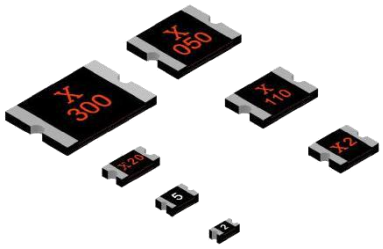
WT1812 Series Surface Mount PPTC Devices



Features

- compact design saves board space
- RoHS compliant and lead-free
- Halogen-free
- Fast reponse to flault current
- Symmetrical design

Applications

- USB port protection - USB 2.0, 3.0&OTG
- HDMI 1.4 Source protection
- PDAs / digital cameras
- Game console port protection
- PC motherboards-plug and play protection

HF RoHS REACH Pb

1.Electrical Characteristics

Model	I-hold	I-trip	Vmax	Imax	Pd typ	Max. Time to trip		R0 min	R1max
						Current	Time		
	(A)	(A)	(Vdc)	(A)	(W)	(A)	(Sec.)	(Ohm)	(Ohm)
WT1812-010	0.10	0.30	30.00	100.00	0.80	0.50	1.50	1.40	15.00
WT1812-010/60	0.10	0.30	60.00	10.00	0.80	0.50	1.50	1.40	15.00
WT1812-014	0.14	0.34	60.00	10.00	0.80	1.50	0.15	1.20	6.50
WT1812-020	0.20	0.40	30.00	100.00	0.80	8.00	0.02	0.80	5.00
WT1812-020/60	0.20	0.40	60.00	10.00	0.80	8.00	0.02	1.20	6.00
WT1812-030	0.30	0.60	30.00	40.00	0.80	8.00	0.05	0.40	3.00
WT1812-030/48	0.30	0.60	48.00	40.00	0.80	8.00	0.05	0.40	3.00
WT1812-030/60	0.30	0.60	60.00	40.00	0.80	8.00	0.05	0.40	3.00
WT1812-035	0.35	0.70	30.00	40.00	0.80	8.00	0.15	0.35	1.80
WT1812-035/60	0.35	0.70	60.00	10.00	1.00	8.00	0.15	0.35	2.00
WT1812-050	0.50	1.00	16.00	100.00	0.80	8.00	0.15	0.15	1.00
WT1812-050/30	0.50	1.00	30.00	100.00	0.80	8.00	0.15	0.15	1.00
WT1812-050/60	0.50	1.00	60.00	10.00	1.50	8.00	0.15	0.15	1.20
WT1812-075	0.75	1.50	16.00	100.00	0.80	8.00	0.20	0.11	0.45
WT1812-075/24	0.75	1.50	24.00	100.00	0.80	8.00	0.20	0.11	0.45
WT1812-075/33	0.75	1.50	33.00	40.00	0.80	8.00	0.20	0.11	0.45
WT1812-110	1.10	2.20	8.00	100.00	0.80	8.00	0.30	0.050	0.225
WT1812-110/12	1.10	2.20	12.00	100.00	0.80	8.00	0.30	0.050	0.225
WT1812-110/16	1.10	2.20	16.00	100.00	0.80	8.00	0.30	0.050	0.225
WT1812-110/24	1.10	2.20	24.00	40.00	0.80	8.00	0.50	0.045	0.225
WT1812-110/33	1.10	2.20	33.00	40.00	0.80	8.00	0.50	0.045	0.225
WT1812-125	1.25	2.50	8.00	100.00	0.80	8.00	0.40	0.035	0.140
WT1812-125/12	1.25	2.50	12.00	100.00	0.80	8.00	0.40	0.035	0.140
WT1812-125/16	1.25	2.50	16.00	100.00	0.80	8.00	0.40	0.035	0.140
WT1812-150	1.50	3.00	8.00	100.00	0.80	8.00	0.30	0.030	0.120

