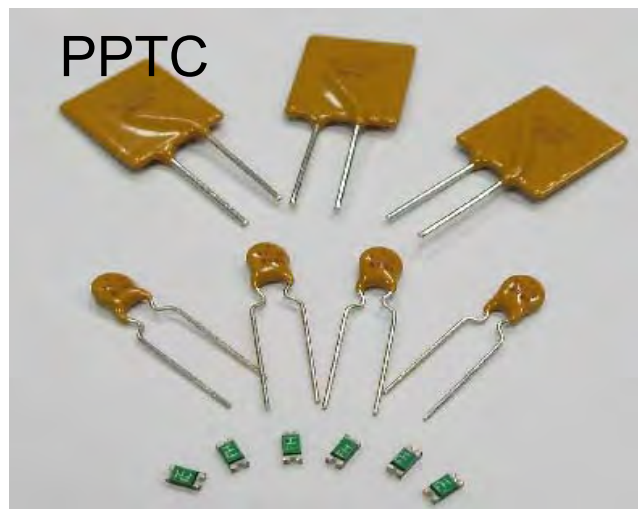


## 七、PPTC Resettable Fuse :

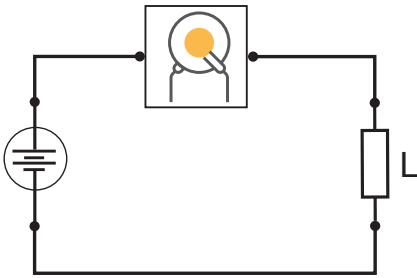
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<b>FUNDAMENTAL</b>	<b>:P101 ~ P102</b>
<b>Radial Leaded PPTC</b>	<b>:P103 ~ P113</b>
<b>Surface Mount PPTC</b>	<b>:P114 ~ P119</b>
<b>Lo Rho PPTC</b>	<b>:P120 ~ P124</b>



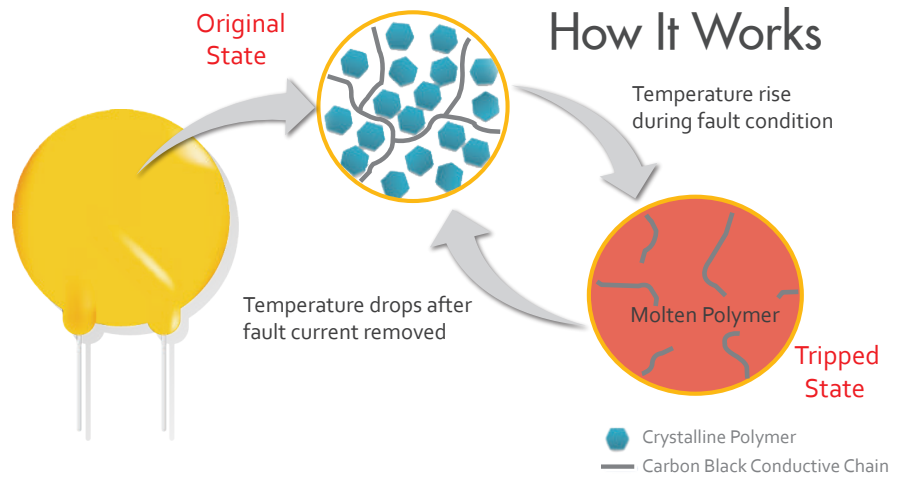
# How Does the Resettable Fuse Work

UNICTRON™ resettable fuses are designed and made of patented novel polymeric PTC material in thin chip form, developed solely by UNICTRON™. With electrodes and leads attached on both sides, it is placed in series to protect a circuit. At “normal operating condition” the device remains at an extremely low resistance (milli-ohms) and allows the electrical current to flow through it without any restriction. When overcurrent conditions occur, the polymeric PTC material heats up and its resistance increases sharply. Such a sharp resistance increase (to an insulated status) cuts off the current in the circuit, and consequently protects the element and device in the circuit. Upon fault current being removed, the resettable fuse cools down and its resistance drops to the original extremely low value. The resettable fuse is “reset” and allows the current flow through the circuit again.



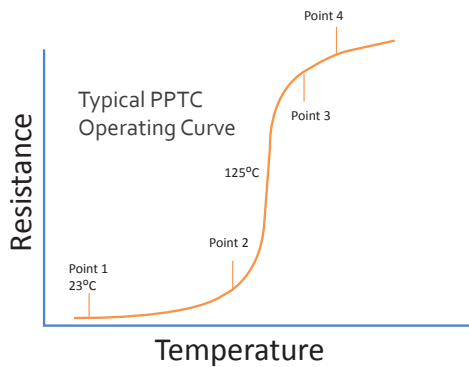
## PPTC in Circuit

The typical PPTC application is to be used as a series component in a circuit.



## Basic Structure

- Epoxy Coating
- Solder Layer
- Nickel Plated Copper Foil
- PTC Element



# Unictron Patents & Formula

UNICTRON™ holds 51 self-developed PTC patents (US x 21, TW x 19, CN x 11 ) and continue applies multiple patents each year. These expertises of polymeric PTC material and product engineering, grants us the flexibility and advantage on new product development. With our own patented PPTC formula, we can custom the product electrical characteristics to meet customer specific requirements and design PPTC device structure for special application. UNICTRON's technical know-how and engineering expertise altogether, is your solution provider for circuit protection.

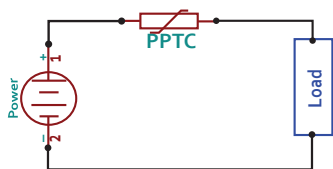
NOTE : All Specifications subject to change without notice.

# the PPTC Selection Guide

## SELECTION GUIDE

### 1 Circuit Parameters

Determine your circuit parameters`



- Circuit Operating Current
- Maximum Operating Voltage
- Maximum Interrupt Current
- Maximum Ambient Operating Temperature

### 2 Voltage & Current Rating

Select a Fuzetec PPTC Device with proper electrical characteristics`



$V_{Max}/I_{Max}$  are the maximum voltage/current PPTC devices can withstand without damage  
 Hold Current ( $I_H$ ) is the maximum current which a PPTC device will keep in low resistance state at 23°C  
 Trip Current ( $I_T$ ) is the minimum current which a PPTC will trip at 23°C  
 Check the electrical characteristics table to ensure the PPTC device can match the circuit parameters

### 3 Ambient Temperature

Evaluate the maximum circuit operating ambient temperature



PPTC device is temperature sensitive, check the Thermal Derating table to verify the performance of PPTC device you select in Step 2 under different ambient temperature

### 4 Time to Trip

Determine Time to Trip for desired protection capabilities



Time to Trip is the amount of time that a PPTC device need to transfer low resistance state to high resistance "Tripped" state under fault condition.  
 Make sure the PPTC device to provide the desired protection capabilities

### 5 Check Dimension

Fuzetec provide a various types of packages and different dimensions, use the dimension table to compare the PPTC device you selected and your application's design consideration.

## > Glossary of Terms

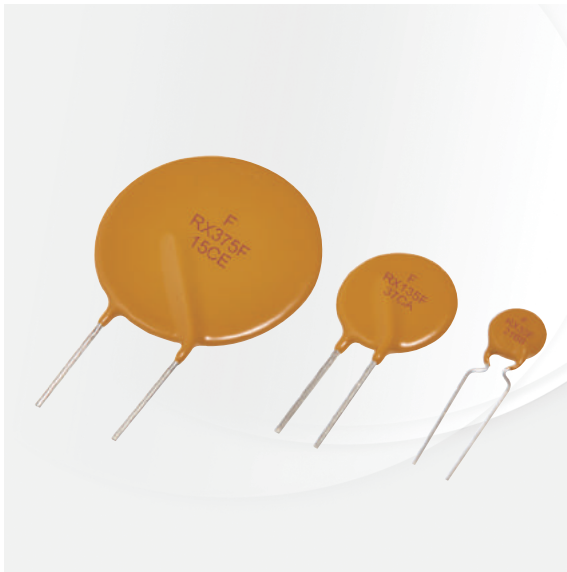
- $I_H$  : Hold Current - Maximum current at which the device will not trip at 23°C still air.
- $I_T$  : Trip Current - Minimum current at which the device will always trip at 23°C still air.
- $V_{Max}$  : Maximum voltage device can withstand without damage at its rated current.
- $I_{Max}$  : Maximum fault current device can withstand without damage at rated voltage ( $V_{Max}$ ).
- $P_d$  : Maximum power dissipated from device when in tripped state in 23°C still air environment.
- $R_{MIN}$  : Minimum device resistance at 23°C.
- $R_{Max}$  : Maximum device resistance at 23°C.
- $R_{1Max}$  : 1) Maximum resistance of device at 23°C measured 1 hour, after tripping for all product series;  
 2) or after REFLOW soldering of 260°C for 20 seconds for all SMD series;  
 3) or after WAVE soldering of 260°C for less than 5 seconds for all DIP series.

Special Note : -In the event that TWO of the above three conditions were experienced once each, the acceptance criteria will become 1.3 times of  $R_{1Max}$ .  
 - In the event that ALL of the above three conditions were experienced once each, the acceptance criteria will become 1.5 times of  $R_{1Max}$ .

NOTE : All Specifications subject to change without notice.

# Radial Leaded PPTC

## FRX Series



### Application

Wide variety of electronic equipment

### Product Features

Low hold current, Solid state Radial-leaded product ideal for up to 60V<sub>DC</sub>



### Operation Current

0.05A ~ 3.75A

### Maximum Voltage

60V<sub>DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50004084)



SVHC Compliant

### Electrical Characteristics (23°C)

Part Number	Hold Current	Trip Current	Max. Time to trip	Max. Current	Rated Voltage	Typ. Power	Resistance	
							R <sub>MIN</sub>	R <sub>1MAX</sub>
							Ohms	Ohms
FRX005-60F	0.05	0.10	5.0	40	60	0.26	7.30	20.00
FRX010-60F	0.10	0.20	4.0	40	60	0.38	2.50	7.50
FRX017-60F	0.17	0.34	3.0	40	60	0.48	2.00	8.00
FRX020-60F	0.20	0.40	2.2	40	60	0.41	1.83	4.40
FRX025-60F	0.25	0.50	2.5	40	60	0.45	1.25	3.00
FRX030-60F	0.30	0.60	3.0	40	60	0.49	0.88	2.10
FRX040-60F	0.40	0.80	3.8	40	60	0.56	0.55	1.29
FRX050-60F	0.50	1.00	4.0	40	60	0.77	0.50	1.17
FRX065-60F	0.65	1.30	5.3	40	60	0.88	0.31	0.72
FRX075-60F	0.75	1.50	6.3	40	60	0.92	0.25	0.60
FRX090-60F	0.90	1.80	7.2	40	60	0.99	0.20	0.47
FRX110-60F	1.10	2.20	8.2	40	60	1.50	0.15	0.38
FRX135-60F	1.35	2.70	9.6	40	60	1.70	0.12	0.30
FRX160-60F	1.60	3.20	11.4	40	60	1.90	0.09	0.22
FRX185-60F	1.85	3.70	12.6	40	60	2.10	0.08	0.19
FRX250-60F	2.50	5.00	15.6	40	60	2.50	0.05	0.13
FRX300-60F	3.00	6.00	19.8	40	60	2.80	0.04	0.10
FRX375-60F	3.75	7.50	24.0	40	60	3.20	0.03	0.08

