CONTENTS

FUZETEC TECHNOLOGY

Founded in 1997, as a world leading device manufacturer and designer, Fuzetec Technology Co., Ltd. (FUZETEC ™) is committed to provide continuous circuit protection solutions to today's and tomorrow's electronic and electrical industries.

With the most advanced Positive Temperature Coefficient (PTC) conductive polymer technologies, FUZETEC ™ offers a wide variety of Polymeric PTC resettable fuses to fulfill the needs of modern demanding high-tech applications. They include, but are not limited to: Telecommunications, Networks, Smart Phone, Tablet PC's, Notebook PC's, Computers & Peripherals, Automotives, Instrumentation & Industrial Controls, Power Supplies, Consumer Electronics and Primary & Secondary Batteries etc.

FUZETEC ™ PRODUCT FAMILY

FUZETEC ™ product families are designed for global demanding electronic and electrical industries. Its resettable feature, compact size, flexible design construction, low thermal output and competitive cost out performed the traditional fuse, Ceramic PTC, Bimetal fuse and Current control IC. They are ideal for wide range voltage DC and AC applications. FUZETEC ™ resettable fuses (PTC Thermistor, PTC VARIABLE RESISTER, Variable Resistance PTC Thermistor, Variable Resistor, Current Limiter) are offered in a variety of constructions, which include: Radial Leaded (16V, 30V, 60V, 90V, 120VAC, 240 VAC, 250V & 600V), Surface Mount (0805,1206, 1210, 1812 & 2920 sizes) & Axial Leaded (for all battery pack applications and others). In addition to standard products, FUZETEC ™ also offers a variety range of custom design devices (i.e. Disc Type).

SAFETY, QUALITY AND CUSTOMER SATISFACTION

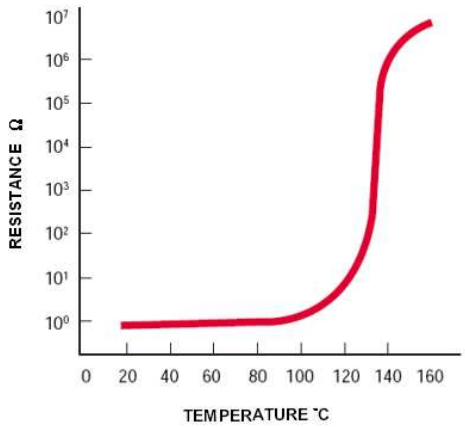
With third party approvals (UL, C-UL and TÜV), FUZETEC ™ products are ensured to provide long lasting safety and performance. From product design and development, through manufacturing and quality control to delivery and shipment. Fuzetec Technology strictly implements ISO/TS16949:2009, ISO9001:2008 and ISO14001:2004 quality standards to assure its products' quality and consistency. With continuous improvement, we are committed to provide top products and services to better satisfy our customer's needs. We strongly believe that excellent partnership between customers and us are the best and the only route to achieve success in tomorrow's competing business world.

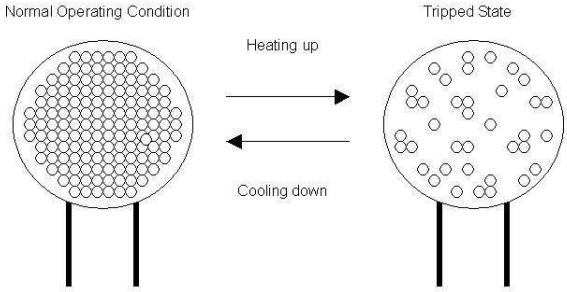
TECHNOLOGY NICHE

Polymeric PTC material and devices technology synergistically integrate the advanced polymer material technologies, conductive material science, novel processing engineering, and fundamental electronic and electrical theory. Electrical resistance of such material and devices increases with temperature increases and vice versa. When experiencing "overcurrent and/or over voltage", the device generates thermal energy (Energy = I*V) and heats up itself. This makes the polymer matrix's morphology change from crystalline to amorphous phase, and results in a resistance increase of thousand orders of magnitude such that "trips" the electricity. The device will remain hot and stay "tripped" until the fault is cleared and power is removed.

HOW DOES THE RESETTABLE FUSE WORK

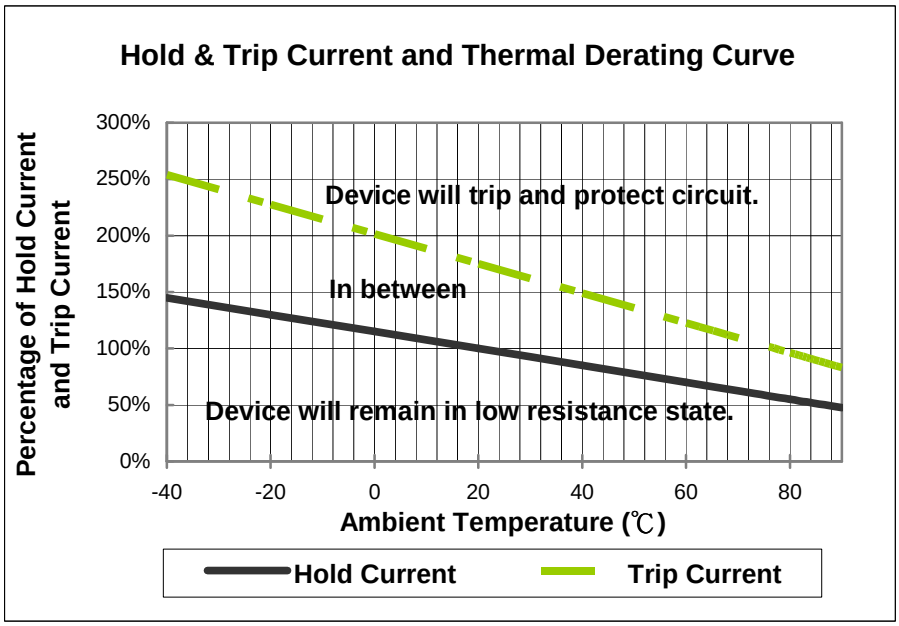
FUZETEC™ resettable fuses are designed and made of patented novel polymeric PTC material in thin chip form, developed solely by FUZETEC ™. With electrodes and leads attached on both sides, it is placed in series to protect a circuit. At “normal operating condition” the device remains at an extremely 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 and its resistance drops to the original extremely low value. The resettable fuse is “reset” and allows the current through the circuit again.





TRIP CURRENT, HOLD CURRENT AND THERMAL DERATING

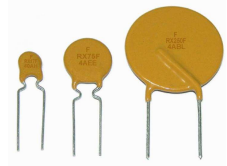
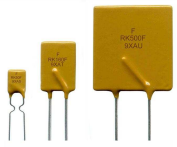
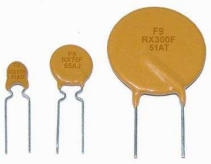
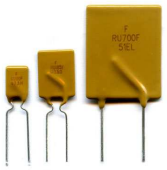
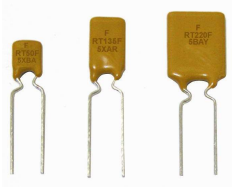
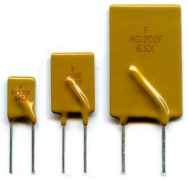
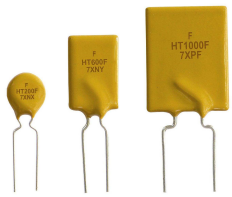
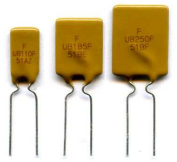
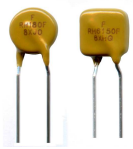
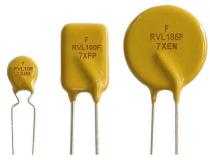
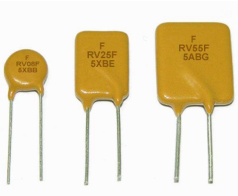
Trip Current (I_T) and Hold Current (I_H) of FUZETEC™ resettable fuse are rated at 23℃. Typically its Trip Current is twice as much as its Hold Current. FUZETEC ™ device does not trip at or below its rated Hold Current, and will trip at or above its Trip Current value. However, due to PTC effect both I_T and I_H reduce with ambient temperature increase and vice versa. As shown bellow, the currents are reduced nearly 50% at 85 ℃ and increased to 150% at -40℃.



PRODUCT SUMMARY

RoHS 2002/95/EC | Pb Lead Free

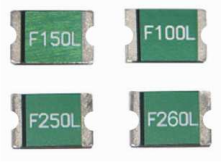
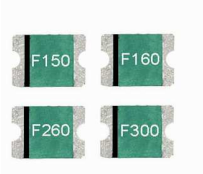
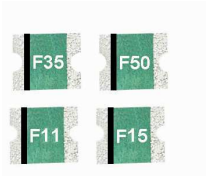
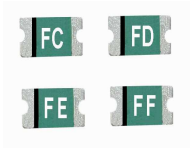
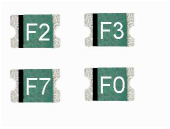
Radial Leaded (For Telecom & Electronic Equipment)

	**FRX** Operation Current:0.05A ~3.75A V_{MAX}:60V_{DC}, I_{MAX}: 40A. Wide Variety of Electronic Equipment		**FRK** Operation Current: 0.5A ~5.0A V_{MAX}:60V_{DC}, I_{MAX}: 40A. Wide Variety of Electronic Equipment
	**FRX90V** Operation Current:0.10A ~3.75A V_{MAX}:72V_{DC}/90V_{DC}, I_{MAX}: 40A. Wide Variety of Electronic Equipment		**FRU** Operation Current:0.90A ~9.00A V_{MAX}:30V_{DC}, I_{MAX}: 40A. Wide Variety of Electronic Equipment
	**FRT** Operation Current:0.50A ~2.50A V_{MAX}:36V_{DC}, I_{MAX}: 40A. IEEE1394 Firewire & Consumer Electronics		**FRG** Operation Current:2.50A~14.00A V_{MAX}:16V_{DC}, I_{MAX}: 100A. Wide Variety of Electronic Equipment
	**FHT** Operation Current: 0.50A~15.00A V_{MAX}:16V_{DC}/30V_{DC}, I_{MAX}: 40A/100A. Wide operating temperatures up to 125℃.		**FUSB** Operation Current:0.75A~2.50A V_{MAX}:16V_{DC}/30V_{DC}, I_{MAX}: 40A. Low Voltage USB Equipment
	**FRHV** Operation Current:0.08A~0.18A Max Operation Voltage: 100V_{DC}/250V_{DC} Max Interrupt Voltage: 250V/600V Telecommunication and Network		**FRVL** Operation Current:0.10A ~3.75A V_{MAX}:120$V_{AC/DC}$, I_{MAX}: 2A~20A. Max Interrupt Voltage: 135$V_{AC/DC}$ Line Voltage Application
	**FRV** Operation Current: 0.05A~2.00A V_{MAX}: 240$V_{AC/DC}$, I_{MAX}: 1A~20A. Max Interrupt Voltage: 265$V_{AC/DC}$ Line Voltage Application		

PRODUCT SUMMARY

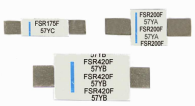
RoHS 2002/95/EC | HF Halogen Free

Surface Mount (For High Density Board)

	**FSMD2920** Operation Current: 0.30A ~3.00A V_{MAX}:6V_{DC}~60V_{DC}, I_{MAX}: 10A~40A. All High-Density Board		**FSMD1812** Operation Current: 0.10A ~3.00A VMAX:6V_{DC}~60V_{DC}, IMAX: 10A~100A. All High-Density Board
	**FSMD1210** Operation Current:0.05A ~2.00A V_{MAX}:6V_{DC}~60V_{DC}, I_{MAX}: 10A~100A. All High-Density Board		**FSMD1206** Operation Current:0.05A ~2.00A V_{MAX}: 6V_{DC}~60V_{DC}, I_{MAX}: 10A~100A. All High-Density Board
	**FSMD0805** Operation Current:0.10A~1.00A V_{MAX}:6V_{DC}~15V_{DC}, I_{MAX}: 40A~100A All High-Density Board		

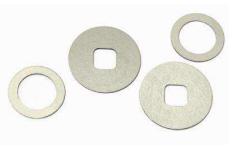
RoHS 2002/95/EC | HF Halogen Free

Axial Leaded (For Rechargeable Battery Packs)

	**FVL** Operation Current: 1.70A~2.30 A V_{MAX}:12V_{DC}, I_{MAX}: 100A. Rechargeable Battery Packs, Lithium Cell and Battery Packs		**FVT** Operation Current: 1.10A~2.40 A V_{MAX}:16V_{DC}, I_{MAX}: 100A. Rechargeable Battery Packs, Lithium Cell and Battery Packs
	**FSR** Operation Current: 1.20A~4.20 A V_{MAX}:15V_{DC}/30V_{DC}, I_{MAX}: 100A Rechargeable Battery Packs		**FLR** Operation Current: 1.90A~7.30 A V_{MAX}:15V_{DC}/20V_{DC}, I_{MAX}: 100A. Rechargeable Battery Packs

RoHS 2002/95/EC | HF Halogen Free

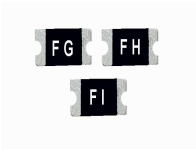
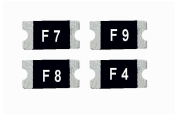
Disk type (For Battery Cell and Charger)

	**Disc (Donut type)** Custom Design Battery Cell and Charger

PRODUCT SUMMARY – Lo Rho PPTC RESETTABLE FUSE

RoHS 2002/95/EC | HF Halogen Free

Surface Mount (For High Density Board)

	**Lo Rho FSMD1812** Operation Current: 1.40A ~3.70A VMAX:6V_{DC},IMAX:100A. All High-Density Board		**Lo Rho FSMD1210** Operation Current:1.75A ~3.50A V_{MAX}:6V_{DC}, I_{MAX}:100A. All High-Density Board
	**Lo Rho FSMD1206** Operation Current:1.10A ~2.00A V_{MAX}: 6V_{DC}, I_{MAX}:100A. All High-Density Board		**Lo Rho FSMD0805** Operation Current:0.75A~1.25A V_{MAX}:6V_{DC}, I_{MAX}:100A. All High-Density Board

RoHS 2002/95/EC | HF Halogen Free

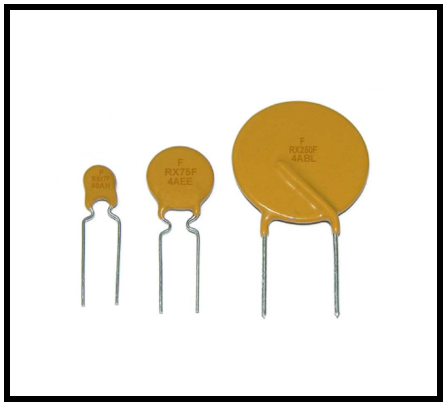
Axial Leaded (For Rechargeable Battery Packs)

	**FSL-RZ** Operation Current:1.40A ~4.50A V_{MAX}:6V_{DC}, I_{MAX}: 50A. Rechargeable Battery Packs, Lithium Cell and Battery Packs

GLOSSARY

I_H	:	Hold Current - Maximum current at which the device will not trip at 23℃ still air.
I_T	:	Trip Current - Minimum current at which the device will always trip at 23℃ 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}).
Pd	:	Maximum power dissipated from device when in tripped state in 23℃ still air environment.
R_{MIN}	:	Minimum device resistance at 23℃.
R_{MAX}	:	Maximum device resistance at 23℃.
$R1_{MAX}$	:	Maximum resistance of device at 23℃ measured 1 hour after tripping or reflow soldering of 260℃ for 20 seconds.

FRX Series



RoHS 2002/95/EC Lead Free

RoHS Compliant & Lead Free

Application: Wide variety of electronic equipment

Product Features: Low hold current, Solid state Radial-leaded product ideal for up to $60V_{DC}$

Operation Current: 0.05A ~ 3.75A

Maximum Voltage: $60V_{DC}$

Temperature Range: -40℃ to 85℃

Agency Recognition : *UL(E211981)
*C-UL(E211981)
*TÜV (R3-50004084)

Electrical Characteristics(23℃)

Part Number	Hold Current	Trip Current	Max.Time to Trip	Max. Current	Rated Voltage	Typ. Power	Resistance	
							R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	at 5xI_H, s	I_{MAX}, A	V_{MAX}, V_{DC}	Pd, W	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

Physical specifications:
Lead material: FRX005-60F~FRX090-60F Tin plated copper, 24 AWG.
FRX110-60F~FRX375-60F Tin plated copper, 20 AWG.
Soldering characteristics: MIL-STD-202, Method 208E.
Insulating coating:Flame retardant epoxy, meets UL 94 V-0 requirement.
* NOTE : UL, C-UL and TÜV are only applied for FRX010-60F~FRX375-60F.

Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
DERATING %	158%	136%	119%	100%	90%	81%	72%	63%	54%	40%

FRX Product Dimensions (mm)

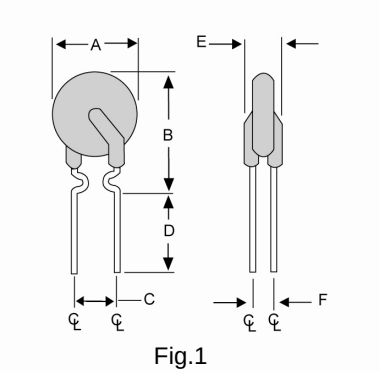


Fig.1
Lead Size: 24AWG
Φ 0.51 mm Diameter

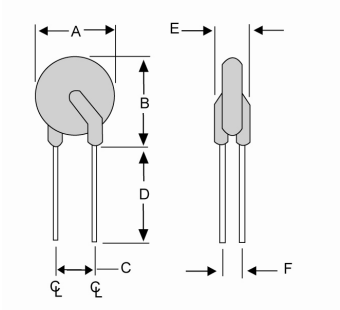
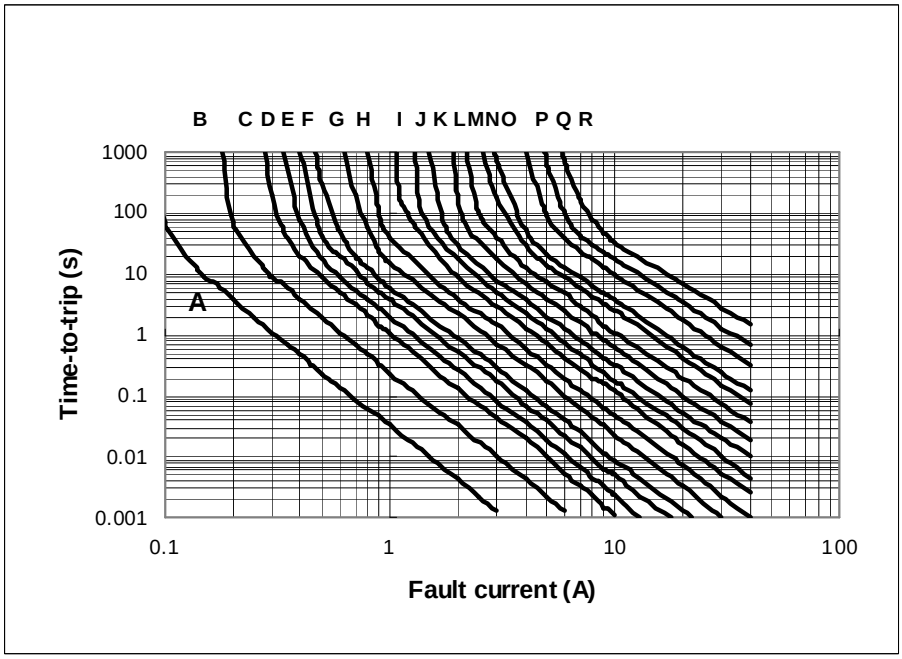


Fig.2
Lead Size: 20AWG
Φ 0.81 mm Diameter

Part Number	Fig.	A	B	C	D	E	F
		Max	Max	Typ	Min	Max	Typ.
FRX005-60F	1	7.4	12.7	5.1	7.6	3.1	1.1
FRX010-60F	1	7.4	12.7	5.1	7.6	3.1	1.1
FRX017-60F	1	7.4	12.7	5.1	7.6	3.1	1.1
FRX020-60F	1	7.4	12.7	5.1	7.6	3.1	1.1
FRX025-60F	1	7.4	12.7	5.1	7.6	3.1	1.1
FRX030-60F	1	7.4	13.0	5.1	7.6	3.1	1.1
FRX040-60F	1	7.6	13.5	5.1	7.6	3.1	1.1
FRX050-60F	1	7.9	13.7	5.1	7.6	3.1	1.1
FRX065-60F	1	9.7	14.5	5.1	7.6	3.1	1.1
FRX075-60F	1	10.4	15.2	5.1	7.6	3.1	1.1
FRX090-60F	1	11.7	15.8	5.1	7.6	3.1	1.1
FRX110-60F	2	13.0	18.0	5.1	7.6	3.1	1.4
FRX135-60F	2	14.5	19.6	5.1	7.6	3.1	1.4
FRX160-60F	2	16.3	21.3	5.1	7.6	3.1	1.4
FRX185-60F	2	17.8	22.9	5.1	7.6	3.1	1.4
FRX250-60F	2	21.3	26.4	10.2	7.6	3.1	1.4
FRX300-60F	2	24.9	30.0	10.2	7.6	3.1	1.4
FRX375-60F	2	28.5	33.5	10.2	7.6	3.1	1.4

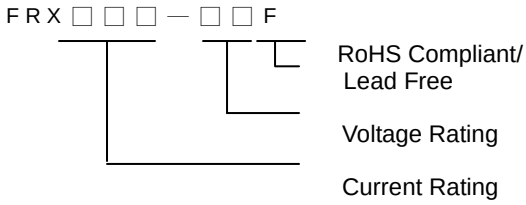
Typical Time-To-Trip at 23℃

A = FRX005-60F
B = FRX010-60F
C = FRX017-60F
D = FRX020-60F
E = FRX025-60F
F = FRX030-60F
G = FRX040-60F
H = FRX050-60F
I = FRX065-60F
J = FRX075-60F
K = FRX090-60F
L = FRX110-60F
M = FRX135-60F
N = FRX160-60F
O = FRX185-60F
P = FRX250-60F
Q = FRX300-60F
R = FRX375-60F

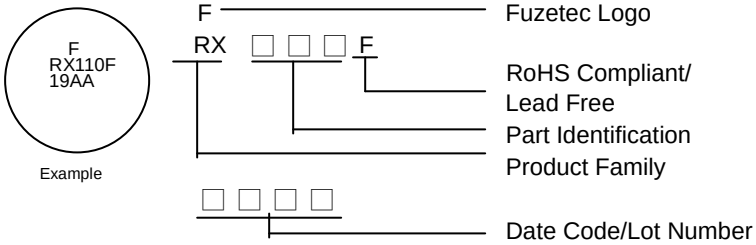


III - Product - Radial Leaded PTC

Part Numbering System



Part Marking System



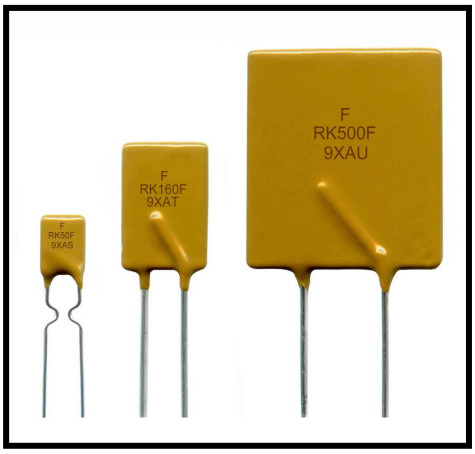
Standard Package

FRX005-60F~FRX050-60F	:	500 Pcs /Bag, 3.0K Reel/Tape
FRX065-60F~FRX090-60F	:	300 Pcs /Bag, 3.0K Reel/Tape
FRX110-60F	:	300 Pcs /Bag, 1.5K Reel/Tape
FRX135-60F~FRX185-60F	:	200 Pcs /Bag, 1.5K Reel/Tape
FRX250-60F~FRX375-60F	:	100 Pcs /Bag, 1.0K Reel/Tape

Warning:

- Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.
- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

FRK Series



RoHS 2002/95/EC | Pb Lead Free

RoHS Compliant & Lead Free

Application: Wide variety of electronic equipment

Product Features: Solid state, Radial leaded product ideal for up to 60$V_{DC,}$ Reduced size, increased current upto 5.00A.

Operation Current: 0.50A~5.00A

Maximum Voltage: 60V_{DC}

Temperature Range: -40℃ to 85℃

Agency Recognition: UL, C-UL and TÜV Pending

Electrical Characteristics (23℃)

Part Number	Hold Current	Trip Current	Max.Time to Trip		Max. Current	Rated Voltage	Typ. Power	Resistance	
								R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	I,A	Time,sec	I_{MAX}, A	V_{MAX}, V_{DC}	Pd, W	Ohms	Ohms
FRK050-60F	0.50	1.00	8.00	0.8	40	60	1.00	0.320	0.900
FRK065-60F	0.65	1.30	8.00	1.0	40	60	1.25	0.250	0.720
FRK075-60F	0.75	1.50	8.00	1.5	40	60	1.40	0.200	0.640
FRK090-60F	0.90	1.80	8.00	2.0	40	60	1.50	0.190	0.520
FRK110-60F	1.10	2.20	8.00	3.0	40	60	2.20	0.170	0.470
FRK135-60F	1.35	2.70	8.00	4.5	40	60	2.30	0.110	0.370
FRK160-60F	1.60	3.20	8.20	9.0	40	60	2.40	0.100	0.320
FRK185-60F	1.85	3.70	9.25	12.6	40	60	2.60	0.060	0.250
FRK250-60F	2.50	5.00	12.50	15.6	40	60	2.80	0.040	0.140
FRK300-60F	3.00	6.00	15.00	19.8	40	60	3.20	0.030	0.080
FRK375-60F	3.75	7.50	18.75	22.0	40	60	3.40	0.017	0.060
FRK400-60F	4.00	8.00	20.00	24.0	40	60	3.70	0.014	0.060
FRK500-60F	5.00	10.00	25.00	28.0	40	60	5.00	0.012	0.050

Physical specifications:
Lead material：FRK050-60F~FRK090-60F Tin plated copper, 24 AWG.
FRK110-60F~FRK500-60F Tin plated copper, 20 AWG
Soldering characteristics: MIL-STD-202, Method 208E.
Insulating coating:Flame retardant epoxy, meets UL94V-0 requirement.

Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
DERATING %	147%	131%	115%	100%	97%	83%	77%	68%	62%	52%

FRK Product Dimensions (mm)

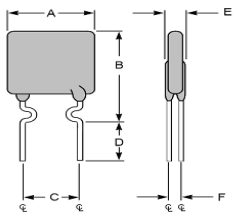


Fig.1
Lead Size :24AWG
Φ 0.51 mm Diameter

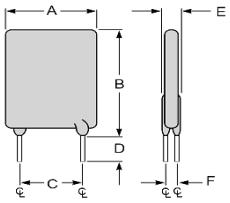


Fig.3
Lead Size : 20AWG
Φ 0.81 mm Diameter

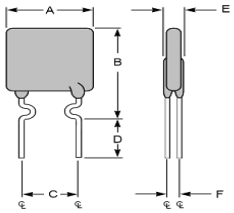
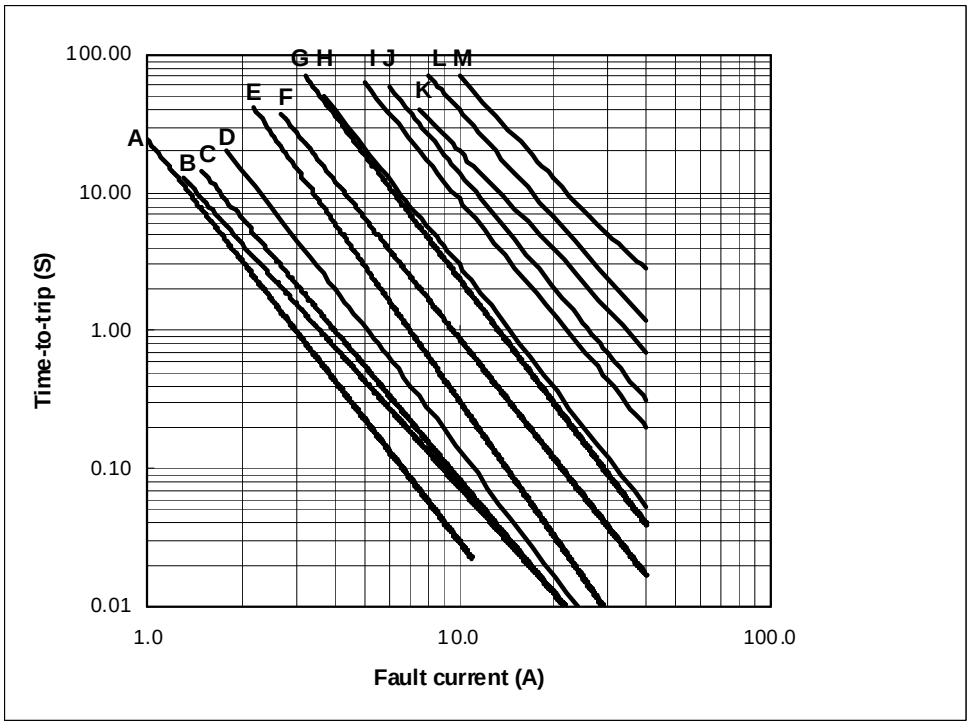


Fig.2
Lead Size : 20AWG
Φ 0.81 mm Diameter

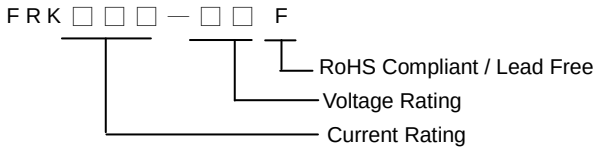
Part Number	Fig	A	B	C	D	E	F
		Max	Max	Typ	Min	Max	Typ
FRK050-60F	1	7.10	11.43	5.1	7.6	3.56	1.1
FRK065-60F	1	7.11	12.20	5.1	7.6	3.56	1.1
FRK075-60F	1	7.87	12.20	5.1	7.6	3.56	1.1
FRK090-60F	1	7.87	13.97	5.1	7.6	3.56	1.1
FRK110-60F	2	7.60	15.00	5.1	7.6	4.10	1.4
FRK135-60F	3	10.20	17.00	5.1	7.6	3.81	1.4
FRK160-60F	3	12.20	18.30	5.1	7.6	3.81	1.4
FRK185-60F	3	13.00	18.80	5.1	7.6	3.81	1.4
FRK250-60F	3	14.00	20.60	5.1	7.6	3.00	1.4
FRK300-60F	3	16.50	21.20	5.1	7.6	3.00	1.4
FRK375-60F	3	16.50	25.20	10.2	7.6	3.00	1.4
FRK400-60F	3	21.00	24.90	10.2	7.6	3.00	1.4
FRK500-60F	3	24.10	29.00	10.2	7.6	3.00	1.4

Typical Time-To-Trip at 23℃

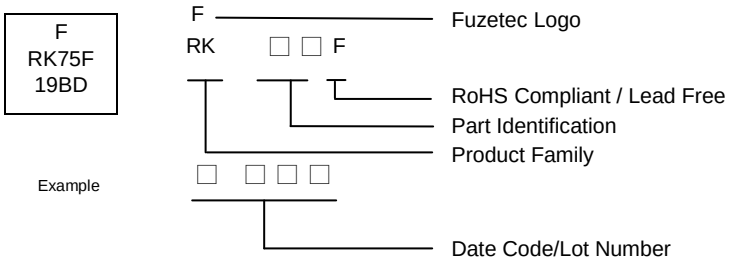
A = FRK050-60F
B = FRK065-60F
C = FRK075-60F
D = FRK090-60F
E = FRK110-60F
F = FRK135-60F
G = FRK160-60F
H = FRK185-60F
I = FRK250-60F
J = FRK300-60F
K = FRK375-60F
L = FRK400-60F
M = FRK500-60F



Part Numbering System



Part Marking System



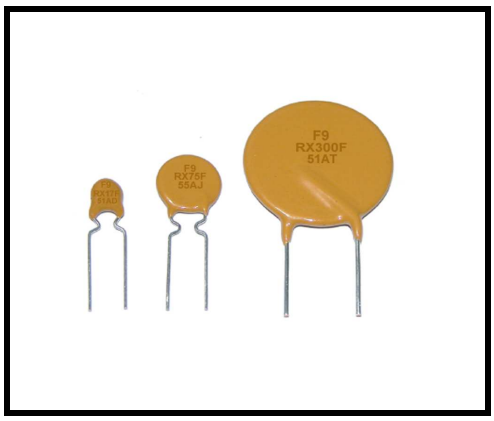
Standard Package

FRK050-60F	:	500 Pcs/Bag, 3.0K Reel/Tape
FRK065-60F~ FRK075-60F	:	300 Pcs/Bag, 3.0K Reel/Tape
FRK090-60F~ FRK110-60F	:	300 Pcs/Bag, 1.5K Reel/Tape
FRK135-60F~ FRK185-60F	:	200 Pcs/Bag, 1.5K Reel/Tape
FRK250-60F~ FRK500-60F	:	100 Pcs/Bag, 1.0K Reel/Tape

Warning:

- Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.
- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

FRX90V Series



RoHS 2002/95/EC | Lead Free

RoHS Compliant & Lead Free

Application: Telecom & wide variety of electronic equipment
Product Features: Low hold current, Solid state, Radial leaded product ideal for up to 90V_{DC}
Operation Current: 0.10A~3.75A
Maximum Voltage: Up to 90V_{DC}
Temperature Range: -40℃ to 85℃
Agency Recognition: UL (E211981)
C-UL (E211981)
*TÜV (R50004084)

Electrical Characteristics (23℃)

Part Number	Hold Current	Trip Current	Max.Time to Trip	Max. Current	Rated Voltage	Typ. Power	Resistance	
							R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	at 5xI_H, s	I_{MAX}, A	V_{MAX},V_{DC}	Pd, W	Ohms	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

Physical specifications:
Lead material: FRX010-90F~FRX090-90F Tin plated copper, 24 AWG.
FRX110-90F~FRX375-90F Tin plated copper, 20 AWG.
Soldering characteristics: MIL-STD-202, Method 208E.
Insulating coating:Flame retardant epoxy, meets UL 94 V-0 requirement.
* NOTE : TÜV is only applied for FRX040-90F~FRX375-90F.

Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
DERATING %	158%	136%	119%	100%	90%	81%	72%	63%	54%	40%

FRX90V Product Dimensions (mm)

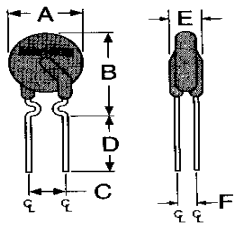


Fig. 1
Lead Size : 24AWG
Φ 0.51 mm Diameter

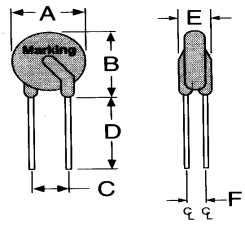
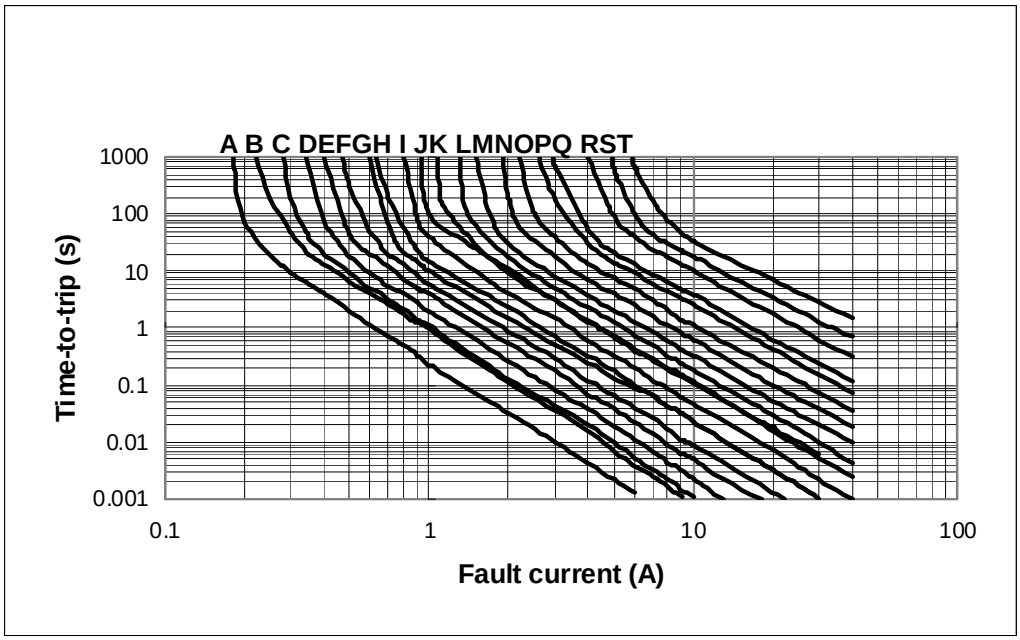


Fig. 2
Lead Size : 20AWG
Φ 0.81 mm Diameter

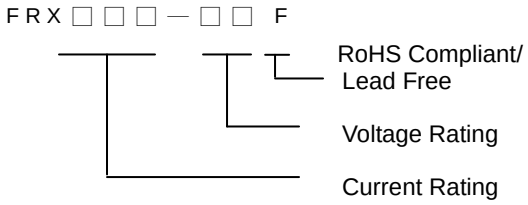
Part Number	Fig	A	B	C	D	E	F
		Max	Max	Typ	Min	Max	Typ
FRX010-90F	1	7.4	12.7	5.1	7.6	3.1	1.1
FRX015-90F	1	7.4	12.7	5.1	7.6	3.1	1.1
FRX017-90F	1	7.4	12.7	5.1	7.6	3.1	1.1
FRX020-90F	1	7.4	12.7	5.1	7.6	3.1	1.1
FRX025-90F	1	7.4	12.7	5.1	7.6	3.1	1.1
FRX030-90F	1	7.4	13.0	5.1	7.6	3.1	1.1
FRX035-90F	1	7.4	12.7	5.1	7.6	3.1	1.1
FRX040-90F	1	7.6	13.5	5.1	7.6	3.1	1.1
FRX050-90F	1	7.9	13.7	5.1	7.6	3.1	1.1
FRX055-90F	1	9.7	14.0	5.1	7.6	3.1	1.1
FRX065-90F	1	9.7	14.5	5.1	7.6	3.1	1.1
FRX075-90F	1	10.4	15.2	5.1	7.6	3.1	1.1
FRX090-90F	1	11.7	15.8	5.1	7.6	3.1	1.1
FRX110-90F	2	13.0	18.0	5.1	7.6	3.1	1.4
FRX135-90F	2	14.5	19.6	5.1	7.6	3.1	1.4
FRX160-90F	2	16.3	21.3	5.1	7.6	3.1	1.4
FRX185-90F	2	17.8	22.9	5.1	7.6	3.1	1.4
FRX250-90F	2	21.3	26.4	10.2	7.6	3.1	1.4
FRX300-90F	2	24.9	30.0	10.2	7.6	3.1	1.4
FRX375-90F	2	28.5	33.5	10.2	7.6	3.1	1.4

Typical Time-To-Trip at 23℃

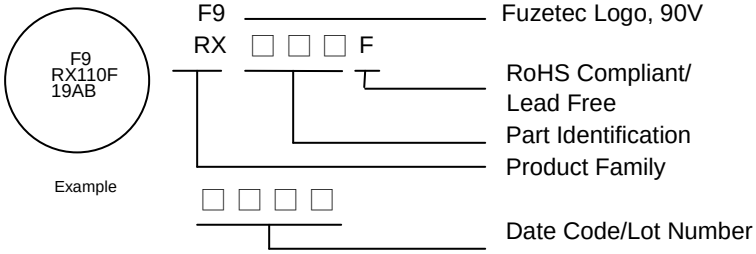
A = FRX010-90F
B = FRX015-90F
C = FRX017-90F
D = FRX020-90F
E = FRX025-90F
F = FRX030-90F
G = FRX035-90F
H = FRX040-90F
I = FRX050-90F
J = FRX055-90F
K = FRX065-90F
L = FRX070-90F
M = FRX090-90F
N = FRX110-90F
O = FRX135-90F
P = FRX160-90F
Q = FRX185-90F
R = FRX250-90F
S = FRX300-90F
T = FRX375-90F



Part Numbering System



Part Marking System



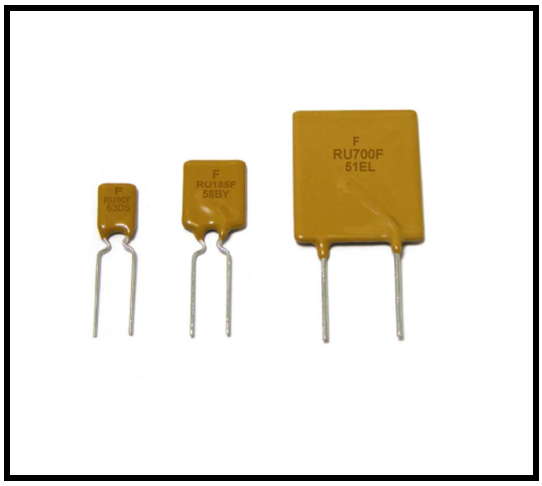
Standard Package

FRX010-90F~FRX055-90F	:	500Pcs/Bag, 3.0K Reel/Tape
FRX065-90F~FRX090-90F	:	300Pcs/Bag, 3.0K Reel/Tape
FRX110-90F	:	300Pcs/Bag, 1.5K Reel/Tape
FRX135-90F~FRX185-90F	:	200Pcs/Bag, 1.5K Reel/Tape
FRX250-90F~FRX375-90F	:	100Pcs/Bag, 1.0K Reel/Tape

Warning: - Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.

- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

FRU Series



RoHS 2002/95/EC | Pb Lead Free

RoHS Compliant & Lead Free

Application: Wide variety of electronic equipment
Product Features: Low resistance, High hold current, Solid state Radial-leaded product ideal for up to $30V_{DC}$
Operation Current: 0.9A~9.0A
Maximum Voltage: $30V_{DC}$
Temperature Range: -40℃ to 85℃
Agency Recognition: UL(E211981)
C-UL(E211981)
TÜV (R3-50004084)

Electrical Characteristics(23℃)

Part Number	Hold Current	Trip Current	Max.Time To Trip	Max. Current	Rated Voltage	Typ. Power	Resistance	
							R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	at 5xI_H, s	I_{MAX}, A	V_{MAX}, V_{DC}	Pd, W	Ohms	Ohms
FRU090-30F	0.90	1.80	5.9	40	30	0.6	0.070	0.220
FRU110-30F	1.10	2.20	6.6	40	30	0.7	0.050	0.170
FRU135-30F	1.35	2.70	7.3	40	30	0.8	0.040	0.130
FRU160-30F	1.60	3.20	8.0	40	30	0.9	0.030	0.110
FRU185-30F	1.85	3.70	8.7	40	30	1.0	0.030	0.090
FRU250-30F	2.50	5.00	10.3	40	30	1.2	0.020	0.070
FRU300-30F	3.00	6.00	10.8	40	30	2.0	0.020	0.080
FRU400-30F	4.00	8.00	12.7	40	30	2.5	0.010	0.050
FRU500-30F	5.00	10.00	14.5	40	30	3.0	0.010	0.050
FRU600-30F	6.00	12.00	16.0	40	30	3.5	0.005	0.040
FRU700-30F	7.00	14.00	17.5	40	30	3.8	0.005	0.030
FRU800-30F	8.00	16.00	18.8	40	30	4.0	0.005	0.020
FRU900-30F	9.00	18.00	20.0	40	30	4.2	0.005	0.020

Physical specifications:
Lead material: FRU090-30F~FRU250-30F Tin plated copper, 24 AWG.
FRU300-30F~FRU900-30F Tin plated copper, 20 AWG.
Soldering characteristics: MIL-STD-202, Method 208E.
Insulating coating:Flame retardant epoxy, meets UL 94 V-0 requirement.

Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
DERATING %	145%	130%	115%	100%	91%	83%	76%	67%	61%	52%

FRU Product Dimensions (mm)

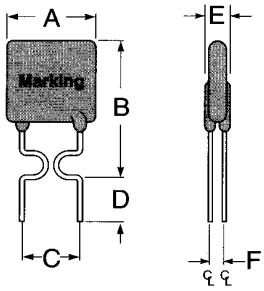


Fig.1
Lead Size: 24AWG,
Φ 0.51 mm Diameter

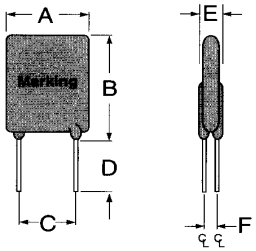
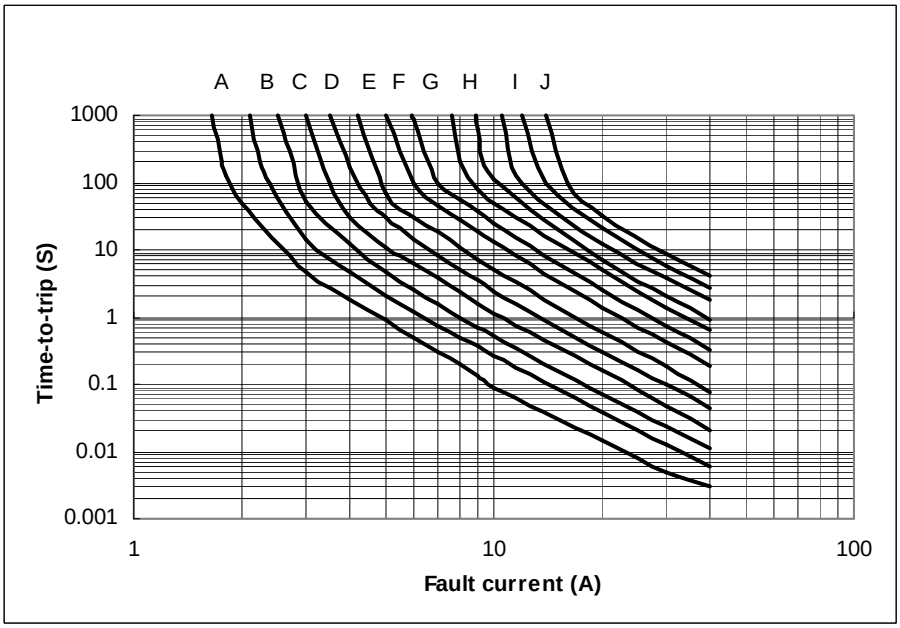


Fig.2
Lead Size: 20AWG
Φ 0.81 mm Diameter

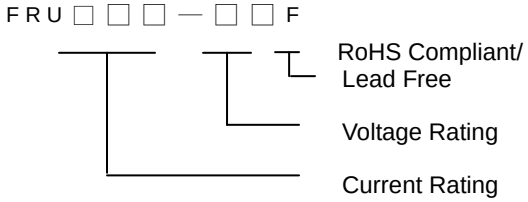
Part Number	Fig	A	B	C	D	E	F
		Max	Max	Typ	Min	Max	Typ
FRU090-30F	1	7.4	12.2	5.1	7.6	3.0	0.9
FRU110-30F	1	7.4	14.2	5.1	7.6	3.0	0.9
FRU135-30F	1	8.9	13.5	5.1	7.6	3.0	0.9
FRU160-30F	1	8.9	15.2	5.1	7.6	3.0	0.9
FRU185-30F	1	10.2	15.7	5.1	7.6	3.0	0.9
FRU250-30F	1	11.4	18.3	5.1	7.6	3.0	0.9
FRU300-30F	2	11.4	17.3	5.1	7.6	3.0	1.2
FRU400-30F	2	14.0	20.1	5.1	7.6	3.0	1.2
FRU500-30F	2	14.0	24.9	10.2	7.6	3.0	1.2
FRU600-30F	2	16.5	24.9	10.2	7.6	3.0	1.2
FRU700-30F	2	19.1	26.7	10.2	7.6	3.0	1.2
FRU800-30F	2	21.6	29.2	10.2	7.6	3.0	1.2
FRU900-30F	2	24.1	29.7	10.2	7.6	3.0	1.2

Typical Time-To-Trip at 23℃

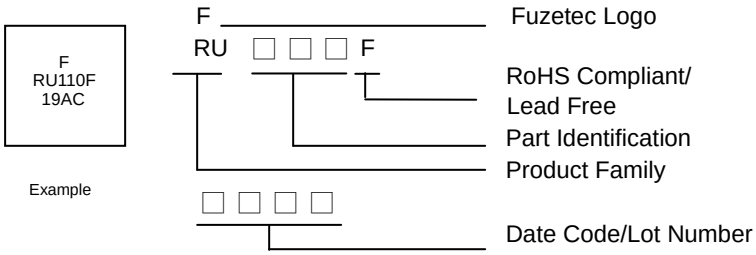
A = FRU090-30F
B = FRU110-30F
C = FRU135-30F
D = FRU160-30F
E = FRU185-30F
F = FRU250-30F
G = FRU300-30F
H = FRU400-30F
I = FRU500-30F
J = FRU600-30F
K = FRU700-30F
L = FRU800-30F
M = FRU900-30F



Part Numbering System



Part Marking System



Standard Package

FRU090-30F~FRU110-30F	:	500 Pcs/Bag, 3.0K Reel/Tape
FRU135-30F~FRU250-30F	:	300 Pcs/Bag, 3.0K Reel/Tape
FRU300-30F~FRU400-30F	:	200 Pcs/Bag, 1.5K Reel/Tape
FRU500-30F	:	200 Pcs/Bag
FRU600-30F~FRU900-30F	:	100 Pcs/Bag

Warning:

- Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.
- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

FRT Series

RoHS 2002/95/EC | Lead Free

RoHS Compliant& Lead Free

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_{DC}

Operation Current: 0.5A~2.5A

Maximum Voltage: 36V_{DC}

Temperature Range: -40℃ to 85℃

Agency Recognition: UL(E211981)
C-UL(E211981)
TÜV (R50004084)

Electrical Characteristics (23℃)

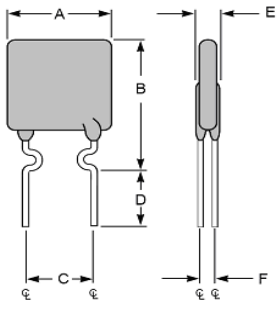
Part Number	Hold Current	Trip Current	Max.Time To Trip	Max. Current	Rated Voltage	Typ. Power	Resistance	
							R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	at 5xI_H, s	I_{MAX}, A	V_{MAX}, V_{DC}	Pd, W	Ohms	Ohms
FRT050-33F	0.50	1.00	5.0	40	36	0.67	0.140	0.448
FRT075-33F	0.75	1.50	4.0	40	36	0.71	0.115	0.368
FRT090-33F	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

Physical specifications:
Lead material: Tin plated copper, 24 AWG.
Soldering characteristics:MIL-STD-202, Method 208E.
Insulating coating:Flame retardant epoxy, meets UL 94 V-0 requirement.

Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
DERATING %	148%	135%	120%	100%	98%	90%	85%	78%	70%	64%

FRT Product Dimensions (mm)

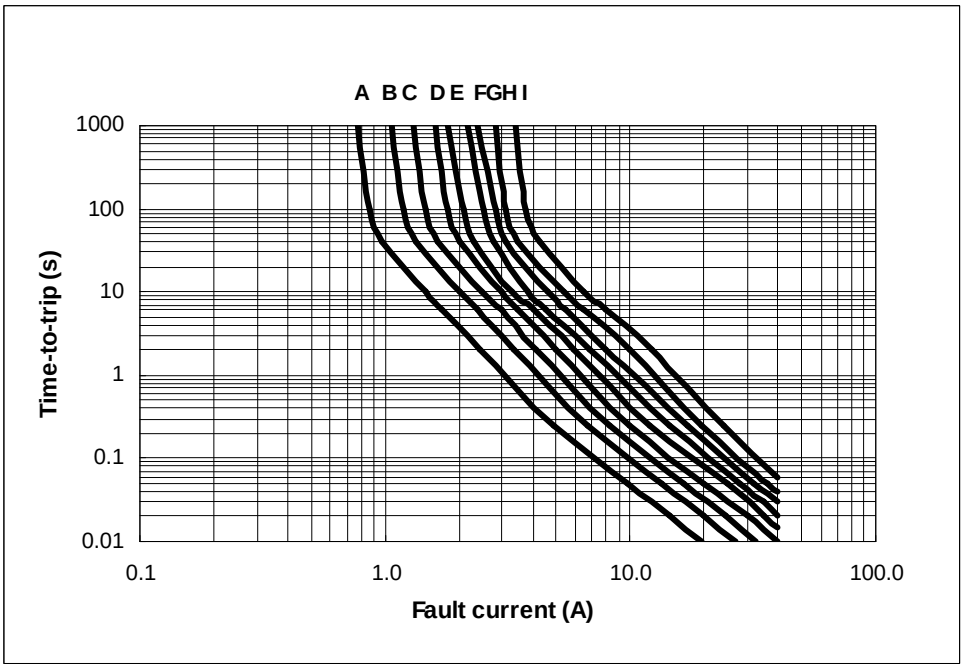


Lead Size: 24AWG,
Φ 0.51 mm Diameter

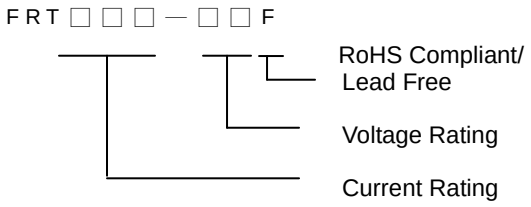
Part Number	A	B	C	D	E	F
	Max	Max	Typ	Min	Max	Typ
FRT050-33F	7.4	12.2	5.1	7.6	3.0	1.1
FRT075-33F	7.4	12.2	5.1	7.6	3.0	1.1
FRT090-33F	7.4	12.2	5.1	7.6	3.0	1.1
FRT120-33F	7.4	12.2	5.1	7.6	3.0	1.1
FRT135-33F	7.4	14.2	5.1	7.6	3.0	1.1
FRT160-33F	7.4	14.0	5.1	7.6	3.0	1.1
FRT190-33F	9.0	13.5	5.1	7.6	3.0	1.1
FRT220-33F	10.0	17.0	5.1	7.6	3.0	1.1
FRT250-33F	10.0	19.5	5.1	7.6	3.0	1.1

Typical Time-To-Trip at 23℃

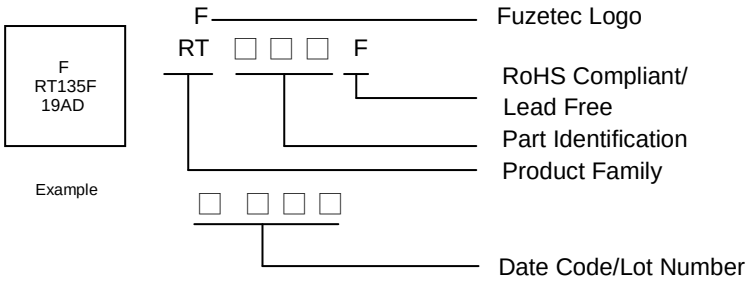
A = FRT 050-33F
B = FRT 075-33F
C = FRT 090-33F
D = FRT 120-33F
E = FRT 135-33F
F = FRT 160-33F
G = FRT 190-33F
H = FRT 220-33F
I = FRT 250-33F



Part Numbering System



Part Marking System

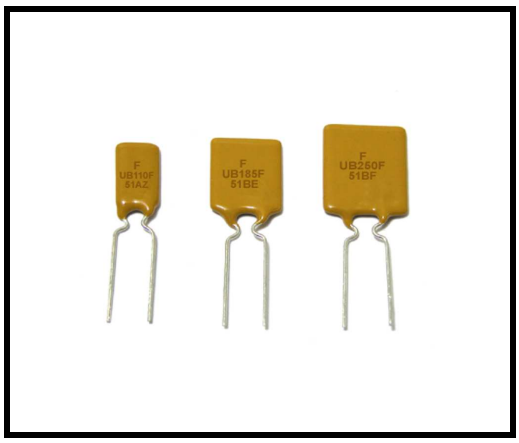


Standard Packag

FRT050-33F~FRT250-33F **:** 500 Pcs/Bag, 3.0K Reel/Tape

Warning:
- Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.
- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

FUSB Series



RoHS 2002/95/EC | Lead Free

RoHS Compliant & Lead Free

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_{DC}

Temperature Range: -40℃ to 85℃

Agency Recognition: UL(E211981)
C-UL(E211981)
TÜV (R3-50004084)

Electrical characteristics(23℃)

Part Number	Hold Current	Trip Current	Max.Time to Trip		Max. Current	Rated Voltage	Typ. Power	Resistance	
								R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	at 8A, s	at 5xI_H, s	I_{MAX}, A	V_{MAX}, V_{DC}	Pd, W	Ohms	Ohms
FUSB075F	0.75	1.30	0.4	--	40	16	0.3	0.08	0.23
FUSB090F	0.90	1.80	1.2	5.9	40	16/30	0.6	0.07	0.18
FUSB110F	1.10	2.20	2.3	6.6	40	16/30	0.7	0.05	0.14
FUSB120F	1.20	2.00	0.5	--	40	16	0.6	0.04	0.14
FUSB135F	1.35	2.70	4.5	7.3	40	16/30	0.8	0.04	0.12
FUSB155F	1.55	2.70	0.6	--	40	16	0.7	0.03	0.12
FUSB160F	1.60	3.20	9.0	8.0	40	16/30	0.9	0.03	0.11
FUSB185F	1.85	3.70	10.0	8.7	40	16/30	1.0	0.03	0.09
FUSB250F	2.50	5.00	40.0	10.3	40	16/30	1.2	0.02	0.07

Physical specifications:
Lead material: Tin plated copper, 24 AWG.
Soldering characteristics:MIL-STD-202, Method 208E.
Insulating coating:Flame retardant epoxy polymer,meets UL 94V-0 requirement.

Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
DERATING %	145%	130%	115%	100%	91%	83%	76%	67%	61%	52%

FUSB Product Dimensions (mm)

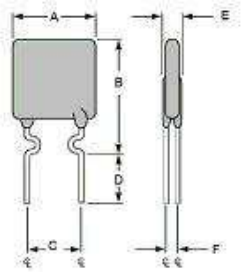


Fig.1
Lead Size: 24AWG,
Φ 0.51 mm Diameter

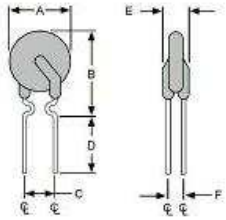
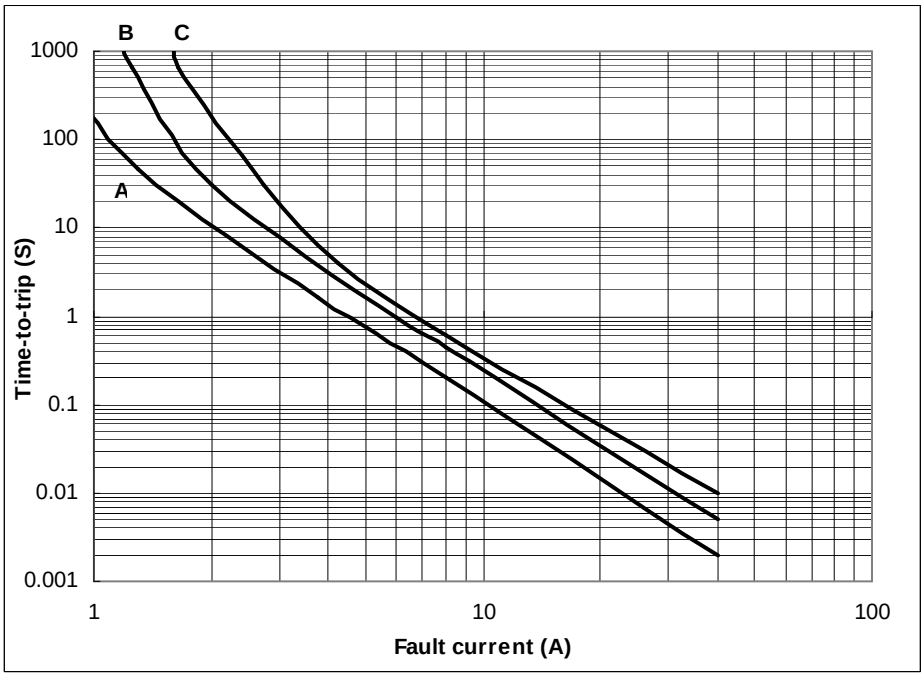


Fig.2
Lead Size: 24AWG
Φ 0.51 mm Diameter

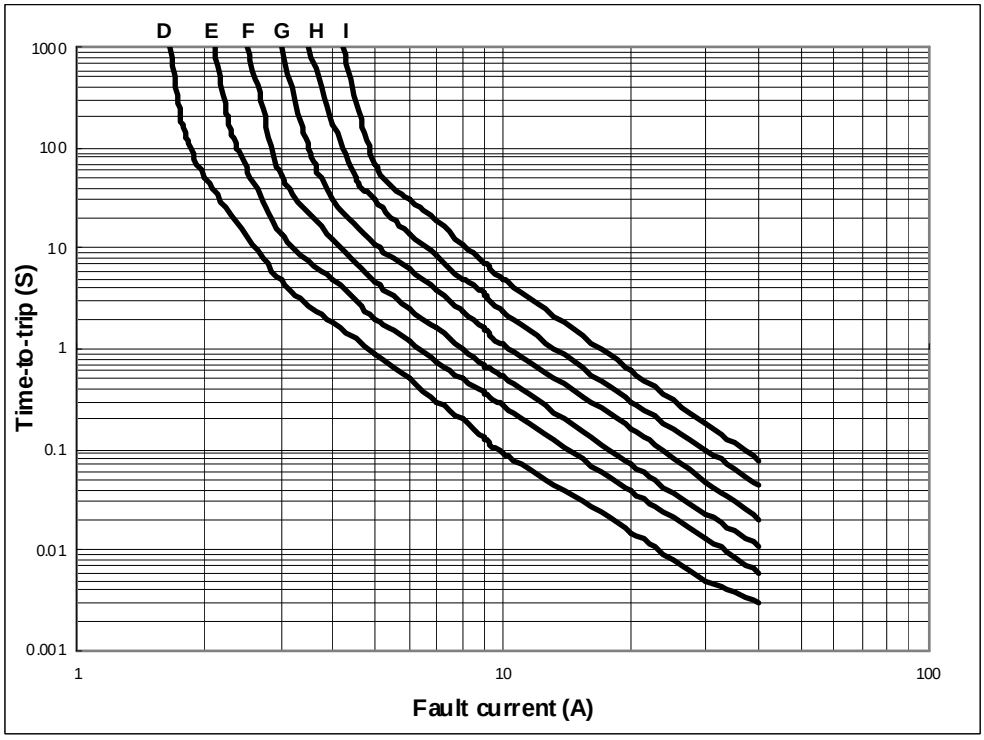
Part Number	Fig	A	B	C	D	E	F
		Max	Max	Typ	Min	Max	Typ
FUSB075F	2	6.9	11.4	5.1	7.6	3.0	0.8
FUSB090F	1	7.4	12.2	5.1	7.6	3.0	0.8
FUSB110F	1	7.4	14.2	5.1	7.6	3.0	0.8
FUSB120F	2	6.9	11.7	5.1	7.6	3.0	0.8
FUSB135F	1	8.9	13.5	5.1	7.6	3.0	0.8
FUSB155F	2	6.9	11.7	5.1	7.6	3.0	0.8
FUSB160F	1	8.9	15.2	5.1	7.6	3.0	0.8
FUSB185F	1	10.2	15.7	5.1	7.6	3.0	0.8
FUSB250F	1	11.4	18.3	5.1	7.6	3.0	0.8

Typical Time-To-Trip at 23℃

A = FUSB075F
B = FUSB120F
C = FUSB155F



D = FUSB090F
E = FUSB110F
F = FUSB135F
G = FUSB160F
H = FUSB185F
I = FUSB250F



Part Numbering System

F U S B □ □ □ F

RoHS Compliance/ Lead Free

Current Rating

Part Marking System

Example

F — Fuzetec Logo

UB □ □ □ F

RoHS Compliance/ Lead Free

Part Identification

Product Family

□ □ □ □

Date Code/Lot Number

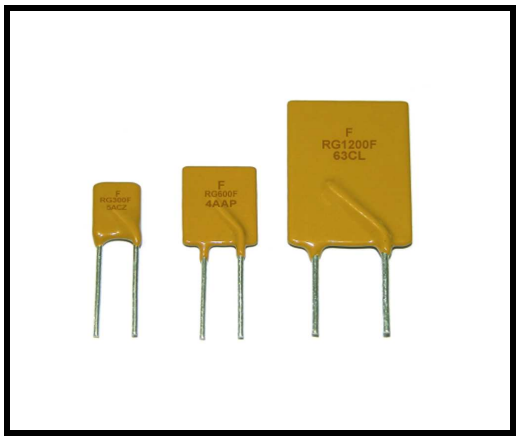
Standard Package

FUSB075F~FUSB250F : 500 Pcs/Bag, 3.0K Reel/Tape

Warning: - Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.

- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

FRG Series



RoHS 2002/95/EC | Lead Free

RoHS Compliant & Lead Free

Application: Wide variety of electronic equipment
Product Features: Very high hold current, Solid state Radial-leaded product ideal for up to 16V_{DC}
Operation Current: 2.5 A~14.0A
Maximum Voltage: 16V_{DC}
Temperature Range: -40℃ to 85℃
Agency Recognition: UL(E211981)
C-UL(E211981)
TÜV (R50004084)

Electrical Characteristics(23℃)

Part Number	Hold Current	Trip Current	Max.time to trip	Max. Current	Rated Voltage	Typ. Power	Resistance	
							R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	at 5xI_H, s	I_{MAX}, A	V_{MAX}, V_{DC}	Pd, 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

Physical specifications:
Lead material: FRG250-16F Tin plated copper, 24 AWG.
FRG300-16F~FRG1100-16F Tin plated copper, 20 AWG.
FRG1200-16F~FRG1400-16F Tin plated copper, 18 AWG.
Soldering characteristics: MIL-STD-202, Method 208E.
Insulating coating:Flame retardant epoxy, meets UL 94 V-0 requirement.

Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
DERATING %	149%	132%	120%	100%	95%	88%	80%	71%	61%	47%

FRG Product Dimensions (mm)

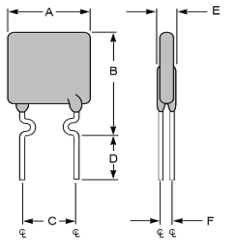


Fig.1
Lead Size: 24AWG
Φ 0.51 mm Diameter

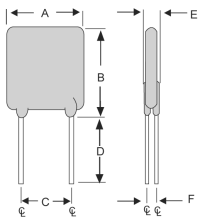


Fig.2
Lead Size: 20AWG
Φ 0.81 mm Diameter

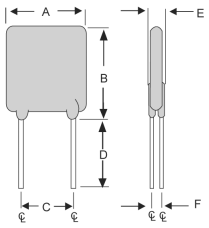
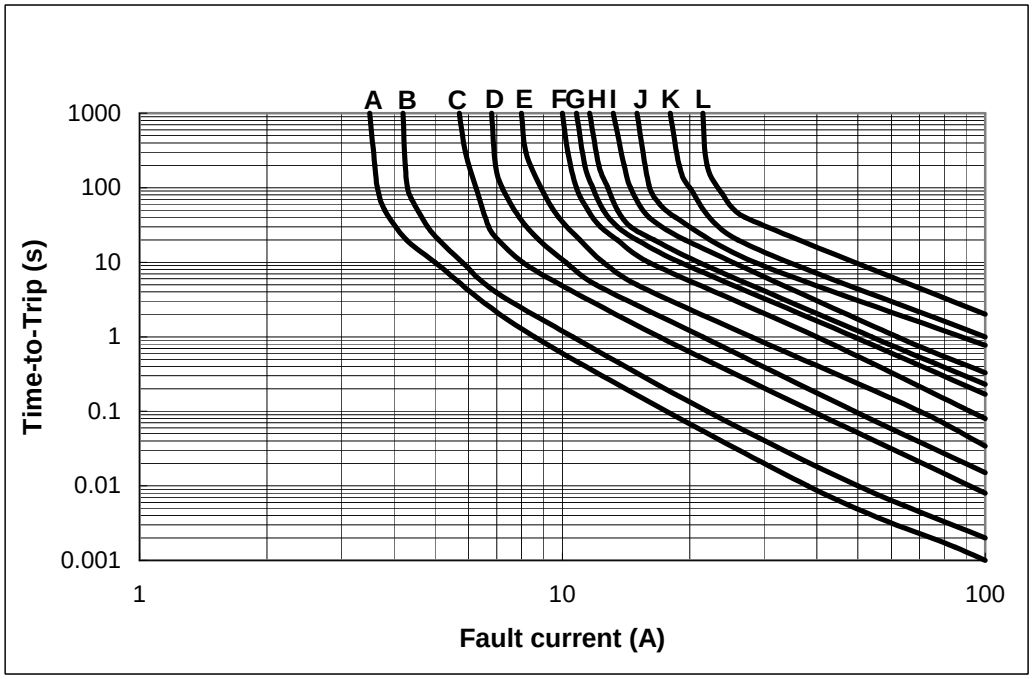


Fig.3
Lead Size: 18AWG
Φ 1.0 mm Diameter

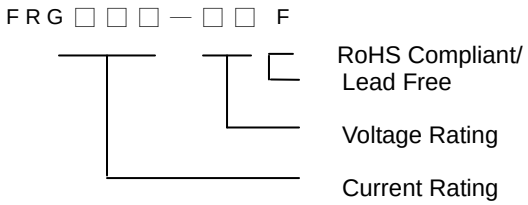
Part Number	Fig	A	B	C	D	E	F
		Max	Max	Typ	Min	Max	Typ
FRG250-16F	1	8.9	12.8	5.1	7.6	3.0	1.2
FRG300-16F	2	7.1	11.0	5.1	7.6	3.0	1.2
FRG400-16F	2	8.9	12.8	5.1	7.6	3.0	1.2
FRG500-16F	2	10.4	14.3	5.1	7.6	3.0	1.2
FRG600-16F	2	10.7	17.1	5.1	7.6	3.0	1.2
FRG700-16F	2	11.2	19.7	5.1	7.6	3.0	1.2
FRG800-16F	2	12.7	20.9	5.1	7.6	3.0	1.2
FRG900-16F	2	14.0	21.7	5.1	7.6	3.0	1.2
FRG1000-16F	2	16.5	24.1	5.1	7.6	3.0	1.2
FRG1100-16F	2	17.5	26.0	5.1	7.6	3.0	1.2
FRG1200-16F	3	17.5	28.0	10.2	7.6	3.6	1.4
FRG1400-16F	3	27.9	27.9	10.2	7.6	3.6	1.4

Typical Time-To-Trip at 23℃

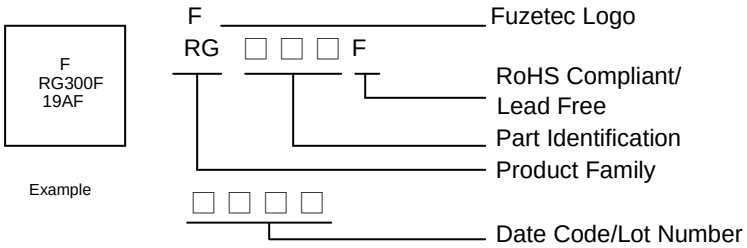
A = FRG250-16F
B = FRG300-16F
C = FRG400-16F
D = FRG500-16F
E = FRG600-16F
F = FRG700-16F
G = FRG800-16F
H = FRG900-16F
I = FRG1000-16F
J = FRG1100-16F
K = FRG1200-16F
L = FRG1400-16F



Part Numbering System



Part Marking System



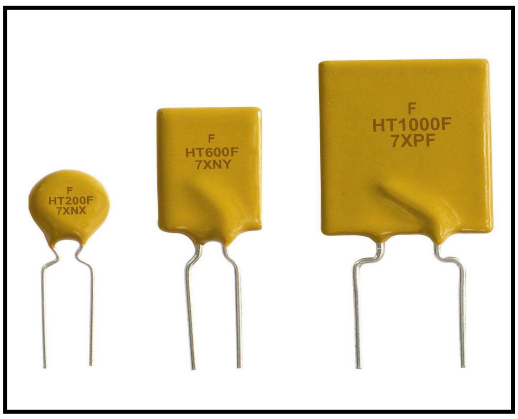
Standard Package

FRG250-16F~FRG300-16F	:	500 Pcs/Bag, 2.5K Reel/Tape
FRG400-16F~FRG600-16F	:	300 Pcs/Bag, 2.5K Reel/Tape
FRG700-16F	:	200 Pcs/Bag, 1.5K Reel/Tape
FRG800-16F~FRG900-16F	:	200 Pcs/Bag
FRG1000-16F~FRG1400-16F	:	100 Pcs/Bag

Warning:

- Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.
- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

FHT Series



RoHS 2002/95/EC | Pb Lead Free

RoHS Compliant & Lead Free

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_{DC} and operating temperatures up to 125℃.

Operation Current : 0.5A~15.0A

Maximum Voltage : 16V/30V_{DC}

Temperature Range : -40℃ to 125℃

Agency Recognition : *UL(E211981)
*C-UL(E211981)
TÜV (Pending)

Electrical Characteristics(23℃)

Part Number	Hold Current	Trip Current	Max.Time to Trip	Max. Current	Rated Voltage	Typical Power	Resistance	
							R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	at 5xI_H, s	I_{MAX}, A	V_{MAX}, V_{DC}	Pd, 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

Physical specifications:
Lead material: FHT050-30F~FHT100-30F and FHT200-16F Tin plated copper, 24 AWG.
FHT300-16F~FHT1100-16F Tin plated copper, 20 AWG.
FHT1300-16F~FHT1500-16F Tin plated copper, 18 AWG.
Soldering characteristics:MIL-STD-202, Method 208E.
Insulating coating:Flame retardant epoxy, meets UL 94 V-0 requirement.

*Note: FHT050-30F, FHT070-30F and FHT100-30F UL, C-UL Pending

Thermal Derating for PPTC Device at Various Ambient Temperatures

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

FHT Product Dimensions (mm)

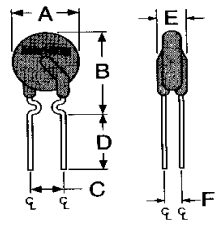


Fig.1
Lead Size :24AWG
Φ0.51 mm Diameter

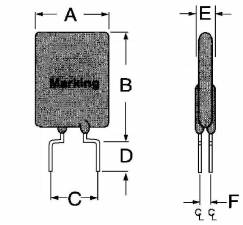


Fig.3
Lead Size : 20AWG
Φ0.81 mm Diameter

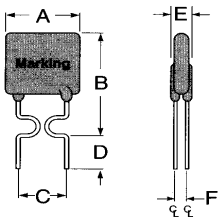


Fig.2
Lead Size :24AWG
Φ0.51 mm Diameter

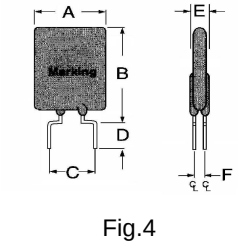
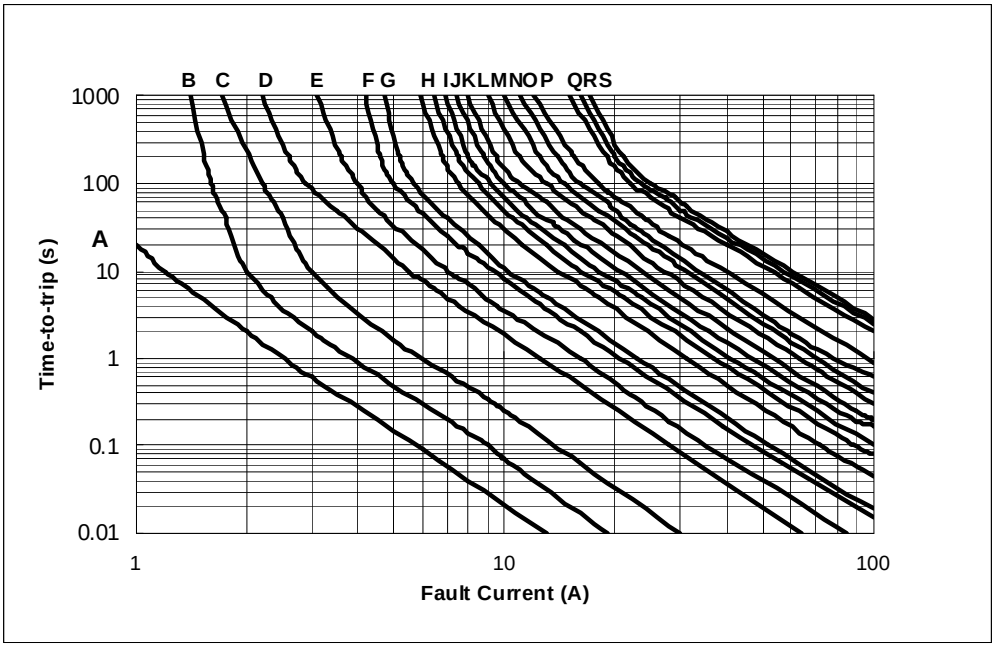


Fig.4
Lead Size : 18AWG
Φ 1.00 mm Diameter

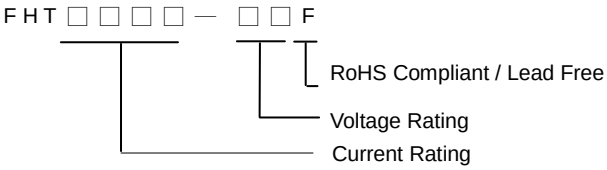
Part Number	Fig	A	B	C	D	E	F
		Max	Max	Typ	Min	Max	Typ
FHT050-30F	1	7.4	12.7	5.1	7.6	3.0	1.2
FHT070-30F	2	6.9	10.8	5.1	7.6	3.0	1.2
FHT100-30F	1	9.7	13.6	5.1	7.6	3.0	1.2
FHT200-16F	1	9.4	14.4	5.1	7.6	3.0	1.2
FHT300-16F	3	8.8	13.8	5.1	7.6	3.0	1.2
FHT400-16F	3	10.0	15.0	5.1	7.6	3.0	1.2
FHT450-16F	3	10.4	15.6	5.1	7.6	3.0	1.2
FHT550-16F	3	11.2	18.9	5.1	7.6	3.0	1.2
FHT600-16F	3	11.2	21.0	5.1	7.6	3.0	1.2
FHT650-16F	3	12.7	22.2	5.1	7.6	3.0	1.2
FHT700-16F	3	14.0	21.9	5.1	7.6	3.0	1.2
FHT750-16F	3	14.0	23.5	5.1	7.6	3.0	1.2
FHT800-16F	3	16.5	22.5	5.1	7.6	3.0	1.2
FHT900-16F	3	16.5	25.7	5.1	7.6	3.0	1.2
FHT1000-16F	3	17.5	26.5	10.2	7.6	3.0	1.2
FHT1100-16F	3	21.0	26.1	10.2	7.6	3.0	1.2
FHT1300-16F	4	23.5	28.7	10.2	7.6	3.6	1.4
FHT1400-16F	4	23.5	28.7	10.2	7.6	3.6	1.4
FHT1500-16F	4	23.5	28.7	10.2	7.6	3.6	1.4

Typical Time-To-Trip at 23℃

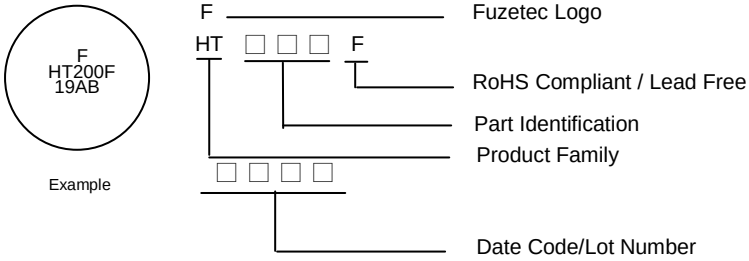
A = FHT050-30F
B = FHT070-30F
C = FHT100-30F
D = FHT200-16F
E = FHT300-16F
F = FHT400-16F
G = FHT450-16F
H = FHT550-16F
I = FHT600-16F
J = FHT650-16F
K = FHT700-16F
L = FHT750-16F
M = FHT800-16F
N = FHT900-16F
O = FHT1000-16F
P = FHT1100-16F
Q = FHT1300-16F
R = FHT1400-16F
S = FHT1500-16F



Part Numbering System



Part Marking System



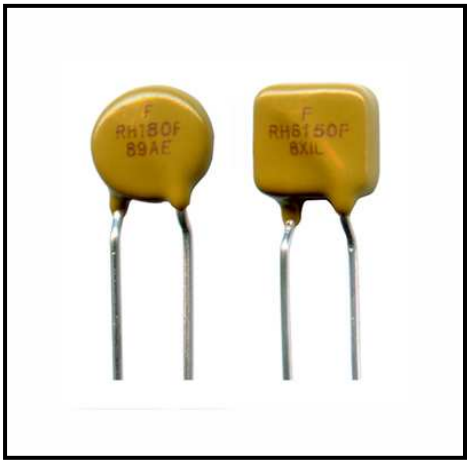
Standard Package

FHT050-30F~FHT100-30F, FHT200-16F~FHT300-16F	:	500 Pcs/Bag, 2.5K Reel/Tape
FHT400-16F	:	300 Pcs/Bag, 2.5K Reel/Tape
FHT450-16F~FHT550-16F	:	300 Pcs/Bag, 1.5K Reel/Tape
FHT600-16F	:	200 Pcs/Bag, 1.5K Reel/Tape
FHT650-16F~FHT700-16F	:	200 Pcs/Bag
FHT750-16F~FHT1500-16F		100 Pcs/Bag

Warning:

- Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.
- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

FRHV Series



RoHS 2002/95/EC | Pb Lead Free

RoHS Compliant & Lead Free

Application : Telecommunication and Data transmitting
Product Features : Low hold current, Solid state
Operation Current : 0.08 A~0.18A
Max. Operation Voltage : 100V/250V_{DC}
Max. Interrupt Voltage : 250V/600V
Temperature Range : -40℃ to 85℃
Agency Recognition : UL(E211981) ,C-UL(E211981)
TÜV (R50138901)
*UL497A

Electrical Characteristics (23℃)

Part Number	Hold Current	Trip Current	Max. Time To Trip		Max. Current	Max. Oper. Voltage	Max. Int. Voltage	Typ. Power	Resistance	
			Current	Time					R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	A	Sec	I_{MAX}, A	V_{MAX}, V_{DC}	V_{I-MAX},V	Pd, W	Ohms	Ohms
FRH080-250UVF	0.08	0.16	0.35	4.0	3.0	100	250	1.0	14.0	33.0
FRH080-250VF	0.08	0.16	0.35	4.0	3.0	100	250	1.0	14.0	33.0
FRH110-250UVF	0.11	0.22	1.00	2.0	3.0	100	250	1.0	5.0	16.0
FRH110-250VF	0.11	0.22	1.00	2.0	3.0	100	250	1.0	5.0	16.0
FRH120-250UVF	0.12	0.24	1.00	2.0	3.0	100	250	1.0	6.0	16.0
FRH120-250VF	0.12	0.24	1.00	2.0	3.0	100	250	1.0	4.0	16.0
FRH145-250UVF	0.15	0.29	1.00	2.5	3.0	100	250	1.0	3.5	12.0
FRH145-250VF	0.15	0.29	1.00	2.5	3.0	100	250	1.0	3.0	12.0
FRH180-250UVF	0.18	0.65	1.50	10.0	10.0	100	250	1.5	0.8	4.0
FRH180-250VF	0.18	0.65	1.50	11.0	10.0	100	250	1.5	0.8	4.0
FRH180-250XF	0.18	0.65	3.00	2.0	10.0	100	250	1.5	0.8	4.0
FRH150-600VF	0.15	0.30	1.00	5.0	3.0	250	600	1.0	6.0	22.0
FRH150-600MF	0.15	0.30	1.00	3.0	3.0	250	600	1.0	6.0	17.0
FRH160-600VF	0.16	0.32	1.00	7.0	3.0	250	600	1.0	4.0	18.0

Physical specifications:
Lead material: FRH080-250VF ~ FRH180-250VF Tin plated copper,22 AWG.
FRH150-600VF ~ FRH160-600VF Tin plated copper,22 AWG.
Soldering characteristics:MIL-STD-202, Method 208E.
Insulating coating:Flame retardant epoxy ,meet UL 94 V-0 requirement.
*NOTE : All FRHV products are designed to assist equipment to pass ITU, UL60950, GR1089 and TIA-968-A specification.
*FRH150-600VF, FRH150-600MF, FRH160-600VF meet UL497A Overvoltage and Endurance Conditioning requirements for Thermistor type component.

