.00	1.75	1.52	1.25	1.00	0.95	0.90	0.75	0.53
SMD1812E150SF	2.10	1.96	1.77	1.50	1.23	1.09	0.95	0.82	0.61
SMD1812E160SF	2.30	2.05	1.88	1.60	1.26	1.12	0.98	0.84	0.63
SMD1812E200SF	2.88	2.61	2.25	2.00	1.80	1.66	1.45	1.09	0.80
SMD1812E260SF	3.90	3.42	2.96	2.60	2.33	2.07	1.94	1.35	1.00
SMD1812E300SF	4.15	3.76	3.46	3.00	2.55	2.28	2.01	1.61	1.33
SMD1812E350SF	4.84	4.39	4.04	3.50	2.98	2.66	2.35	1.88	1.55
SMD1812E400SF	5.80	5.20	4.60	4.00	3.35	3.12	2.75	2.45	2.10

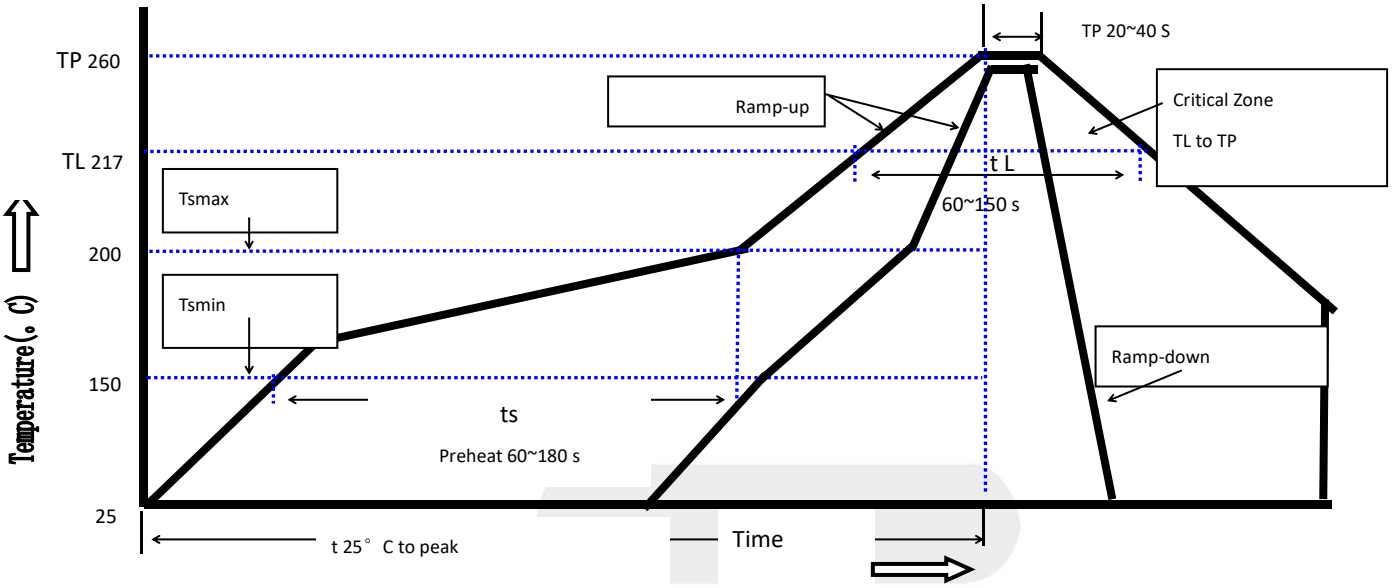
Thermal Derating Curve



Average Time-Current Curve



Soldering Parameters



Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate(Ts max to T p)	3℃/second mac.
Preheat	
-Temperature Min(Ts min)	150℃
-Temperature Max(Ts max)	200℃
-Time(Ts min to Ts max)	60~180 seconds
Time maintained above:	
-Temperature(TL)	217℃
-Time(tL)	60~150 seconds
Peak Temperature(Tp)	260℃
Ramp-Down Rate	6℃/second max.
Time 25℃ to Peak Temperature	8 minutes max
Storage Condition	0℃~30℃,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

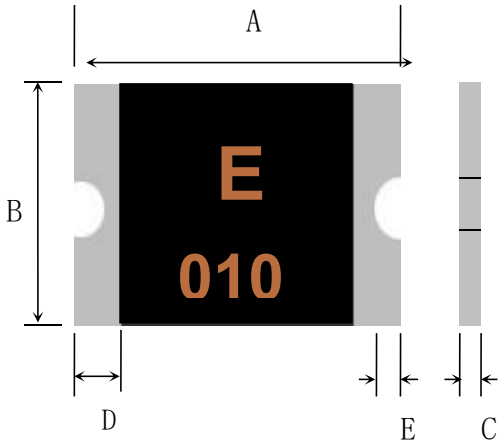
Devices can be cleaned using standard industry methods and solvents.

