

Positive Temperature Coefficient (PTC) Data Sheet

Description

The 2920 series provides surface mount resettable overcurrent protection with holding current from 0.3A to 5.0A. This series offers complete portfolio in terms of holding current and working voltage, and is suitable for wide range of application.

Features

- ROHS compliant and lead-free
- Fast response to fault current
- Low profile
- Low resistance
- Compatible with high temperature solders
- Compact design saves board space

Applications

- USB peripherals
- Disk drives
- CD-ROMs
- Plug and play protection for motherboards and peripherals
- Mobile phones-battery and port protection
- PDAs/digital cameras
- Game console port protection
- Type-C
- HDMI and Set-top-box

Electrical Characteristics

Part Number	Marking	I _{hold} (A)	I _{trip} (A)	V _{max} (V)	I _{max} (A)	Pd typ. (W)	Maximum time to trip		Resistance	
							Time(s)	Current(A)	R _{min} (Ω)	R _{1max} (Ω)
FTR2920-030	JK 030L	0.30	0.60	60	10	1.50	3.00	1.50	0.600	4.800
FTR2920-050	JK 050L	0.50	1.00	60	10	1.50	4.00	2.50	0.180	1.400
FTR2920-075	JK 075L	0.75	1.50	30	40	1.50	0.30	8.00	0.100	1.000
FTR2920-075/60	JK 075L	0.75	1.50	60	10	1.50	0.30	8.00	0.100	0.950
FTR2920-100	JK 100L	1.10	2.20	33	40	1.50	0.50	8.00	0.065	0.410
FTR2920-125	JK 125L	1.25	2.50	15	40	1.50	2.00	8.00	0.050	0.250
FTR2920-150	JK 150L	1.50	3.00	33	40	1.50	2.00	8.00	0.035	0.230
FTR2920-185	JK 185L	1.85	3.70	33	40	1.50	2.50	8.00	0.030	0.150
FTR2920-200/24	JK 200L	2.00	4.00	24	40	1.50	5.00	8.00	0.020	0.125
FTR2920-250	JK 250L	2.50	5.00	15	40	1.50	5.00	8.00	0.020	0.085
FTR2920-260	JK 260L	2.60	5.00	6	40	1.50	10.00	8.00	0.014	0.075
FTR2920-260/24	JK 260L	2.60	5.00	24	40	1.50	5.00	8.00	0.014	0.075
FTR2920-300/15	JK 300L	3.00	5.00	15	40	1.50	20.00	8.00	0.012	0.048
FTR2920-400	JK 400L	4.00	8.00	15	40	1.50	4.00	20.00	0.008	0.040
FTR2920-500	JK 500L	5.00	10.00	12	40	1.50	5.00	20.00	0.005	0.031
FTR2920-500/16	JK 500L	5.00	10.00	16	40	2.00	5.00	20.00	0.005	0.031

·I_{hold}= Hold current: maximum current device will pass without tripping in 23°C still air.

·I_{trip}= Trip current: minimum current at which the device will trip in 23°C still air.

·V_{max}= 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})

·Pd typ.= Typical power dissipated from device when in the tripped state at 23°C still air.

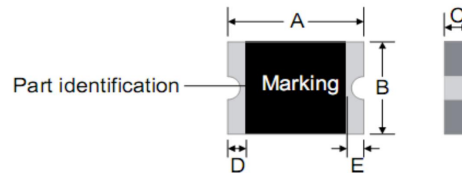
·R_{min}= Minimum resistance of device in initial (un-soldered) state.

·R_{1max}= Maximum resistance of device at 23°C measured one hour after tripping or reflow soldering of 260°C for 20 sec.

■Caution: Operation beyond the specified rating may result in damage and possible arcing and flame.