CAUTION : FRH devices are not intended for continous use of Line Voltage such as 120 VAC~ 240VAC and above.

Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
DERATING %	159%	138%	119%	100%	92%	83%	73%	64%	55%	42%

FRHV Product Dimensions (mm)

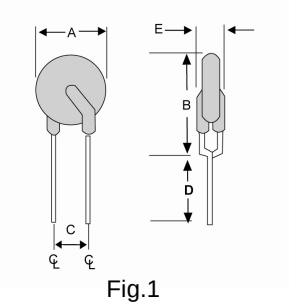


Fig.1
Lead Size : 22AWG,
Φ 0.65 mm Diameter

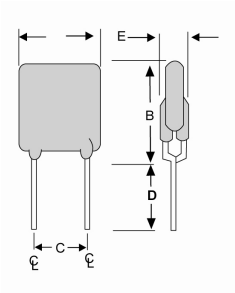
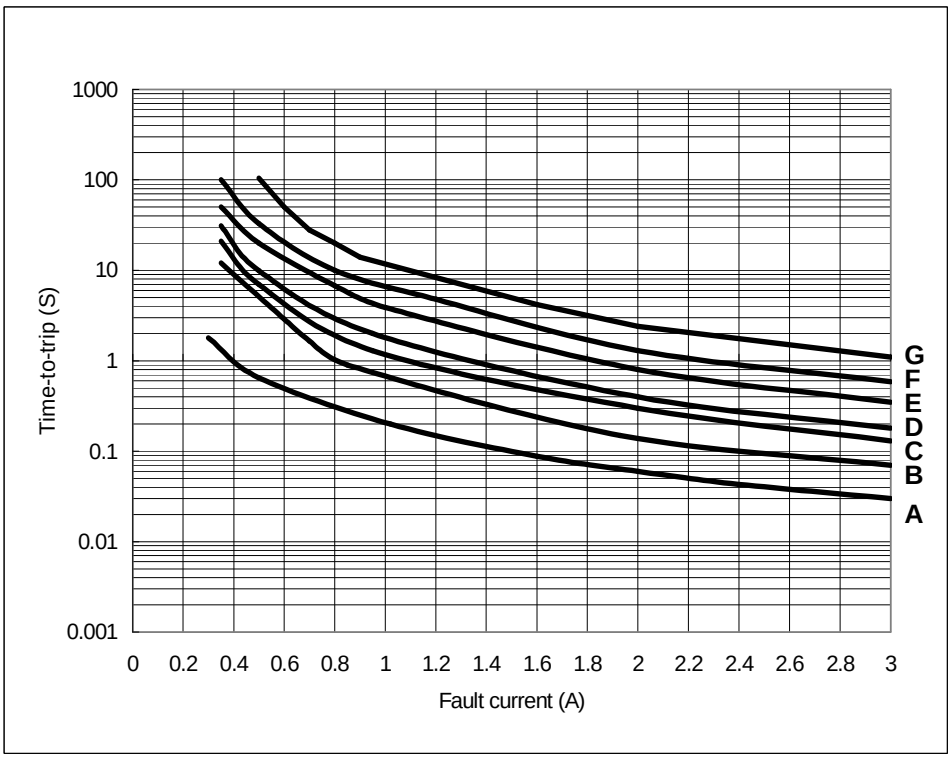


Fig.2
Lead Size : 22AWG,
Φ 0.65 mm Diameter

Part Number	Fig	A	B	C	D	E
		Max	Max	Typ	Min	Max
FRH080-250UVF	1	5.1	9.1	5.0	4.7	3.8
FRH080-250VF	1	5.8	9.6	5.0	4.7	4.6
FRH110-250UVF	1	5.9	9.4	5.0	4.7	3.8
FRH110-250VF	1	6.8	9.9	5.0	4.7	4.6
FRH120-250UVF	2	6.0	10.0	5.0	4.7	3.8
FRH120-250VF	2	6.5	11.0	5.0	4.7	4.6
FRH145-250UVF	2	6.0	10.0	5.0	4.7	3.8
FRH145-250VF	2	6.5	11.0	5.0	4.7	4.6
FRH180-250UVF	2	10.4	12.6	5.0	4.7	3.8
FRH180-250VF	2	10.9	12.6	5.0	4.7	4.6
FRH180-250XF	1	9.0	12.0	5.0	4.7	3.8
FRH150-600VF	2	13.5	12.6	5.0	4.7	6.0
FRH150-600MF	2	9.0	12.5	5.0	4.7	4.6
FRH160-600VF	2	16.0	12.6	5.0	4.7	6.0

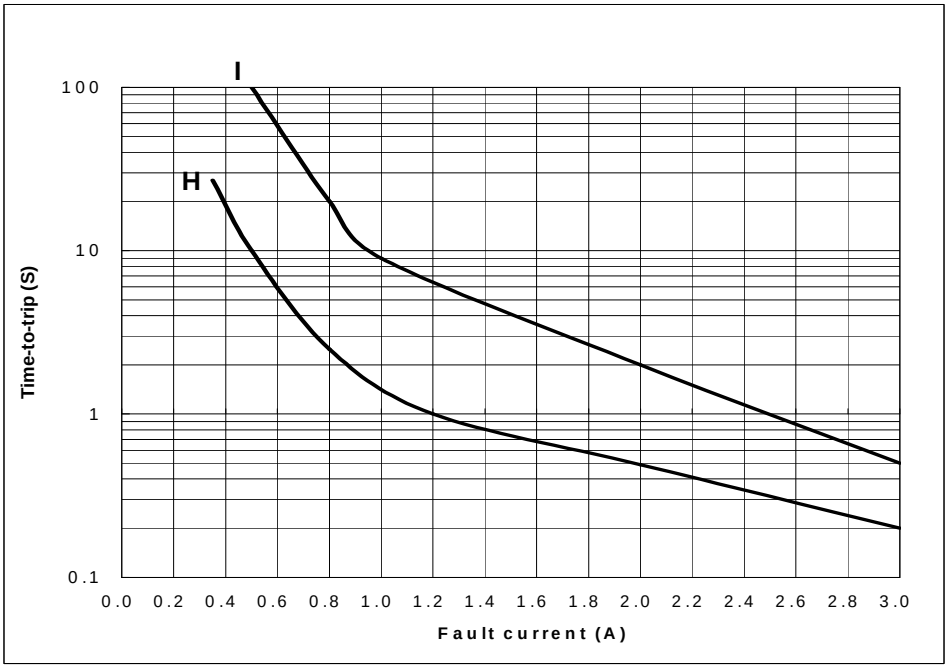
Typical Time-To-Trip at 23℃

A = FRH080-250UVF & FRH080-250VF
B = FRH110-250UVF & FRH110-250VF
C = FRH120-250UVF & FRH120-250VF
D = FRH145-250UVF & FRH145-250VF
E = FRH180-250UVF & FRH180-250VF
F = FRH150-600VF
G = FRH160-600VF



H = FRH180-250XF

I = FRH150-600MF

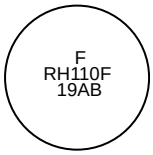


Part Numbering System

FRH □□□ — □□□ UVF

- RoHS Compliant / Lead Free
- V: High operating voltage device
- X: Round type
- M: Special type
- Unencapsulated part
- Maximum interrupt
- Voltage Rating
- Current Rating

Part Marking System



Example

F — Fuzetec Logo

RH □□□ F

- RoHS Compliant / Lead Free
- Part Identification
- Product Family

□□□□ — Date Code/Lot Number

*** FRH150-600F Marking : RH6150F**

*** FRH160-600F Marking : RH6160F**

Standard Package

FRH080-250UVF~FRH145-250VF	:	300 Pcs/Bag, 1.5K Reel/Tape
FRH180-250UVF	:	300 Pcs/Bag, 1.2K Reel/Tape
FRH180-250VF	:	200 Pcs/Bag, 1.2K Reel/Tape
FRH180-250XF	:	200 Pcs/Bag, 1.5K Reel/Tape
FRH150-600VF	:	100 Pcs/Bag, 0.6K Reel/Tape
FRH150-600MF	:	100 Pcs/Bag, 1.5K Reel/Tape
FRH160-600V	:	100 Pcs/Bag, 0.6K Reel/Tape

Warning: - Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.

- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

FRVL Series

RoHS Compliant & Lead Free

RoHS 2002/95/EC | Pb Lead Free

Application : Line Voltage Power Supply, Transformer and Appliances Product

Features : Solid state, Radial leaded product ideal for up to 120V_{AC}/V_{DC}

Maximum Operation Current : 0.10A~3.75A

Maximum Voltage : 120$V_{AC/DC}$

Maximum Interrupt Voltage : 135$V_{AC/DC}$

Temperature Range : -40℃ to 85℃

Agency Recognition : UL :File No. E211981
*C-UL:File No. E211981
TÜV :File No. R50122733

Electrical Characteristics (23℃)

Part Number	Hold Current	Trip Current	Max.Time to Trip	Max. Current	Max. Oper. Voltage	Max. Int. Voltage	Typ. Power	Resistance	
								R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	at 5xI_H,s	I_{MAX}, A	V_{MAX}, $V_{AC/DC}$	V_{I-MAX},$V_{AC/DC}$	Pd, W	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

Physical specifications:
Lead material: Tin plated copper, 24AWG, 22AWG, 20AWG
Soldering characteristics:MIL-STD-202, Method 208E.
Insulating coating:Flame retardant epoxy, meets UL 94 V-0 requirement.

*NOTE : C-UL is only applied for FRVL010-120F~FRVL030-120F, FRVL075-120F and FRVL135-120F~FRVL375-120F.

Thermal Derating for PPTC Device at Various Ambient Temperatures

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

FRVL Product Dimensions (mm)

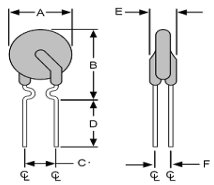


Fig.1
Lead S ize :24AWG
Φ 0.51 mm Diameter

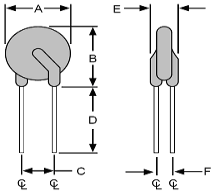


Fig.3
Lead Size :20AWG
Φ 0.81 mm Diameter

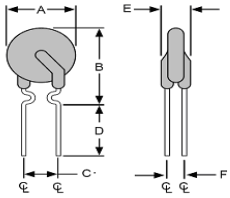


Fig.2
Lead Size :22AWG
Φ 0.65 mm Diameter

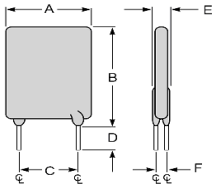
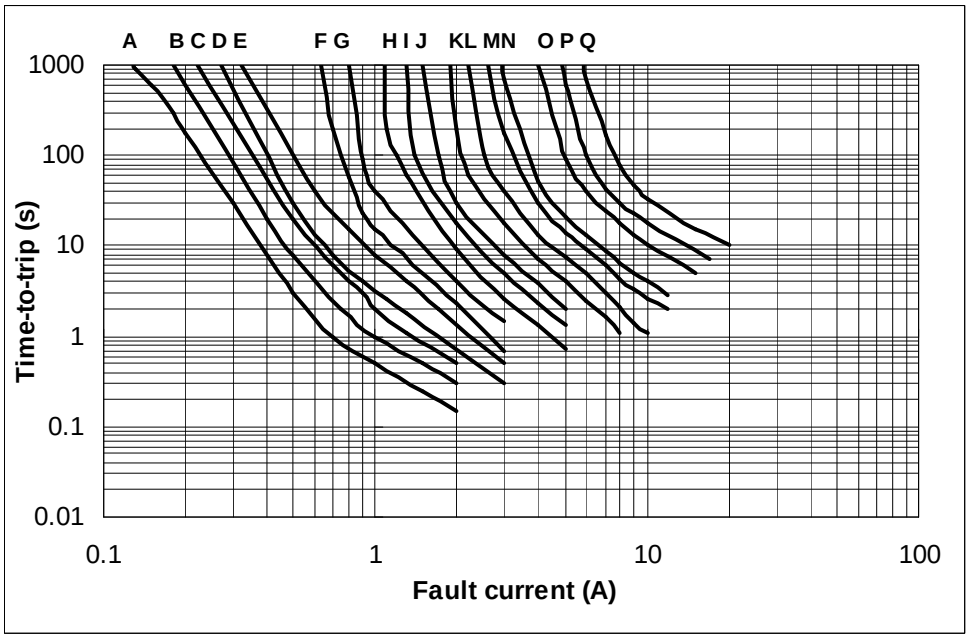


Fig.4
Lead Size : 20AWG
Φ 0.81 mm Diameter

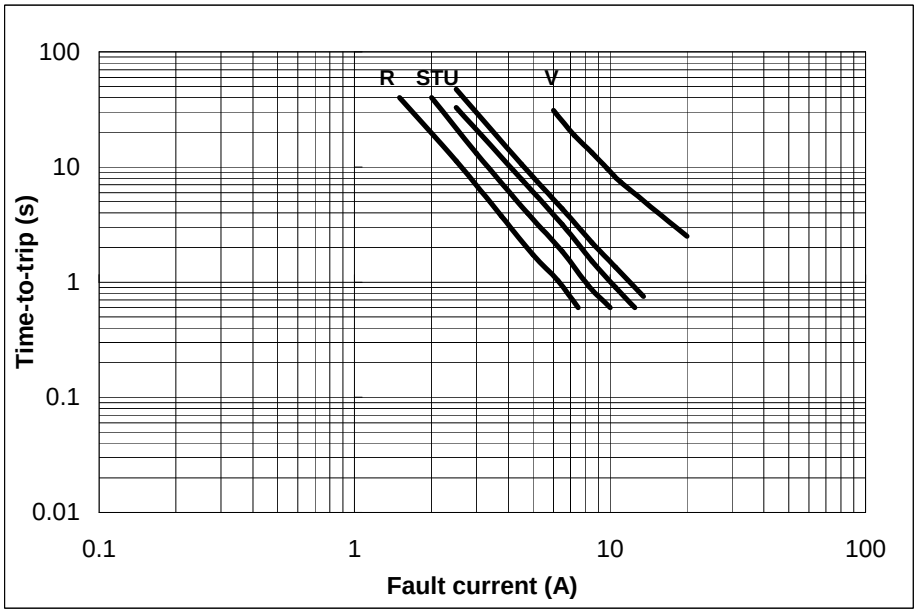
Part Number	Fig	A	B	C	D	E	F
		Max	Max	Typ	Min	Max	Typ
FRVL010-120F	1	7.9	13.0	5.1	7.6	3.8	2.2
FRVL017-120F	1	7.9	13.0	5.1	7.6	3.8	2.2
FRVL020-120F	2	7.9	13.0	5.1	7.6	3.8	2.2
FRVL025-120F	2	7.9	13.0	5.1	7.6	3.8	2.2
FRVL030-120F	2	7.9	13.0	5.1	7.6	3.8	2.2
FRVL040-120F	2	8.2	14.2	5.1	7.6	3.8	2.2
FRVL050-120F	2	9.2	14.9	5.1	7.6	3.8	2.2
FRVL065-120F	2	9.7	14.9	5.1	7.6	3.8	2.2
FRVL070-120F	2	10.6	15.5	5.1	7.6	3.8	2.2
FRVL075-120F	4	10.9	17.0	5.1	7.6	4.1	2.2
FRVL090-120F	2	11.9	15.9	5.1	7.6	3.8	2.2
FRVL100-120F	4	11.5	20.1	5.1	7.6	4.1	2.2
FRVL110-120F	3	13.3	18.3	5.1	7.6	4.1	2.2
FRVL125-120F	4	14.0	21.7	5.1	7.6	4.1	2.2
FRVL130-120F	3	15.5	20.6	5.1	7.6	4.1	2.2
FRVL135-120F	4	16.3	21.7	5.1	7.6	4.1	2.2
FRVL160-120F	3	17.5	22.5	5.1	7.6	4.1	2.2
FRVL185-120F	3	19.9	24.9	5.1	7.6	4.1	2.2
FRVL200-120F	4	23.5	27.9	10.2	7.6	4.1	2.2
FRVL250-120F	3	22.5	27.5	10.2	7.6	4.1	2.2
FRVL300-120F	3	25.5	30.0	10.2	7.6	4.1	2.2
FRVL375-120F	3	29.5	34.0	10.2	7.6	4.1	2.2

Typical Time-To-Trip at 23℃

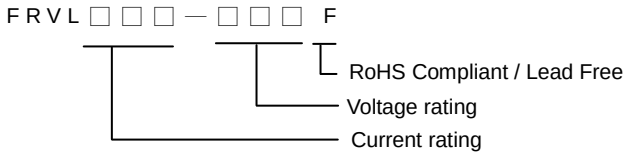
A =FRVL010-120F
B =FRVL017-120F
C =FRVL020-120F
D =FRVL025-120F
E =FRVL030-120F
F =FRVL040-120F
G =FRVL050-120F
H =FRVL065-120F
I =FRVL070-120F
J =FRVL090-120F
K =FRVL110-120F
L =FRVL130-120F
M=FRVL160-120F
N =FRVL185-120F
O =FRVL250-120F
P =FRVL300-120F
Q =FRVL375-120F



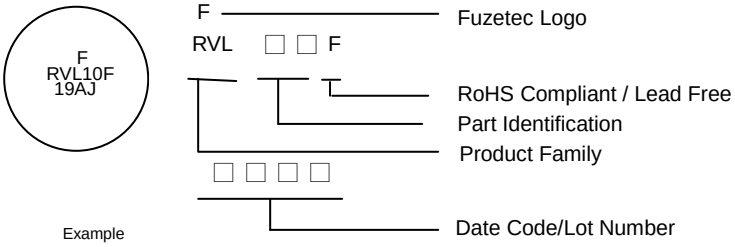
R=FRVL075-120F
S=FRVL100-120F
T=FRVL125-120F
U=FRVL135-120F
V=FRVL200-120F



Part Numbering System



Part Marking System

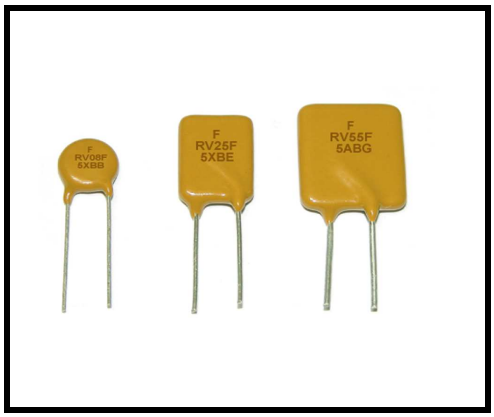


Standard Package

FRVL010-120F~FRVL050-120F	:	500 Pcs/Bag, 2.0K Reel/Tape
FRVL065-120F~FRVL075-120F	:	300 Pcs/Bag, 1.5K Reel/Tape
FRVL090-120F	:	300 Pcs/Bag, 2.0K Reel/Tape
FRVL100-120F~FRVL110-120F	:	300 Pcs/Bag, 1.5K Reel/Tape
FRVL125-120F~FRVL135-120F	:	200 Pcs/Bag, 1.0K Reel/Tape
FRVL160-120F	:	200 Pcs/Bag
FRVL185-120F~FRVL375-120F	:	100 Pcs/Bag

Warning:
- Each product should be carefully evaluated and tested for their suitability of application.
- Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.
- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent, including some inert material such as silicone based oil, lubricant and etc. Prolonged contact will damage the device performance.
- Additional protection mechanism are strongly recommended to be used in conjunction with the PPTC device for protection against abnormal or failure conditions.
- Avoid use of PPTC device in a constrained space such as potting material, housing and containers where have limited space to accommodate device thermal expansion and/or contraction.

FRV Series



RoHS Compliant & Lead Free

Application : Line Voltage Power Supply, Transformer and Appliances

Product Features : Low hold current, Solid state, Radial leaded product ideal for up to 265$V_{AC/DC}$

Maximum Operation Current : 0.05A~2.00A

Maximum Operating Voltage : 240$V_{AC/DC}$

Maximum Interrupt Voltage : 265$V_{AC/DC}$

Temperature Range : -40℃ to 85℃

Agency Recognition : *UL(E211981)
*C-UL(E211981)
TÜV(R50087018)

Electrical Characteristics (23℃)

Part Number	Hold Current	Trip Current	Max.Time to Trip	Max. Current	Rated Voltage	Max.Int Voltage	Typ. Power	Resistance	
								R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	at 5xI_H,s	I_{MAX}, A	V_{MAX}, $V_{AC/DC}$	V_{I-MAX},$V_{AC/DC}$	Pd, W	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	18.5	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
FRV200-240F	2.00	4.00	28.0	20.0	240	265	4.50	0.09	0.22

Physical specifications:
Lead material: FRV005-240F~FRV016-240F Tin plated copper, 24AWG.
FRV025-240F~FRV040-240F Tin plated copper, 22AWG.
FRV055-240F~FRV200-240F Tin plated copper, 20AWG.
Soldering characteristics: MIL-STD-202, Method 208E.
Insulating coating:Flame retardant epoxy, meets UL 94 V-0 requirement.

*Note: FRV075-240F~FRV200-240F UL and C-UL Pending.

Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
DERATING %	148%	133%	114%	100%	92%	86%	73%	64%	52%	40%

FRV Product Dimensions (mm)

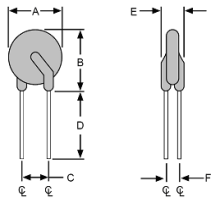


Fig.1
Lead Size: 24AWG
Φ 0.51 mm Diameter

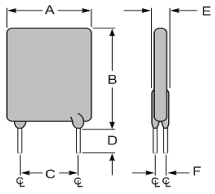


Fig.2
Lead Size: 22AWG
Φ 0.65 mm Diameter

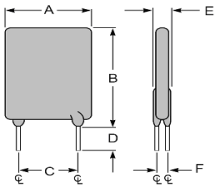


Fig.3
Lead Size: 20AWG
Φ 0.81 mm Diameter

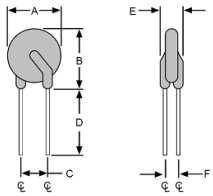
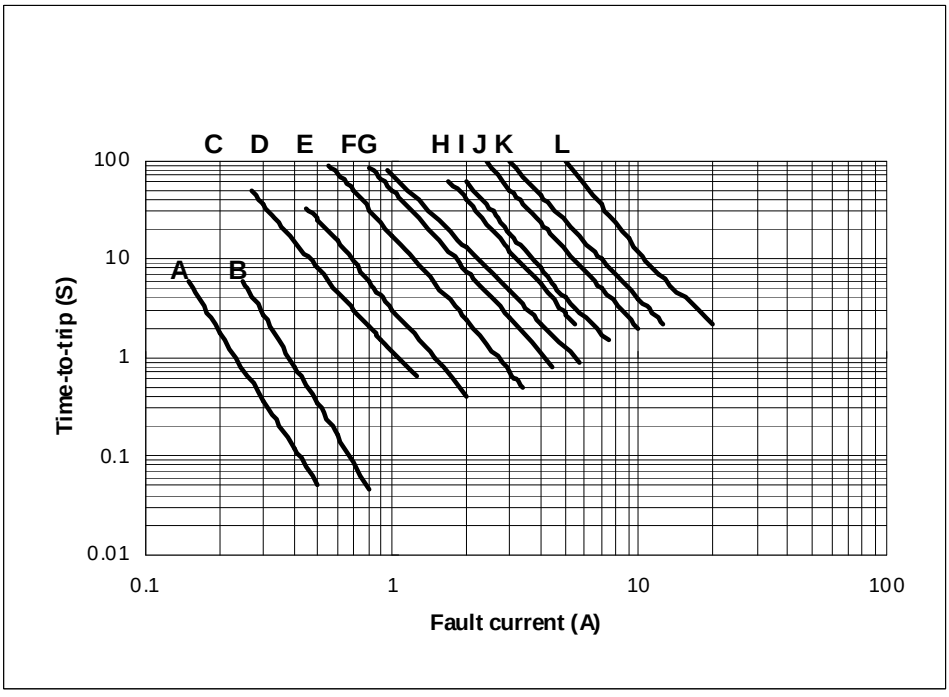


Fig.4
Lead Size: 20AWG
Φ 0.81 mm Diameter

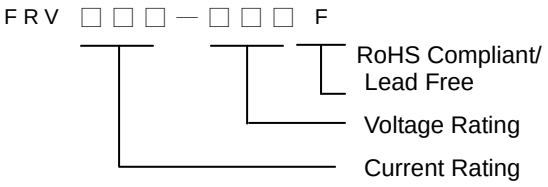
Part Number	Fig	A	B	C	D	E	F
		Max	Max	Typ	Min	Max	Typ
FRV005-240F	1	8.3	10.7	5.1	7.6	3.8	1.6
FRV008-240F	1	8.3	10.7	5.1	7.6	3.8	1.6
FRV012-240F	1	8.3	10.7	5.1	7.6	3.8	1.6
FRV016-240F	1	9.9	12.5	5.1	7.6	3.8	1.6
FRV025-240F	2	9.6	17.4	5.1	7.6	3.8	1.8
FRV033-240F	2	11.4	16.5	5.1	7.6	3.8	1.8
FRV040-240F	2	11.5	19.5	5.1	7.6	3.8	1.8
FRV055-240F	3	14.0	21.7	5.1	7.6	4.1	1.9
FRV075-240F	3	11.5	23.4	5.1	7.6	4.8	1.9
FRV100-240F	4	18.7	24.4	10.2	7.6	5.1	1.9
FRV125-240F	4	21.2	27.4	10.2	7.6	5.3	1.9
FRV200-240F	3	24.9	33.8	10.2	7.6	6.1	1.9

Typical Time-To-Trip at 23℃

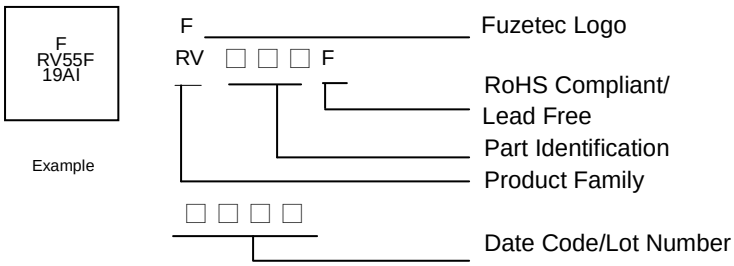
A = FRV005-240F
B = FRV008-240F
C = FRV012-240F
D = FRV016-240F
E = FRV025-240F
F = FRV033-240F
G = FRV040-240F
H = FRV055-240F
I = FRV075-240F
J = FRV100-240F
K = FRV125-240F
L = FRV200-240F



Part Numbering System



Part Marking System



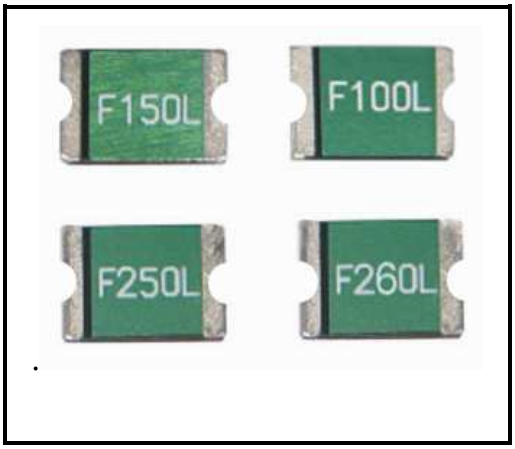
Standard Package

FRV005-240F~FRV016-240F	:	500 Pcs/Bag, 2.0K Reel/Tape
FRV025-240F	:	300 Pcs/Bag, 2.0K Reel/Tape
FRV033-240F~FRV040-240F	:	200 Pcs/Bag, 2.0K Reel/Tape
FRV055-240F	:	200 Pcs/Bag, 1.0K Reel/Tape
FRV075-240F	:	200 Pcs/Bag
FRV100-240F~FRV200-240F	:	100 Pcs/Bag

Warning:

- Each product should be carefully evaluated and tested for their suitability of application.
- Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.
- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent, including some inert material such as silicone based oil, lubricant and etc. Prolonged contact will damage the device performance.
- Additional protection mechanism are strongly recommended to be used in conjunction with the PPTC device for protection against abnormal or failure conditions.
- Avoid use of PPTC device in a constrained space such as potting material, housing and containers where have limited space to accommodate device thermal expansion and/or contraction.

FSMD2920 Series



RoHS Compliant & Halogen Free

RoHS 2002/95/EC | HF Halogen Free

Application: All high-density boards

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

Operation Current: 0.3A~3.0A

Maximum Voltage: 6V~60V_{DC}

Temperature Range: -40℃ to 85℃

Agency Recognition : UL (E211981)
C-UL (E211981)
TÜV (R50090556)

Electrical Characteristics (23℃)

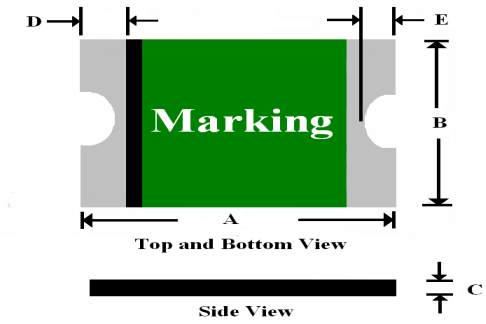
Part Number	Hold Current	Trip Current	Rated Voltage	Max Current	Typ. Power	Max Time to Trip		Resistance	
						Current	Time	R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	V_{MAX},V_{DC}	I_{MAX}, A	Pd, W	A	Sec	Ohms	Ohms
FSMD030-2920-R	0.30	0.60	60	10	1.5	1.5	3.0	1.000	4.800
FSMD050-2920-R	0.50	1.00	60	10	1.5	2.5	4.0	0.300	1.400
FSMD075-2920-R	0.75	1.50	33	40	1.5	8.0	0.3	0.180	1.000
FSMD100-2920-R	1.10	2.20	33	40	1.5	8.0	0.5	0.090	0.410
FSMD125-2920-R	1.25	2.50	33	40	1.5	8.0	2.0	0.050	0.250
FSMD150-2920-R	1.50	3.00	33	40	1.5	8.0	2.0	0.050	0.230
FSMD185-2920-R	1.85	3.70	33	40	1.5	8.0	2.5	0.040	0.150
FSMD200-2920-R	2.00	4.00	16	40	1.5	8.0	4.5	0.035	0.120
FSMD250-2920-R	2.50	5.00	16	40	1.5	8.0	16.0	0.025	0.085
FSMD260-2920-R	2.60	5.20	6	40	1.5	8.0	20.0	0.020	0.075
FSMD300-2920-R	3.00	5.20	6	40	1.5	8.0	25.0	0.010	0.048

Termination pad characteristics
Termination pad materials: Pure Tin

Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
DERATING %	158%	134%	117%	100%	92%	83%	75%	66%	58%	45%

FSMD2920 Product Dimensions (mm)

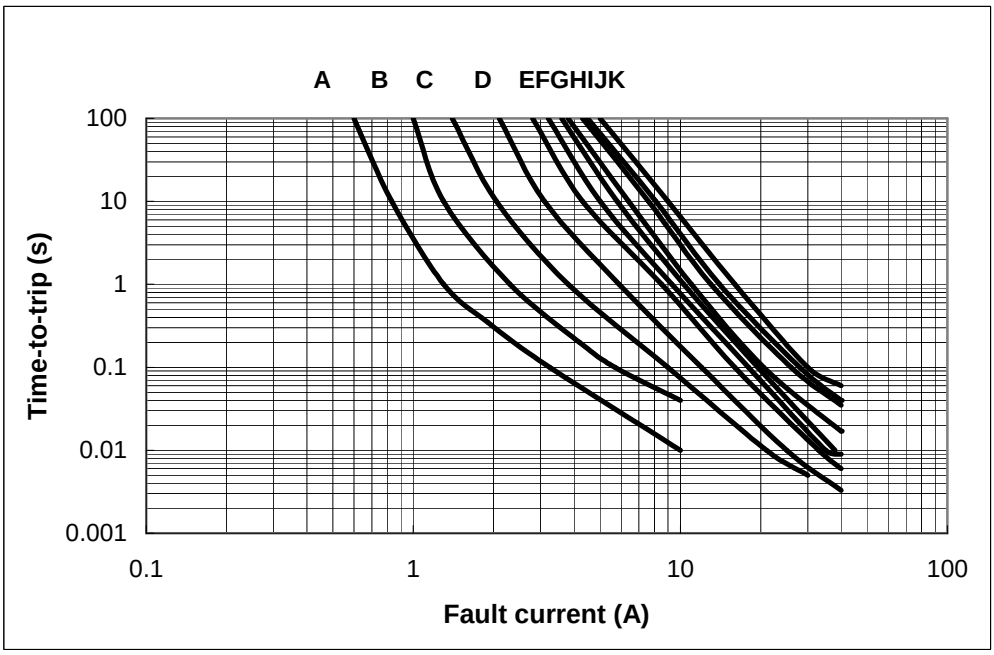


Part Number	A		B		C		D		E	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
FSMD030-2920-R	6.73	7.98	4.80	5.44	0.60	1.15	0.50	1.20	0.50	0.90
FSMD050-2920-R	6.73	7.98	4.80	5.44	0.60	1.15	0.50	1.20	0.50	0.90
FSMD075-2920-R	6.73	7.98	4.80	5.44	0.40	1.15	0.50	1.20	0.50	0.90
FSMD100-2920-R	6.73	7.98	4.80	5.44	0.40	1.00	0.50	1.20	0.50	0.90
FSMD125-2920-R	6.73	7.98	4.80	5.44	0.40	0.90	0.50	1.20	0.50	0.90
FSMD150-2920-R	6.73	7.98	4.80	5.44	0.40	0.90	0.50	1.20	0.50	0.90
FSMD185-2920-R	6.73	7.98	4.80	5.44	0.30	0.90	0.50	1.20	0.50	0.90
FSMD200-2920-R	6.73	7.98	4.80	5.44	0.30	0.90	0.50	1.20	0.50	0.90
FSMD250-2920-R	6.73	7.98	4.80	5.44	0.30	0.90	0.50	1.20	0.50	0.90
FSMD260-2920-R	6.73	7.98	4.80	5.44	0.30	0.90	0.50	1.20	0.50	0.90
FSMD300-2920-R	6.73	7.98	4.80	5.44	0.40	0.90	0.50	1.20	0.50	0.90

*For Reflow Soldering Profile information, please refer to P.70 ” IV APPENDIX – SMD PRODUCT SOLDER REFLOW RECOMMENDATIONS “

Typical Time-To-Trip at 23℃

A = FSMD030-2920-R
B = FSMD050-2920-R
C = FSMD075-2920-R
D = FSMD100-2920-R
E = FSMD125-2920-R
F = FSMD150-2920-R
G = FSMD185-2920-R
H = FSMD200-2920-R
I = FSMD250-2920-R
J = FSMD260-2920-R
K= FSMD300-2920-R

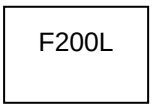


Part Numbering System

F S M D □ □ □ - 2920 - R

Current Rating

Part Marking System



Example

F □ □ □ L

Part Identification

Fuzetec Logo

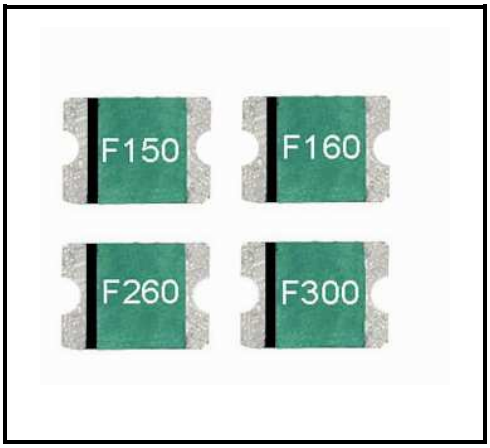
Standard Package

FSMD030-2920-R~FSMD300-2920-R : 2.0K Reel/Tape

Warning: - Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.

- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

FSMD1812 Series



RoHS 2002/95/EC | HF Halogen Free

RoHS Compliant & Halogen Free

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: 0.1A~3.0A

Maximum Voltage: 6V~60V_{DC}

Temperature Range: -40℃ to 85℃

Agency Recognition: UL (E211981)
C-UL (E211981)
*TÜV (50004084/R50090556)

Electrical Characteristics(23℃)

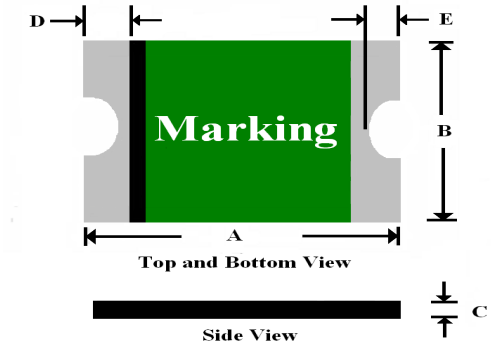
Part Number	Hold Current	Trip Current	Rated Voltage	Max Current	Typ. Power	Max Time to Trip		Resistance	
						Current	Time	R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	V_{MAX}, V_{DC}	I_{MAX}, A	Pd, W	A	Sec	Ohms	Ohms
FSMD010-R	0.10	0.30	60	10	0.8	8.0	0.020	1.600	15.00
FSMD014-R	0.14	0.30	60	10	0.8	8.0	0.008	1.200	6.500
FSMD020-R	0.20	0.40	30	10	0.8	8.0	0.020	0.800	5.000
FSMD035-R	0.35	0.70	16	40	0.8	8.0	0.100	0.320	1.500
FSMD050-R	0.50	1.00	16	40	0.8	8.0	0.150	0.150	1.000
FSMD075-R	0.75	1.50	16	40	0.8	8.0	0.200	0.110	0.450
FSMD075-24R	0.75	1.50	24	40	1.0	8.0	0.200	0.110	0.290
FSMD075-33R	0.75	1.50	33	40	1.0	8.0	0.200	0.110	0.400
FSMD110-R	1.10	2.20	8	100	0.8	8.0	0.300	0.040	0.210
FSMD110-16-R	1.10	2.20	16	100	0.8	8.0	0.500	0.040	0.180
FSMD110-24R	1.10	2.20	24	100	1.0	8.0	0.500	0.060	0.200
FSMD125-R	1.25	2.50	6	40	0.8	8.0	0.400	0.050	0.140
FSMD150-R	1.50	3.00	8	100	0.8	8.0	0.500	0.040	0.110
FSMD150-12R	1.50	3.00	12	100	1.0	8.0	0.500	0.040	0.110
FSMD150-24R	1.50	3.00	24	100	1.0	8.0	1.500	0.040	0.120
FSMD160-R	1.60	3.20	8	100	0.8	8.0	0.500	0.030	0.100
FSMD160-12R	1.60	3.20	12	100	1.0	8.0	1.000	0.030	0.100
FSMD160-16R	1.60	3.20	16	100	1.0	8.0	1.000	0.030	0.100
FSMD200R	2.00	3.50	8	100	1.0	8.0	2.000	0.020	0.070
FSMD260R	2.60	5.00	6	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	100	1.3	8.0	5.000	0.015	0.050
FSMD300R	3.00	5.00	6	100	1.0	8.0	4.000	0.012	0.040

Termination pad characteristics
Termination pad materials: Pure Tin
*Note: FSMD010 TÜV Pending

Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
DERATING %	157%	135%	118%	100%	93%	87%	79%	72%	65%	56%

FSMD1812 Product Dimensions (mm)

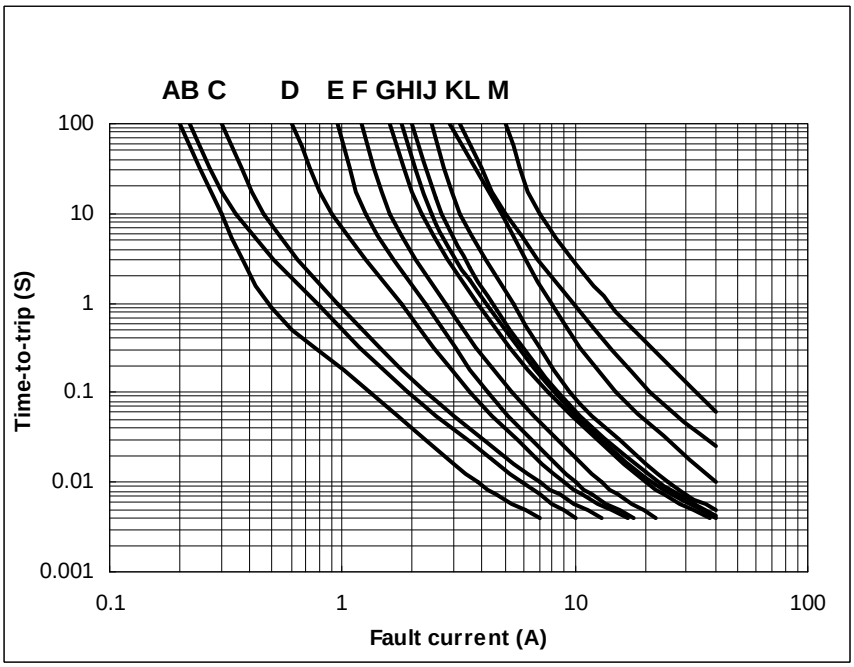


Part Number	A		B		C		D		E	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
FSMD010-R	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	0.25	0.65
FSMD014-R	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	0.25	0.65
FSMD020-R	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	0.25	0.65
FSMD035-R	4.37	4.73	3.07	3.41	0.40	0.70	0.30	0.95	0.25	0.65
FSMD050-R	4.37	4.73	3.07	3.41	0.35	0.65	0.30	0.95	0.25	0.65
FSMD075-R	4.37	4.73	3.07	3.41	0.35	0.65	0.30	0.95	0.25	0.65
FSMD075-24R	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65
FSMD075-33R	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65
FSMD110-R	4.37	4.73	3.07	3.41	0.25	0.55	0.30	0.95	0.25	0.65
FSMD110-16-R	4.37	4.73	3.07	3.41	0.25	0.90	0.30	0.95	0.25	0.65
FSMD110-24R	4.37	4.73	3.07	3.41	0.80	1.30	0.25	0.95	0.25	0.65
FSMD125-R	4.37	4.73	3.07	3.41	0.25	0.55	0.30	0.95	0.25	0.65
FSMD150-R	4.37	4.73	3.07	3.41	0.25	0.55	0.30	0.95	0.25	0.65
FSMD150-12R	4.37	4.73	3.07	3.41	0.60	1.10	0.25	0.95	0.25	0.65
FSMD150-24R	4.37	4.73	3.07	3.41	0.60	1.55	0.25	0.95	0.25	0.65
FSMD160-R	4.37	4.73	3.07	3.41	0.25	0.90	0.30	0.95	0.25	0.65
FSMD160-12R	4.37	4.73	3.07	3.41	0.60	1.35	0.25	0.95	0.25	0.65
FSMD160-16R	4.37	4.73	3.07	3.41	0.60	1.35	0.25	0.95	0.25	0.65
FSMD200R	4.37	4.73	3.07	3.41	0.55	1.20	0.25	0.95	0.25	0.65
FSMD260R	4.37	4.73	3.07	3.41	0.55	1.20	0.25	0.95	0.25	0.65
FSMD260-13R	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65
FSMD260-16R	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65
FSMD300R	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65

*For Reflow Soldering Profile information, please refer to P.70 " IV APPENDIX – SMD PRODUCT SOLDER REFLOW RECOMMENDATIONS "

Typical Time-To-Trip at 23℃

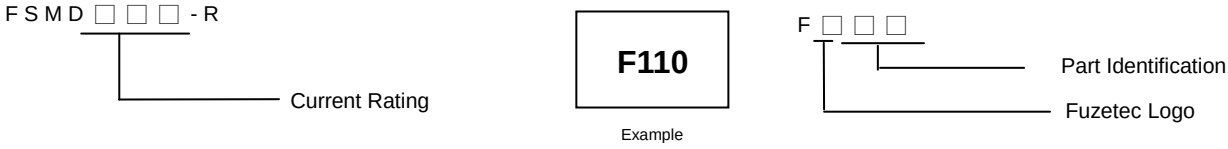
A = FSMD010-R
B = FSMD014-R
C = FSMD020-R
D = FSMD035-R
E = FSMD050-R
F = FSMD075-R/ 075-24R/075-33R
G = FSMD110-R/ 110-16-R/110-24R
H = FSMD125-R
I = FSMD150-R/ 150-12R/150-24R
J = FSMD160-R/ 160-12R/160-16R
K = FSMD200R
L = FSMD260R/260-13R/ 260-16R
M = FSMD300R



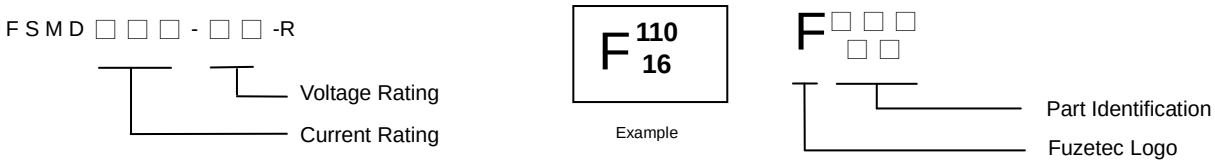
Part Numbering System

Part Marking System

For： FSMD010-R, FSMD014-R, FSMD020-R, FSMD035-R, FSMD050-R, FSMD075-R, FSMD110-R, FSMD125-R, FSMD150-R, FSMD160-R, FSMD200R, FSMD260R and FSMD300R



For：FSMD110-16-R, FSMD110-24R, FSMD075-24R, FSMD075-33R, FSMD150-12R, FSMD150-24R, FSMD160-12R, FSMD160-16R, FSMD260-13R and FSMD260-16R



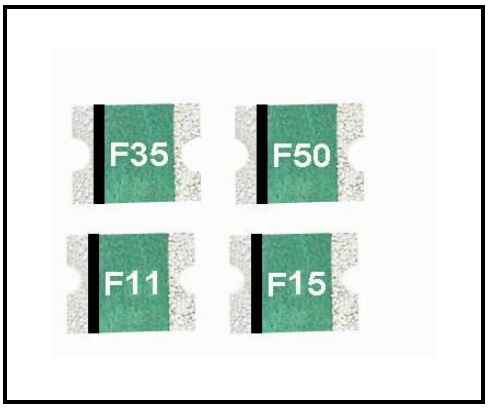
Standard Package

FSMD010~FSMD075	:	2.0K Reel/Tape
FSMD075-24R~FSMD075-33R	:	1.5K Reel/Tape
FSMD110~FSMD110-16	:	2.0K Reel/Tape
FSMD110-24R	:	1.5K Reel/Tape
FSMD125~FSMD260R	:	2.0K Reel/Tape
FSMD260-13R~FSMD300R	:	1.5K Reel/Tape

Warning: - Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.

- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance..

FSMD1210 Series



RoHS Compliant & Halogen Free

RoHS 2002/95/EC | HF Halogen Free

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_{DC}

Temperature Range: -40℃ to 85℃

Agency Recognition : UL (E211981)
C-UL (E211981)
TÜV (R50090556)

Electrical Characteristics(23℃)

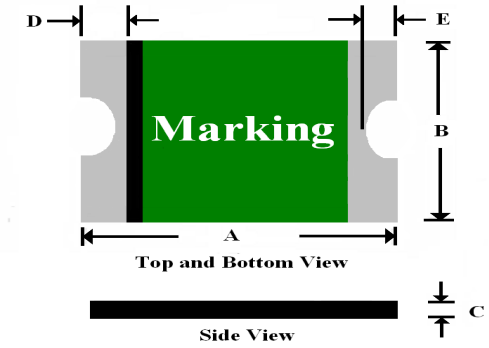
Part Number	Hold Current	Trip Current	Rated Voltage	Max Current	Typ. Power	Max Time to Trip		Resistance	
						Current	Time	R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	V_{MAX}, V_{DC}	I_{MAX}, A	Pd, W	A	Sec	Ohms	Ohms
FSMD005-1210-R	0.05	0.15	60	10	0.60	0.25	3.00	3.600	50.000
FSMD010-1210-R	0.10	0.25	60	10	0.60	0.50	1.50	1.600	15.000
FSMD020-1210-R	0.20	0.40	30	10	0.60	8.00	0.02	0.800	5.000
FSMD035-1210-R	0.35	0.70	16	40	0.60	8.00	0.20	0.320	1.300
FSMD050-1210-R	0.50	1.00	16	40	0.60	8.00	0.10	0.250	0.900
FSMD075-1210-R	0.75	1.50	8	40	0.60	8.00	0.10	0.130	0.400
FSMD110-1210R	1.10	2.20	6	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	4.00	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

Termination pad characteristics
Termination pad materials: Pure Tin

Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
DERATING %	155%	132%	115%	100%	92%	83%	75%	64%	59%	46%

FSMD1210 Product Dimensions (mm)

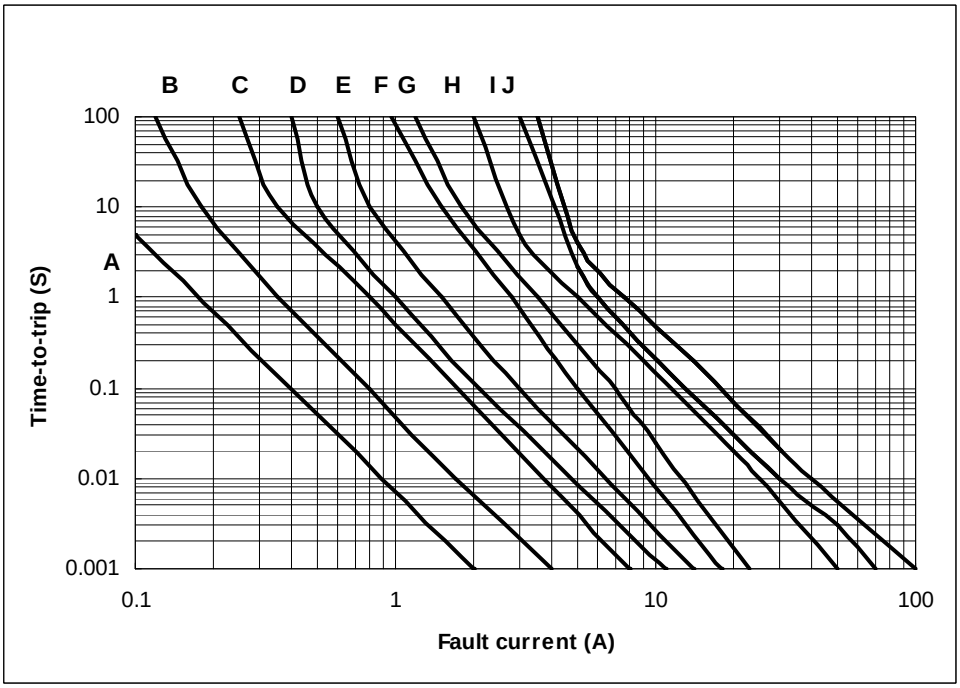


Part Number	A		B		C		D		E	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
FSMD005-1210-R	3.00	3.43	2.35	2.80	0.60	1.15	0.25	0.75	0.10	0.45
FSMD010-1210-R	3.00	3.43	2.35	2.80	0.60	1.15	0.25	0.75	0.10	0.45
FSMD020-1210-R	3.00	3.43	2.35	2.80	0.40	0.85	0.25	0.75	0.10	0.45
FSMD035-1210-R	3.00	3.43	2.35	2.80	0.40	0.80	0.25	0.75	0.10	0.45
FSMD050-1210-R	3.00	3.43	2.35	2.80	0.30	0.75	0.25	0.75	0.10	0.45
FSMD075-1210-R	3.00	3.43	2.35	2.80	0.30	0.70	0.25	0.75	0.10	0.45
FSMD110-1210R	3.00	3.43	2.35	2.80	0.60	1.00	0.25	0.75	0.10	0.45
FSMD150-1210R	3.00	3.43	2.35	2.80	0.50	0.90	0.25	0.75	0.10	0.45
FSMD175-1210R	3.00	3.43	2.35	2.80	0.80	1.40	0.25	0.75	0.10	0.45
FSMD200-1210R	3.00	3.43	2.35	2.80	0.80	1.40	0.25	0.75	0.10	0.45

