

## Positive Temperature Coefficient (PTC) Data Sheet

### Description

The 30V series provides radial resettable overcurrent protection with holding current from 0.9A to 9.0A. This series is suitable for applications with higher working voltage up to 30V.

### 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
- Computers
- Motor protection

### Electrical Characteristics

Part Number	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		Resistance	
						Current(A)	Times (S)	R <sub>min</sub> (Ω)	R <sub>max</sub> (Ω)
FTR30-090	0.90	1.80	30	40	0.6	4.50	5.90	0.090	0.220
FTR30-110	1.10	2.20	30	40	0.7	5.50	6.60	0.070	0.200
FTR30-135	1.35	2.70	30	40	0.8	6.75	7.30	0.055	0.160
FTR30-160	1.60	3.20	30	40	0.9	8.00	8.00	0.045	0.140
FTR30-185	1.85	3.70	30	40	1.0	9.25	8.70	0.035	0.120
FTR30-200	2.00	4.00	30	40	1.2	10.00	9.80	0.040	0.100
FTR30-250	2.50	5.00	30	40	1.2	12.50	10.30	0.027	0.080
FTR30-300	3.00	6.00	30	40	2.0	15.00	10.80	0.022	0.070
FTR30-400	4.00	8.00	30	40	2.5	20.00	12.70	0.010	0.060
FTR30-500	5.00	10.00	30	40	3.0	24.00	14.50	0.010	0.050
FTR30-600	6.00	12.00	30	40	3.5	30.00	16.00	0.005	0.040
FTR30-700	7.00	14.00	30	40	3.8	35.00	17.50	0.005	0.030
FTR30-800	8.00	16.00	30	40	4.0	40.00	18.80	0.005	0.025
FTR30-900	9.00	18.00	30	40	4.2	45.00	20.00	0.005	0.020

- 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.

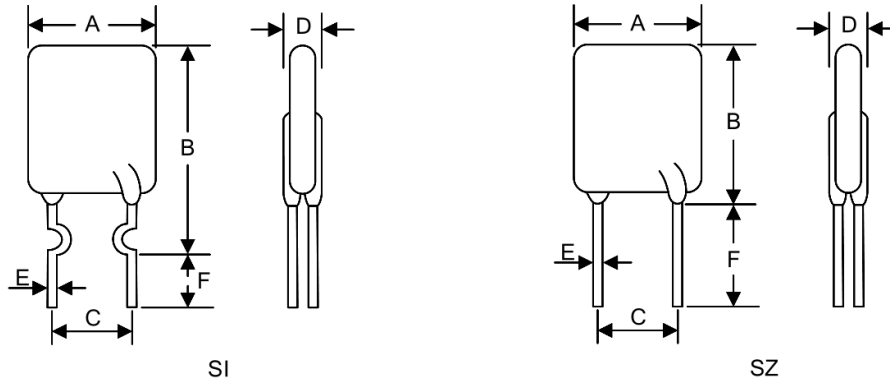
**Test Procedures and Requirement**

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 Ihold	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 – Ihold**

