

Features


- ▶ compact design saves board space
- ▶ RoHS compliant and lead-free
- ▶ Halogen-free
- ▶ Fast reponse to fault 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 Free

1. Electrical Characteristics

Model	I-hold (A)	I-trip (A)	Vmax (Vdc)	Imax (A)	Pd typ (W)	Max. Time to trip		R0 min (Ohm)	R1max (Ohm)	Agency Approval 
						Current (A)	Time (Sec.)			
DT-1210-005	0.05	0.15	30.00	10.00	0.60	0.25	1.50	2.80	50.00	×
DT-1210-005/60	0.05	0.15	60.00	10.00	0.60	0.25	1.50	2.80	50.00	×
DT-1210-010	0.10	0.30	30.00	10.00	0.60	0.50	1.50	1.50	15.00	×
DT-1210-010/60	0.10	0.30	60.00	10.00	0.60	0.50	1.50	1.50	15.00	×
DT-1210-020	0.20	0.40	24.00	10.00	0.60	8.00	0.02	0.80	5.00	×
DT-1210-020/30	0.20	0.40	30.00	10.00	0.60	8.00	0.02	0.80	5.00	×
DT-1210-035	0.35	0.70	6.00	100.00	0.60	8.00	0.20	0.25	1.30	×
DT-1210-035/24	0.35	0.70	24.00	40.00	0.60	8.00	0.20	0.25	1.30	×
DT-1210-035/30	0.35	0.70	30.00	40.00	0.60	8.00	0.20	0.20	1.50	×
DT-1210-035/30S	0.35	0.70	30.00	40.00	0.60	8.00	0.20	0.25	1.30	×
DT-1210-050	0.50	1.00	13.20	100.00	0.60	8.00	0.10	0.18	0.90	×
DT-1210-050/16	0.50	1.00	16.00	100.00	0.60	8.00	0.10	0.18	0.90	×
DT-1210-050/24	0.50	1.00	24.00	100.00	0.60	8.00	0.10	0.18	0.90	×
DT-1210-050/30	0.50	1.00	30.00	40.00	0.60	8.00	0.15	0.18	1.00	×
DT-1210-075	0.75	1.50	6.00	100.00	0.60	8.00	0.10	0.10	0.45	×
DT-1210-075/13.2	0.75	1.50	13.20	100.00	0.60	8.00	0.10	0.10	0.45	×
DT-1210-075/16	0.75	1.50	16.00	100.00	0.60	8.00	0.10	0.10	0.45	×
DT-1210-075/24	0.75	1.50	24.00	100.00	0.60	8.00	0.10	0.10	0.45	×
DT-1210-110	1.10	2.20	8.00	100.00	0.60	8.00	0.10	0.05	0.21	×
DT-1210-110/12	1.10	2.20	12.00	100.00	0.60	8.00	0.10	0.05	0.21	×
DT-1210-110/16	1.10	2.20	16.00	100.00	0.60	8.00	0.10	0.05	0.21	×
DT-1210-110/16S	1.10	2.20	16.00	100.00	0.60	8.00	0.10	0.05	0.21	×
DT-1210-110/24	1.10	2.20	24.00	100.00	0.60	8.00	0.10	0.05	0.21	×
DT-1210-150	1.50	3.00	6.00	100.00	0.80	8.00	0.30	0.03	0.11	×
DT-1210-150/8	1.50	3.00	8.00	100.00	0.80	8.00	0.30	0.03	0.11	×
DT-1210-150/12	1.50	3.00	12.00	100.00	0.80	8.00	0.30	0.03	0.11	×
DT-1210-150/16	1.50	3.00	16.00	100.00	0.80	8.00	0.30	0.03	0.11	×
DT-1210-175	1.75	3.50	6.00	100.00	0.80	8.00	0.60	0.02	0.09	×
DT-1210-175/12	1.75	3.50	12.00	100.00	0.80	8.00	0.60	0.02	0.09	×
DT-1210-175/16	1.75	3.50	16.00	100.00	0.80	8.00	0.60	0.02	0.09	×
DT-1210-200	2.00	4.00	6.00	100.00	0.80	8.00	1.00	0.015	0.090	×
DT-1210-200/12	2.00	4.00	12.00	100.00	0.80	8.00	1.00	0.015	0.090	×
DT-1210-200/16	2.00	4.00	16.00	100.00	0.80	8.00	1.00	0.015	0.090	×

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

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

Vmax: Maximum voltage device can withstand without damage at rated current(I_{max}).