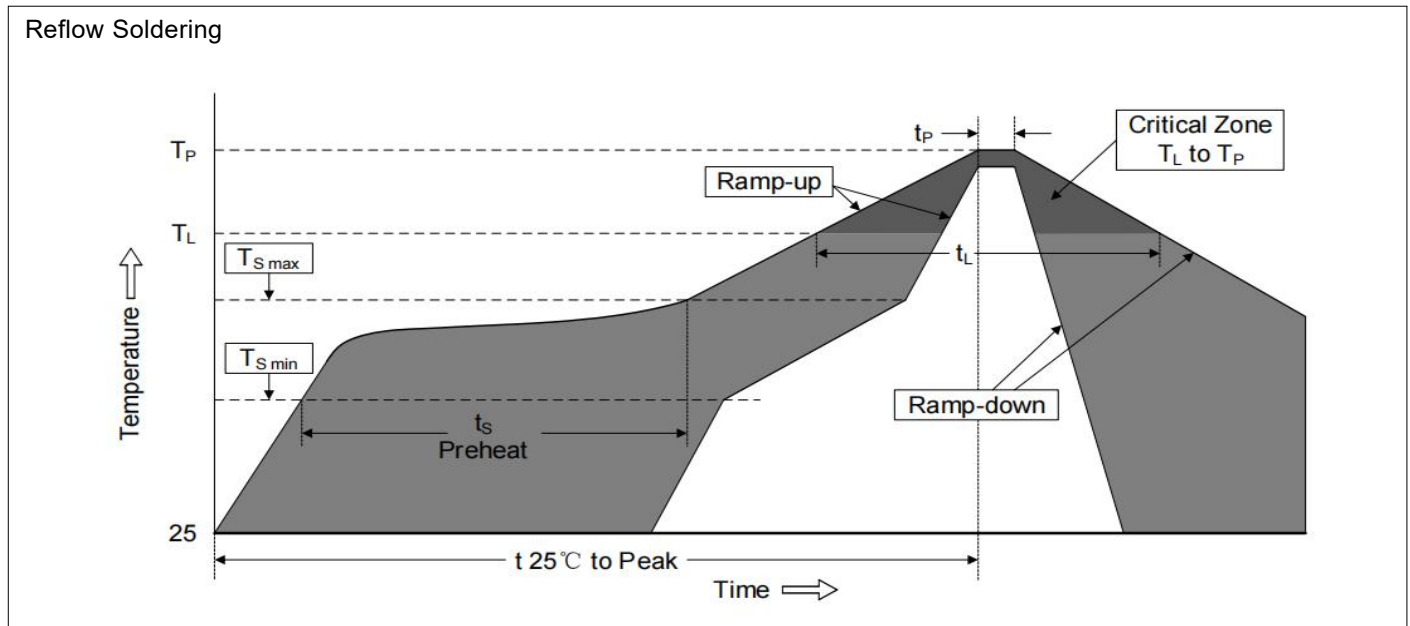
Part Number	Ambient Operation Temperature								
	-40°C	-20°C	0°C	23°C	40°C	50°C	60°C	70°C	85°C
FTR2920-030	0.45	0.40	0.35	0.30	0.25	0.23	0.20	0.17	0.14
FTR2920-050	0.76	0.67	0.59	0.50	0.42	0.38	0.33	0.29	0.23
FTR2920-075	1.13	1.01	0.88	0.75	0.62	0.56	0.50	0.44	0.34
FTR2920-075/60	1.13	1.01	0.88	0.75	0.62	0.56	0.50	0.44	0.34
FTR2920-100	1.66	1.47	1.29	1.10	0.91	0.83	0.73	0.64	0.50
FTR2920-125	1.89	1.68	1.46	1.25	1.04	0.94	0.83	0.73	0.56
FTR2920-150	2.27	2.01	1.76	1.50	1.25	1.13	1.00	0.87	0.74
FTR2920-185	2.80	2.47	2.17	1.85	1.54	1.39	1.22	1.07	0.85
FTR2920-200/24	3.14	2.77	2.42	2.00	1.73	1.56	1.38	1.20	0.98
FTR2920-250	3.78	3.35	2.93	2.50	2.08	1.88	1.65	1.45	1.13
FTR2920-260	3.64	3.25	2.91	2.60	2.26	2.08	1.95	1.74	1.48
FTR2920-260/24	3.64	3.25	2.91	2.60	2.26	2.08	1.95	1.74	1.48
FTR2920-300/15	4.20	3.85	3.44	3.00	2.69	2.50	2.31	2.12	1.83
FTR2920-400	5.50	5.00	4.50	4.00	3.40	3.10	2.80	2.50	2.10
FTR2920-500	7.55	6.70	5.85	5.00	4.15	3.75	3.30	2.90	2.25
FTR2920-500/16	7.55	6.70	5.85	5.00	4.15	3.75	3.30	2.90	2.25