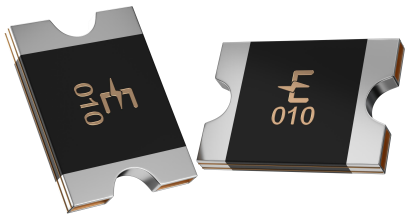
Note 1:All temperature refer to topside of the package, measured on the package body surface.

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

SMD1812 E Series Surface Mount PTC Devices

EPhysical Dimensions(mm.)





注：E 为“闪电 E”LOGO

Model	A		B		C		D	E
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Min.
SMD1812RE010SF30V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812E010SF33V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812E010SF60V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812E014SF33V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812E014SF60V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812E020SF30V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812E020SF33V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812E020SF60V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812E030SF30V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812E030SF33V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812E030SF60V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812E050SF15V	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812E050SF24V	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812E050SF30V	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812E050SF33V	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812E050SF60V	4.37	4.73	3.07	3.41	0.60	1.50	0.30	0.25
SMD1812E075SF13.2V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812E075SF24V	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
SMD1812E075SF33V	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
SMD1812E110SF8V	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812E110SF16V	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812E110SF24V	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
SMD1812E10SF33V	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
SMD1812E125SF8V	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812E125SF16V	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
SMD1812E150SF8V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812E150SF16V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812E150SF24V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812E150SF33V	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812E160SF8V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25

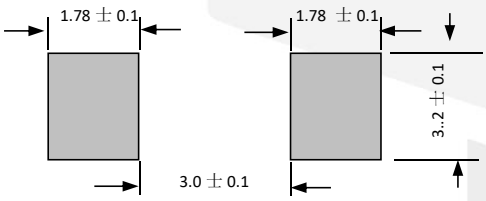
SMD1812E160SF16V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812E200SF8V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812E200SF16V	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
SMD1812E200SF24V	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812E200SF30V	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812E260SF8V	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812E260SF16V	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812E260SF24V	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812E300SF8V	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812E300SF16V	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812E350SF6V	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812E350SF16V	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812E400SF6V	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
SMD1812E400SF12V	4.37	4.73	3.07	3.41	1.00	1.80	0.30	0.25
SMD1812E400SF16V	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

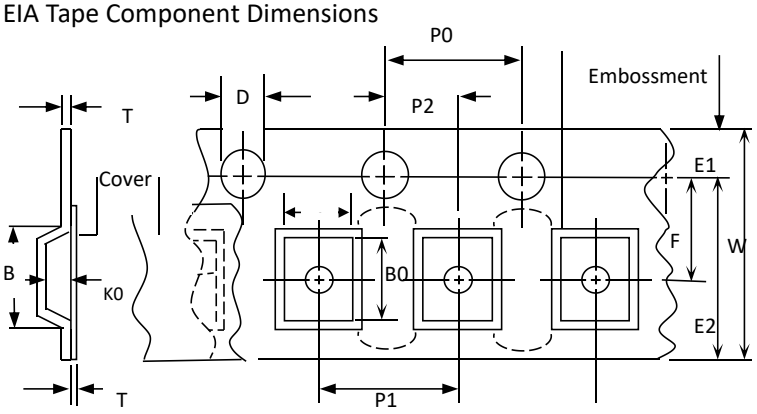
Part Number	Quantity
SMD1812 Series	1,500 or 2,000pcs/reel

Tape & reel packaging per EIA481-1

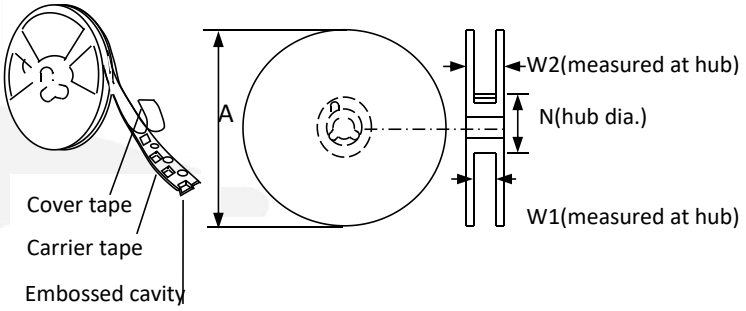
Tape And Reel Specifications (mm)

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℃~30℃, 30%~60% R.H.

· Devices may not meet specified performance if storage conditions are exceeded.

Part Number System

SMD 1812 E □□□ S F □□ V

- special voltage Rating(Optional)
- Lead-Free
- Tin-plated Nickel-Copper
- Holding Current Rating
- PROTECTOM
- Device Dimensions: Length/width(Unit:1/100 inch) Size 4532 mm / 1812 inch
- Surface Mount Device