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	158%	138%	119%	100%	90%	81%	70%	60%	50%	36%

# Radial Leaded PPTC

## FRX90V Series



### Application

Telecom & wide variety of electronic equipment

### Product Features

Low hold current, Solid state, Radial leaded product ideal for up to 90V<sub>DC</sub>



### Operation Current

0.10A~3.75A

### Maximum Voltage

Up to 90V<sub>DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50004084)



SVHC Compliant

### Electrical Characteristics (23°C)

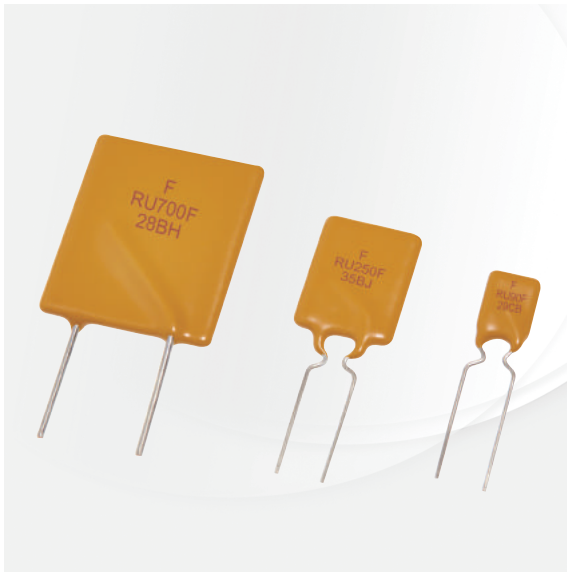
Part Number	Hold Current I <sub>H</sub> , A	Trip Current I <sub>T</sub> , A	Max. Time to trip at 5xI <sub>H</sub> , s	Max. Current I <sub>MAX</sub> , A	Rated Voltage V <sub>MAX</sub> , V <sub>DC</sub>	Typ. Power Pd, W	Resistance	
							R <sub>MIN</sub> Ohms	R <sub>1MAX</sub> Ohms
FRX010-90F	0.10	0.20	4.0	40	72/90	0.38	2.50	7.50
FRX015-90F	0.15	0.35	10.0	40	72/90	0.70	2.40	7.00
FRX017-90F	0.17	0.34	3.0	40	72/90	0.48	2.00	8.00
FRX020-90F	0.20	0.40	2.2	40	72/90	0.41	1.83	4.40
FRX025-90F	0.25	0.50	2.5	40	72/90	0.45	1.25	3.00
FRX030-90F	0.30	0.60	3.0	40	72/90	0.49	0.88	2.10
FRX035-90F	0.35	0.75	10.0	40	72/90	1.30	0.70	2.50
FRX040-90F	0.40	0.80	3.8	40	72/90	0.56	0.55	1.29
FRX050-90F	0.50	1.00	4.0	40	72/90	0.77	0.50	1.17
FRX055-90F	0.55	1.20	10.0	40	72/90	1.50	0.40	1.50
FRX065-90F	0.65	1.30	5.3	40	72/90	0.88	0.31	0.72
FRX075-90F	0.75	1.50	6.3	40	72/90	0.92	0.25	0.60
FRX090-90F	0.90	1.80	7.2	40	72/90	0.99	0.20	0.47
FRX110-90F	1.10	2.20	8.2	40	72/90	1.50	0.15	0.38
FRX135-90F	1.35	2.70	9.6	40	72/90	1.70	0.12	0.30
FRX160-90F	1.60	3.20	11.4	40	72/90	1.90	0.09	0.22
FRX185-90F	1.85	3.70	12.6	40	72/90	2.10	0.08	0.19
FRX250-90F	2.50	5.00	15.6	40	72/90	2.50	0.05	0.13
FRX300-90F	3.00	6.00	19.8	40	72/90	2.80	0.04	0.10
FRX375-90F	3.75	7.50	24.0	40	72/90	3.20	0.03	0.08

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	158%	138%	119%	100%	90%	81%	70%	60%	50%	36%

# Radial Leaded PPTC

## FRU Series



### Application

Wide variety of electronic equipment

### Product Features

Low resistance, High hold current, Solid state  
Radial-leaded product ideal for up to 30V<sub>DC</sub>



### Operation Current

0.90A~9.00A

### Maximum Voltage

30V<sub>DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50004084)



SVHC Compliant

### Electrical Characteristics (23°C)

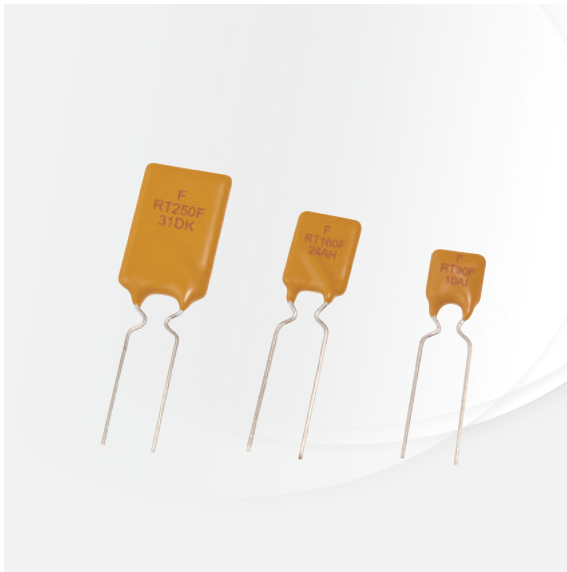
Part Number	Hold Current I <sub>H</sub> , A	Trip Current I <sub>T</sub> , A	Max. Time to trip at 5xI <sub>H</sub> , s	Max. Current I <sub>MAX</sub> , A	Rated Voltage V <sub>MAX</sub> , V <sub>DC</sub>	Typ. Power Pd, W	Resistance	
							R <sub>MIN</sub> Ohms	R <sub>1MAX</sub> Ohms
FRU090-30F	0.90	1.80	5.9	100	30	0.6	0.070	0.220
FRU110-30F	1.10	2.20	6.6	100	30	0.7	0.050	0.170
FRU135-30F	1.35	2.70	7.3	100	30	0.8	0.040	0.130
FRU160-30F	1.60	3.20	8.0	100	30	0.9	0.030	0.110
FRU185-30F	1.85	3.70	8.7	100	30	1.0	0.030	0.090
FRU250-30F	2.50	5.00	10.3	100	30	1.2	0.020	0.070
FRU300-30F	3.00	6.00	10.8	100	30	2.0	0.020	0.080
FRU400-30F	4.00	8.00	12.7	100	30	2.5	0.010	0.050
FRU500-30F	5.00	10.00	14.5	100	30	3.0	0.010	0.050
FRU600-30F	6.00	12.00	16.0	100	30	3.5	0.005	0.040
FRU700-30F	7.00	14.00	17.5	100	30	3.8	0.005	0.030
FRU800-30F	8.00	16.00	18.8	100	30	4.0	0.005	0.020
FRU900-30F	9.00	18.00	20.0	100	30	4.2	0.005	0.020

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	145%	130%	115%	100%	92%	84%	76%	70%	61%	50%

# Radial Leaded PPTC

## FRT Series



### Application

IEEE 1394 Firewire, Computers & Consumer electronics

### Product Features

Fast trip time, Lower Trip-to-hold Ratio, Radial-leaded product ideal for up to 36V<sub>DC</sub>



### Operation Current

0.50A~2.50A

### Maximum Voltage

36V<sub>DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50004084)



### Electrical Characteristics (23°C)

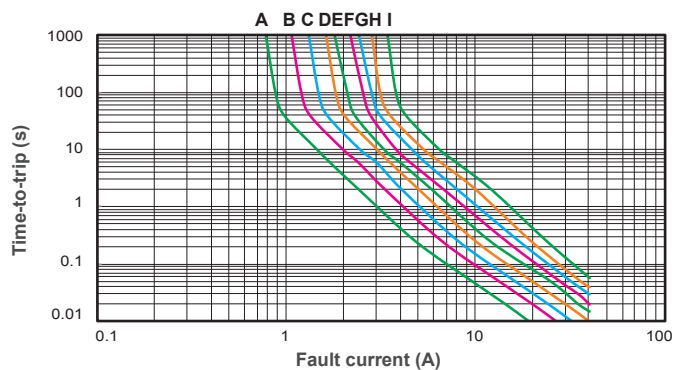
Part Number	Hold Current I <sub>H</sub> , A	Trip Current I <sub>T</sub> , A	Max. Time to trip at 5xI <sub>H</sub> , S	Max. Current I <sub>MAX</sub> , A	Rated Voltage V <sub>MAX</sub> , V <sub>DC</sub>	Typ. Power Pd, W	Resistance	
							R <sub>MIN</sub> Ohms	R <sub>1MAX</sub> Ohms
FRT050-33F	0.50	1.00	5.0	40	36	0.67	0.140	0.448
FRT075-33F	0.75	1.50	4.0	40	36	0.71	0.115	0.368
FRT090-33F	0.90	1.80	3.5	40	36	0.74	0.090	0.288
FRT120-33F	1.20	2.30	3.5	40	36	0.78	0.074	0.180
FRT135-33F	1.35	2.50	4.5	40	36	0.84	0.059	0.143
FRT160-33F	1.60	2.75	4.5	40	36	0.86	0.041	0.131
FRT190-33F	1.90	3.00	3.5	40	36	0.90	0.045	0.092
FRT220-33F	2.20	3.50	6.5	40	36	0.95	0.025	0.080
FRT250-33F	2.50	4.00	8.0	40	36	0.99	0.020	0.064

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	148%	134%	120%	100%	98%	90%	84%	78%	70%	59%

### Typical Time-To-Trip at 23°C

- A = FRT050-33F
- B = FRT075-33F
- C = FRT090-33F
- D = FRT120-33F
- E = FRT135-33F
- F = FRT160-33F
- G = FRT190-33F
- H = FRT220-33F
- I = FRT250-33F



# Radial Leaded PPTC

## FUSB Series



### Application

Low voltage USB equipment

### Product Features

Low resistance, Fast trip time, Lower Trip-to-hold Ratio



### Operation Current

0.75A ~2.50A

### Maximum Voltage

16V/30V<sub>DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50004084)