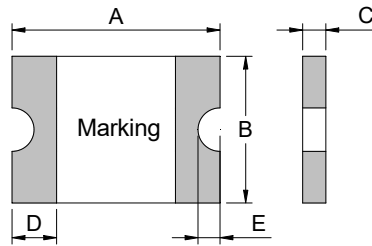
I_{max}: Maximum fault current device can withstand without damage at rated voltage(V_{max}).

P_d typ: Typical power dissipated from device when in the tripped state at 25°C still air.

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

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

2.Product Dimensions(mm)&Marking



Model	A		B		C		D		E	Marking
	Min	Max	Min	Max	Min	Max	Min	Max	Min	
DT-1210-005	3.00	3.43	2.35	2.80	0.65	1.15	0.25	0.75	0.10	D0
DT-1210-005/60	3.00	3.43	2.35	2.80	0.65	1.15	0.25	0.75	0.10	D0
DT-1210-010	3.00	3.43	2.35	2.80	0.65	1.15	0.25	0.75	0.10	D1
DT-1210-010/60	3.00	3.43	2.35	2.80	0.65	1.15	0.25	0.75	0.10	D1
DT-1210-020	3.00	3.43	2.35	2.80	0.65	1.15	0.25	0.75	0.10	D2
DT-1210-020/30	3.00	3.43	2.35	2.80	0.65	1.15	0.25	0.75	0.10	D2
DT-1210-035	3.00	3.43	2.35	2.80	0.35	0.85	0.25	0.75	0.10	D3
DT-1210-035/24	3.00	3.43	2.35	2.80	0.35	0.85	0.25	0.75	0.10	D3
DT-1210-035/30	3.00	3.43	2.35	2.80	0.65	1.15	0.25	0.75	0.10	DA
DT-1210-035/30S	3.00	3.43	2.35	2.80	0.35	0.85	0.25	0.75	0.10	D3
DT-1210-050	3.00	3.43	2.35	2.80	0.35	0.85	0.25	0.75	0.10	D5
DT-1210-050/16	3.00	3.43	2.35	2.80	0.35	0.85	0.25	0.75	0.10	D5
DT-1210-050/24	3.00	3.43	2.35	2.80	0.35	0.85	0.25	0.75	0.10	D5
DT-1210-050/30	3.00	3.43	2.35	2.80	0.65	1.15	0.25	0.75	0.10	DB
DT-1210-075	3.00	3.43	2.35	2.80	0.35	0.85	0.25	0.75	0.10	D7
DT-1210-075/13.2	3.00	3.43	2.35	2.80	0.35	0.85	0.25	0.75	0.10	D7
DT-1210-075/16	3.00	3.43	2.35	2.80	0.35	0.85	0.25	0.75	0.10	D7
DT-1210-075/24	3.00	3.43	2.35	2.80	0.65	1.15	0.25	0.75	0.10	DC
DT-1210-110	3.00	3.43	2.35	2.80	0.35	0.85	0.25	0.75	0.10	D8
DT-1210-110/12	3.00	3.43	2.35	2.80	0.35	0.85	0.25	0.75	0.10	D8
DT-1210-110/16	3.00	3.43	2.35	2.80	0.65	1.15	0.25	0.75	0.10	DE
DT-1210-110/16S	3.00	3.43	2.35	2.80	0.35	0.85	0.25	0.75	0.10	D8
DT-1210-110/24	3.00	3.43	2.35	2.80	0.65	1.15	0.25	0.75	0.10	DE
DT-1210-150	3.00	3.43	2.35	2.80	0.65	1.15	0.25	0.75	0.10	DF
DT-1210-150/8	3.00	3.43	2.35	2.80	0.65	1.15	0.25	0.75	0.10	DF
DT-1210-150/12	3.00	3.43	2.35	2.80	0.65	1.15	0.25	0.75	0.10	DF
DT-1210-150/16	3.00	3.43	2.35	2.80	0.65	1.15	0.25	0.75	0.10	DF