Dimensions and PAD Size



Part Number	A		B		C		D		E	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
FTR2920-030	6.73	7.98	4.80	5.44	0.75	1.25	0.30	2.50	0.25	2.00
FTR2920-050	6.73	7.98	4.80	5.44	0.55	1.05	0.30	2.50	0.25	2.00
FTR2920-075	6.73	7.98	4.80	5.44	0.75	1.25	0.30	2.50	0.25	2.00
FTR2920-075/60	6.73	7.98	4.80	5.44	0.75	1.80	0.30	2.50	0.25	2.00
FTR2920-100	6.73	7.98	4.80	5.44	0.55	1.00	0.30	2.50	0.25	2.00
FTR2920-125	6.73	7.98	4.80	5.44	0.55	1.25	0.30	2.50	0.25	2.00
FTR2920-150	6.73	7.98	4.80	5.44	0.50	1.25	0.30	2.50	0.25	2.00
FTR2920-185	6.73	7.98	4.80	5.44	0.75	1.25	0.30	2.50	0.25	2.00
FTR2920-200/24	6.73	7.98	4.80	5.44	0.70	1.25	0.30	2.50	0.25	2.00
FTR2920-250	6.73	7.98	4.80	5.44	0.75	1.25	0.30	2.50	0.25	2.00
FTR2920-260	6.73	7.98	4.80	5.44	0.55	1.25	0.30	2.50	0.25	2.00
FTR2920-260/24	6.73	7.98	4.80	5.44	0.70	1.60	0.30	2.50	0.25	2.00
FTR2920-300/15	6.73	7.98	4.80	5.44	0.70	1.80	0.30	2.50	0.25	2.00
FTR2920-400	6.73	7.98	4.80	5.44	0.80	1.60	0.30	2.50	0.25	2.00
FTR2920-500	6.73	7.98	4.80	5.44	0.80	1.60	0.30	2.50	0.25	2.00
FTR2920-500/16	6.73	7.98	4.80	5.44	0.80	1.60	0.30	2.50	0.25	2.00

Recommended Soldering Conditions



Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3°C/second max.
Preheat	
-Temperature Min ($T_{S\ min}$)	150°C
-Temperature Max ($T_{S\ max}$)	200°C
-Time (min to max) (t_s)	60-180 seconds
$T_{S\ max}$ to T_L	
-Ramp-up Rate	3°C/second max.
Time maintained above:	
-Temperature (T_L)	217°C
-Time (t_L)	60-150 seconds
Peak Temperature (T_P)	260°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	8 minutes max.
Storage Condition	0°C~35°C, ≤70%RH

·Recommended reflow methods: IR, vapor phase oven, hot air oven, N₂ environment for lead-free