SVHC Compliant

### Electrical Characteristics (23°C)

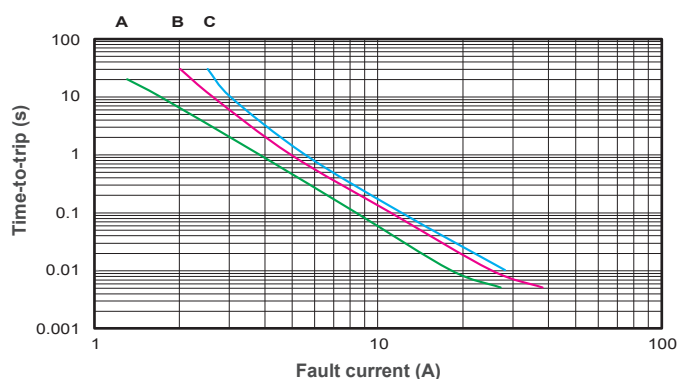
Part Number	Hold Current	Trip Current	Max. Time to trip		Max. Current	Rated Voltage	Typ. Power	Resistance	
			Current	Time				R <sub>MIN</sub>	R <sub>1MAX</sub>
			I <sub>H</sub> , A	I <sub>T</sub> , A				A	Sec
FUSB075F	0.75	1.30	8.0	0.4	40	16	0.3	0.08	0.23
FUSB090F	0.90	1.80	8.0	1.2	40	16/30	0.6	0.07	0.18
FUSB110F	1.10	2.20	8.0	2.3	40	16/30	0.7	0.05	0.14
FUSB120F	1.20	2.00	8.0	0.7	40	16	0.6	0.04	0.14
FUSB135F	1.35	2.70	8.0	4.5	40	16/30	0.8	0.04	0.12
FUSB155F	1.55	2.70	7.8	2.2	40	16	0.7	0.03	0.12
FUSB160F	1.60	3.20	8.0	9.0	40	16/30	0.9	0.03	0.11
FUSB185F	1.85	3.70	8.0	10.0	40	16/30	1.0	0.03	0.09
FUSB250F	2.50	5.00	8.0	40.0	40	16/30	1.2	0.02	0.07

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	145%	130%	115%	100%	91%	83%	78%	70%	61%	50%

### Typical Time-To-Trip at 23°C

- A = FUSB075F
- B = FUSB120F
- C = FUSB155F





# Radial Leaded PPTC

## FRG Series



### Application

Wide variety of electronic equipment

### Product Features

Very high hold current, Solid state Radial-leaded product ideal for up to 16V<sub>DC</sub>



### Operation Current

2.50 A~14.00A

### Maximum Voltage

16V<sub>DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50004084)



SVHC Compliant

### Electrical Characteristics (23°C)

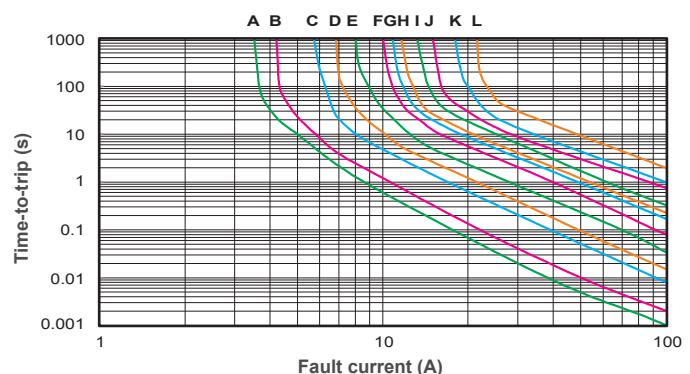
Part Number	Hold Current	Trip Current	Max. Time to trip	Max. Current	Rated Voltage	Typ. Power	Resistance	
							R <sub>MIN</sub>	R <sub>1MAX</sub>
	I <sub>H</sub> , A	I <sub>T</sub> , A	at 5xI <sub>H</sub> , s	I <sub>MAX</sub> , A	V <sub>MAX</sub> , V <sub>DC</sub>	P <sub>d</sub> , W	Ohms	Ohms
FRG250-16F	2.5	4.7	5.0	100	16	1.0	0.022	0.053
FRG300-16F	3.0	5.1	2.0	100	16	2.3	0.034	0.105
FRG400-16F	4.0	6.8	3.5	100	16	2.4	0.020	0.063
FRG500-16F	5.0	8.5	3.6	100	16	2.6	0.014	0.044
FRG600-16F	6.0	10.2	5.8	100	16	2.8	0.009	0.033
FRG700-16F	7.0	11.9	8.0	100	16	3.0	0.006	0.021
FRG800-16F	8.0	13.6	9.0	100	16	3.0	0.005	0.018
FRG900-16F	9.0	15.3	12.0	100	16	3.3	0.004	0.015
FRG1000-16F	10.0	17.0	12.5	100	16	3.3	0.003	0.012
FRG1100-16F	11.0	18.7	13.5	100	16	3.7	0.003	0.010
FRG1200-16F	12.0	20.4	16.0	100	16	4.2	0.002	0.009
FRG1400-16F	14.0	23.8	20.0	100	16	4.6	0.002	0.008

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	148%	132%	116%	100%	91%	84%	76%	69%	60%	48%

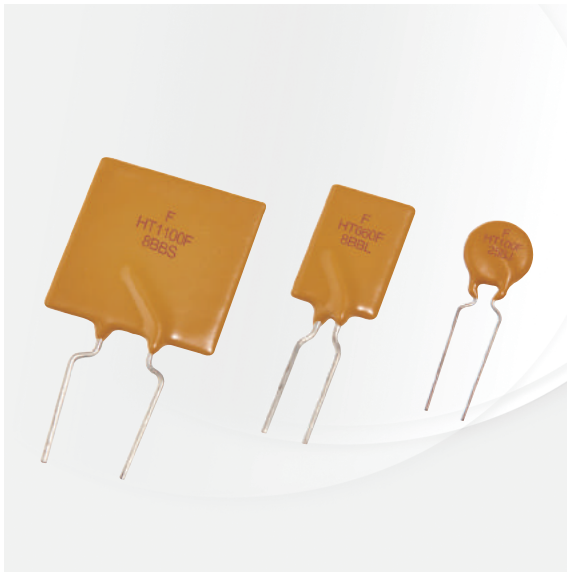
### Typical Time-To-Trip at 23°C

- A = FRG250-16F
- B = FRG300-16F
- C = FRG400-16F
- D = FRG500-16F
- E = FRG600-16F
- F = FRG700-16F
- G = FRG800-16F
- H = FRG900-16F
- I = FRG1000-16F
- J = FRG1100-16F
- K = FRG1200-16F
- L = FRG1400-16F



# Radial Leaded PPTC

## FHT Series



### Application

Wide variety of electronic equipment

### Product Features

Very Low resistance, Very High hold current, Solid state, Radial leaded product ideal for up to 16V/30V<sub>DC</sub> and operating temperatures up to 125°C.



### Operation Current

0.50A~15.00A

### Maximum Voltage

16V/30V<sub>DC</sub>



### Temperature Range

-40°C to 125°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50004084)



### Electrical Characteristics (23°C)

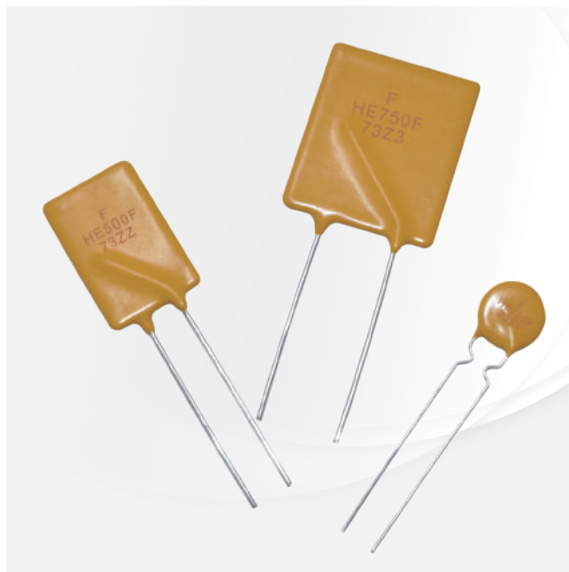
Part Number	Hold Current	Trip Current	Max. Time to trip	Max. Current	Rated Voltage	Typ. Power	Resistance	
							R <sub>MIN</sub>	R <sub>1MAX</sub>
	I <sub>H</sub> , A	I <sub>T</sub> , A	at 5xI <sub>H</sub> , s	I <sub>MAX</sub> , A	V <sub>MAX</sub> , V <sub>DC</sub>	P <sub>d</sub> , W	Ohms	Ohms
FHT050-30F	0.5	0.9	2.5	40	30	0.9	0.4800	1.1000
FHT070-30F	0.7	1.4	3.2	40	30	1.4	0.3000	0.8000
FHT100-30F	1.0	1.8	5.2	40	30	1.4	0.1800	0.4300
FHT200-16F	2.0	3.8	3.0	100	16	1.4	0.0450	0.1100
FHT300-16F	3.0	6.0	5.0	100	16	3.0	0.0330	0.0790
FHT400-16F	4.0	7.0	5.0	100	16	3.3	0.0240	0.0600
FHT450-16F	4.5	7.8	3.0	100	16	3.6	0.0220	0.0540
FHT550-16F	5.5	10.0	6.0	100	16	3.5	0.0150	0.0370
FHT600-16F	6.0	10.8	5.0	100	16	4.1	0.0130	0.0320
FHT650-16F	6.5	12.0	5.5	100	16	4.3	0.0110	0.0260
FHT700-16F	7.0	13.0	7.0	100	16	4.0	0.0100	0.0250
FHT750-16F	7.5	13.1	7.0	100	16	4.5	0.0094	0.0220
FHT800-16F	8.0	15.0	8.0	100	16	4.2	0.0080	0.0200
FHT900-16F	9.0	16.5	10.0	100	16	5.0	0.0074	0.0170
FHT1000-16F	10.0	18.5	9.0	100	16	5.3	0.0062	0.0150
FHT1100-16F	11.0	20.0	11.0	100	16	5.5	0.0055	0.0130
FHT1300-16F	13.0	24.0	13.0	100	16	6.9	0.0041	0.0100
FHT1400-16F	14.0	27.0	13.0	100	16	6.9	0.0030	0.0090
FHT1500-16F	15.0	28.0	20.0	100	16	7.0	0.0032	0.0092

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C	125°C
DERATING %	143%	129%	116%	100%	93%	87%	80%	72%	65%	55%	26%

# Radial Leaded PPTC

## FHE Series



### Application

Wide variety of electronic equipment

### Product Features

Very Low resistance, Very High hold current, Solid state, Radial leaded product ideal for up to 32V and Operating temperatures up to 125°C.