WT1812-150/12	1.50	3.00	12.00	100.00	0.80	8.00	0.50	0.030	0.120
WT1812-150/16	1.50	3.00	16.00	100.00	0.80	8.00	0.50	0.030	0.120
WT1812-150/24	1.50	3.00	24.00	40.00	0.80	8.00	1.50	0.030	0.150
WT1812-160	1.60	3.20	8.00	100.00	0.80	8.00	0.30	0.030	0.110
WT1812-160/12	1.60	3.20	12.00	100.00	0.80	8.00	0.50	0.030	0.110
WT1812-160/16	1.60	3.20	16.00	100.00	0.80	8.00	0.50	0.030	0.110
WT1812-200	2.00	4.00	8.00	100.00	0.80	8.00	2.00	0.020	0.080
WT1812-200/12	2.00	4.00	12.00	100.00	1.00	8.00	2.00	0.020	0.080
WT1812-200/16	2.00	4.00	16.00	100.00	1.00	8.00	2.00	0.020	0.080
WT1812-200/24	2.00	4.00	24.00	100.00	1.00	8.00	2.00	0.02	0.11
WT1812-200/30	2.00	4.00	30.00	100 .00	1.00	8.00	2.00	0.02	0.11
WT1812-250	2.50	5.00	8.00	100.00	0.80	8.00	5.00	0.015	0.075
WT1812-250/12	2.50	5.00	12.00	100.00	0.80	8.00	5.00	0.015	0.075
WT1812-250/16	2.50	5.00	16.00	100.00	1.00	8.00	5.00	0.015	0.075
WT1812-260	2.60	5.20	8.00	100.00	0.80	8.00	5.00	0.015	0.075
WT1812-260/12	2.60	5.20	12.00	100.00	0.80	8.00	5.00	0.015	0.075
WT1812-260/16	2.60	5.20	16.00	100.00	1.00	8.00	5.00	0.015	0.075
WT1812-300	3.00	6.00	12.00	100.00	1.00	8.00	4.00	0.012	0.060
WT1812-300/8	3.00	6.00	8.00	100.00	1.00	8.00	4.00	0.012	0.060
WT1812-300/16	3.00	6.00	16.00	100.00	1.00	8.00	4.00	0.012	0.060
WT1812-350	3.50	7.00	12.00	100.00	1.00	10.00	4.00	0.008	0.035
WT1812-350/16	3.50	7.00	16.00	100.00	1.00	10.00	4.00	0.008	0.035
WT1812-400	4.00	8.00	6.00	100.00	2.00	10.00	4.00	0.005	0.025

I-hold: Holding Current: maximum current at which the device will not trip in 25℃ still air.

I-trip: Tripping Current: minimum current at which the device will trip in 25℃ still air.

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

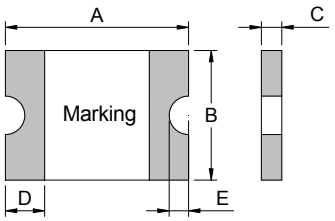
I max: Maximum fault current device can withstand without damage at rated voltage(Vmax).

Pd typ:Typical power dissipated from device when in the tripped state at 25℃ still air.

R0 min:Minimum resistance of device in initial (un-soldered) state.

R1 max:Maximum resistance of device at 25℃ measured one hour after tripping or reflow soldering of 260℃ for 20 sec.