*For Reflow Soldering Profile information, please refer to P.70 ” IV APPENDIX – SMD PRODUCT SOLDER REFLOW RECOMMENDATIONS “

Typical Time-To-Trip at 23℃

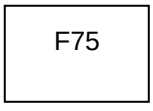
A =FSMD005-1210-R
B =FSMD010-1210-R
C =FSMD020-1210-R
D =FSMD035-1210-R
E =FSMD050-1210-R
F =FSMD075-1210-R
G =FSMD110-1210R
H =FSMD150-1210R
I =FSMD175-1210R
J =FSMD200-1210R



Part Numbering System

F S M D □ □ □ - 1210 R
Current Rating

Part Marking System



Example

F □ □
Part Identification
Fuzetec Logo

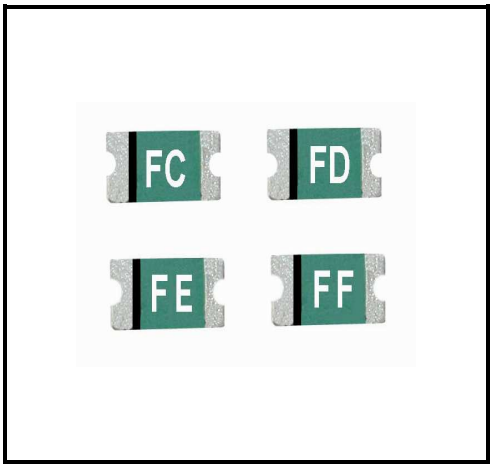
F05 =FSMD005-1210-R
F10 =FSMD010-1210-R
F20 =FSMD020-1210-R
F35 =FSMD035-1210-R
F50 =FSMD050-1210-R
F75 =FSMD075-1210-R
F11 =FSMD110-1210R
F15 =FSMD150-1210R
F17 =FSMD175-1210R
F21 =FSMD200-1210R

Standard Package

FSMD005-1210-R~FSMD020-1210-R : 3.0K Reel/Tape
FSMD035-1210-R~FSMD075-1210-R : 4.0K Reel/Tape
FSMD110-1210R~FSMD200-1210R : 3.0K Reel/Tape

Warning: - Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.
- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

FSMD1206 Series



RoHS 2002/95/EC | HF Halogen Free

RoHS Compliant & Halogen Free

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_{DC}

Temperature Range : -40℃ to 85℃

Agency Recognition : *UL (E211981)

*C-UL (E211981)

* TÜV (R50090556)

Electrical Characteristics(23℃)

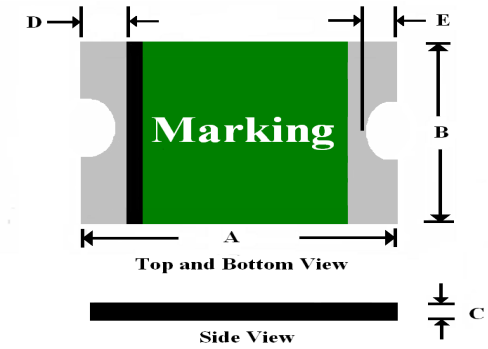
Part Number	Hold Current	Trip Current	Rated Voltage	Max Current	Typ. Power	Max Time to Trip		Resistance	
						Current	Time	R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	V_{MAX}, V_{DC}	I_{MAX}, A	Pd, W	A	Sec	Ohms	Ohms
FSMD005-1206-R	0.05	0.15	60	10	0.4	0.25	1.50	3.600	50.000
FSMD010-1206-R	0.10	0.25	60	10	0.4	0.50	1.00	1.600	15.000
FSMD012-1206-R	0.12	0.39	48	10	0.6	1.00	0.20	1.400	6.500
FSMD016-1206-R	0.16	0.45	48	10	0.6	1.00	0.30	1.100	5.000
FSMD020-1206-R	0.20	0.40	30	10	0.4	8.00	0.10	0.600	2.500
FSMD025-1206-R	0.25	0.50	16	40	0.6	8.00	0.08	0.550	2.300
FSMD035-1206-R	0.35	0.75	16	40	0.4	8.00	0.10	0.300	1.200
FSMD050-1206-R	0.50	1.00	8	40	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	6	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	6	100	0.8	8.00	0.30	0.040	0.180
FSMD150-1206R	1.50	3.00	6	100	0.8	8.00	1.00	0.030	0.120
FSMD200-1206R	2.00	3.50	6	100	0.8	8.00	1.50	0.018	0.080

Termination pad characteristics
Termination pad materials : Pure Tin
*Note: (1) FSMD075-16-1206R, FSMD200-1206R : C-UL Pending
(2) FSMD012-1206-R, FSMD016-1206-R, FSMD025-1206-R, FSMD050-24-1206R, FSMD075-16-1206R, FSMD200-1206R : TÜV Pending

Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
DERATING %	148%	135%	117%	100%	94%	88%	81%	71%	66%	52%

FSMD1206 Product Dimensions (mm)

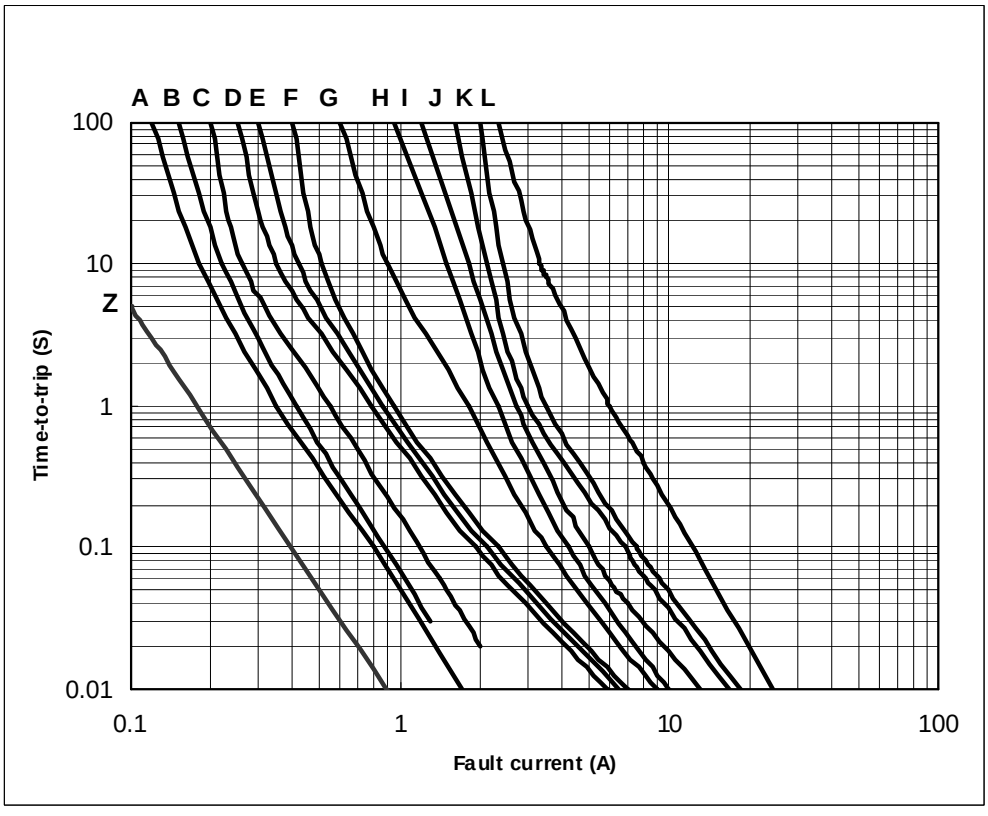


Part Number	A		B		C		D		E	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
FSMD005-1206-R	3.00	3.50	1.50	1.80	0.45	0.85	0.10	0.75	0.10	0.45
FSMD010-1206-R	3.00	3.50	1.50	1.80	0.45	0.85	0.10	0.75	0.10	0.45
FSMD012-1206-R	3.00	3.50	1.50	1.80	0.45	0.85	0.10	0.75	0.10	0.45
FSMD016-1206-R	3.00	3.50	1.50	1.80	0.45	0.75	0.10	0.75	0.10	0.45
FSMD020-1206-R	3.00	3.50	1.50	1.80	0.45	0.75	0.10	0.75	0.10	0.45
FSMD025-1206-R	3.00	3.50	1.50	1.80	0.45	0.75	0.10	0.75	0.10	0.45
FSMD035-1206-R	3.00	3.50	1.50	1.80	0.45	0.75	0.10	0.75	0.10	0.45
FSMD050-1206-R	3.00	3.50	1.50	1.80	0.25	0.55	0.10	0.75	0.10	0.45
FSMD050-24-1206R	3.00	3.50	1.50	1.80	0.90	1.30	0.25	0.75	0.10	0.45
FSMD075-1206R	3.00	3.50	1.50	1.80	0.45	1.25	0.25	0.75	0.10	0.45
FSMD075-16-1206R	3.00	3.50	1.50	1.80	0.45	1.25	0.25	0.75	0.10	0.45
FSMD100-1206R	3.00	3.50	1.50	1.80	0.45	1.00	0.25	0.75	0.10	0.45
FSMD110-1206R	3.00	3.50	1.50	1.80	0.45	1.00	0.25	0.75	0.10	0.45
FSMD150-1206R	3.00	3.50	1.50	1.80	0.80	1.40	0.25	0.75	0.10	0.45
FSMD200-1206R	3.00	3.50	1.50	1.80	0.85	1.60	0.25	0.75	0.10	0.45

*For Reflow Soldering Profile information, please refer to P.70 ” IV APPENDIX – SMD PRODUCT SOLDER REFLOW RECOMMENDATIONS “

Typical Time-To-Trip at 23℃

Z= FSMD005-1206-R
A= FSMD010-1206-R
B= FSMD012-1206-R
C= FSMD016-1206-R
D= FSMD020-1206-R
E= FSMD025-1206-R
F= FSMD035-1206-R
G= FSMD050-1206-R/ FSMD050-24-1206R
H= FSMD075-1206R / FSMD075-16-1206R
I= FSMD100-1206R
J= FSMD110-1206R
K= FSMD150-1206R
L= FSMD200-1206R

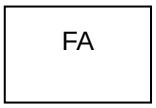


Part Numbering System

F S M D □ □ □ – 1206 – R

Current Rating

Part Marking System



Example

F □

Part Identification

Fuzetec Logo

FZ = FSMD005-1206-R
FA = FSMD010-1206-R
FJ = FSMD012-1206-R
FK = FSMD016-1206-R
FB = FSMD020-1206-R
FL = FSMD025-1206-R
FC = FSMD035-1206-R
FD = FSMD050-1206-R
FN = FSMD050-24-1206R
FE = FSMD075-1206R
FO = FSMD075-16-1206R
FF = FSMD100-1206R
FG = FSMD110-1206R
FH = FSMD150-1206R
FI = FSMD200-1206R

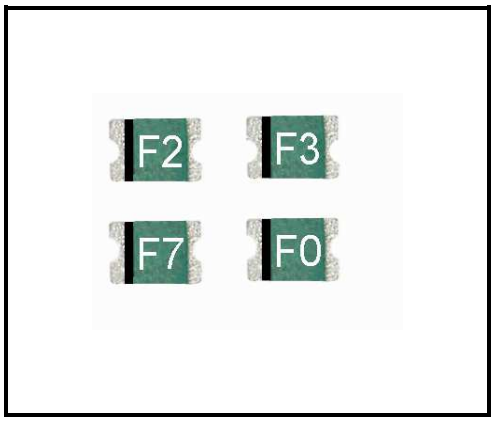
Standard Package

FSMD005-1206-R~FSMD020-1206-R	:	3.0K Reel/Tape
FSMD025-1206-R	:	3.0K Reel/Tape
FSMD035-1206-R~FSMD050-1206-R	:	4.0K Reel/Tape
FSMD075-1206R~FSMD110-1206R	:	3.0K Reel/Tape
FSMD150-1206R~FSMD200-1206R	:	2.0K Reel/Tape

Warning: - Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.

- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

FSMD0805 Series



RoHS Compliant & Halogen Free

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 : 0.1A~1.0A

Maximum Voltage : 6V~15V_{DC}

Temperature Range : -40℃ to 85℃

Agency Recognition : UL (E211981)
C-UL (E211981)
TÜV (R50090556)

Electrical Characteristics(23℃)

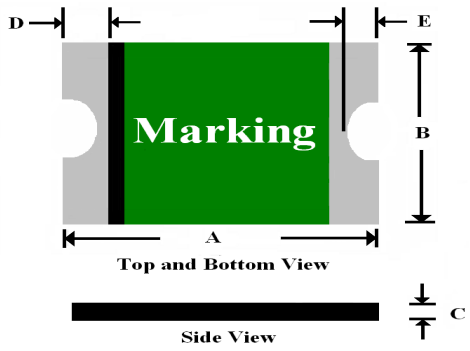
Part Number	Hold Current	Trip Current	Rated Voltage	Max Current	Typ. Power	Max Time to Trip		Resistance	
						Current	Time	R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	V_{MAX}, V_{DC}	I_{MAX}, A	Pd, W	A	Sec	Ohms	Ohms
FSMD010-0805-R	0.10	0.30	15	100	0.5	0.50	1.50	0.700	6.000
FSMD020-0805-R	0.20	0.50	9	100	0.5	8.00	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
FSMD075-0805R	0.75	1.50	6	40	0.6	8.00	0.20	0.090	0.350
FSMD100-0805R	1.00	1.95	6	40	0.6	8.00	0.30	0.060	0.210

Termination pad characteristics
Termination pad materials: Pure Tin

Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
DERATING %	145%	130%	116%	100%	91%	84%	76%	69%	61%	53%

FSMD0805 Product Dimensions (mm)

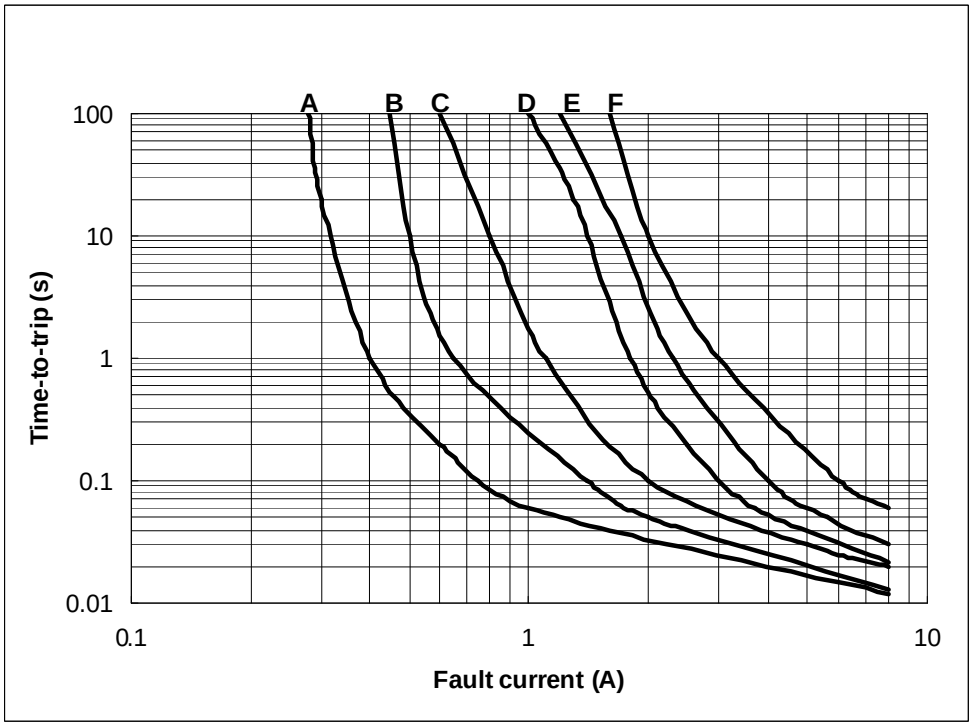


Part Number	A		B		C		D		E	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
FSMD010-0805-R	2.00	2.30	1.20	1.50	0.55	1.00	0.20	0.60	0.10	0.45
FSMD020-0805-R	2.00	2.30	1.20	1.50	0.55	1.00	0.20	0.60	0.10	0.45
FSMD035-0805-R	2.00	2.30	1.20	1.50	0.45	0.75	0.20	0.60	0.10	0.45
FSMD050-0805R	2.00	2.30	1.20	1.50	0.55	1.25	0.20	0.60	0.10	0.45
FSMD075-0805R	2.00	2.30	1.20	1.50	0.55	1.25	0.20	0.60	0.10	0.45
FSMD100-0805R	2.00	2.30	1.20	1.50	0.75	1.80	0.20	0.60	0.10	0.45

*For Reflow Soldering Profile information, please refer to P.70 ” IV APPENDIX – SMD PRODUCT SOLDER REFLOW RECOMMENDATIONS “

Typical Time-To-Trip at 23℃

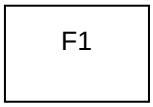
A =FSMD010-0805-R
B =FSMD020-0805-R
C =FSMD035-0805-R
D =FSMD050-0805R
E =FSMD075-0805R
F =FSMD100-0805R



Part Numbering System

F S M D □ □ □ - 0805 - R
Current Rating

Part Marking System



Example

F □
Part Identification
Fuzetec Logo

F1 =FSMD010-0805-R
F2 =FSMD020-0805-R
F3 =FSMD035-0805-R
F5 =FSMD050-0805R
F7 =FSMD075-0805R
F0 =FSMD100-0805R

Standard Package

FSMD010-0805-R~FSMD035-0805-R : 4.0K Reel/Tape
FSMD050-0805R~FSMD100-0805R : 3.0K Reel/Tape

Warning: - Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.
- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

STRAP Series

RoHS Compliant & Halogen Free

RoHS 2002/95/EC | HF Halogen Free

Application: Rechargeable battery packs, Lithium cell and battery packs

Product Features: Low profile, Solid state

Operation Current:

FVL Series 1.7A~2.3A ; FVT Series 1.1A~2.4A

FLR Series 1.9A~7.3A ; FSR Series 1.2A~4.2A

Maximum Voltage: 12V ~ 30V_{DC}

Temperature Range: -40℃ to 85℃

Agency Recognition : UL (E211981)

C-UL (E211981)

TÜV (R3-50004084)

Electrical Characteristics(23℃)

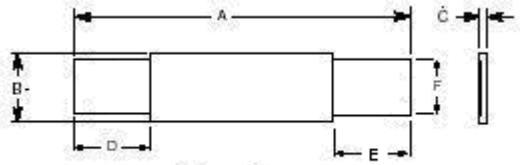
Part Number	Hold Current	Trip Current	Max. Time to Trip	Rated Voltage	Max. Current	Typ. Power	Resistance		
							R_{MIN}	R_{MAX}	$R1_{MAX}$
	I_H, A	I_T, A	at 5xI_H, S	V_{MAX}, V_{DC}	I_{MAX}, A	Pd, W	Ohms	Ohms	Ohms
FVL170F	1.70	4.10	5.0	12	100	1.4	0.018	0.032	0.064
FVL175F	1.75	4.20	5.0	12	100	1.4	0.017	0.031	0.062
FVL230F	2.30	5.00	5.0	12	100	1.4	0.012	0.018	0.036
FVT110F	1.10	2.70	5.0	16	100	0.7	0.038	0.070	0.140
FVT170F	1.70	3.40	5.0	16	100	0.7	0.030	0.052	0.105
FVT175F	1.75	3.60	5.0	16	100	0.8	0.029	0.051	0.102
FVT200F	2.00	4.70	5.0	16	100	0.9	0.022	0.039	0.078
FVT210GF	2.10	4.70	5.0	16	100	1.2	0.018	0.030	0.060
FVT240F	2.40	5.90	5.0	16	100	1.0	0.014	0.026	0.052
FSR120F	1.20	2.70	5.0	15	100	1.2	0.085	0.160	0.220
FSR175F	1.75	3.80	5.0	15	100	1.5	0.050	0.090	0.120
FSR200F	2.00	4.40	4.0	30	100	1.9	0.030	0.060	0.100
FSR350F	3.50	6.30	3.0	30	100	2.5	0.017	0.031	0.050
FSR420F	4.20	7.60	6.0	30	100	2.9	0.012	0.024	0.040
FLR190F	1.90	3.90	5.0	15	100	1.2	0.039	0.072	0.102
FLR260F	2.60	5.80	5.0	15	100	2.5	0.020	0.042	0.063
FLR380F	3.80	8.30	5.0	15	100	2.5	0.013	0.026	0.037
FLR450F	4.50	8.90	5.0	20	100	2.5	0.011	0.020	0.028
FLR550F	5.50	10.50	5.0	20	100	2.8	0.009	0.016	0.022
FLR600F	6.00	11.70	5.0	20	100	2.8	0.007	0.014	0.019
FLR730F	7.30	14.10	5.0	20	100	3.3	0.006	0.012	0.015

Physical specifications:
Lead material:0.13mm nominal thickness, quarter-hard nickel.
Insulating material: Polyester tape.

Thermal Derating for PPTC Device at Various Ambient Temperatures

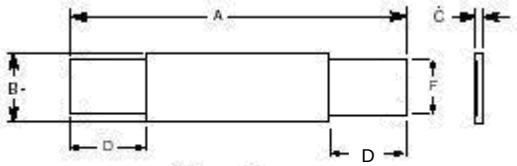
TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
FVL Series	195%	163%	132%	100%	85%	68%	53%	38%	21%	-
FVT Series	172%	149%	127%	100%	90%	77%	65%	53%	41%	23%
FSR Series	153%	135%	118%	100%	92%	85%	77%	69%	62%	50%
FLR Series	147%	130%	115%	100%	93%	86%	78%	71%	64%	56%

Production Dimensions (mm)



Top view

Fig.1



Top view

Fig.2

Part Number	Fig	A		B		C		D		E		F	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
FVL170F	1	20.8	23.2	3.5	3.9	0.5	0.8	4.5	6.5	4.5	6.5	2.4	2.6
FVL175F	1	23.0	24.5	2.9	3.3	0.5	0.8	4.7	7.2	3.8	5.4	2.4	2.6
FVL230F	1	20.9	23.1	4.9	5.3	0.5	0.8	4.1	5.8	4.1	5.8	3.9	4.1
FVT110F	2	23.6	25.6	2.6	2.9	0.5	0.9	7.0	8.0	---	---	2.3	2.5
FVT170F	2	15.4	17.5	7.0	7.4	0.5	0.9	4.0	6.2	---	---	3.9	4.1
FVT175F	2	21.0	23.0	3.5	3.9	0.5	0.9	4.6	6.6	---	---	2.9	3.1
FVT200F	2	21.0	23.0	4.1	4.5	0.5	0.9	3.0	4.8	---	---	2.9	3.1
FVT210GF	2	21.0	23.0	4.9	5.2	0.5	0.9	4.1	5.5	---	---	3.9	4.1
FVT240F	2	23.8	26.0	4.9	5.3	0.5	0.9	3.5	5.5	---	---	3.9	4.1
FSR120F	2	19.9	22.1	4.9	5.2	0.6	1.0	5.5	7.5	---	---	3.9	4.1
FSR175F	2	20.9	23.1	4.9	5.2	0.6	1.0	4.1	5.5	---	---	3.9	4.1
FSR200F	2	21.3	23.4	10.2	11.0	0.5	1.1	5.0	7.6	---	---	4.8	5.4
FSR350F	2	28.4	31.8	13.0	13.5	0.5	1.1	6.3	8.9	---	---	6.0	6.6
FSR420F	2	30.6	32.4	12.9	13.6	0.5	1.1	5.0	7.5	---	---	6.0	6.7
FLR190F	2	19.9	22.1	4.9	5.5	0.6	1.0	5.5	7.5	---	---	3.9	4.1
FLR260F	2	20.9	23.1	4.9	5.5	0.6	1.0	4.1	5.5	---	---	3.9	4.1
FLR380F	2	24.0	26.0	6.9	7.5	0.6	1.0	4.1	5.5	---	---	4.9	5.1
FLR450F	2	24.0	26.0	9.9	10.5	0.6	1.0	5.3	6.7	---	---	5.9	6.1
FLR550F	2	35.0	37.0	6.9	7.5	0.6	1.0	5.3	6.7	---	---	4.9	5.1
FLR600F	2	24.0	26.0	13.9	14.5	0.6	1.0	4.1	5.5	---	---	5.9	6.1
FLR730F	2	27.1	29.1	13.9	14.5	0.6	1.0	4.1	5.5	---	---	5.9	6.1