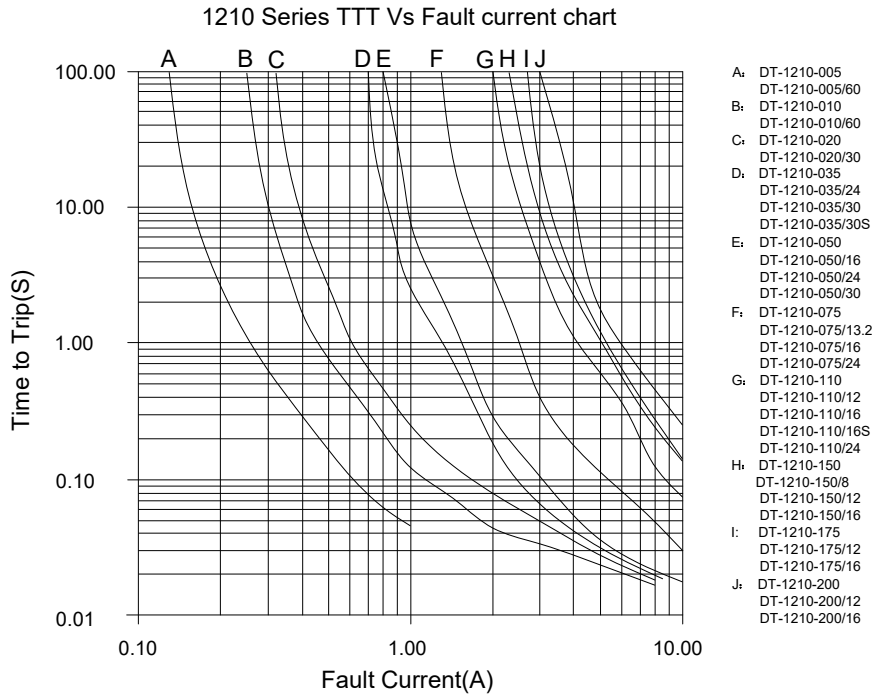
DT-1210-175	3.00	3.43	2.35	2.80	0.65	1.15	0.25	0.75	0.10	DG
DT-1210-175/12	3.00	3.43	2.35	2.80	0.85	1.25	0.25	0.75	0.10	D ₁₇
DT-1210-175/16	3.00	3.43	2.35	2.80	0.85	1.25	0.25	0.75	0.10	D ₁₇
DT-1210-200	3.00	3.43	2.35	2.80	0.65	1.15	0.25	0.75	0.10	DH
DT-1210-200/12	3.00	3.43	2.35	2.80	0.85	1.25	0.25	0.75	0.10	D ₂₀
DT-1210-200/16	3.00	3.43	2.35	2.80	0.85	1.25	0.25	0.75	0.10	D ₂₀

3. Thermal Derating Chart

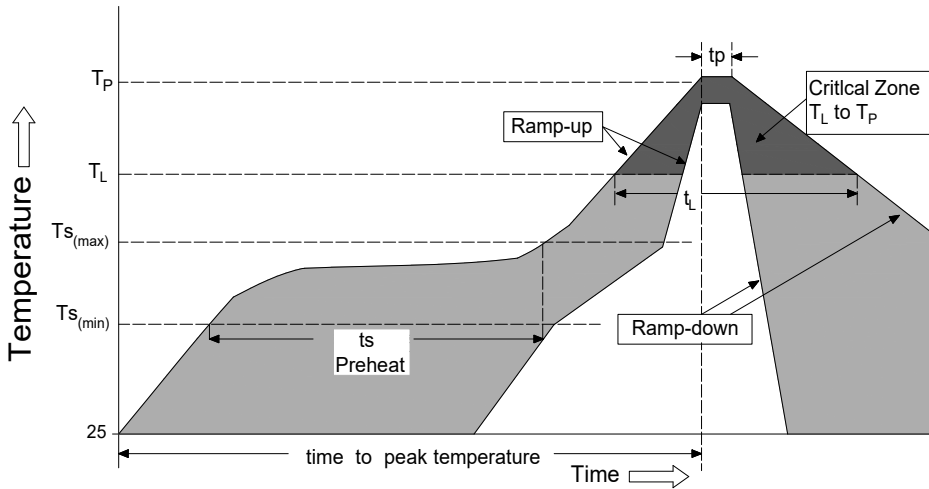
Recommended hold current(A) at ambient Temperature(°C)