2.Product Dimensions(mm)&Marking



Model	A		B		C		D		E	Marking
	Min	Max	Min	Max	Min	Max	Min	Max	Min	
WT1812-010	4.37	4.73	3.07	3.41	0.65	1.15	0.30	1.20	0.20	X 010
WT1812-010/60	4.37	4.73	3.07	3.41	0.65	1.15	0.30	1.20	0.20	X 010
WT1812-014	4.37	4.73	3.07	3.41	0.65	1.15	0.30	1.20	0.20	X 014
WT1812-020	4.37	4.73	3.07	3.41	0.65	1.15	0.30	1.20	0.20	X 020
WT1812-020/60	4.37	4.73	3.07	3.41	0.65	1.15	0.30	1.20	0.20	X 020 60
WT1812-030	4.37	4.73	3.07	3.41	0.65	1.15	0.30	1.20	0.20	X 030
WT1812-030/48	4.37	4.73	3.07	3.41	0.65	1.15	0.30	1.20	0.20	X 030
WT1812-030/60	4.37	4.73	3.07	3.41	0.65	1.15	0.30	1.20	0.20	X 030
WT1812-035	4.37	4.73	3.07	3.41	0.65	1.15	0.30	1.20	0.20	X 035
WT1812-035/60	4.37	4.73	3.07	3.41	1.00	1.50	0.30	1.20	0.20	X 035 60
WT1812-050	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 050
WT1812-050/30	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 050
WT1812-050/60	4.37	4.73	3.07	3.41	1.00	1.50	0.30	1.20	0.20	X 050 60
WT1812-075	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 075
WT1812-075/24	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 075 24
WT1812-075/33	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 075 33
WT1812-110	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 110
WT1812-110/12	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 110
WT1812-110/16	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 110
WT1812-110/24	4.37	4.73	3.07	3.41	0.65	1.15	0.30	1.20	0.20	X 110 24
WT1812-110/33	4.37	4.73	3.07	3.41	0.85	1.35	0.30	1.20	0.20	X 110 33
WT1812-125	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 125
WT1812-125/12	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 125
WT1812-125/16	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 125 16
WT1812-150	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 150
WT1812-150/12	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 150
WT1812-150/16	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 150 16
WT1812-150/24	4.37	4.73	3.07	3.41	0.85	1.35	0.30	1.20	0.20	X 150 24
WT1812-160	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 160

WT1812-160/12	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 160
WT1812-160/16	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 160 16
WT1812-200	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 200
WT1812-200/12	4.37	4.73	3.07	3.41	0.65	1.15	0.30	1.20	0.20	X 200 12
WT1812-200/16	4.37	4.73	3.07	3.41	0.65	1.15	0.30	1.20	0.20	X 200 16
WT1812-200/24	4.37	4.73	3.07	3.41	0.85	1.35	0.30	1.20	0.20	X 200 24
WT1812-200/30	4.37	4.73	3.07	3.41	0.85	1.35	0.30	1.20	0.20	X 200 30
WT1812-250	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 250
WT1812-250/12	4.37	4.73	3.07	3.41	0.65	1.15	0.30	1.20	0.20	X 250 12
WT1812-250/16	4.37	4.73	3.07	3.41	0.85	1.35	0.30	1.20	0.20	X 250 16
WT1812-260	4.37	4.73	3.07	3.41	0.35	0.85	0.30	1.20	0.20	X 260
WT1812-260/12	4.37	4.73	3.07	3.41	0.65	1.15	0.30	1.20	0.20	X 260 12
WT1812-260/16	4.37	4.73	3.07	3.41	0.85	1.35	0.30	1.20	0.20	X 260 16
WT1812-300	4.37	4.73	3.07	3.41	0.85	1.35	0.30	1.20	0.20	X 300
WT1812-300/8	4.37	4.73	3.07	3.41	0.85	1.35	0.30	1.20	0.20	X 300
WT1812-300/16	4.37	4.73	3.07	3.41	0.85	1.35	0.30	1.20	0.20	X 300
WT1812-350	4.37	4.73	3.07	3.41	1.00	1.50	0.30	1.20	0.20	X 350
WT1812-350/16	4.37	4.73	3.07	3.41	1.00	1.50	0.30	1.20	0.20	X 350
WT1812-400	4.37	4.73	3.07	3.41	1.00	1.50	0.30	1.20	0.20	X 400