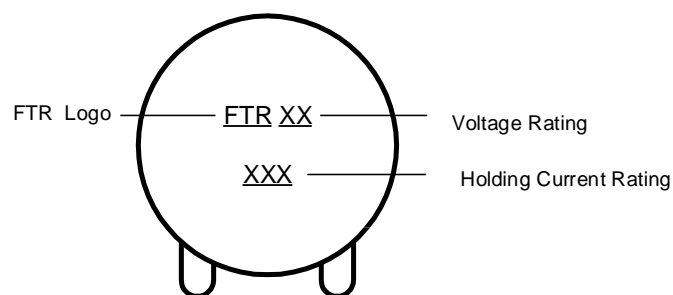
Part Number	Ambient Operation Temperature									
	-40°C	-20°C	0°C	25°C	30°C	40°C	50°C	60°C	70°C	85°C
FTR30-090	1.25	1.17	1.04	0.90	0.82	0.75	0.69	0.61	0.55	0.47
FTR30-110	1.50	1.43	1.27	1.10	1.00	0.91	0.85	0.75	0.67	0.57
FTR30-135	1.90	1.76	1.55	1.35	1.23	1.12	1.04	0.92	0.82	0.70
FTR30-160	2.20	2.08	1.84	1.60	1.46	1.33	1.23	1.09	0.98	0.83
FTR30-185	2.62	2.41	2.13	1.85	1.68	1.54	1.42	1.26	1.13	0.96
FTR30-200	2.80	2.60	2.30	2.00	1.82	1.66	1.54	1.36	1.22	1.04
FTR30-250	3.50	3.25	2.88	2.50	2.28	2.08	1.93	1.70	1.53	1.30
FTR30-300	4.20	3.90	3.45	3.00	2.73	2.49	2.31	2.04	1.83	1.56
FTR30-400	5.60	5.20	4.60	4.00	3.64	3.32	3.08	2.72	2.44	2.08
FTR30-500	7.10	6.50	5.75	5.00	4.55	4.15	3.85	3.40	3.05	2.60
FTR30-600	8.50	7.80	6.90	6.00	5.46	4.98	4.62	4.08	3.66	3.12
FTR30-700	9.90	9.10	8.05	7.00	6.37	5.81	5.39	4.76	4.27	3.64
FTR30-800	11.30	10.40	9.20	8.00	7.28	6.64	6.16	5.44	4.88	4.16
FTR30-900	12.70	11.70	10.35	9.00	8.19	7.47	6.93	6.12	5.49	4.68

## Dimensions



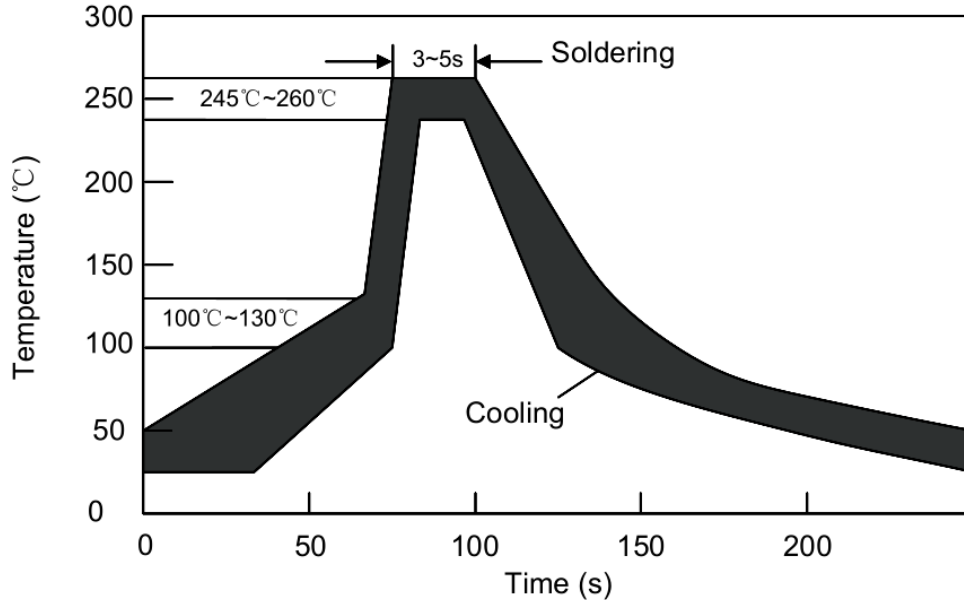
Part Number	Dimensions (mm)						Style.
	A	B	C	D	E	F	
	Max.	Max.	±0.6	Max.	Typ.	Min.	
FTR30-090	7.4	14.5/14.2	5.1	3.1	0.5	4.6 / 7.6	SI / SZ
FTR30-110	7.4	17.8/14.2	5.1	3.1	0.5	4.6 / 7.6	SI / SZ
FTR30-135	9.2	16.8	5.1	3.1	0.5	4.6	SI
FTR30-160	9.5	16.5	5.1	3.1	0.5	4.6	SI
FTR30-185	9.8	18.6	5.1	3.1	0.5	4.6	SI
FTR30-200	11.0	18.6	5.1	3.1	0.5	4.6	SI
FTR30-250	13.2	20.5	5.1	3.1	0.5	4.6	SI
FTR30-300	13.2	20.5	5.1	3.1	0.8	7.6	SZ
FTR30-400	14.0	23.6	5.1	3.1	0.8	7.6	SZ
FTR30-500	14.0	23.6	10.5	3.1	0.8	7.6	SZ
FTR30-600	17.5	27.5	10.5	3.1	0.8	7.6	SZ
FTR30-700	17.5	27.5	10.5	3.1	0.8	7.6	SZ
FTR30-800	23.5	31.0	10.5	3.1	0.8	7.6	SZ
FTR30-900	24.3	31.5	10.5	3.1	0.8	7.6	SZ