### Operation Current

0.50A~10.00A

### Maximum Voltage

32V



### Temperature Range

-40°C to 125°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50004084)



### Electrical Characteristics (23°C)

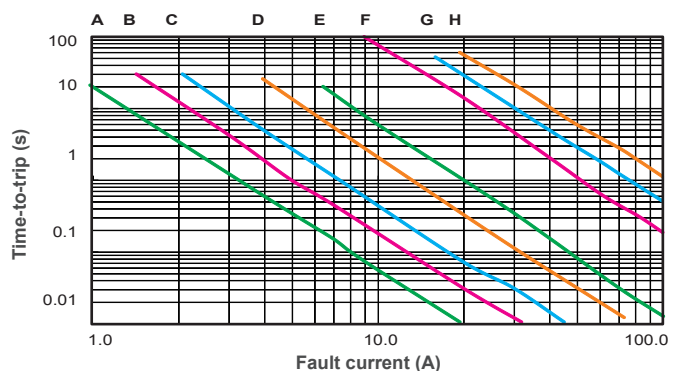
Part Number	Hold Current $I_H, A$	Trip Current $I_T, A$	Max. Time to trip at $5xI_H, s$	Max. Current $I_{MAX}, A$	Rated Voltage $V_{MAX}, V_{DC}$	Typ. Power $P_d, W$	Resistance	
							$R_{MIN}$ Ohms	$R1_{MAX}$ Ohms
FHE050-32F	0.5	1.0	3.0	100	32	0.9	0.3500	1.1000
FHE070-32F	0.7	1.4	3.2	100	32	1.4	0.2300	0.8000
FHE100-32F	1.0	1.9	6.2	100	32	1.4	0.1500	0.4300
FHE200-32F	2.0	4.0	5.5	100	32	2.2	0.0650	0.2500
FHE300-32F	3.0	6.0	5.0	100	32	3.2	0.0350	0.1100
FHE500-32F	5.0	10.0	9.0	100	32	5.3	0.0150	0.0400
FHE750-32F	7.5	15.0	13.0	100	32	6.5	0.0074	0.0230
FHE1000-32F	10.0	20.0	15.0	100	32	7.0	0.0060	0.0160

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C	125°C
DERATING %	143%	130%	115%	100%	92%	88%	80%	72%	65%	55%	28%

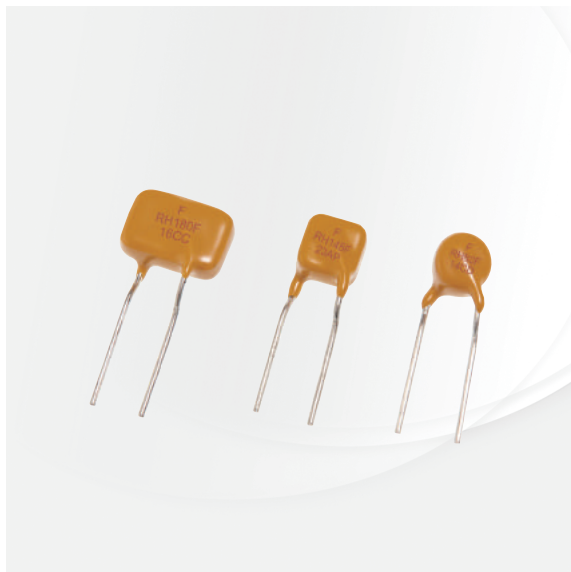
### Typical Time-To-Trip at 23°C

- A = FHE050-32F
- B = FHE070-32F
- C = FHE100-32F
- D = FHE200-32F
- E = FHE300-32F
- F = FHE500-32F
- G = FHE750-32F
- H = FHE1000-32F



# Radial Leaded PPTC

## FRHV Series



### Application

Telecommunication and Data transmitting

### Product Features

Low hold current, Solid state



### Operation Current

0.08 A~0.40A

### Maximum Operating Voltage

60V/100V/250V<sub>DC</sub>

### Maximum Interrupt Voltage

250V/600V<sub>AC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50004084)



SVHC Compliant

### Electrical Characteristics (23°C)

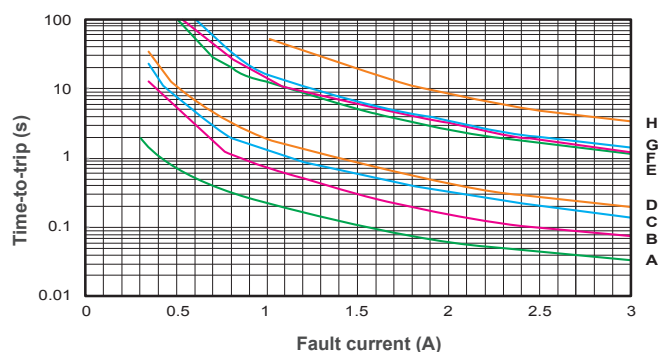
Part Number	Hold Current	Trip Current	Max. Time to trip		Max. Current	Max. Oper. Voltage	Max. Int. Voltage	Typ. Power	Resistance	
			Current	Time					R <sub>MIN</sub>	R <sub>1MAX</sub>
FRH080-250VF	0.08	0.16	0.35	4.0	3.0	100	250	1.0	14.00	33.00
FRH110-250VF	0.11	0.22	1.00	2.0	3.0	100	250	1.0	5.00	16.00
FRH120-250VF	0.12	0.24	1.00	2.0	3.0	100	250	1.0	4.00	16.00
FRH145-250VF	0.15	0.29	1.00	2.5	3.0	100	250	1.0	3.00	12.00
FRH180-250XF	0.18	0.65	3.00	2.0	10.0	100	250	1.0	0.80	4.00
FRH150-600MF	0.15	0.30	1.00	4.0	3.0	250	600	1.0	6.00	17.00
FRH160-600MF	0.16	0.32	1.00	7.0	3.0	250	600	1.0	4.00	16.00
FRH160-600VF	0.16	0.32	1.00	7.0	3.0	250	600	1.0	4.00	18.00
FRH200-600VF	0.20	0.40	1.00	12.0	3.0	250	600	1.0	4.00	13.50
FRH250-600VF	0.25	0.85	3.00	1.0	3.0	250	600	1.0	1.00	7.00
FRH400-600F	0.40	1.00	3.00	4.0	3.0	60	600	1.0	0.95	1.90

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	158%	138%	119%	100%	92%	83%	73%	64%	54%	40%

### Typical Time-To-Trip at 23°C

- A = FRH080-250VF
- B = FRH110-250VF
- C = FRH120-250VF
- D = FRH145-250VF
- E = FRH160-600VF
- F = FRH200-600VF
- G = FRH250-600VF
- H = FRH400-600F



# Radial Leaded PPTC

## FRV Series



### Application

Line Voltage Power Supply, Transformer and Appliances

### Product Features

Low hold current, Solid state, Radial leaded product ideal for up to 265V<sub>AC/DC</sub>



### Maximum Operation Current

0.05A~2.00A

### Maximum Operating Voltage

240V<sub>AC/DC</sub>

### Maximum Interrupt Voltage

265V<sub>AC/DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50004084)



### Electrical Characteristics (23°C)

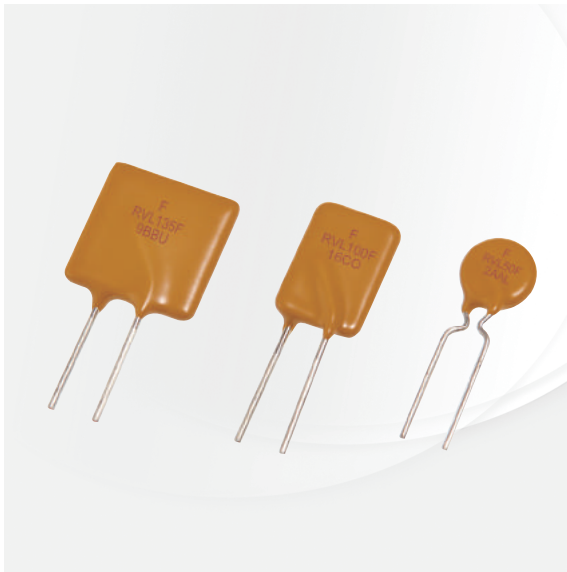
Part Number	Hold Current	Trip Current	Max. Time to trip	Max. Current	Rated Voltage	Max. Int. Voltage	Typ. Power	Resistance	
	I <sub>H</sub> , A	I <sub>T</sub> , A	at 5xI <sub>H</sub> , S	I <sub>MAX</sub> , A	V <sub>MAX</sub> , V <sub>AC/DC</sub>	V <sub>I-MAX</sub> , V <sub>AC/DC</sub>		R <sub>MIN</sub>	R <sub>1MAX</sub>
								Ohms	Ohms
FRV005-240F	0.05	0.12	15.0	1.0	240	265	0.70	18.50	65.00
FRV008-240F	0.08	0.19	15.0	1.2	240	265	0.80	7.40	26.00
FRV012-240F	0.12	0.30	15.0	1.2	240	265	1.00	3.00	12.00
FRV016-240F	0.16	0.37	15.0	2.0	240	265	1.40	2.50	7.80
FRV025-240F	0.25	0.56	18.5	3.5	240	265	1.50	1.30	3.80
FRV033-240F	0.33	0.74	21.0	4.5	240	265	1.70	0.83	2.60
FRV040-240F	0.40	0.90	24.0	5.5	240	265	2.00	0.60	1.90
FRV055-240F	0.55	1.25	26.0	7.0	240	265	3.40	0.45	1.45
FRV075-240F	0.75	1.50	18.0	7.5	240	265	2.60	0.32	0.84
FRV100-240F	1.00	2.00	21.0	10.0	240	265	2.90	0.22	0.58
FRV125-240F	1.25	2.50	23.0	12.5	240	265	3.30	0.17	0.44
FRV150-240F	1.50	3.00	23.0	15.0	240	265	3.70	0.12	0.32
FRV200-240F	2.00	4.00	28.0	20.0	240	265	4.50	0.09	0.22

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	150%	134%	116%	100%	90%	81%	74%	65%	58%	44%

# Radial Leaded PPTC

## FRVL Series



### Application

Line Voltage Power Supply, Transformer and Appliances Product

### Features

Solid state, Radial leaded product ideal for up to 120V<sub>AC/DC</sub>



### Maximum Operation Current

0.10A~3.75A

### Maximum Voltage

120V<sub>AC/DC</sub>

### Maximum Interrupt Voltage

135V<sub>AC/DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50004084)