3.Thermal Derating Chart

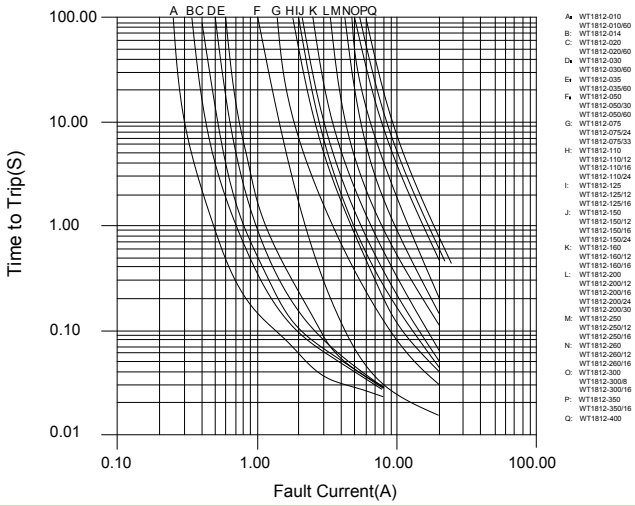
Recommended hold current(A) at ambient Temperature(℃)

Model	Ambient Operating Temperature								
	-40℃	-20℃	0℃	25℃	40℃	50℃	60℃	70℃	85℃
WT1812-010	0.16	0.14	0.12	0.10	0.08	0.07	0.06	0.05	0.03
WT1812-010/60	0.16	0.14	0.12	0.10	0.08	0.07	0.06	0.05	0.03
WT1812-014	0.23	0.19	0.17	0.14	0.12	0.10	0.09	0.08	0.06
WT1812-020	0.29	0.26	0.23	0.20	0.17	0.15	0.14	0.12	0.10
WT1812-020/60	0.29	0.26	0.23	0.20	0.17	0.15	0.14	0.12	0.10
WT1812-030	0.43	0.39	0.34	0.30	0.26	0.22	0.21	0.17	0.14
WT1812-030/48	0.43	0.39	0.34	0.30	0.26	0.22	0.21	0.17	0.14
WT1812-030/60	0.43	0.39	0.34	0.30	0.26	0.22	0.21	0.17	0.14
WT1812-035	0.50	0.45	0.40	0.35	0.30	0.26	0.24	0.20	0.16
WT1812-035/60	0.50	0.45	0.40	0.35	0.30	0.26	0.24	0.20	0.16
WT1812-050	0.77	0.68	0.59	0.50	0.44	0.40	0.37	0.33	0.29
WT1812-050/30	0.77	0.68	0.59	0.50	0.44	0.40	0.37	0.33	0.29
WT1812-050/60	0.77	0.68	0.59	0.50	0.44	0.40	0.37	0.33	0.29
WT1812-075	1.15	1.01	0.88	0.75	0.65	0.60	0.55	0.49	0.43
WT1812-075/24	1.15	1.01	0.88	0.75	0.65	0.60	0.55	0.49	0.43
WT1812-075/33	1.15	1.01	0.88	0.75	0.65	0.60	0.55	0.49	0.43
WT1812-110	1.59	1.43	1.26	1.10	0.95	0.87	0.80	0.71	0.60