## Marking Code



## Recommended Soldering Conditions

Wave Soldering Recommendation Parameters

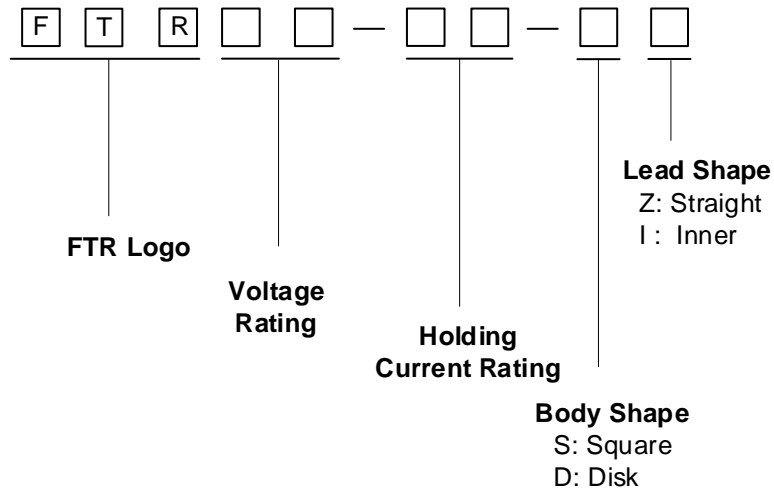


Items	Conditions
Pre-Heating Zone	Refer to the condition recommended by the flux manufacturer. Max. ramping rate should not exceed 4°C/Sec.
Soldering Zone	Max. solder temperature should not exceed 260°C Time within 5°C of actual Max. solder temperature within 3 - 5 seconds Total time from 25°C room to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



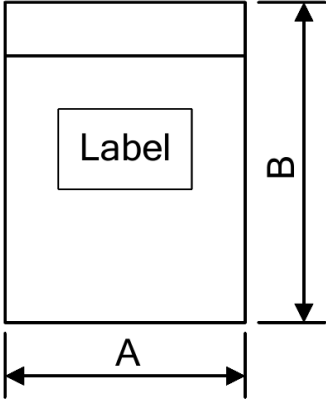
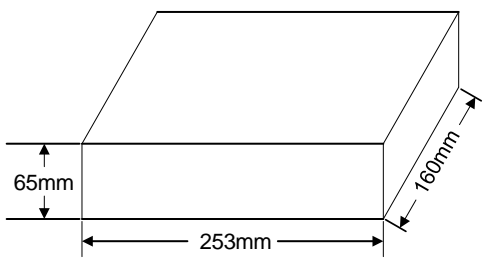
## Environmental Specifications

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 AxB (mm)	Quantity
	FTR30-090	120x150	1000pcs/bag 4000pcs/box
	FTR30-110		
	FTR30-135		
	FTR30-160	150x200	
	FTR30-185		
	FTR30-200		
	FTR30-250	150x200	500pcs/bag 2000pcs/box
	FTR30-300	120x150	
	FTR30-400	150x200	
	FTR30-500		
	FTR30-600	150x200	200pcs/bag 800pcs/box
	FTR30-700		
	FTR30-800		
	FTR30-900		

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