SVHC Compliant

## Electrical Characteristics (23°C)

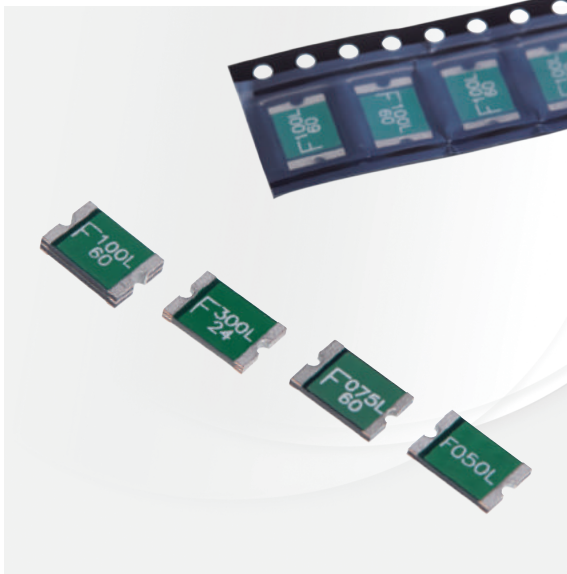
Part Number	Hold Current I <sub>H</sub> , A	Trip Current I <sub>T</sub> , A	Max. Time to trip at 5xI <sub>H</sub> , s	Max. Current I <sub>MAX</sub> , A	Max. Oper. Voltage V <sub>MAX</sub> , V <sub>AC/DC</sub>	Max. Int. Voltage V <sub>I-MAX</sub> , V <sub>AC/DC</sub>	Typ. Power Pd, W	Resistance	
								R <sub>MIN</sub>	R <sub>1MAX</sub>
								Ohms	Ohms
FRVL010-120F	0.10	0.20	10.0	2.0	120	135	0.84	3.00	7.50
FRVL017-120F	0.17	0.34	10.0	2.0	120	135	0.84	2.00	7.00
FRVL020-120F	0.20	0.40	9.0	2.0	120	135	1.08	1.83	4.40
FRVL025-120F	0.25	0.50	7.5	3.0	120	135	1.08	1.25	3.00
FRVL030-120F	0.30	0.60	8.5	3.0	120	135	1.44	0.88	2.10
FRVL040-120F	0.40	0.80	6.5	3.0	120	135	1.44	0.55	1.29
FRVL050-120F	0.50	1.00	6.0	3.0	120	135	1.56	0.50	1.17
FRVL065-120F	0.65	1.30	5.7	5.0	120	135	1.68	0.31	0.72
FRVL070-120F	0.75	1.50	6.3	5.0	120	135	1.80	0.25	0.60
FRVL075-120F	0.75	1.50	15.0	7.5	120	135	2.64	0.25	0.69
FRVL090-120F	0.90	1.80	7.2	5.0	120	135	1.80	0.20	0.47
FRVL100-120F	1.00	2.00	15.0	10.0	120	135	2.64	0.18	0.47
FRVL110-120F	1.10	2.20	8.2	8.0	120	135	2.28	0.15	0.38
FRVL125-120F	1.25	2.50	20.0	12.5	120	135	2.88	0.11	0.33
FRVL130-120F	1.35	2.70	9.6	10.0	120	135	2.64	0.12	0.30
FRVL135-120F	1.35	2.70	20.0	13.5	120	135	3.12	0.11	0.30
FRVL160-120F	1.60	3.20	11.4	12.0	120	135	3.12	0.09	0.22
FRVL185-120F	1.85	3.70	12.6	12.0	120	135	3.36	0.08	0.19
FRVL200-120F	2.00	4.20	36.0	20.0	120	135	4.32	0.08	0.21
FRVL250-120F	2.50	5.00	15.6	15.0	120	135	4.44	0.05	0.13
FRVL300-120F	3.00	6.00	19.8	17.0	120	135	4.56	0.04	0.10
FRVL375-120F	3.75	7.50	24.0	20.0	120	135	4.80	0.03	0.08

## Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	158%	138%	119%	100%	90%	80%	70%	60%	50%	38%

# Surface Mount PPTC

## FSMD2920 Series



### Application

All high-density boards

### Product Features

2920 Dimension, Surface mountable, Solid state, Faster time to trip than standard SMD devices.



### Operation Current

0.30A~7.00A

### Maximum Voltage

6V~60V<sub>DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50090556)



SVHC Compliant

### Electrical Characteristics (23°C)

Part Number	Hold Current	Trip Current	Rated Voltage	Max. Current	Typ. Power	Max. Time to trip		Resistance	
						Current	Time	R <sub>MIN</sub>	R <sub>1MAX</sub>
						I <sub>H</sub> , A	I <sub>T</sub> , A	V <sub>MAX</sub> , V <sub>DC</sub>	I <sub>MAX</sub> , A
FSMD030-2920-R	0.30	0.60	60	100	1.5	1.5	3.0	1.000	4.800
FSMD050-2920-R	0.50	1.00	60	100	1.5	2.5	4.0	0.300	1.400
FSMD075-2920-R	0.75	1.50	33	100	1.5	8.0	0.3	0.180	1.000
FSMD075-60-2920-R	0.75	1.50	60	100	1.5	8.0	0.3	0.180	1.000
FSMD100-2920-R	1.10	2.20	33	100	1.5	8.0	0.5	0.090	0.410
FSMD110-60-2920R	1.10	2.20	60	100	1.5	8.0	0.5	0.090	0.410
FSMD125-2920-R	1.25	2.50	33	100	1.5	8.0	2.0	0.050	0.250
FSMD150-2920-R	1.50	3.00	33	100	1.5	8.0	2.0	0.050	0.230
FSMD185-2920-R	1.85	3.70	33	100	1.5	8.0	2.5	0.040	0.150
FSMD200-2920-R	2.00	4.00	16	100	1.5	8.0	5.0	0.035	0.120
FSMD200-24-2920-R	2.00	4.00	24	100	1.5	8.0	5.0	0.035	0.120
FSMD250-2920-R	2.50	5.00	16	100	1.5	8.0	16.0	0.025	0.085
FSMD260-2920-R	2.60	5.20	6	100	1.5	8.0	20.0	0.020	0.075
FSMD260-24-2920R	2.60	5.20	24	100	1.5	8.0	20.0	0.020	0.075
FSMD300-2920-R	3.00	5.20	6	100	1.5	8.0	25.0	0.010	0.048
FSMD300-15-2920R	3.00	5.20	15	100	1.5	8.0	20.0	0.010	0.048
FSMD300-24-2920R	3.00	5.20	24	100	1.5	8.0	20.0	0.010	0.048
FSMD330-2920R	3.30	5.50	24	100	1.5	8.0	20.0	0.010	0.048
FSMD400-16-2920R	4.00	8.00	16	100	1.5	20.0	4.0	0.010	0.040
FSMD500-16-2920R	5.00	10.00	16	100	1.5	20.0	5.0	0.005	0.025
FSMD600-12-2920R	6.00	12.00	12	100	2.0	30.0	2.0	0.004	0.020
FSMD700-12-2920R	7.00	14.00	12	100	2.0	35.0	2.0	0.003	0.018

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	145%	130%	115%	100%	92%	85%	78%	70%	62%	50%

# Surface Mount PPTC

## FSMD2016 Series



### Application

All high-density boards

### Product Features

Small surface mount, Solid state, Faster time to trip than standard SMD devices, Lower resistance than standard SMD devices



### Operation Current

0.30A~2.00A

### Maximum Voltage

6V~60V<sub>DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50090556)



### Electrical Characteristics (23°C)

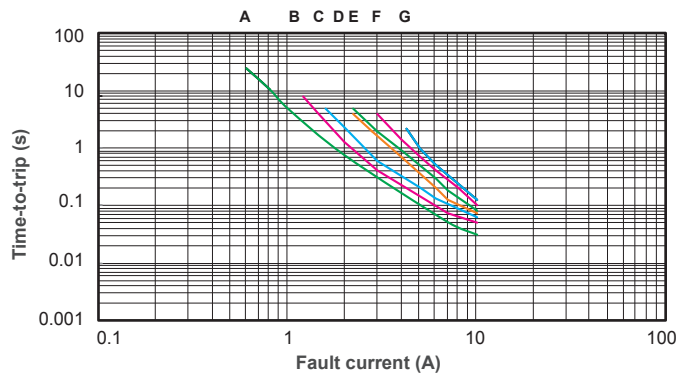
Part Number	Hold Current	Trip Current	Rated Voltage	Max. Current	Typ. Power	Max. Time to trip		Resistance	
						Current	Time	R <sub>MIN</sub>	R <sub>1MAX</sub>
	I <sub>H</sub> , A	I <sub>T</sub> , A	V <sub>MAX</sub> , V <sub>DC</sub>	I <sub>MAX</sub> , A	P <sub>d</sub> , W	A	Sec	Ohms	Ohms
FSMD030-2016-R	0.30	0.60	60	100	1.4	1.5	3.0	0.400	2.300
FSMD050-2016R	0.55	1.10	60	100	1.4	2.5	5.0	0.200	1.000
FSMD075-2016R	0.75	1.50	60	100	1.4	8.0	0.5	0.130	0.900
FSMD100-2016-R	1.10	2.20	15	100	1.4	8.0	0.5	0.070	0.400
FSMD100-33-2016-R	1.10	2.20	33	100	1.4	8.0	0.5	0.070	0.400
FSMD150-2016-R	1.50	3.00	15	100	1.4	8.0	0.8	0.050	0.180
FSMD200-2016-R	2.00	4.20	6	100	1.4	8.0	3.0	0.030	0.100

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	157%	133%	118%	100%	90%	81%	70%	60%	51%	36%

### Typical Time-To-Trip at 23°C

- A = FSMD030-2016-R
- B = FSMD050-2016R
- C = FSMD075-2016R
- D = FSMD100-2016-R
- E = FSMD100-33-2016-R
- F = FSMD150-2016-R
- G = FSMD200-2016-R





# Surface Mount PPTC

## FSMD1812 Series



### Application

All high-density boards

### Product Features

Small surface mount, Solid state Faster time to trip than standard SMD devices Lower resistance than standard SMD devices



### Operation Current

0.10A~3.00A

### Maximum Voltage

6V~60V<sub>DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50090556)