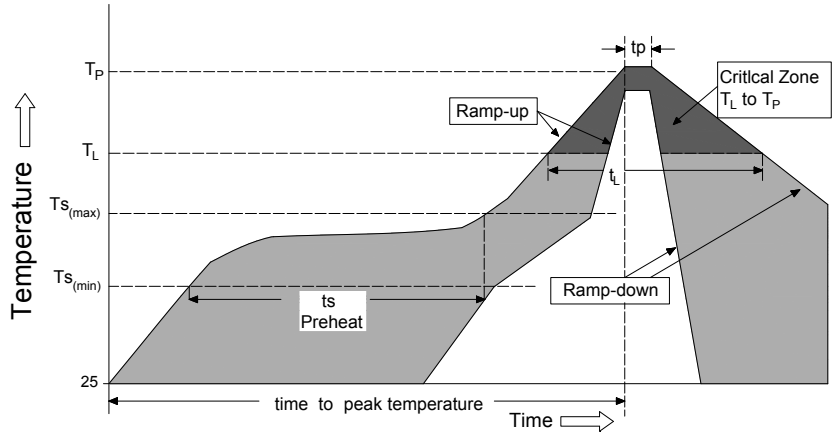
WT1812-110/12	1.59	1.43	1.26	1.10	0.95	0.87	0.80	0.71	0.60
WT1812-110/16	1.59	1.43	1.26	1.10	0.95	0.87	0.80	0.71	0.60
WT1812-110/24	1.59	1.43	1.26	1.10	0.95	0.87	0.80	0.71	0.60
WT1812-110/33	1.59	1.43	1.26	1.10	0.95	0.87	0.80	0.71	0.60
WT1812-125	2.00	1.75	1.52	1.25	1.00	0.95	0.90	0.75	0.53
WT1812-125/12	2.00	1.75	1.52	1.25	1.00	0.95	0.90	0.75	0.53
WT1812-125/16	2.00	1.75	1.52	1.25	1.00	0.95	0.90	0.75	0.53
WT1812-150	2.06	1.93	1.79	1.50	1.28	1.10	1.02	0.80	0.68
WT1812-150/12	2.06	1.93	1.79	1.50	1.28	1.10	1.02	0.80	0.68
WT1812-150/16	2.06	1.93	1.79	1.50	1.28	1.10	1.02	0.80	0.68
WT1812-150/24	2.06	1.93	1.79	1.50	1.28	1.10	1.02	0.80	0.68
WT1812-160	2.20	2.06	1.91	1.60	1.36	1.17	1.09	0.85	0.72
WT1812-160/12	2.20	2.06	1.91	1.60	1.36	1.17	1.09	0.85	0.72
WT1812-160/16	2.20	2.06	1.91	1.60	1.36	1.17	1.09	0.85	0.72
WT1812-200	2.60	2.44	2.22	2.00	1.78	1.67	1.50	1.45	1.29
WT1812-200/12	2.60	2.44	2.22	2.00	1.78	1.67	1.50	1.45	1.29
WT1812-200/16	2.60	2.44	2.22	2.00	1.78	1.67	1.50	1.45	1.29
WT1812-200/24	2.60	2.44	2.22	2.00	1.78	1.67	1.50	1.45	1.29
WT1812-200/30	2.60	2.44	2.22	2.00	1.78	1.67	1.50	1.45	1.29
WT1812-250	3.27	3.04	2.88	2.50	2.21	2.07	1.92	1.78	1.57
WT1812-250/12	3.27	3.04	2.88	2.50	2.21	2.07	1.92	1.78	1.57
WT1812-250/16	3.27	3.04	2.88	2.50	2.21	2.07	1.92	1.78	1.57
WT1812-260	3.40	3.16	3.00	2.60	2.30	2.15	2.00	1.85	1.63
WT1812-260/12	3.40	3.16	3.00	2.60	2.30	2.15	2.00	1.85	1.63
WT1812-260/16	3.40	3.16	3.00	2.60	2.30	2.15	2.00	1.85	1.63
WT1812-300	4.13	3.75	3.30	3.00	2.62	2.43	2.25	2.00	1.78
WT1812-300/8	4.13	3.75	3.30	3.00	2.62	2.43	2.25	2.00	1.78
WT1812-300/16	4.13	3.75	3.30	3.00	2.62	2.43	2.25	2.00	1.78
WT1812-350	4.84	4.39	4.04	3.50	2.98	2.66	2.35	1.88	1.55
WT1812-350/16	4.84	4.39	4.04	3.50	2.98	2.66	2.35	1.88	1.55
WT1812-400	5.80	5.20	4.60	4.00	3.35	3.12	2.75	2.45	2.10

4. Typical time to trip at 25℃

1812 Series TTT Vs Fault current chart



5.Soldering parameters



Profile Feature		Pb-Free Assembly
Average Ramp-Up Rate ($Ts_{(max)}$ to T_P)		3°C/second max
Pre Heat:	Temperature Min ($Ts_{(min)}$)	150°C
	Temperature Max ($Ts_{(max)}$)	200°C
	Time (Min to Max) (t_s)	60 – 180 secs
Time Maintained Above:	Temperature (T_L)	217°C
	Temperature (t_L)	60 – 150 seconds
Peak / Classification Temperature (T_P)		$260^{+0/-5}$ °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 (T_P)		8 minutes Max.

