

## Positive Temperature Coefficient (PTC) Data Sheet

### Description

The 16V series provides radial resettable overcurrent protection with holding current from 2.0A to 14.0A. This series is suitable for applications with higher working voltage up to 16V.

### Features

- Radial leaded devices.
- High voltage surge capabilities
- Flame retardant epoxy polymer insulating material meets UL94 V-0 requirement.
- Over-current protection
- Available in lead-free version.
- Operating Temperature: -40°C~+85°C
- Meets MSL level 1, per J-STD-020

### Applications

- Powered supplies
- Security systems
- Automotive applications
- Industrial controls
- General electronics
- Motor protection

### Electrical Characteristics

Part Number	Marking	I <sub>hold</sub> (A)	I <sub>trip</sub> (A)	V <sub>max</sub> (V <sub>DC</sub> )	I <sub>max</sub> (A)	Pd typ. (W)	Maximum time to trip		Resistace	
							Current(A)	Times (S)	R <sub>min</sub> (Ω)	R <sub>max</sub> (Ω)
FTR16-200	JK16 200T	2	4	16	40	2.2	10.0	1.0	0.040	0.120
FTR16-300	JK16 300	3	6	16	100	2.3	15.0	1.0	0.020	0.072
FTR16-400	JK16 400	4	8	16	100	2.4	20.0	1.7	0.018	0.043
FTR16-500	JK16 500	5	10	16	100	2.6	25.0	2.0	0.014	0.030
FTR16-600	JK16 600	6	12	16	100	2.8	30.0	3.3	0.009	0.025
FTR16-700	JK16 700	7	14	16	100	3.0	35.0	3.5	0.008	0.019
FTR16-800	JK16 800	8	16	16	100	3.0	40.0	5.6	0.006	0.0145
FTR16-900	JK16 900	9	18	16	100	3.3	45.0	4.7	0.004	0.012
FTR16-1000	JK16 1000	10	20	16	100	3.7	50.0	6.0	0.004	0.011
FTR16-1100	JK16 1100	11	22	16	100	3.7	55.0	7.0	0.003	0.010
FTR16-1200	JK16 1200	12	24	16	100	4.2	60.0	7.5	0.003	0.009
FTR16-1400	JK16 1400	14	28	16	100	4.2	70.0	9.0	0.003	0.008

·I<sub>hold</sub>= Hold current: maximum current device will pass without tripping in 25°C still air.  
 ·I<sub>trip</sub>= Trip current: minimum current at which the device will trip in 25°C still air.  
 ·V<sub>max</sub>= Maximum voltage device can withstand without damage at rated current (I<sub>max</sub>)  
 ·I<sub>max</sub>= Maximum fault current device can withstand without damage at rated voltage  
 ·Pd typ.= Typical power dissipated from device when in the tripped state at 23°C still air.  
 ·R<sub>min</sub>= Minimum resistance of device in initial (un-soldered) state.  
 ·R<sub>max</sub>= Maximum resistance of device in initial (un-soldered) state.

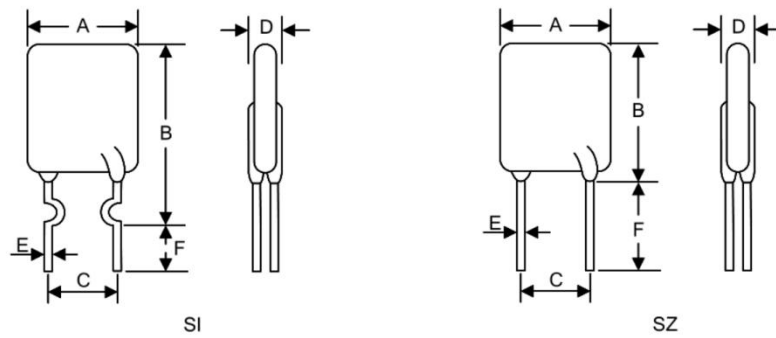
## Test Procedures and Requirement

Items	Test Conditions	Accept/Reject Criteria
Resistance	In still air @25°C	$R_{min} \leq R \leq R_{max}$
Time to Trip	Specified current, V max , 25°C	$T \leq \text{max. Time to trip (T trip)}$
Hold Current	30 min, at $I_{hold}$	No trip
Trip Cycle Life	V max , I max , 100 cycle	No arcing or burning
Trip Endurance	V max , 24hours	No arcing or burning