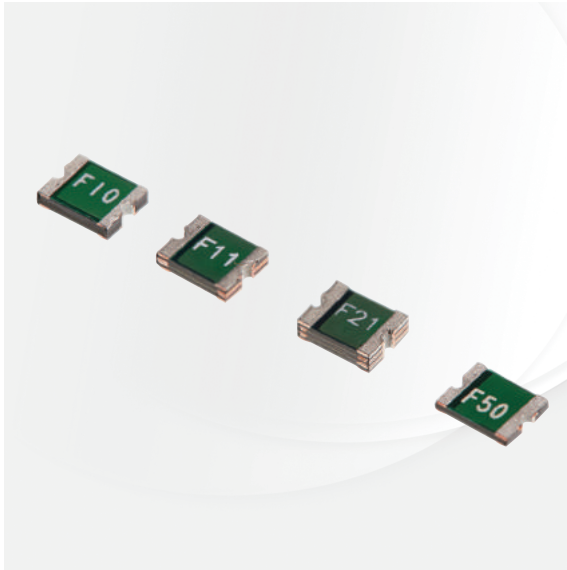
SVHC Compliant

### Electrical Characteristics (23°C)

Part Number	Hold Current	Trip Current	Rated Voltage	Max. Current	Typ. Power	Max. Time to trip		Resistance	
						Current	Time	R <sub>MIN</sub>	R <sub>1MAX</sub>
	I <sub>H</sub> , A	I <sub>T</sub> , A	V <sub>MAX</sub> , V <sub>DC</sub>	I <sub>MAX</sub> , A	Pd, W	A	Sec	Ohms	Ohms
FSMD010-R	0.10	0.30	60.0	100	0.8	8.0	0.020	1.600	15.000
FSMD014-R	0.14	0.30	60.0	100	0.8	8.0	0.008	1.200	6.500
FSMD020-R	0.20	0.40	30.0	100	0.8	8.0	0.020	0.800	5.000
FSMD020-60-R	0.20	0.40	60.0	100	0.8	8.0	0.020	0.800	5.000
FSMD030-R	0.30	0.60	30.0	100	0.8	8.0	0.100	0.200	1.750
FSMD035-R	0.35	0.70	16.0	100	0.8	8.0	0.100	0.320	1.500
FSMD035-30-R	0.35	0.70	30.0	100	0.8	8.0	0.100	0.320	1.500
FSMD050-R	0.50	1.00	16.0	100	0.8	8.0	0.150	0.150	1.000
FSMD050-30-R	0.50	1.00	30.0	100	0.8	8.0	0.150	0.150	1.000
FSMD075-R	0.75	1.50	16.0	100	0.8	8.0	0.200	0.110	0.450
FSMD075-24R	0.75	1.50	24.0	100	1.0	8.0	0.200	0.110	0.290
FSMD075-33R	0.75	1.50	33.0	100	1.0	8.0	0.200	0.110	0.400
FSMD110-R	1.10	2.20	8.0	100	0.8	8.0	0.300	0.040	0.210
FSMD110-16-R	1.10	2.20	16.0	100	0.8	8.0	0.500	0.060	0.180
FSMD110-24R	1.10	2.20	24.0	100	1.0	8.0	0.500	0.060	0.200
FSMD110-33R	1.10	2.20	33.0	100	0.8	8.0	0.500	0.060	0.200
FSMD125-R	1.25	2.50	6.0	100	0.8	8.0	0.400	0.050	0.140
FSMD125-16R	1.25	2.50	16.0	100	0.8	8.0	0.400	0.050	0.140
FSMD150-R	1.50	3.00	8.0	100	0.8	8.0	0.500	0.040	0.110
FSMD150-12R	1.50	3.00	12.0	100	1.0	8.0	0.500	0.040	0.110
FSMD150-24R	1.50	3.00	24.0	100	1.0	8.0	1.500	0.040	0.120
FSMD160-R	1.60	3.20	8.0	100	0.8	8.0	0.500	0.030	0.100
FSMD160-12R	1.60	3.20	12.0	100	1.0	8.0	1.000	0.030	0.100
FSMD160-16R	1.60	3.20	16.0	100	1.0	8.0	1.000	0.030	0.100
FSMD160-24R	1.60	3.20	24.0	100	1.0	8.0	1.000	0.030	0.100
FSMD200R	2.00	3.50	8.0	100	1.0	8.0	2.000	0.020	0.070
FSMD200-16R	2.00	3.50	16.0	100	1.0	8.0	5.000	0.020	0.085
FSMD260R	2.60	5.00	8.0	100	1.0	8.0	2.500	0.015	0.047
FSMD260-13R	2.60	5.00	13.2	100	1.3	8.0	5.000	0.015	0.050
FSMD260-16R	2.60	5.00	16.0	100	1.3	8.0	5.000	0.015	0.050
FSMD300R	3.00	5.00	6.0	100	1.0	8.0	4.000	0.012	0.040

# Surface Mount PPTC

## FSMD1210 Series



### Application

All high-density boards

### Product Features

Small surface mount, Solid state Faster time to trip than standard SMD devices Lower resistance than standard SMD devices



### Operation Current

0.05A~2.00A

### Maximum Voltage

6V~60V<sub>DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50090556)



SVHC Compliant

### Electrical Characteristics (23°C)

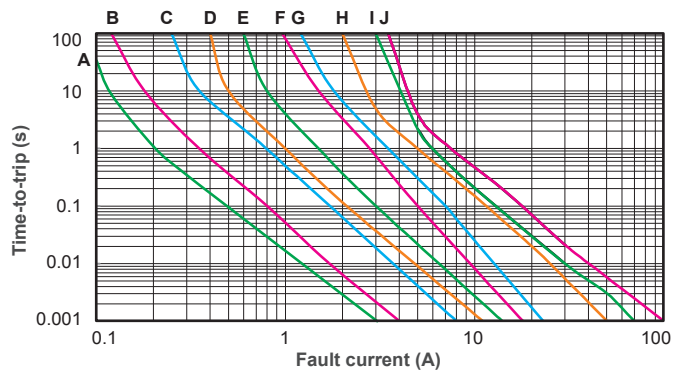
Part Number	Hold Current	Trip Current	Rated Voltage	Max. Current	Typ. Power	Max. Time to trip		Resistance	
						Current	Time	R <sub>MIN</sub>	R <sub>1MAX</sub>
								A	Sec
FSMD005-1210-R	0.05	0.15	60	100	0.60	0.25	1.50	3.600	50.000
FSMD010-1210-R	0.10	0.25	60	100	0.60	0.50	1.50	1.600	15.000
FSMD020-1210-R	0.20	0.40	30	100	0.60	8.00	0.02	0.800	5.000
FSMD035-1210-R	0.35	0.70	16	100	0.60	8.00	0.20	0.320	1.300
FSMD050-1210-R	0.50	1.00	16	100	0.60	8.00	0.10	0.250	0.900
FSMD075-1210-R	0.75	1.50	8	100	0.60	8.00	0.10	0.130	0.400
FSMD075-24-1210R	0.75	1.50	24	100	0.60	8.00	0.10	0.130	0.400
FSMD110-1210R	1.10	2.20	8	100	0.80	8.00	0.30	0.060	0.210
FSMD110-16-1210R	1.10	2.20	16	100	0.80	8.00	0.30	0.060	0.210
FSMD150-1210R	1.50	3.00	6	100	0.80	8.00	0.50	0.040	0.110
FSMD175-1210R	1.75	3.50	6	100	0.80	8.00	0.60	0.020	0.080
FSMD200-1210R	2.00	4.00	6	100	0.80	8.00	1.00	0.015	0.070

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	145%	130%	115%	100%	92%	83%	76%	70%	62%	50%

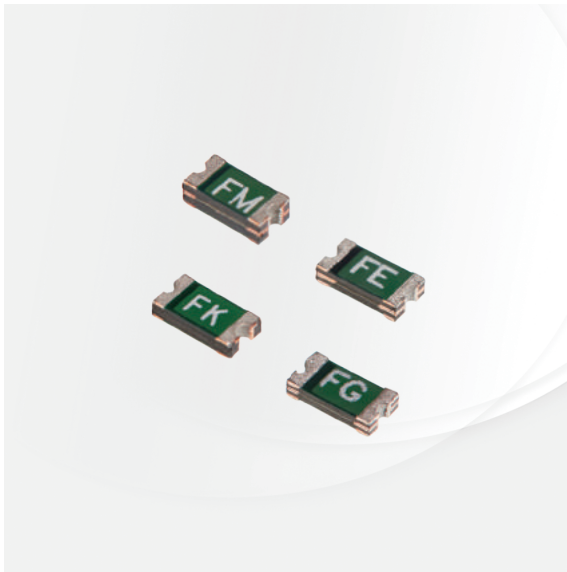
### Typical Time-To-Trip at 23°C

- A = FSMD005-1210-R
- B = FSMD010-1210-R
- C = FSMD020-1210-R
- D = FSMD035-1210-R
- E = FSMD050-1210-R
- F = FSMD075-1210-R / 075-24-1210R
- G = FSMD110-1210R / 110-16-1210R
- H = FSMD150-1210R
- I = FSMD175-1210R
- J = FSMD200-1210R



# Surface Mount PPTC

## FSMD1206 Series



### Application

All high-density boards

### Product Features

Small surface mount, Solid state Faster time to trip than standard SMD devices Lower resistance than standard SMD devices



### Operation Current

0.05A~2.00A

### Maximum Voltage

6V~60V<sub>DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50090556)



SVHC Compliant

### Electrical Characteristics (23°C)

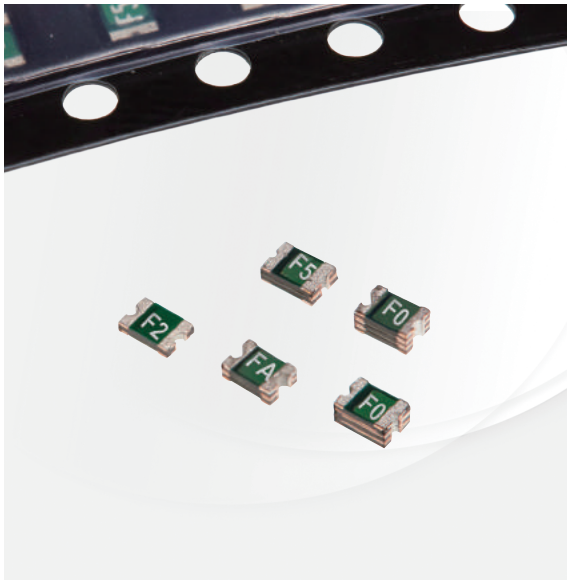
Part Number	Hold Current	Trip Current	Rated Voltage	Max. Current	Typ. Power	Max. Time to trip		Resistance	
						Current	Time	R <sub>MIN</sub>	R <sub>1MAX</sub>
						I <sub>H</sub> , A	I <sub>T</sub> , A	V <sub>MAX</sub> , V <sub>DC</sub>	I <sub>MAX</sub> , A
FSMD005-1206-R	0.05	0.15	60	100	0.4	0.25	1.50	3.600	50.000
FSMD010-1206-R	0.10	0.25	60	100	0.4	0.50	1.00	1.600	15.000
FSMD012-1206-R	0.12	0.39	48	100	0.5	1.00	0.20	1.400	6.500
FSMD016-1206-R	0.16	0.45	48	100	0.5	1.00	0.30	1.100	5.000
FSMD020-1206-R	0.20	0.40	30	100	0.4	8.00	0.10	0.600	2.500
FSMD025-1206-R	0.25	0.50	16	100	0.6	8.00	0.08	0.550	2.300
FSMD025-24-1206-R	0.25	0.50	24	100	0.6	8.00	0.08	0.550	2.300
FSMD035-1206-R	0.35	0.75	16	100	0.4	8.00	0.10	0.300	1.200
FSMD035-30-1206R	0.35	0.75	30	100	0.6	8.00	0.10	0.300	1.200
FSMD050-1206-R	0.50	1.00	8	100	0.4	8.00	0.10	0.150	0.700
FSMD050-24-1206R	0.50	1.00	24	100	0.6	8.00	0.10	0.150	0.750
FSMD075-1206R	0.75	1.50	8	100	0.6	8.00	0.20	0.090	0.290
FSMD075-16-1206R	0.75	1.50	16	100	0.6	8.00	0.20	0.090	0.290
FSMD100-1206R	1.00	1.80	6	100	0.6	8.00	0.30	0.055	0.210
FSMD110-1206R	1.10	2.20	8	100	0.8	8.00	0.30	0.040	0.180
FSMD110-16-1206R	1.10	2.20	16	100	0.8	8.00	0.30	0.040	0.180
FSMD150-1206R	1.50	3.00	8	100	0.8	8.00	1.00	0.040	0.120
FSMD200-1206R	2.00	3.50	6	100	0.8	8.00	1.50	0.018	0.080

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	145%	130%	115%	100%	92%	84%	78%	69%	62%	50%

# Surface Mount PPTC

## FSMD0805 Series



### Application

All high-density boards

### Product Features

Small surface mountable, Solid state, Faster time to trip than standard SMD devices, Lower resistance than standard SMD devices



### Operation Current

0.10A~1.10A

### Maximum Voltage

6V~24V<sub>DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50090556)