Model	Ambient Operating Temperature								
	-40°C	-20°C	0°C	25°C	40°C	50°C	60°C	70°C	85°C
DT-1210-005	0.08	0.07	0.06	0.05	0.04	0.04	0.03	0.03	0.02
DT-1210-005/60	0.08	0.07	0.06	0.05	0.04	0.04	0.03	0.03	0.02
DT-1210-010	0.16	0.14	0.12	0.10	0.08	0.07	0.06	0.05	0.04
DT-1210-010/60	0.16	0.14	0.12	0.10	0.08	0.07	0.06	0.05	0.04
DT-1210-020	0.29	0.26	0.22	0.20	0.16	0.14	0.13	0.11	0.08
DT-1210-020/30	0.29	0.26	0.22	0.20	0.16	0.14	0.13	0.11	0.08
DT-1210-035	0.47	0.45	0.40	0.35	0.33	0.28	0.24	0.21	0.18
DT-1210-035/24	0.47	0.45	0.40	0.35	0.33	0.28	0.24	0.21	0.18
DT-1210-035/30	0.47	0.45	0.40	0.35	0.33	0.28	0.24	0.21	0.18
DT-1210-035/30S	0.47	0.45	0.40	0.35	0.33	0.28	0.24	0.21	0.18
DT-1210-050	0.76	0.67	0.58	0.50	0.43	0.40	0.36	0.32	0.28
DT-1210-050/16	0.76	0.67	0.58	0.50	0.43	0.40	0.36	0.32	0.28
DT-1210-050/24	0.76	0.67	0.58	0.50	0.43	0.40	0.36	0.32	0.28
DT-1210-050/30	0.76	0.67	0.58	0.50	0.43	0.40	0.36	0.32	0.28
DT-1210-075	1.00	0.97	0.86	0.75	0.64	0.59	0.54	0.48	0.40
DT-1210-075/13.2	1.00	0.97	0.86	0.75	0.64	0.59	0.54	0.48	0.40
DT-1210-075/16	1.00	0.97	0.86	0.75	0.64	0.59	0.54	0.48	0.40
DT-1210-075/24	1.00	0.97	0.86	0.75	0.64	0.59	0.54	0.48	0.40
DT-1210-110	1.60	1.42	1.26	1.10	0.94	0.86	0.80	0.70	0.58
DT-1210-110/12	1.60	1.42	1.26	1.10	0.94	0.86	0.80	0.70	0.58
DT-1210-110/16	1.60	1.42	1.26	1.10	0.94	0.86	0.80	0.70	0.58
DT-1210-110/16S	1.60	1.42	1.26	1.10	0.94	0.86	0.80	0.70	0.58
DT-1210-110/24	1.60	1.42	1.26	1.10	0.94	0.86	0.80	0.70	0.58
DT-1210-150	2.30	2.02	1.76	1.50	1.24	1.11	1.00	0.85	0.65
DT-1210-150/8	2.30	2.02	1.76	1.50	1.24	1.11	1.00	0.85	0.65
DT-1210-150/12	2.30	2.02	1.76	1.50	1.24	1.11	1.00	0.85	0.65
DT-1210-150/16	2.30	2.02	1.76	1.50	1.24	1.11	1.00	0.85	0.65
DT-1210-175	2.45	2.22	2.01	1.75	1.45	1.26	1.10	0.98	0.80
DT-1210-175/12	2.45	2.22	2.01	1.75	1.45	1.26	1.10	0.98	0.80
DT-1210-175/16	2.45	2.22	2.01	1.75	1.45	1.26	1.10	0.98	0.80
DT-1210-200	2.60	2.44	2.35	2.00	1.78	1.67	1.50	1.45	1.10
DT-1210-200/12	2.60	2.44	2.35	2.00	1.78	1.67	1.50	1.45	1.10
DT-1210-200/16	2.60	2.44	2.35	2.00	1.78	1.67	1.50	1.45	1.10

4. Typical time to trip at 25°C



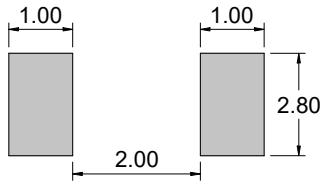
5. Soldering parameters



Profile Feature		Pb-Free Assembly
Average Ramp-Up Rate ($T_{s(max)}$ to T_P)		3°C/second max
Pre Heat:	Temperature Min ($T_{s(min)}$)	150°C
	Temperature Max ($T_{s(max)}$)	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 the package, 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 methods and solvents

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

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.