## Thermal Derating Chart - $I_{hold}$

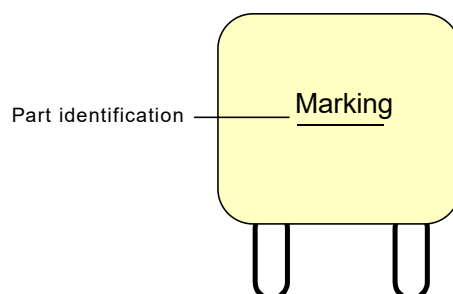
Part Number	Ambient Operation Temperature									
	-40°C	-20°C	0°C	25°C	30°C	40°C	50°C	60°C	70°C	85°C
FTR16-200	2.94	2.66	2.40	2.0	1.87	1.74	1.60	1.40	1.26	0.94
FTR16-300	4.20	3.96	3.60	3.00	2.88	2.64	2.40	2.13	1.83	1.56
FTR16-400	5.60	5.28	4.80	4.00	3.84	3.52	3.20	2.84	2.44	2.08
FTR16-500	7.20	6.60	6.00	5.00	4.80	4.40	4.00	3.55	3.05	2.60
FTR16-600	8.60	7.92	7.20	6.00	5.76	5.28	4.80	4.26	3.66	3.12
FTR16-700	10.10	9.24	8.40	7.00	6.72	6.16	5.60	4.97	4.27	3.64
FTR16-800	11.50	10.56	9.60	8.00	7.68	7.04	6.40	5.68	4.88	4.16
FTR16-900	13.00	11.88	10.80	9.00	8.64	7.92	7.20	6.39	5.49	4.68
FTR16-1000	14.20	13.20	12.00	10.00	9.60	8.80	8.00	7.10	6.10	5.20
FTR16-1100	15.80	14.52	13.20	11.00	10.56	9.68	8.80	7.81	6.71	5.72
FTR16-1200	17.30	15.84	14.40	12.00	11.52	10.56	9.60	8.52	7.32	6.24
FTR16-1400	20.00	18.48	16.80	14.00	13.44	12.32	11.20	9.94	8.54	7.28

## Dimensions



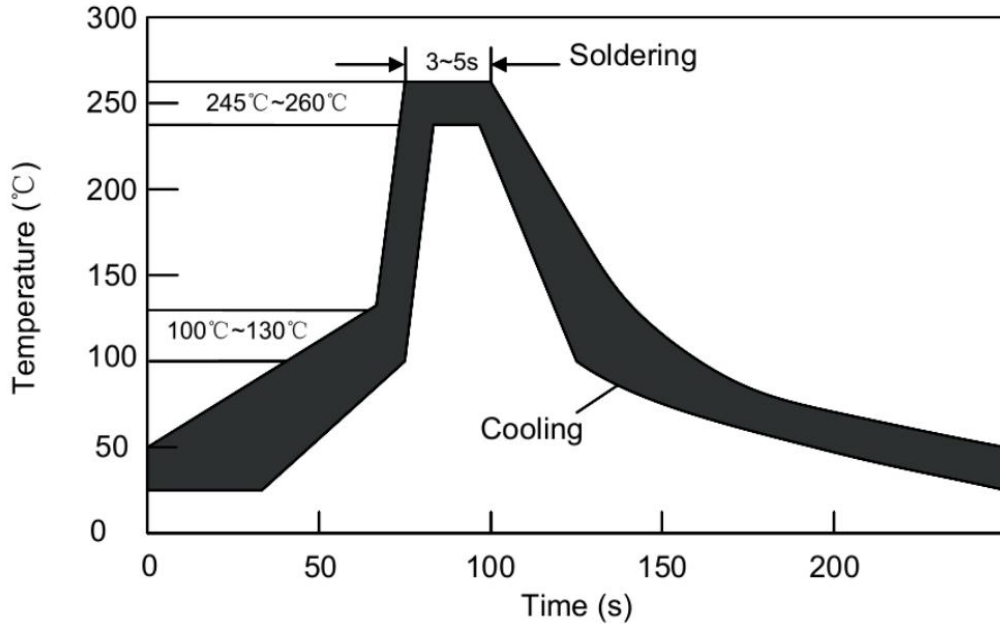
Part Number	Dimensions ( mm )						Style.
	A	B	C	D	E	F	
	Max.	Max.	$\pm 0.6$	Max.	Typ.	Min.	
FTR16-200	6.5	12.5/17.8	5.1	3.1	0.6	7.6	SZ/SI
FTR16-300	9.0	16.8	5.1	3.1	0.8	7.6	SZ
FTR16-400	10.0	17.5	5.1	3.1	0.8	7.6	SZ
FTR16-500	10.7	19.6	5.1	3.1	0.8	7.6	SZ
FTR16-600	13.5	19.6	5.1	3.1	0.8	7.6	SZ
FTR16-700	13.5	22	5.1	3.1	0.8	7.6	SZ
FTR16-800	14.5	25	5.1	3.1	0.8	7.6	SZ
FTR16-900	15.0	25	5.1	3.1	0.8	7.6	SZ
FTR16-1000	18.0	27.5	10.5	3.1	0.8	7.6	SZ
FTR16-1100	18.0	27.5	10.5	3.1	0.8	7.6	SZ
FTR16-1200	22.5	28.5	10.5	3.1	0.8	7.6	SZ
FTR16-1400	24.0	31.0	10.5	3.1	0.8	7.6	SZ