SVHC Compliant

### Electrical Characteristics (23°C)

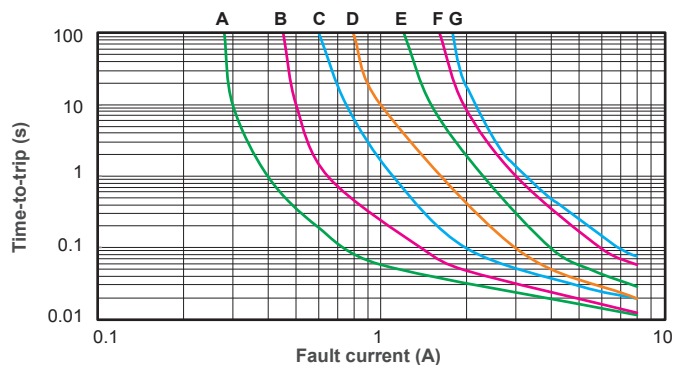
Part Number	Hold Current	Trip Current	Rated Voltage	Max. Current	Typ. Power	Max. Time to trip		Resistance	
						Current	Time	R <sub>MIN</sub>	R <sub>1MAX</sub>
						I <sub>H</sub> , A	I <sub>T</sub> , A	V <sub>MAX</sub> , V <sub>DC</sub>	I <sub>MAX</sub> , A
FSMD010-0805-R	0.10	0.30	15	100	0.5	0.50	1.50	0.700	6.000
FSMD010-24-0805-R	0.10	0.30	24	100	0.5	0.50	1.50	0.700	6.000
FSMD020-0805-R	0.20	0.50	9	100	0.5	8.00	0.02	0.400	3.500
FSMD035-0805-R	0.35	0.75	6	100	0.5	8.00	0.10	0.250	1.200
FSMD050-0805R	0.50	1.00	6	100	0.5	8.00	0.10	0.150	0.850
FSMD050-9-0805R	0.50	1.00	9	100	0.5	8.00	0.10	0.150	0.850
FSMD075-0805R	0.75	1.50	6	100	0.6	8.00	0.20	0.090	0.350
FSMD100-0805R	1.00	1.95	6	100	0.6	8.00	0.30	0.060	0.210
FSMD110-0805R	1.10	2.20	6	100	0.6	8.00	0.20	0.050	0.200

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	145%	130%	116%	100%	91%	84%	76%	69%	61%	50%

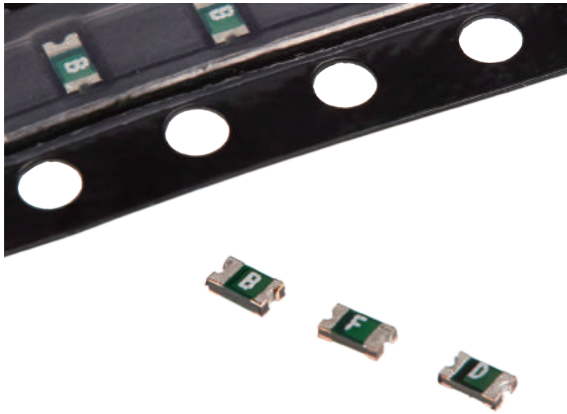
### Typical Time-To-Trip at 23°C

- A = FSMD010-0805-R / FSMD010-24-0805-R
- B = FSMD020-0805-R
- C = FSMD035-0805-R
- D = FSMD050-0805R / FSMD050-9-0805R
- E = FSMD075-0805R
- F = FSMD100-0805R
- G = FSMD110-0805R



# Surface Mount PPTC

## FSMD0603 Series



### Application

All high-density boards

### Product Features

Small surface mountable, Solid state, Faster time to trip than standard SMD devices, Lower resistance than standard SMD devices



### Operation Current

0.01A~0.20A

### Maximum Voltage

9V~60V<sub>DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50090556)



SVHC Compliant

## Electrical Characteristics (23°C)

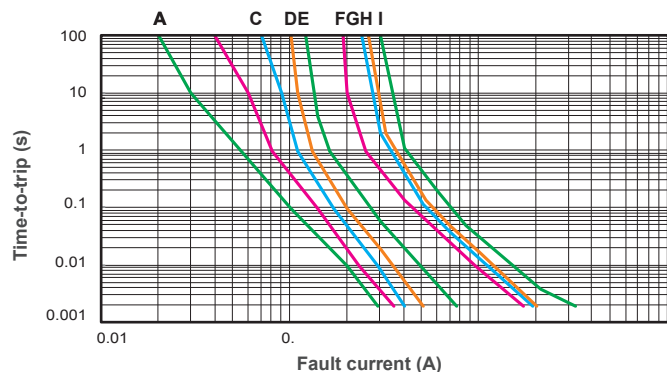
Part Number	Hold Current	Trip Current	Rated Voltage	Max. Current	Typ. Power	Max. Time to trip		Resistance	
						Current	Time	R <sub>MIN</sub>	R <sub>1MAX</sub>
						I <sub>H</sub> , A	I <sub>T</sub> , A	V <sub>MAX</sub> , V <sub>DC</sub>	I <sub>MAX</sub> , A
FSMD001-0603-R	0.01	0.03	60	40	0.5	0.20	1.00	15.00	100.00
FSMD002-0603-R	0.02	0.06	60	40	0.5	0.20	1.00	12.00	70.00
FSMD003-0603-R	0.03	0.09	30	40	0.5	0.20	1.00	6.00	50.00
FSMD004-0603-R	0.04	0.12	24	40	0.5	0.20	1.00	4.00	40.00
FSMD005-0603-R	0.05	0.15	15	40	0.5	0.50	0.10	3.80	30.00
FSMD010-0603-R	0.10	0.25	15	40	0.5	0.70	0.10	0.90	8.00
FSMD012-0603-R	0.12	0.30	9	40	0.5	0.80	0.10	1.10	5.80
FSMD016-0603-R	0.16	0.40	9	40	0.5	1.00	0.10	1.00	4.20
FSMD020-0603-R	0.20	0.45	9	40	0.5	2.00	0.10	0.55	3.50

## Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	157%	137%	118%	100%	89%	80%	70%	60%	51%	37%

## Typical Time-To-Trip at 23°C

- A = FSMD001-0603-R
- B = FSMD002-0603-R
- C = FSMD003-0603-R
- D = FSMD004-0603-R
- E = FSMD005-0603-R
- F = FSMD010-0603-R
- G = FSMD012-0603-R
- H = FSMD016-0603-R
- I = FSMD020-0603-R



# Lo Rho PPTC

## Low Rho FSMD1812 Series



### Application

All high-density boards

### Product Features

Small surface mountable, Solid state, Faster time to trip than standard SMD devices, Lower resistance than standard SMD devices



### Operation Current

1.40A~6.00A

### Maximum Voltage

6V<sub>DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50090556)



SVHC Compliant

### Electrical Characteristics (23°C)

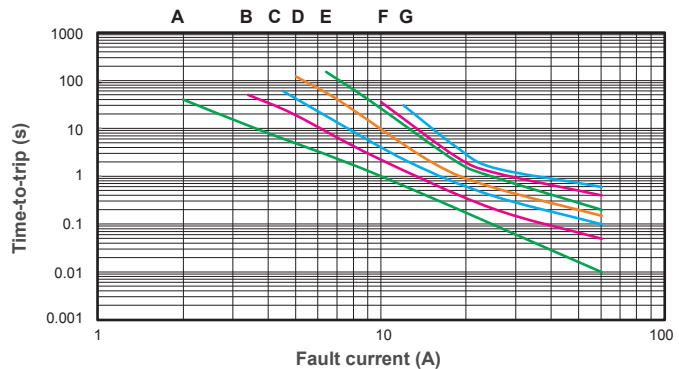
Part Number	Hold Current	Trip Current	Rated Voltage	Max. Current	Typ. Power	Max. Time to trip		Resistance	
						Current	Time	R <sub>MIN</sub>	R <sub>1MAX</sub>
						I <sub>H</sub> , A	I <sub>T</sub> , A	V <sub>MAX</sub> , V <sub>DC</sub>	I <sub>MAX</sub> , A
FSMD140RZ	1.40	3.60	6	100	1.0	8.0	3.00	0.0100	0.0350
FSMD190RZ	1.90	4.90	6	100	1.0	8.0	5.00	0.0030	0.0250
FSMD270RZ	2.70	6.20	6	100	1.0	13.5	3.00	0.0030	0.0230
FSMD300RZ	3.00	7.00	6	100	1.0	15.0	2.00	0.0030	0.0220
FSMD370RZ	3.70	9.10	6	100	1.0	18.5	2.00	0.0030	0.0180
FSMD500RZ	5.00	10.00	6	100	1.0	25.0	2.00	0.0015	0.0140
FSMD600RZ	6.00	12.00	6	100	1.0	30.0	3.00	0.0010	0.0100

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	145%	130%	115%	100%	92%	84%	77%	69%	61%	50%

### Typical Time-To-Trip at 23°C

- A = FSMD140RZ
- B = FSMD190RZ
- C = FSMD270RZ
- D = FSMD300RZ
- E = FSMD370RZ
- F = FSMD500RZ
- G = FSMD600RZ



# Lo Rho PPTC

## Low Rho FSMD1210 Series



### Application

All high-density boards

### Product Features

Small surface mountable, Solid state, Faster time to trip than standard SMD devices, Lower resistance than standard SMD devices



### Operation Current

1.75A~7.50A

### Maximum Voltage

6V<sub>DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50090556)



SVHC Compliant

### Electrical Characteristics (23°C)

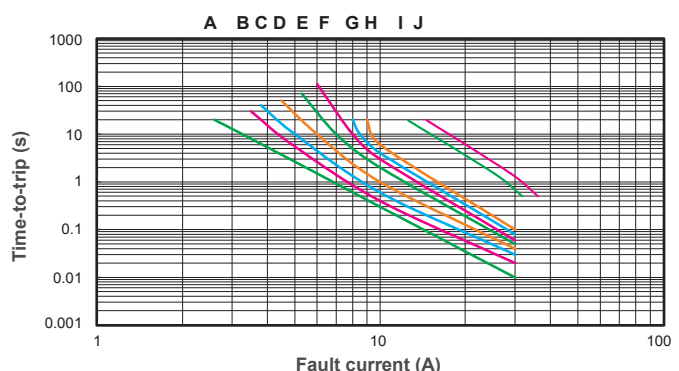
Part Number	Hold Current	Trip Current	Rated Voltage	Max. Current	Typ. Power	Max. Time to trip		Resistance	
						Current	Time	R <sub>MIN</sub>	R <sub>1MAX</sub>
						I <sub>H</sub> , A	I <sub>T</sub> , A	V <sub>MAX</sub> , V <sub>DC</sub>	I <sub>MAX</sub> , A
FSMD175-1210RZ	1.75	3.50	6	100	1.0	8.00	2.50	0.006	0.040
FSMD200-1210RZ	2.00	4.90	6	100	1.0	8.00	3.00	0.005	0.024
FSMD260-1210RZ	2.60	5.00	6	100	0.8	8.00	4.00	0.003	0.020
FSMD300-1210RZ	3.00	6.00	6	100	0.8	15.00	2.00	0.003	0.020
FSMD350-1210RZ	3.50	7.00	6	100	1.0	17.50	2.00	0.003	0.018
FSMD380-1210RZ	3.80	8.00	6	100	1.0	8.00	5.00	0.002	0.016
FSMD400-1210RZ	4.00	8.00	6	100	1.0	8.00	5.00	0.002	0.016
FSMD450-1210RZ	4.50	9.00	6	100	1.0	22.50	2.00	0.001	0.014
FSMD650-1210RZ	6.50	13.00	6	100	1.2	32.50	2.00	0.001	0.009
FSMD750-1210RZ	7.50	15.00	6	100	1.2	37.50	2.00	0.001	0.007