◆All temperature refer to topside of thepackage, measured on the package body surface

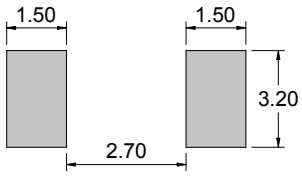
◆If reflow temperature exceeds the recommended profile,devices may not meet the performance requirements

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

◆Recommended maximum paste thickness is 0.25mm (0.010inch)

◆Devices can be cleaned using standard industry

6.Recommended Pad Layout(mm) & Physical Specifications



Terminal Material	Tin-Plated Nickle-Copper (Solder Material: Matte Tin (Sn))
Lead Solderability	Meets EIA Specification RS186-9E, ANSI/J-STD-002 Category 3.

7.Environmental Specifications

Http://wwwweitefuse.com

Operating Temperature	-40 °C to +85 °C
Maximum Device Surface Temperature in Tripped State	125°C
Passive Aging	+85 °C, 1000 hours ; ±5 % typical resistance change
Humidity Aging	+85 °C, 85 % R.H. 1000 hours; ±5 % typical resistance change
Thermal Shock	MIL–STD–202, Method 107; +85 °C to -40 °C, 20 times;-30 % typical resistance change
Solvent Resistance	MIL–STD–202, Method 215 ; No change
Vibration	MIL–STD–883, Method 2007, Condition A; No change
Moisture Sensivity Level	Level 1, J–STD–020
Storage Conditions	+40 °C Max. 70% RH Max. Packed in original packaging.

8.Test Procedures And Requirements

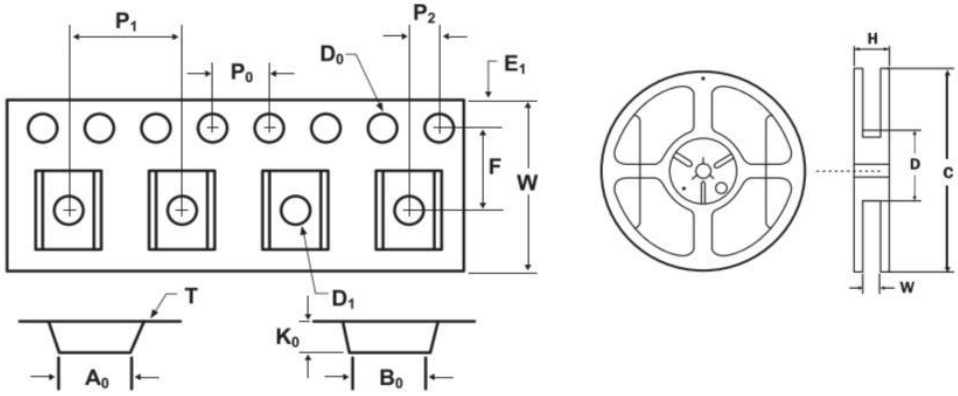
No.	Test	Test Conditions	Accept/Reject Criteria
1	R0 min	Resistance measurement at 25℃	R0min ≤ R ≤ R1max
2	R1 max	Resistance measurement one hour after post trip	R0min ≤ R ≤ R1max
3	I-hold	Hold rated current 1800 second without trip, @ 25℃	No trip
4	I-trip	Device must trip within 900 second under rated current, @25℃	Trip
5	Max. time to trip	At specified current, 25 °C	T ≤ max. time to trip (seconds)
6	Trip Cycle Life	Vmax, Imax, 100 cycles	No arcing or burning
7	Trip Endurance	Vmax,Imax 24 hours	No arcing or burning
8	Solderability	ANSI/J-STD-002	95 % min. coverage