## Marking Code



## Recommended Soldering Conditions

Wave Soldering Recommendation Parameters

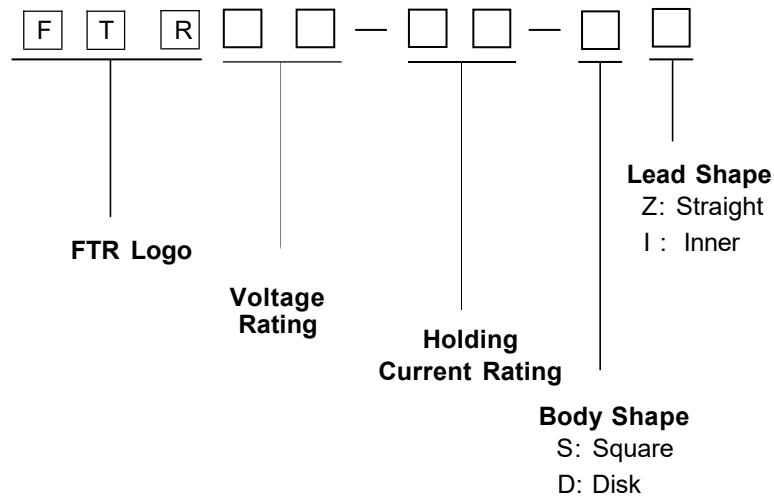


Items	Conditions
Pre-Heating Zone	Refer to the condition recommended by the flux manufacturer. Max. ramping rate should not exceed 4°C/Sec.
Soldering Zone	Max. solder temperature should not exceed 260°C Time within 5°C of actual Max. solder temperature within 3 - 5 seconds Total time from 25°C room to Max. solder temperature within 5 minutes including Pre-Heating time
Cooling Zone	Cooling by natural convection in air. Max. ramping down rate should not exceed 6°C/Sec.

Manual Soldering Recommendation Parameters

Items	Conditions
Soldering condition	The highest power of the manual soldering iron should be 30W or less, soldering temperature should not be higher than 280°C.
Soldering time	The soldering time should be kept within 3 seconds, otherwise it might cause insulation layer cracking, and increased part resistance.
Soldering position	The distance on the leads between the soldering point and bottom of the PPTC body should be equal or greater than 4mm.
Other	The soldering iron should not contact the PPTC body except the leads. If the soldering conditions are kept to lower temperature, less time and larger distance, the outcome of the soldering will be better.

## Partnumber code



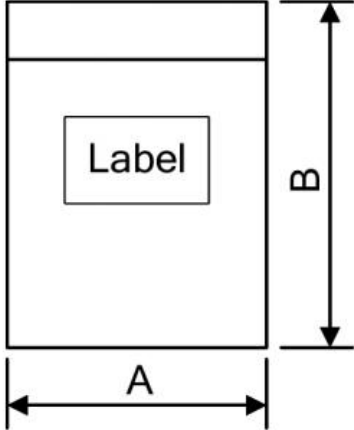
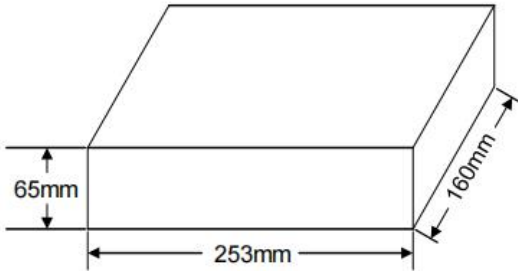
## Environmental Specifications

Operating / Storage 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%RH, 1000 hours ±5% typical resistance change
Thermal Shock	+85°C to -40°C 10 times 30% typical resistance change
Solvent Resistance	MIL-STD-202, Method 215 No change
Moisture Level Sensitivity	Level 1, J-STD-020

## Mechanical Specifications

Tensile strength	1.0Kgf, 10 seconds, No visible damage
Bending strength	0.5Kgf, 90°, 3 times, No visible damage
Vibration	Freq: 10-55Hz, Amp: 0.75mm, 1min; No visible damage

## Packaging

Bag	Part Number	Dimension A×B (mm)	Quantity
	FTR16-300	150×200	1000pcs/bag 4000pcs/box
	FTR16-400		
	FTR16-500	120×150	500pcs/bag 2000pcs/box
	FTR16-600		
	FTR16-200	150×200	500pcs/bag 2000pcs/box
	FTR16-700		
	FTR16-800		
	FTR16-900		
	FTR16-1000	150×200	200pcs/bag 800pcs/box
	FTR16-1100		
	FTR16-1200		
	FTR16-1400		