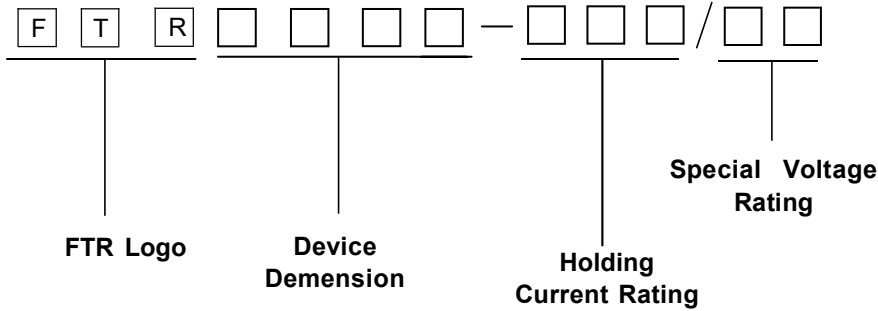
·Recommended maximum paste thickness is 0.25mm (0.010 inch)

·Device 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.

Partnumber code



Environmental Specifications

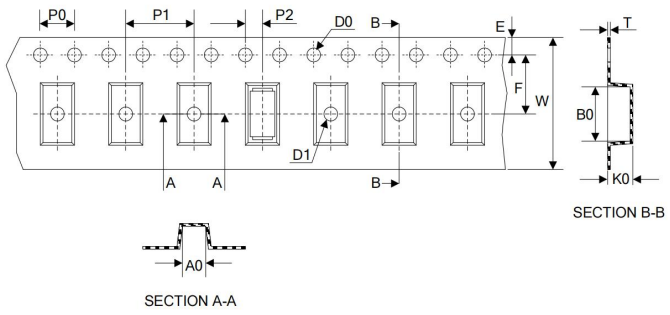
Operating / Storage temperature	-40°C to +85°C
Maximum Device Surface Temperature in Tripped State	125°C
Passive Aging	+85°C, 1000 hours ±50% typical resistance change
Humidity Aging	+85°C, 85%RH, 1000 hours ±50% typical resistance change
Thermal Shock	MIL-STD-202, Method 107G +85°C/-40°C 20 times -50% typical resistance change
Solvent Resistance	MIL-STD-202, Method 215 No change
Vibration	MIL-STD-883C, Method 2007.1, Condition A No change
Moisture Level Sensitivity	Level 1, J-STD-020C

Physical Specifications

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

Packaging

Part Number	Quantity	Part Number	Quantity	Part Number	Quantity
FTR2920-030	1500	FTR2920-150	1500	FTR2920-260/24	1500
FTR2920-050	1500	FTR2920-185	1500	FTR2920-300/15	1500
FTR2920-075	1500	FTR2920-200/24	1500	FTR2920-400	1000
FTR2920-075/60	1000	FTR2920-250	1500	FTR2920-500	1000
FTR2920-100	2000	FTR2920-260	2000	FTR2920-500/16	1000
FTR2920-125	2000				

Tape	Symbol	Dimension (mm)			
		030,050,075 150,185 250,200/24, 260/24 300/15	100, 125, 260	075/60, 400,500, 500/16	
	W	16.00±0.30	16.00±0.30	16.00±0.30	
	P0	4.00±0.10	4.00±0.10	4.00±0.10	
	P1	8.00±0.10	8.00±0.10	8.00±0.10	
	P2	2.00±0.10	2.00±0.10	2.00±0.10	
	D0	Φ1.55±0.10	Φ1.55±0.10	Φ1.50±0.10	
	D1	Φ1.5±0.10	Φ1.5±0.10	Φ1.5±0.10	
	E	1.75±0.10	1.75±0.10	1.75±0.10	
	F	7.50±0.10	7.50±0.10	7.50±0.10	
	A0	5.74±0.1	5.74±0.1	5.74±0.1	
	B0	8.02±0.1	8.02±0.1	8.02±0.1	
	K0	1.30±0.1	0.91±0.1	2.00±0.1	
	T	0.30±0.1	0.30±0.1	0.30±0.1	
	Reel	C	Φ 180.0±3.0		
		D	Φ 60.0±0.5		
H		19.5±1.0			
W		17.0±0.2			