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	145%	130%	115%	100%	92%	84%	77%	69%	61%	50%

### Typical Time-To-Trip at 23°C

- |                    |                    |
|--------------------|--------------------|
| A = FSMD175-1210RZ | F = FSMD380-1210RZ |
| B = FSMD200-1210RZ | G = FSMD400-1210RZ |
| C = FSMD260-1210RZ | H = FSMD450-1210RZ |
| D = FSMD300-1210RZ | I = FSMD650-1210RZ |
| E = FSMD350-1210RZ | J = FSMD750-1210RZ |



# Lo Rho PPTC

## Low Rho FSMD1206 Series



### Application

All high-density boards

### Product Features

Small surface mountable, Solid state, Faster time to trip than standard SMD devices, Lower resistance than standard SMD devices



### Operation Current

0.50A~6.00A

### Maximum Voltage

6V<sub>DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50090556)



SVHC Compliant

### Electrical Characteristics (23°C)

Part Number	Hold Current	Trip Current	Rated Voltage	Max. Current	Typ. Power	Max. Time to trip		Resistance	
						Current	Time	R <sub>MIN</sub>	R <sub>1MAX</sub>
						A	Sec	Ohms	Ohms
FSMD050-1206RZ	0.50	1.50	6	100	0.8	8.0	0.20	0.025	0.200
FSMD075-1206RZ	0.75	1.80	6	100	0.8	8.0	0.30	0.018	0.180
FSMD110-1206RZ	1.10	2.20	6	100	0.8	8.0	0.30	0.015	0.100
FSMD150-1206RZ	1.50	3.00	6	100	0.8	8.0	0.30	0.010	0.065
FSMD175-1206RZ	1.75	3.50	6	100	0.8	8.0	0.40	0.005	0.030
FSMD200-1206RZ	2.00	4.00	6	100	0.8	8.0	0.50	0.005	0.025
FSMD260-1206RZ	2.60	5.20	6	100	0.8	8.0	4.00	0.003	0.025
FSMD300-1206RZ	3.00	6.00	6	100	0.8	8.0	4.00	0.003	0.020
FSMD350-1206RZ	3.50	7.00	6	100	0.8	8.0	5.00	0.003	0.018
FSMD380-1206RZ	3.80	8.00	6	100	0.8	8.0	5.00	0.002	0.014
FSMD400-1206RZ	4.00	8.00	6	100	0.8	8.0	5.00	0.002	0.014
FSMD450-1206RZ	4.50	9.00	6	100	0.8	22.5	2.00	0.001	0.014
FSMD500-1206RZ	5.00	10.00	6	100	0.8	25.0	5.00	0.001	0.012
FSMD600-1206RZ	6.00	12.00	6	100	1.0	30.0	2.00	0.001	0.010

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	145%	130%	115%	100%	92%	84%	77%	69%	61%	50%



# Lo Rho PPTC

## Low Rho FSMD0805 Series



### Application

All high-density boards

### Product Features

Small surface mountable, Solid state, Faster time to trip than standard SMD devices, Lower resistance than standard SMD devices



### Operation Current

0.75A~3.50A

### Maximum Voltage

6V<sub>DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50090556)



### Electrical Characteristics (23°C)

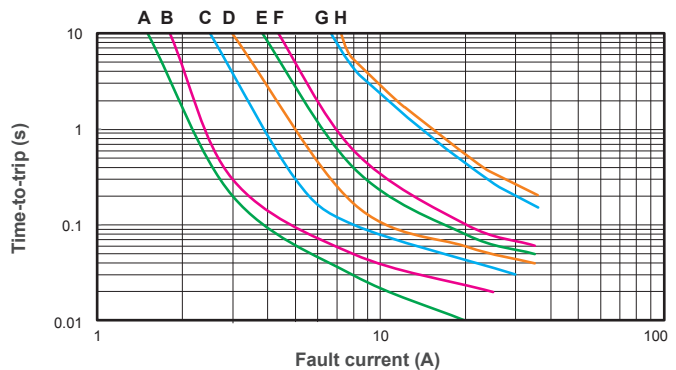
Part Number	Hold Current	Trip Current	Rated Voltage	Max. Current	Typ. Power	Max. Time to trip		Resistance	
						Current	Time	R <sub>MIN</sub>	R <sub>1MAX</sub>
						I <sub>H</sub> , A	I <sub>T</sub> , A	V <sub>MAX</sub> , V <sub>DC</sub>	I <sub>MAX</sub> , A
FSMD075-0805RZ	0.75	1.50	6	100	0.6	8.0	0.20	0.040	0.160
FSMD110-0805RZ	1.10	1.80	6	100	0.6	8.0	0.30	0.030	0.130
FSMD125-0805RZ	1.25	2.50	6	100	0.6	8.0	0.30	0.025	0.110
FSMD150-0805RZ	1.50	3.00	6	100	0.6	8.0	0.30	0.015	0.065
FSMD175-0805RZ	1.75	3.50	6	100	0.6	8.0	0.60	0.005	0.055
FSMD200-0805RZ	2.00	4.00	6	100	0.6	8.0	1.00	0.005	0.045
FSMD300-0805RZ	3.00	7.00	6	100	0.6	8.0	5.00	0.003	0.030
FSMD350-0805RZ	3.50	7.00	6	100	0.6	8.0	5.00	0.002	0.025

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	145%	130%	115%	100%	92%	84%	77%	69%	61%	50%

### Typical Time-To-Trip at 23°C

- A = FSMD075-0805RZ
- B = FSMD110-0805RZ
- C = FSMD125-0805RZ
- D = FSMD150-0805RZ
- E = FSMD175-0805RZ
- F = FSMD200-0805RZ
- G = FSMD300-0805RZ
- H = FSMD350-0805RZ



# Lo Rho PPTC

## Low Rho FSMD0603 Series



### Application

All high-density boards

### Product Features

Small surface mountable, Solid state, Faster time to trip than standard SMD devices, Lower resistance than standard SMD devices



### Operation Current

0.25A~1.00A

### Maximum Voltage

6V~9V<sub>DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50090556)



SVHC Compliant

### Electrical Characteristics (23°C)

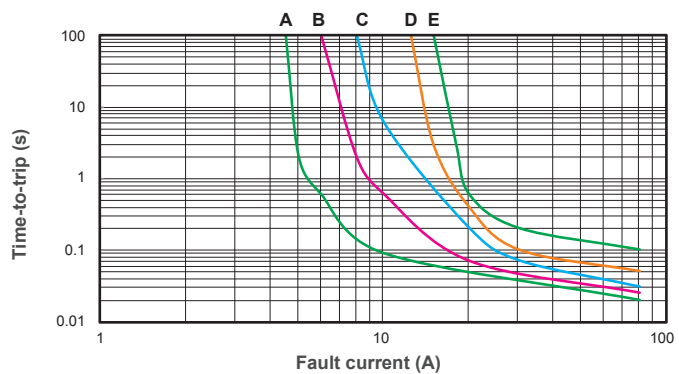
Part Number	Hold Current	Trip Current	Rated Voltage	Max. Current	Typ. Power	Max. Time to trip		Resistance	
						Current	Time	R <sub>MIN</sub>	R <sub>1MAX</sub>
						A	Sec	Ohms	Ohms
FSMD025-0603RZ	0.25	0.55	9	100	0.5	8.0	0.08	0.500	3.000
FSMD035-0603RZ	0.35	0.75	6	100	0.5	8.0	0.10	0.200	1.000
FSMD050-0603RZ	0.50	1.00	6	100	0.6	8.0	0.10	0.070	0.350
FSMD075-0603RZ	0.75	1.50	6	100	0.6	8.0	0.20	0.050	0.250
FSMD100-0603RZ	1.00	1.80	6	100	0.6	8.0	0.30	0.040	0.120

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	145%	130%	115%	100%	92%	84%	77%	69%	61%	50%

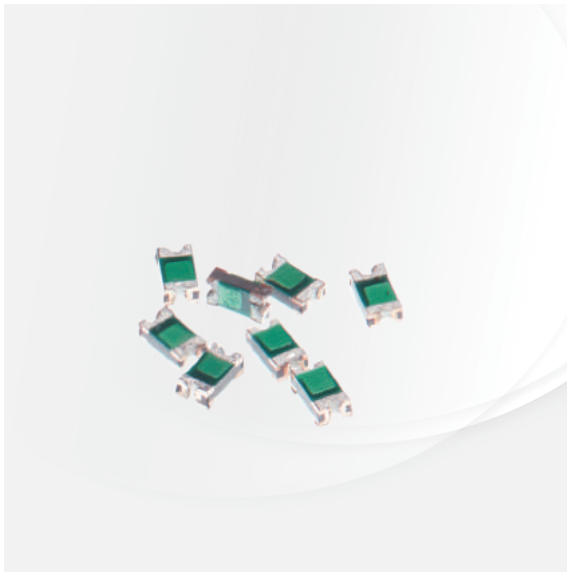
### Typical Time-To-Trip at 23°C

- A = FSMD025-0603RZ
- B = FSMD035-0603RZ
- C = FSMD050-0603RZ
- D = FSMD075-0603RZ
- E = FSMD100-0603RZ



# Lo Rho PPTC

## Low Rho FSMD0402 Series



### Application

All high-density boards

### Product Features

Small surface mountable, Solid state, Faster time to trip than standard SMD devices, Lower resistance than standard SMD devices



### Operation Current

0.10A~0.35A

### Maximum Voltage

6V<sub>DC</sub>



### Temperature Range

-40°C to 85°C

### Agency Recognition

AGENCY	AGENCY FILE NUMBER
	UL(E211981)
	C-UL(E211981)
	TÜV (R50090556)



### Electrical Characteristics (23°C)

Part Number	Hold Current	Trip Current	Rated Voltage	Max. Current	Typ. Power	Max. Time to trip		Resistance	
						Current	Time	R <sub>MIN</sub>	R <sub>1MAX</sub>
						I <sub>H</sub> , A	I <sub>T</sub> , A	V <sub>MAX</sub> , V <sub>DC</sub>	I <sub>MAX</sub> , A
FSMD010-0402RZ	0.10	0.30	6	100	0.5	0.5	1.0	0.150	2.000
FSMD020-0402RZ	0.20	0.50	6	100	0.5	1.0	1.0	0.100	1.250
FSMD035-0402RZ	0.35	0.70	6	100	0.5	8.0	0.1	0.050	0.700

### Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40°C	-20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
DERATING %	145%	130%	115%	100%	92%	84%	77%	69%	61%	50%

### Typical Time-To-Trip at 23°C

- A = FSMD010-0402RZ
- B = FSMD020-0402RZ
- C = FSMD035-0402RZ