9.Tape and Reel Specifications&Packaging quantity per Reel

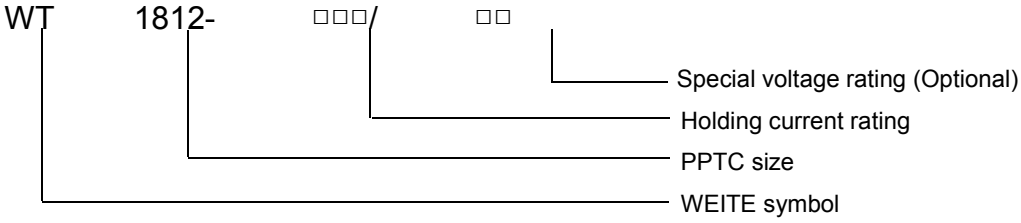
TAPE SPECIFICATIONS: EIA-481-1 (mm)			
Item	WT1812-050 WT1812-075 WT1812-110 WT1812-110/16 WT1812-125/12 WT1812-150 WT1812-150/16 WT1812-160/12 WT1812-200 WT1812-260 WT1812-050/30 WT1812-075/24 WT1812-110/12 WT1812-125 WT1812-125/16 WT1812-150/12 WT1812-160 WT1812-160/16 WT1812-250	WT1812-010 WT1812-014 WT1812-020/60 WT1812-030/48 WT1812-035 WT1812-075/33 WT1812-110/33 WT1812-200/12 WT1812-200/24 WT1812-250/12 WT1812-260/12 WT1812-300 WT1812-300/16 WT1812-010/60 WT1812-020 WT1812-030 WT1812-030/60 WT1812-035/60 WT1812-110/24 WT1812-150/24 WT1812-200/16 WT1812-200/30 WT1812-250/16 WT1812-260/16 WT1812-300/8	WT1812-050/60 WT1812-350 WT1812-350/16 WT1812-400
W	12.0±0.10	12.0±0.10	12.0±0.10
F	5.50±0.05	5.50±0.05	5.50±0.05
E1	1.75±0.10	1.75±0.10	1.75±0.10
D0	1.55±0.05	1.55±0.05	1.55±0.05
D1	1.50 min	1.50 min	1.50 min
P0	4.0±0.10	4.0±0.10	4.0±0.10
P1	8.0±0.10	8.0±0.10	8.0±0.10
P2	2.0±0.05	2.0±0.05	2.0±0.05
A0	3.58±0.10	3.58±0.10	3.50±0.10
B0	4.93±0.10	4.93±0.10	4.90±0.10
T	0.25±0.05	0.25±0.05	0.25±0.05

REEL DIMENSIONS: EIA-481-1 (mm)	
C	Ø178±1.0
D	Ø60.2±0.5
W	13.2±1.5
H	16.0±0.5

K0	0.87±0.10	1.30±0.10	1.70±0.10
Leader	390mm	390mm	390mm
Trailer	160mm	160mm	160mm
Q'ty	2,000pcs/Reel	1,500pcs/Reel	1,000pcs/Reel



10. Part Ordering Number System



⚠Warning:

- ☛Users shall independently assess the suitability of these devices for each of their applications
- ☛Operation of these devices beyond the stated maximum ratings could result in damage to the devices and lead to electrical arcing and/or fire
- ☛These devices are intended to protect against the effects of temporary over-current or over-temperature conditions and are not intended to perform as protective devices where such conditions are expected to be repetitive or prolonged in duration
- ☛Exposure to silicon-based oils, solvents, electrolytes, acids, and similar materials can adversely affect the performance of these PPTC devices
- ☛These devices undergo thermal expansion under fault conditions, and thus shall be provided with adequate space and be protected against mechanical stresses
- ☛Circuits with inductance may generate a voltage (L di/dt) above the rated voltage of the PPTC device.