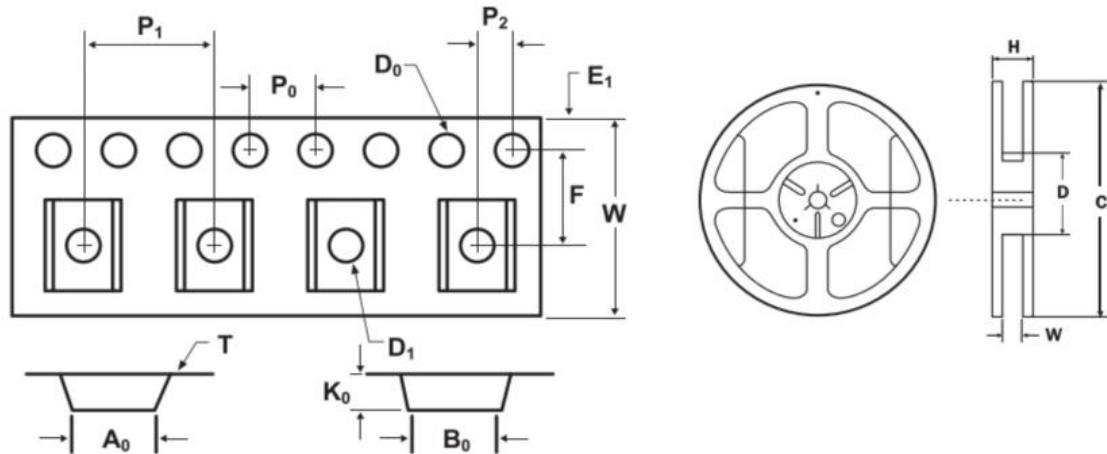
8. Test Procedures And Requirements

No.	Test	Test Conditions	Accept/Reject Criteria
1	R0 min	Resistance measurement at 25°C	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°C	No trip
4	I-trip	Device must trip within 900 second under rated current, @25°C	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

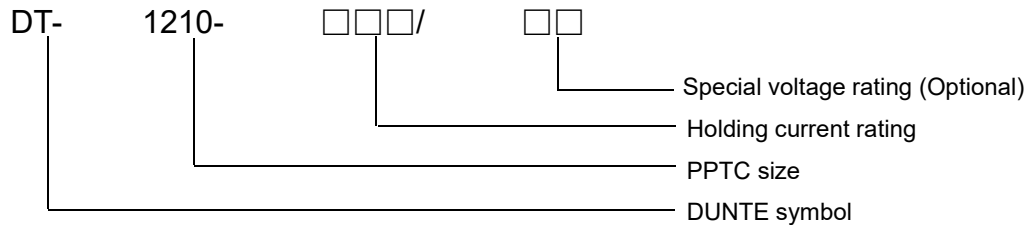
9. Tape and Reel Specifications&Packaging quantity per Reel

TAPE SPECIFICATIONS: EIA-481-1 (mm)				REEL DIMENSIONS: EIA-481-1 (mm)		
Item	DT-1210-035	DT-1210-035/24	DT-1210-005	DT-1210-005/60	C	Ø178±1.0
	DT-1210-035/30S	DT-1210-050	DT-1210-010	DT-1210-010/60	D	Ø60.2±0.5
	DT-1210-050/16	DT-1210-050/24	DT-1210-020	DT-1210-020/30	W	9.0±1.5
	DT-1210-075	DT-1210-075/13.2	DT-1210-035/30	DT-1210-050/30	H	11.0±0.5
	DT-1210-075/16	DT-1210-110	DT-1210-075/24	DT-1210-110/16		
	DT-1210-110/12	DT-1210-110/16S	DT-1210-110/24	DT-1210-150		
			DT-1210-150/8	DT-1210-150/12		
			DT-1210-150/16	DT-1210-175		
			DT-1210-175/12	DT-1210-175/16		
			DT-1210-200	DT-1210-200/12		
		DT-1210-200/16				
W	8.10±0.10		8.10±0.10			
F	3.50±0.05		3.50±0.05			
E1	1.75±0.10		1.75±0.10			
D0	1.55±0.05		1.55±0.05			
D1	1.00 min		1.00 min			

P0	4.0±0.10	4.0±0.10
P1	4.0±0.10	4.0±0.10
P2	2.0±0.05	2.0±0.05
A0	3.00±0.10	3.00±0.10
B0	3.50±0.10	3.50±0.10
T	0.25±0.05	0.25±0.05
K0	0.85±0.10	1.22±0.10
Leader	390mm	390mm
Trailer	160mm	160mm
Q'ty	4,000pcs/Reel	3,500pcs/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.