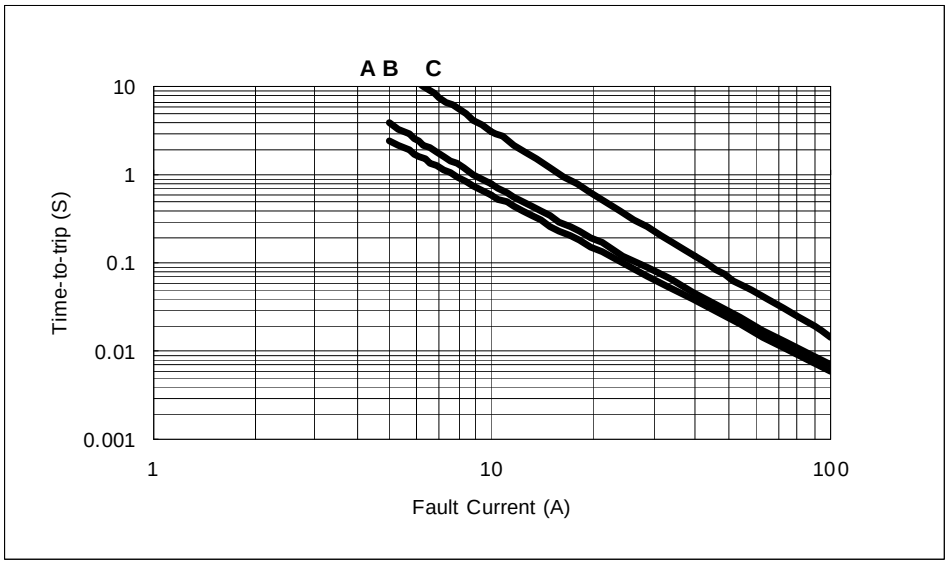
Typical Time-To-Trip at 23℃

FVL Series

A= FVL 170F

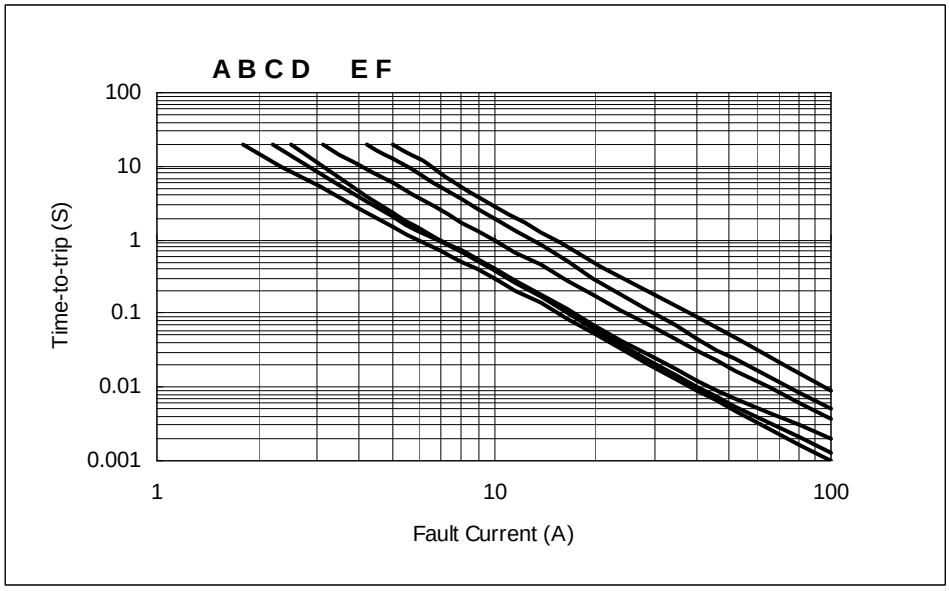
B= FVL 175F

C= FVL 230F



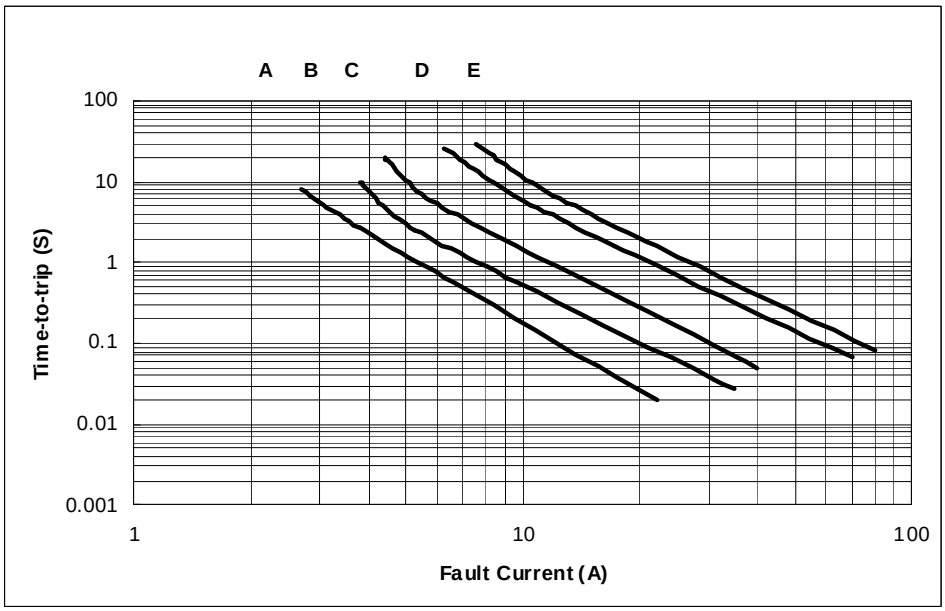
FVT Series

A= FVT 110F
B= FVT 170F
C= FVT 175F
D= FVT 200F
E= FVT 210F
F= FVT 240F



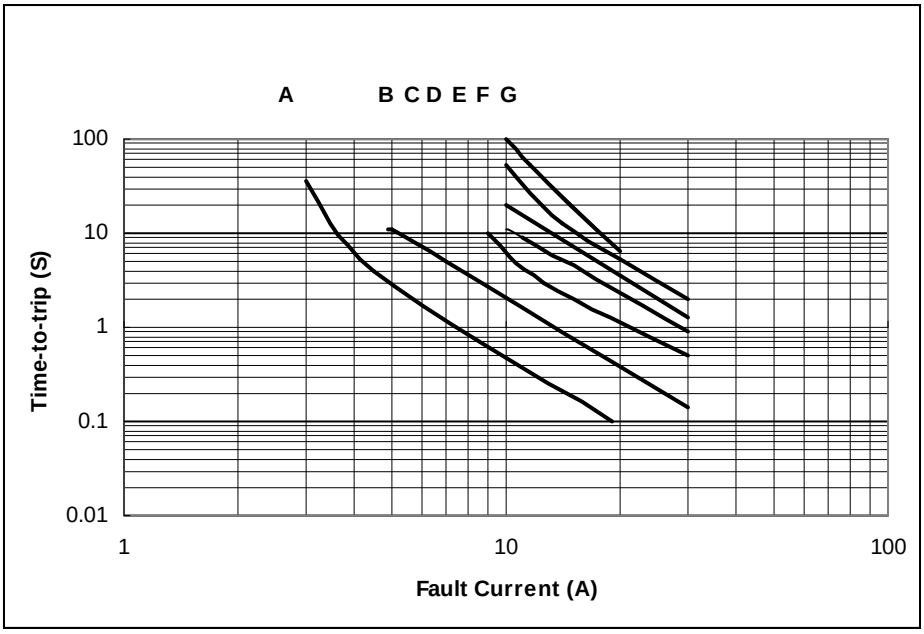
FSR Series

A =FSR 120F
B =FSR 175F
C =FSR 200F
D =FSR 350F
E =FSR 420F

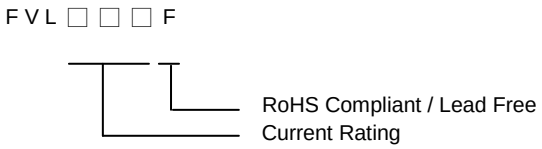


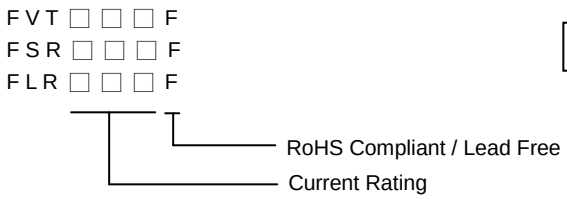
FLR Series

A=FLR 190F
B=FLR 260F
C=FLR 380F
D=FLR 450F
E=FLR 550F
F=FLR 600F
G=FLR 730F



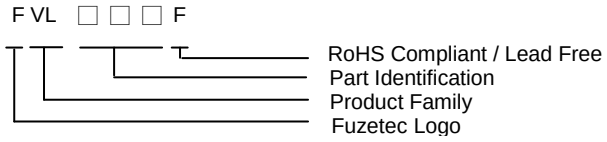
Part Numbering System

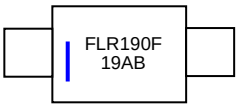




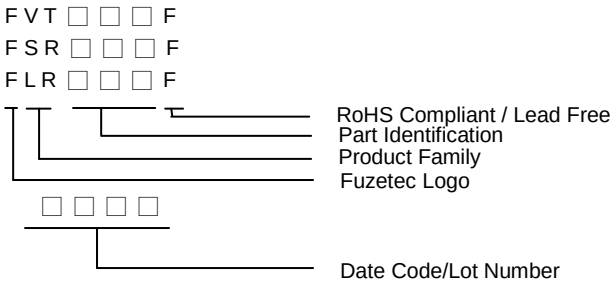
Part Marking System

Example





Example



Standard Package

FVL170F~FVL175F	:	1.0K Pcs/Bag	FVL230F	:	500 Pcs/Bag
FVT110F~FVT210GF	:	1.0K Pcs/Bag	FVT240F	:	500 Pcs/Bag
FSR120F~FSR175F	:	1.0K Pcs/Bag	FSR200F~FSR420F	:	500 Pcs/Bag
FLR190F~FLR380F	:	1.0K Pcs/Bag	FLR450F~FLR730F	:	500 Pcs/Bag

Warning: - Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.

- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

Lo Rho INTRODUCTION AND HIGHLIGHT

Lo Rho (Low Rho) PPTC Resettable Fuse takes advantage of newly developed conductive material technology and manufacturing processing capability; which offer ultra low resistance and miniature device dimension. Fuzetec is pleased to offer Lo Rho PPTC device in both SMD and Strap type forms which are ideal for Portable electronics Battery protection/Protection Circuit Module (PCM), high speed data /charging USB 3.0 and other applications which require compact space and flexible design.

FEATURE

- Ultra Low Resistance
- Smaller Dimension, only 1/4 of Std. Carbon PPTC.
- Less Voltage Drop (Lower Resistance)
- Higher Ihold (same dimension)
- Lower Power Consumption (Smaller Pd)

TYPICAL APPLICATION

- Portable Electronics : SMART PHONE, iPHONE, iPAD….,etc.
- USB 3.0

HOW Lo Rho PPTCs BENEFIT YOUR PORTABLE ELECTRONICS?

- Longer Use/Stand by Time
- Faster Data Transmission rate
- Faster Power Charging Time
- Low Noise on Signal/Data Transmission
- Lower Power Consumption

Lo Rho FSMD1812 Series

RoHS Compliant & Halogen Free

RoHS 2002/95/EC | HF Halogen Free

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: 1.4~3.7A

Maximum Voltage: 6V

Temperature Range: -40℃ to 85℃

Agency Recognition: *UL (E211981)
*C-UL (E211981)
*TÜV (R50004084)

Electrical Characteristics (23℃)

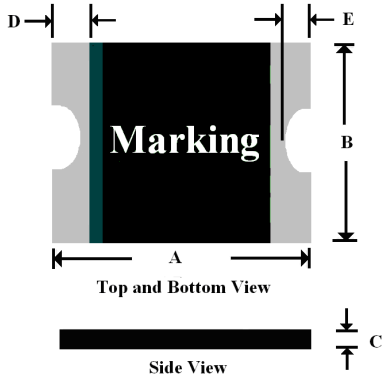
Part Number	Hold Current	Trip Current	Rated Voltage	Max Current	Typ. Power	Max Time to Trip		Resistance	
						Current	Time	R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	V_{MAX}, V_{DC}	I_{MAX}, A	Pd, W	A	Sec	Ohms	Ohms
FSMD140RZ	1.40	3.60	6	100	1.0	8.0	3.00	0.010	0.035
FSMD190RZ	1.90	4.90	6	100	1.0	8.0	5.00	0.003	0.025
FSMD270RZ	2.70	6.20	6	100	1.0	13.5	3.00	0.003	0.023
FSMD370RZ	3.70	9.10	6	100	1.0	18.5	2.00	0.003	0.018

Termination pad characteristics
Termination pad materials: Pure Tin
*Note: FSMD140RZ、 FSMD270RZ、 FSMD370RZ UL, C-UL and TÜV pending

Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
DERATING %	145%	130%	117%	100%	97%	86%	77%	69%	62%	50%

Lo Rho FSMD Product Dimensions (mm)

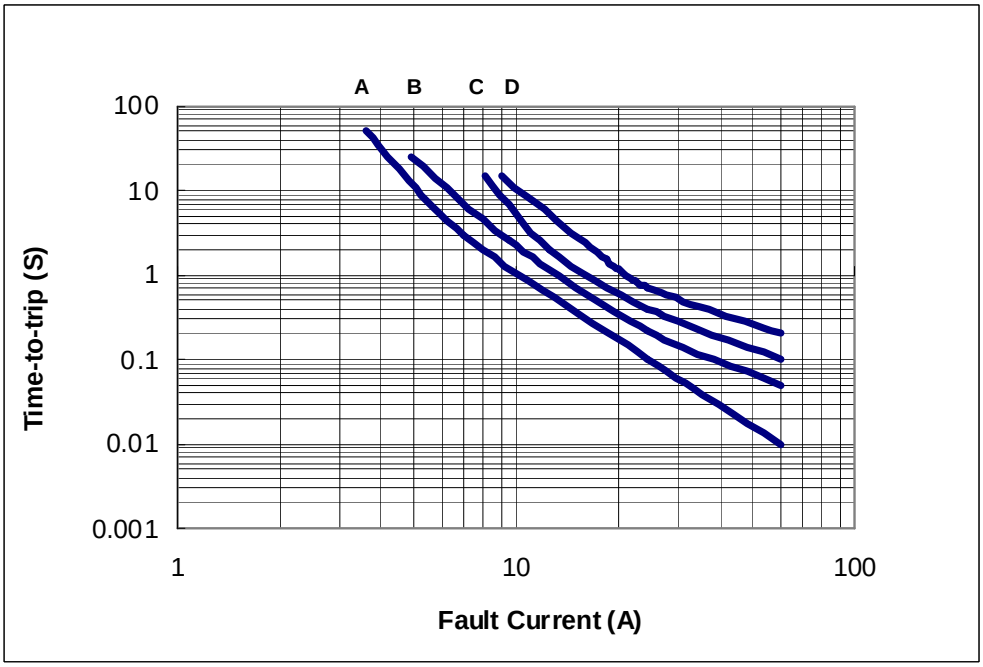


Part Number	A		B		C		D		E	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
FSMD140RZ	4.37	4.73	3.07	3.41	0.30	0.70	0.25	0.95	0.25	0.65
FSMD190RZ	4.37	4.73	3.07	3.41	0.30	0.70	0.25	0.95	0.25	0.65
FSMD270RZ	4.37	4.73	3.07	3.41	0.40	0.75	0.25	0.95	0.25	0.65
FSMD370RZ	4.37	4.73	3.07	3.41	0.40	0.75	0.25	0.95	0.25	0.65

*For Reflow Soldering Profile information, please refer to P.70 ” IV APPENDIX – SMD PRODUCT SOLDER REFLOW RECOMMENDATIONS “

Typical Time-To-Trip at 23℃

A = FSMD140RZ
B = FSMD190RZ
C = FSMD270RZ
D = FSMD370RZ



Part Numbering System

F S M D □ □ □ RZ

Special code

Current Rating

Part Marking System

F190

Example

F □ □ □

Part Identification

Fuzetec Logo

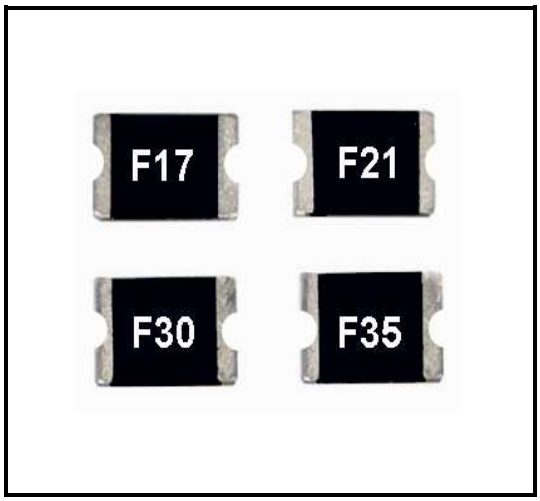
F14Z = FSMD140RZ
F190 = FSMD190RZ
F27Z = FSMD270RZ
F37Z = FSMD370RZ

Standard Package

FSMD140RZ~ FSMD370RZ : 2.0K Reel/Tape

Warning: - Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.
- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

Lo Rho FSMD1210 Series



RoHS Compliant & Halogen Free

RoHS 2002/95/EC | HF Halogen Free

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: 1.75~3.5A

Maximum Voltage: 6V

Temperature Range: -40℃ to 85℃

Agency Recognition: UL, C-UL and TÜV: Pending

Electrical Characteristics (23℃)

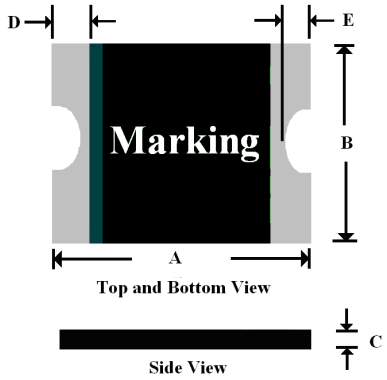
Part Number	Hold Current	Trip Current	Rated Voltage	Max Current	Typ. Power	Max Time to Trip		Resistance	
						Current	Time	R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	V_{MAX}, V_{DC}	I_{MAX}, A	Pd, W	A	Sec	Ohms	Ohms
FSMD175-1210RZ	1.75	3.50	6	100	1.0	8.0	2.50	0.006	0.040
FSMD200-1210RZ	2.00	4.90	6	100	1.0	8.0	3.00	0.005	0.024
FSMD300-1210RZ	3.00	8.00	6	100	1.0	17.5	4.00	0.004	0.018

Termination pad characteristics
Termination pad materials: Pure Tin

Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
DERATING (%)	145%	130%	117%	100%	97%	86%	77%	69%	62%	50%

Lo Rho FSMD Product Dimensions (mm)



Part Number	A		B		C		D		E	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
FSMD175-1210RZ	3.00	3.43	2.35	2.80	0.40	0.75	0.25	0.75	0.10	0.45
FSMD200-1210RZ	3.00	3.43	2.35	2.80	0.40	0.75	0.25	0.75	0.10	0.45
FSMD300-1210RZ	3.00	3.43	2.35	2.80	0.40	0.75	0.25	0.75	0.10	0.45

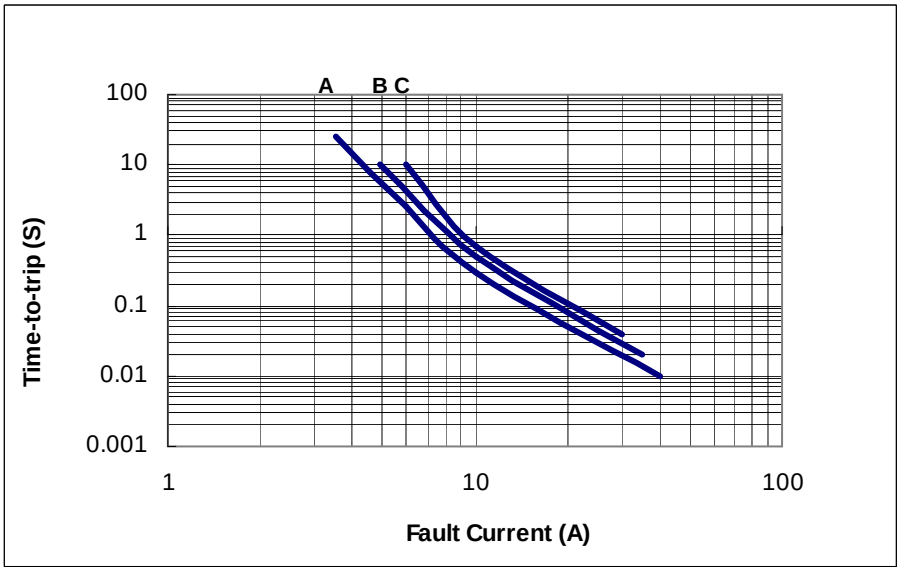
*For Reflow Soldering Profile information, please refer to P.70 ” IV APPENDIX – SMD PRODUCT SOLDER REFLOW RECOMMENDATIONS “

Typical Time-To-Trip at 23℃

A=FSMD175-1210RZ

B=FSMD200-1210RZ

C=FSMD300-1210RZ



Part Numbering System

F S M D □ □ □ - 1210 RZ

Special code

Current Rating

Part Marking System

KZ

Example

F □ □

Part Identification

Fuzetec Logo

KZ = FSMD175-1210RZ

MZ = FSMD200-1210RZ

SZ = FSMD300-1210RZ

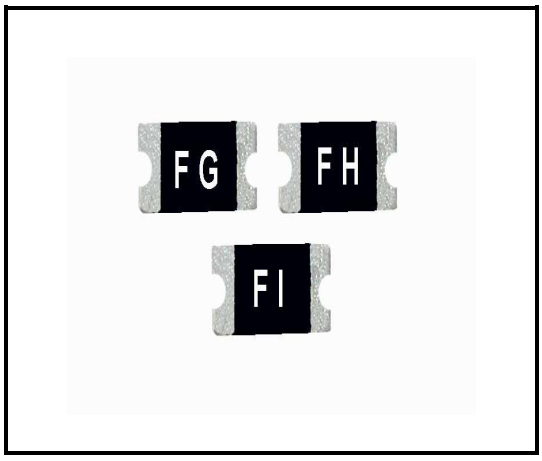
Standard Package

FSMD175-1210RZ~ FSMD300-1210RZ : 4K Reel/Tape

Warning: - Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.

- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

Lo Rho FSMD1206 Series



RoHS Compliant & Halogen Free

RoHS 2002/95/EC | HF Halogen Free

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: 1.1~2.0A

Maximum Voltage: 6V

Temperature Range: -40℃ to 85℃

Agency Recognition: UL, C-UL and TÜV: Pending

Electrical Characteristics (23℃)

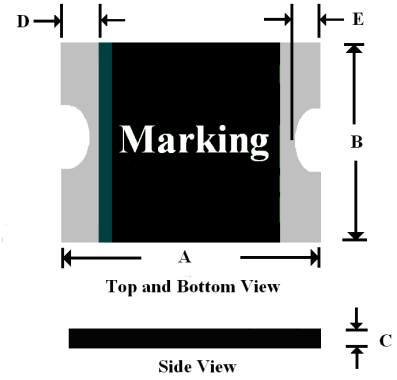
Part Number	Hold Current	Trip Current	Rated Voltage	Max Current	Typ. Power	Max Time to Trip		Resistance	
						Current	Time	R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	V_{MAX}, V_{DC}	I_{MAX}, A	Pd, W	A	Sec	Ohms	Ohms
FSMD110-1206RZ	1.10	2.20	6	100	0.8	8.0	0.30	0.015	0.100
FSMD150-1206RZ	1.50	3.00	6	100	0.8	8.0	0.30	0.010	0.065
FSMD200-1206RZ	2.00	4.00	6	100	0.8	8.0	0.50	0.005	0.055

Termination pad characteristics
Termination pad materials: Pure Tin

Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
DERATING (%)	145%	130%	117%	100%	97%	86%	77%	69%	62%	50%

Lo Rho FSMD Product Dimensions (mm)

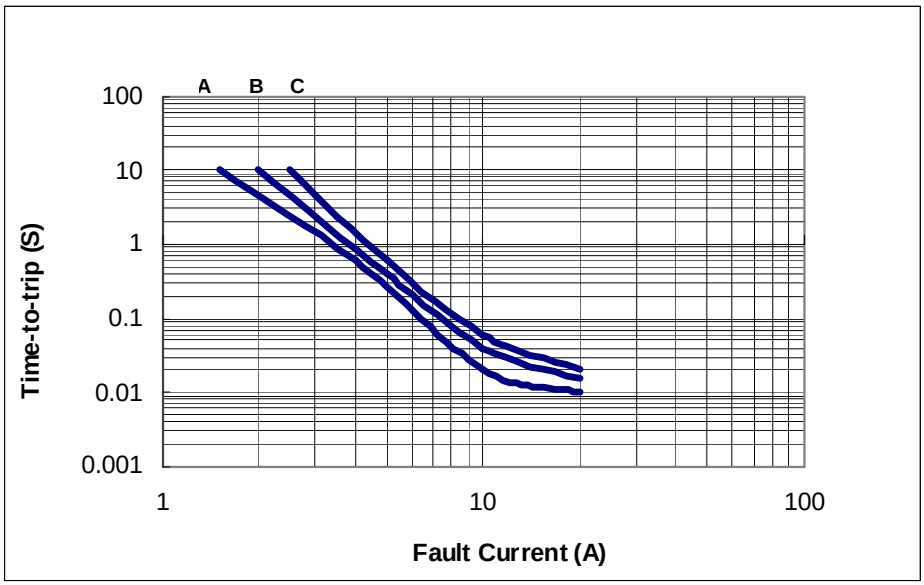


Part Number	A		B		C		D		E	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
FSMD110-1206RZ	3.00	3.50	1.50	1.80	0.40	0.75	0.25	0.75	0.10	0.45
FSMD150-1206RZ	3.00	3.50	1.50	1.80	0.40	0.75	0.25	0.75	0.10	0.45
FSMD200-1206RZ	3.00	3.50	1.50	1.80	0.40	0.75	0.25	0.75	0.10	0.45

*For Reflow Soldering Profile information, please refer to P.70 ” IV APPENDIX – SMD PRODUCT SOLDER REFLOW RECOMMENDATIONS “

Typical Time-To-Trip at 23℃

A=FSMD110-1206RZ
B=FSMD150-1206RZ
C=FSMD200-1206RZ



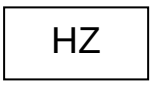
Part Numbering System

F S M D □ □ □ - 1206 RZ

Special code

Current Rating

Part Marking System



Example

F □

Part Identification

Fuzetec Logo

HZ = FSMD110-1206RZ
J Z = FSMD150-1206RZ
MZ = FSMD200-1206RZ

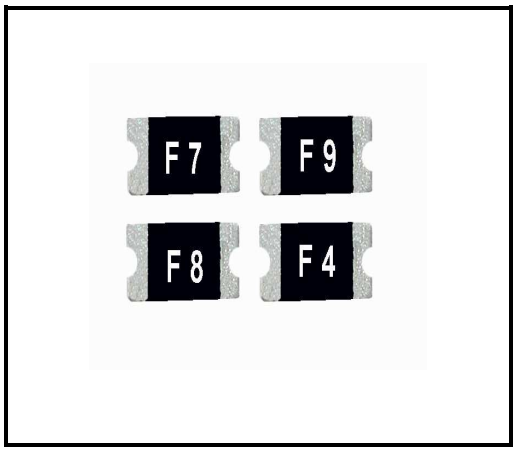
Standard Package

FSMD110-1206RZ~ FSMD200-1206RZ : 4K Reel/Tape

Warning: - Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.

- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

Lo Rho FSMD0805 Series



RoHS Compliant & Halogen Free

RoHS 2002/95/EC | HF Halogen Free

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: 0.75~1.25A

Maximum Voltage: 6V

Temperature Range: -40℃ to 85℃

Agency Recognition: UL, C-UL and TÜV: Pending

Electrical Characteristics (23℃)

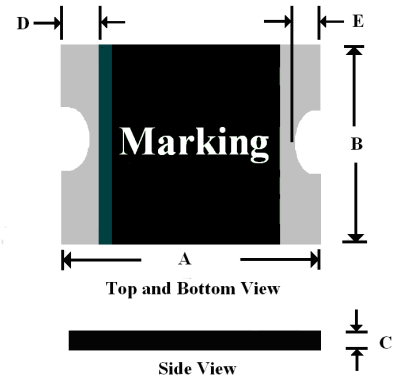
Part Number	Hold Current	Trip Current	Rated Voltage	Max Current	Typ. Power	Max Time to Trip		Resistance	
						Current	Time	R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	V_{MAX}, V_{DC}	I_{MAX}, A	Pd, W	A	Sec	Ohms	Ohms
FSMD075-0805RZ	0.75	1.50	6	100	0.6	8.0	0.20	0.040	0.160
FSMD110-0805RZ	1.10	1.80	6	100	0.6	8.0	0.30	0.030	0.130
FSMD125-0805RZ	1.25	2.50	6	100	0.6	8.0	0.30	0.030	0.120
FSMD150-0805RZ	1.50	3.00	6	100	0.6	8.0	0.30	0.025	0.100

Termination pad characteristics
Termination pad materials: Pure Tin

Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
DERATING (%)	145%	130%	117%	100%	97%	86%	77%	69%	62%	50%

Lo Rho FSMD Product Dimensions (mm)

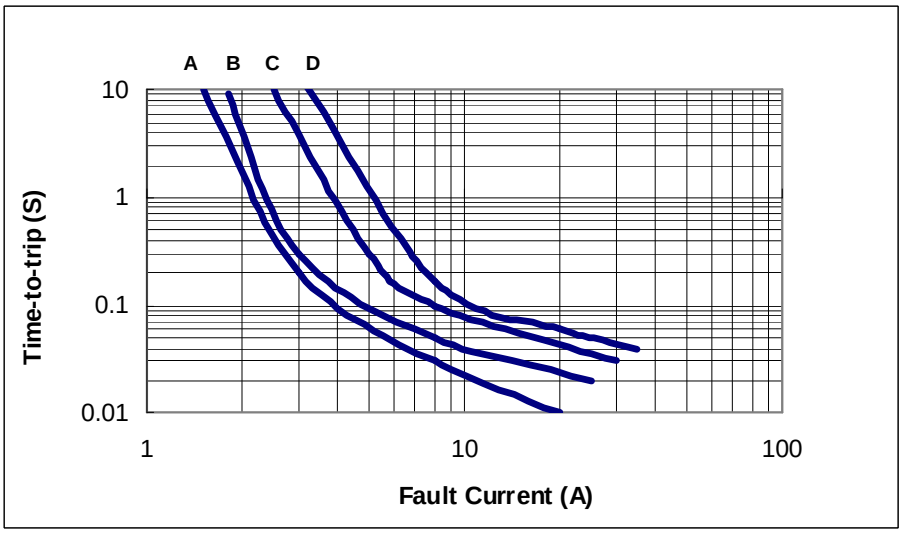


Part Number	A		B		C		D		E	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
FSMD075-0805RZ	2.00	2.20	1.20	1.50	0.40	0.75	0.20	0.60	0.10	0.45
FSMD110-0805RZ	2.00	2.20	1.20	1.50	0.40	0.75	0.20	0.60	0.10	0.45
FSMD125-0805RZ	2.00	2.20	1.20	1.50	0.40	0.75	0.20	0.60	0.10	0.45
FSMD150-0805RZ	2.00	2.20	1.20	1.50	0.40	0.75	0.20	0.60	0.10	0.45

*For Reflow Soldering Profile information, please refer to P.70 ” IV APPENDIX – SMD PRODUCT SOLDER REFLOW RECOMMENDATIONS “

Typical Time-To-Trip at 23℃

A=FSMD075-0805RZ
B=FSMD110-0805RZ
C=FSMD125-0805RZ
D=FSMD150-0805RZ



Part Numbering System

F S M D □ □ □ - 0805 RZ

- Special code
- Current Rating

Part Marking System

Example

F □

- Part Identification
- Fuzetec Logo

F = FSMD075-0805RZ
H = FSMD110-0805RZ
I = FSMD125-0805RZ
J = FSMD150-0805RZ

Standard Package

FSMD075-0805RZ~ FSMD150-0805RZ : 4K Reel/Tape

Warning: - Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.
- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

Lo Rho STRAP FSL Series

RoHS Compliant & Halogen Free

RoHS 2002/95/EC | HF Halogen Free

Application: Laptop Computer, Mobile phone battery packs, Rechargeable battery packs, Lithium cell and battery packs

Product Features: Low resistance, Solid state

Operation Current: 1.4~4.5A

Maximum Voltage: $6V_{DC}$

Temperature Range: -40℃ to 85℃

Agency Recognition : *UL (E211981)
*C-UL (E211981)
*TÜV (R50004084)

Electrical Characteristics(23℃)

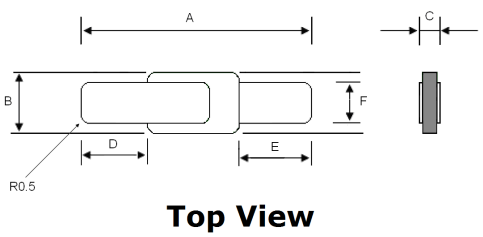
Part Number	Hold Current	Trip Current	Rated Voltage	Max. Current	Typ. Power	Max Time to Trip		Resistance Tolerance		
						Current	Time	R_{MIN}	R_{MAX}	$R1_{MAX}$
	I_H,A	I_T,A	V_{MAX}, V_{DC}	I_{MAX}, A	Pd, W	A	Sec	Ohms	Ohms	Ohms
FSL140F	1.4	3.6	6	50	1.0	7.0	3.0	0.010	0.020	0.035
FSL190F	1.9	4.9	6	50	1.0	9.5	3.0	0.006	0.014	0.024
FSL250F	2.5	8.0	6	50	1.0	12.5	3.0	0.006	0.012	0.020
FSL270F	2.7	8.1	6	50	1.0	13.5	2.0	0.006	0.012	0.018
FSL310F	3.1	8.8	6	50	1.0	15.5	3.0	0.004	0.010	0.016
FSL370F	3.7	9.0	6	50	1.0	18.5	5.0	0.003	0.008	0.014
FSL450LF	4.5	9.5	6	50	1.0	22.5	3.0	0.0025	0.0055	0.010

Physical specifications:
Lead material: 0.1 mm nominal thickness, quarter-hard nickel.
Insulating material: Polyester tape.
*Note: FSL250F, FSL370F, FSL450LF UL, CUL and TÜV pending

Thermal Derating for PPTC Device at Various Ambient Temperatures

TEMPERATURE	-40℃	-20℃	0℃	23℃	30℃	40℃	50℃	60℃	70℃	85℃
DERATING %	184%	158%	130%	100%	93%	80%	67%	55%	40%	20%

Production Dimensions (mm)

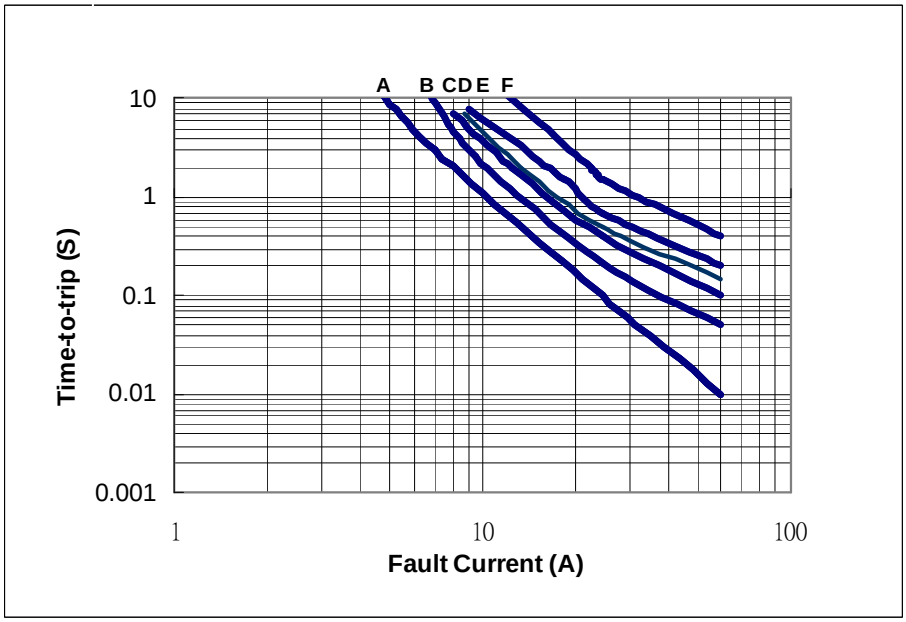


Top View

Part Number	A		B		C		D		E		F	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
FSL140F	9.20	10.80	3.15	3.45	0.55	0.95	2.15	3.25	2.15	3.25	2.20	2.40
FSL190F	9.20	10.80	3.15	3.45	0.55	0.95	2.15	3.25	2.15	3.25	2.20	2.40
FSL250F	9.20	10.80	3.15	3.45	0.55	0.95	2.15	3.25	2.15	3.25	2.20	2.40
FSL270F	9.20	10.80	3.15	3.45	0.55	0.95	2.15	3.25	2.15	3.25	2.20	2.40
FSL310F	9.20	10.80	3.15	3.45	0.55	0.95	2.15	3.25	2.15	3.25	2.20	2.40
FSL370F	9.20	10.80	3.15	3.45	0.55	0.95	2.15	3.25	2.15	3.25	2.20	2.40
FSL450LF	20.5	21.50	3.50	3.90	0.55	0.95	7.00	8.00	7.00	8.00	2.40	2.60

Typical Time-To-Trip at 23℃

A = FSL140F
B = FSL190F
C = FSL250F
C = FSL270F
D = FSL310F
E = FSL370F
F = FSL450LF

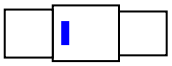


Part Numbering System

F S L □ □ □ (□ F)

- RoHS Compliant/ Lead Free
- L: Long lead
- Current Rating

Part Marking System



FSL190F = FSC

Orientation Mark

Standard Package

FSL140F~FSL450LF : 500 Pcs/Bag

Warning: - Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.

- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

Fuzetec		Tyco (Raychem)		Bourns		Littelfuse	
FRX	005-60F	RXEF	005	MF-R	005	--	--
FRX	010-60F	RXEF	010	MF-R	010	60R	010
FRX	017-60F	RXEF	017	MF-R	017	60R	017
FRX	020-60F	--	--	MF-R	020	60R	020
FRX	025-60F	--	--	MF-R	025	60R	025
FRX	030-60F	--	--	MF-R	030	60R	030
FRX	040-60F	--	--	MF-R	040	60R	040
FRX	050-60F	--	--	MF-R	050	60R	050
FRX	065-60F	--	--	MF-R	065	60R	065
FRX	075-60F	--	--	MF-R	075	60R	075
FRX	090-60F	--	--	MF-R	090	60R	090
FRX	110-60F	--	--	MF-RX	110	60R	110
FRX	135-60F	--	--	MF-RX	135	60R	135
FRX	160-60F	--	--	MF-RX	160	60R	160
FRX	185-60F	--	--	MF-RX	185	60R	185
FRX	250-60F	--	--	MF-RX	250	60R	250
FRX	300-60F	--	--	MF-RX	300	60R	300
FRX	375-60F	--	--	MF-RX	375	60R	375
FRK	050-60F	RKEF	050	--	--	--	--
FRK	065-60F	RKEF	065	--	--	--	--
FRK	075-60F	RKEF	075	--	--	--	--
FRK	090-60F	RKEF	090	--	--	--	--
FRK	110-60F	RKEF	110	--	--	--	--
FRK	135-60F	RKEF	135	--	--	--	--
FRK	160-60F	RKEF	160	--	--	--	--
FRK	185-60F	RKEF	185	--	--	--	--
FRK	250-60F	RKEF	250	--	--	--	--
FRK	300-60F	RKEF	300	--	--	--	--
FRK	375-60F	RKEF	375	--	--	--	--
FRK	400-60F	RKEF	400	--	--	--	--
FRK	500-60F	RKEF	500	--	--	--	--
FRX	010-90F	--	--	--	--	--	--
FRX	015-90F	--	--	--	--	--	--
FRX	017-90F	--	--	--	--	--	--
FRX	020-90F	RXEF	020	MF-RX	020/72	72R	020X
FRX	025-90F	RXEF	025	MF-RX	025/72	72R	025X
FRX	030-90F	RXEF	030	MF-RX	030/72	72R	030X
FRX	035-90F	--	--			--	--
FRX	040-90F	RXEF	040	MF-RX	040/72	72R	040X
FRX	050-90F	RXEF	050	MF-RX	050/72	72R	050X
FRX	055-90F	--	--	--	--	--	--
FRX	065-90F	RXEF	065	MF-RX	065/72	72R	065X
FRX	075-90F	RXEF	075	MF-RX	075/72	72R	075X
FRX	090-90F	RXEF	090	MF-RX	090/72	72R	090X
FRX	110-90F	RXEF	110	MF-RX	110/72	72R	110X
FRX	135-90F	RXEF	135	MF-RX	135/72	72R	135X
FRX	160-90F	RXEF	160	MF-RX	160/72	72R	160X
FRX	185-90F	RXEF	185	MF-RX	185/72	72R	185X
FRX	250-90F	RXEF	250	MF-RX	250/72	72R	250X
FRX	300-90F	RXEF	300	MF-RX	300/72	72R	300X
FRX	375-90F	RXEF	375	MF-RX	375/72	72R	375X
FRU	090-30F	RUEF	090	MF-R	090-0-9	30R	090
FRU	110-30F	RUEF	110	MF-R	110	30R	110
FRU	135-30F	RUEF	135	MF-R	135	30R	135
FRU	160-30F	RUEF	160	MF-R	160	30R	160
FRU	185-30F	RUEF	185	MF-R	185	30R	185
FRU	250-30F	RUEF	250	MF-R	250	30R	250
FRU	300-30F	RUEF	300	MF-R	300	30R	300
FRU	400-30F	RUEF	400	MF-R	400	30R	400
FRU	500-30F	RUEF	500	MF-R	500	30R	500
FRU	600-30F	RUEF	600	MF-R	600	30R	600

Fuzetec		Tyco (Raychem)		Bourns		Littelfuse	
FRU	700-30F	RUEF	700	MF-R	700	30R	700
FRU	800-30F	RUEF	800	MF-R	800	30R	800
FRU	900-30F	RUEF	900	MF-R	900	30R	900
FRT	050-33F	--	--	--	--	--	--
FRT	075-33F	--	--	--	--	--	--
FRT	090-33F	--	--	--	--	--	--
FRT	120-33F	RTEF	120	--	--	--	--
FRT	135-33F	RTEF	135	--	--	--	--
FRT	160-33F	--	--	--	--	--	--
FRT	190-33F	RTEF	190	--	--	--	--
FRT	220-33F	--	--	--	--	--	--
FRT	250-33F	--	--	--	--	--	--
FUSB	075F	RUSBF	075	--	--	06R	075B
FUSB	090F	RUSBF	090	--	--	16R	090B
FUSB	110F	RUSBF	110	--	--	06R	110B
FUSB	120F	RUSBF	120	--	--	06R	120B
FUSB	135F	RUSBF	135	--	--	16R	135B
FUSB	155F	RUSBF	155	--	--	06R	155B
FUSB	160F	RUSBF	160	--	--	16R	160B
FUSB	185F	RUSBF	185	--	--	16R	185B
FUSB	250F	RUSBF	250	--	--	16R	250B
FRG	250-16F	RGEF	250	--	--	16R	250G
FRG	300-16F	RGEF	300	MF-RG	300	16R	300G
FRG	400-16F	RGEF	400	--	--	16R	400G
FRG	500-16F	RGEF	500	MF-RG	500	16R	500G
FRG	600-16F	RGEF	600	--	--	16R	600G
FRG	700-16F	RGEF	700	--	--	16R	700G
FRG	800-16F	RGEF	800	--	--	16R	800G
FRG	900-16F	RGEF	900	--	--	16R	900G
FRG	1000-16F	RGEF	1000	--	--	16R	1000G
FRG	1100-16F	RGEF	1100	MF-R	1100	16R	1100G
FRG	1200-16F	RGEF	1200	--	--	16R	1200G
FRG	1400-16F	RGEF	1400	--	--	16R	1400G
FHT	050-30F	RHEF	050	--	--	--	--
FHT	070-30F	RHEF	070	MF-RHT	070	--	--
FHT	100-30F	RHEF	100	--	--	--	--
FHT	200-16F	RHEF	200	MF-RHT	200	--	--
FHT	300-16F	RHEF	300	--	--	--	--
FHT	400-16F	RHEF	400	--	--	--	--
FHT	450-16F	RHEF	450	MF-RHT	450	--	--
FHT	550-16F	RHEF	550	--	--	--	--
FHT	600-16F	RHEF	600	--	--	--	--
FHT	650-16F	RHEF	650	MF-RHT	650	--	--
FHT	700-16F	RHEF	700	--	--	--	--
FHT	750-16F	RHEF	750	MF-RHT	750	--	--
FHT	800-16F	RHEF	800	--	--	--	--
FHT	900-16F	RHEF	900	--	--	--	--
FHT	1000-16F	RHEF	1000	--	--	--	--
FHT	1100-16F	RHEF	1100	--	--	--	--
FHT	1300-16F	RHEF	1300	MF-RHT	1300	--	--
FHT	1400-16F	RHEF	1400	--	--	--	--
FHT	1500-16F	RHEF	1500	--	--	--	--

Fuzetec		Tyco (Raychem)		Bourns		Littelfuse	
FRH	080-250UVF	TRF	250-080U	--	--	--	--
FRH	080-250VF	--	--	--	--	250R	080
FRH	110-250UVF	TRF	250-110U	--	--	--	--
FRH	110-250VF	--	--	--	--	--	--
FRH	120-250UVF	TRF	250-120U	MF-RX	012/250U	--	--
FRH	120-250VF	TRF	250-120	MF-RX	012/250	250R	120
FRH	145-250UVF	TRF	250-145U	MF-RX	014/250U	--	--
FRH	145-250VF	TRF	250-145	MF-RX	014/250	250R	145
FRH	180-250UVF	--	--	MF-RX	018/250U	--	--
FRH	180-250VF	--	--	MF-RX	018/250	250R	180
FRH	180-250XF	TRF	250-184	--	--	--	--
FRH	150-600VF	TR	600-150F-EX	MF-RX	015/600	--	--
FRH	150-600MF	TRF	600-150	--	--	600R	150
FRH	160-600VF	TRF	600-160	MF-RX	016/600	600R	160
FRV	005-240F	LVR	005S	--	--	--	--
FRV	008-240F	LVR	008S	--	--	--	--
FRV	012-240F	LVR	012S	--	--	--	--
FRV	016-240F	LVR	016S	--	--	--	--
FRV	025-240F	LVR	025S	--	--	--	--
FRV	033-240F	LVR	033S	--	--	--	--
FRV	040-240F	LVR	040S	--	--	--	--
FRV	055-240F	LVR	055S	--	--	--	--
FRV	075-240F	LVR	075S	--	--	--	--
FRV	100-240F	LVR	100S	--	--	--	--
FRV	125-240F	LVR	125S	--	--	--	--
FRV	200-240F	LVR	200S	--	--	--	--
FRVL	010-120F	--	--	--	--	--	--
FRVL	017-120F	--	--	--	--	--	--
FRVL	020-120F	--	--	--	--	--	--
FRVL	025-120F	--	--	--	--	--	--
FRVL	030-120F	--	--	--	--	--	--
FRVL	040-120F	--	--	--	--	--	--
FRVL	050-120F	--	--	--	--	--	--
FRVL	065-120F	--	--	--	--	--	--
FRVL	070-120F	--	--	--	--	--	--
FRVL	075-120F	LVRL	075S	--	--	--	--
FRVL	090-120F	--	--	--	--	--	--
FRVL	100-120F	LVRL	100S	--	--	--	--
FRVL	110-120F	--	--	--	--	--	--
FRVL	125-120F	LVRL	125S	--	--	--	--
FRVL	130-120F	--	--	--	--	--	--
FRVL	135-120F	LVRL	135S	--	--	--	--
FRVL	160-120F	--	--	--	--	--	--
FRVL	185-120F	--	--	--	--	--	--
FRVL	200-120F	LVRL	200S	--	--	--	--
FRVL	250-120F	--	--	--	--	--	--
FRVL	300-120F	--	--	--	--	--	--
FRVL	375-120F	--	--	--	--	--	--
FVT	110F	VTP	110F	--	--	--	--
FVT	170F	VTP	170F	MF-VS	170	16VT	170
FVT	175F	VTP	175F	--	--	16VT	175
FVT	200F	--	--	--	--	16VT	200
FVT	210GF	VTP	210GF	MF-VS	210	16VT	210
FVT	240F	--	--	--	--	16VT	240
FVL	170F	VLR	170F	MF-SVS	170	12VL	170
FVL	175F	VLR	175F	MF-SVS	175	12VL	175
FVL	230F	VLR	230F	MF-SVS	230	12VL	230
FSR	120F	SRP	120F	MF-S	120	15ST	120
FSR	175F	SRP	175F	MF-S	175	15ST	175
FSR	200F	SRP	200F	MF-S	200	STD	200
FSR	350F	SRP	350F	MF-S	350	STD	350
FSR	420F	SRP	420F	MF-S	420	STD	420

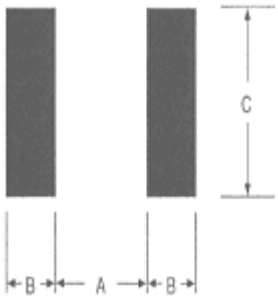
Fuzetec		Tyco (Raychem)		Bourns		Littelfuse	
FLR	190F	LR4	190F	MF-LR	190	15LR	190
FLR	260F	LR4	260F	MF-LR	260	15LR	260
FLR	380F	LR4	380F	MF-LR	380	15LR	380
FLR	450F	LR4	450F	MF-LR	450	20LR	450
FLR	550F	LR4	550F	MF-LR	550	20LR	550
FLR	600F	LR4	600F	MF-LR	600	20LR	600
FLR	730F	LR4	730F	MF-LR	730	20LR	730
FSL	140F	--	--	--	--	--	--
FSL	190F	MXP	190BB	MF-LL	190	06SL	190G
FSL	250F	--	--	--	--	--	--
FSL	270F	--	--	--	--	--	--
FSL	310F	--	--	--	--	--	--
FSL	370F	MXP	370BD	--	--	06SL	370G
FSL	450LF	--	--	--	--	--	--
FSMD	010-R	miniSMDC	010F	MF-MSMF	010	1812L	010
FSMD	014-R	miniSMDC	014F	MF-MSMF	014	1812L	014
FSMD	020-R	miniSMDC	020F	MF-MSMF	020	1812L	020
FSMD	035-R	--	--	--	--	--	--
FSMD	050-R	miniSMDC	050F	MF-MSMF	050	1812L	050
FSMD	075-R	miniSMDC	075F	MF-MSMF	075	1812L	075
FSMD	075-24R	miniSMDC	075F/24	MF-MSMF	075/24	1812L	075/24
FSMD	075-33R	--	--	--	--	1812L	075/33
FSMD	110-R	miniSMDC	110F	MF-MSMF	110	1812L	110
FSMD	110-16-R	miniSMDC	110F/16	MF-MSMF	M110/16	1812L	110/16
FSMD	110-24R	miniSMDC	110F/24	--	--	1812L	110/24
FSMD	125-R	miniSMDC	125F	MF-MSMF	125	1812L	125
FSMD	150-R	miniSMDC	150F	MF-MSMF	150	1812L	150
FSMD	150-12R	miniSMDC	150F/12	--	--	1812L	150/12
FSMD	150-24R	miniSMDC	150F/24	MF-MSMF	150/24X	1812L	150/24
FSMD	160-R	miniSMDC	160F	MF-MSMF	160	1812L	160
FSMD	160-12R	--	--	--	--	1812L	160/12
FSMD	160-16R	--	--	--	--	--	--
FSMD	200R	miniSMDC	200F	MF-MSMF	200	1812L	200
FSMD	260R	miniSMDC	260F	MF-MSMF	260	1812L	260
FSMD	260-13R	miniSMDC	260F/13.2	--	--	--	--
FSMD	260-16R	miniSMDC	260F/16	--	--	--	--
FSMD	300R	miniSMDC	300F	--	--	1812L	300
FSMD*	030-2920-R	SMD	030F	MF-SM	030	2920L	030
FSMD*	050-2920-R	SMD	050F	MF-SM	050	2920L	050
FSMD*	075-2920-R	SMD	075F	MF-SM	075	2920L	075
FSMD*	100-2920-R	SMD	100F	MF-SM	100/33	2920L	100
FSMD*	125-2920-R	SMD	125F	MF-SM	125	2920L	125
FSMD**	150-2920-R	SMD	150F	MF-SM	150/33	2920L	150
FSMD**	185-2920-R	SMD	185F	MF-SM	185/33	2920L	185
FSMD**	200-2920-R	SMD	200F	MF-SM	200	2920L	200
FSMD**	250-2920-R	SMD	250F	MF-SM	250	2920L	250
FSMD**	260-2920-R	SMD	260F	MF-SM	260	2920L	260
FSMD**	300-2920-R	SMD	300F	MF-SM	300	2920L	300
FSMD	005-1210-R	microSMD	005F	MF-USMF	005	1210L	005
FSMD	010-1210-R	microSMD	010F	MF-USMF	010	1210L	010
FSMD	020-1210-R	--	--	MF-USMF	020	1210L	020
FSMD	035-1210-R	microSMD	035F	MF-USMF	035	1210L	035
FSMD	050-1210-R	microSMD	050F	MF-USMF	050	1210L	050
FSMD	075-1210-R	microSMD	075F	MF-USMF	075	1210L	075
FSMD	110-1210R	microSMD	110F	MF-USMF	110	1210L	110
FSMD	150-1210R	microSMD	150F	MF-USMF	150	1210L	150
FSMD	175-1210R	microSMD	175F	MF-USMF	175X	1210L	175
FSMD	200-1210R	microSMD	200F	--	--	1210L	200

Fuzetec		Tyco (Raychem)		Bourns		Littelfuse	
FSMD	005-1206-R	--	--	--	--	--	--
FSMD	010-1206-R	--	--	--	--	--	--
FSMD	012-1206-R	nanoSMDC	012F	MF-NSMF	012	1206L	012
FSMD	016-1206-R	nanoSMDC	016F	--	--	--	--
FSMD	020-1206-R	nanoSMDC	020F	MF-NSMF	020X	1206L	020
FSMD	025-1206-R	nanoSMDC	025F	--	--	1206L	025
FSMD	035-1206-R	nanoSMDC	035F	MF-NSMF	035	1206L	035
FSMD	050-1206-R	nanoSMDC	050F	MF-NSMF	050	1206L	050
FSMD	050-24-1206R	--	--	--	--	--	--
FSMD	075-1206R	nanoSMDC	075F	MF-NSMF	075	1206L	075
FSMD	075-16-1206R	--	--	--	--	--	--
FSMD	100-1206R	--	--	--	--	--	--
FSMD	110-1206R	nanoSMDC	110F	MF-NSMF	110	1206L	110
FSMD	150-1206R	nanoSMDC	150F	MF-NSMF	150	1206L	150
FSMD	200-1206R	nanoSMDC	200F	MF-NSMF	200	1206L	200
FSMD	010-0805-R	picoSMDC	010S	MF-PSMF	010X	0805L	010
FSMD	020-0805-R	picoSMDC	020S	MF-PSMF	020X	0805L	020
FSMD	035-0805-R	picoSMDC	035S	MF-PSMF	035X	0805L	035
FSMD	050-0805R	picoSMDC	050S	MF-PSMF	050X	0805L	050
FSMD	075-0805R	picoSMDC	075S	MF-PSMF	075X	0805L	075
FSMD	100-0805R	picoSMDC	110S	MF-PSMF	110X	0805L	100
FSMD	140RZ	--	--	--	--	--	--
FSMD	190RZ	--	--	--	--	1812L	190SLPR
FSMD	270RZ	--	--	--	--	--	--
FSMD	370RZ	--	--	--	--	--	--
FSMD	175-1210RZ	--	--	--	--	--	--
FSMD	200-1210RZ	--	--	--	--	1210L	200SLYR
FSMD	300-1210RZ	--	--	--	--	--	--
FSMD	350-1210RZ	--	--	--	--	1210L	350SLYR
FSMD	110-1206RZ	--	--	--	--	1206L	110SLYR
FSMD	150-1206RZ	--	--	--	--	1206L	150SLYR
FSMD	200-1206RZ	--	--	--	--	--	--
FSMD	075-0805RZ	--	--	--	--	0805L	075SLYR
FSMD	110-0805RZ	--	--	--	--	0805L	110SLYR
FSMD	125-0805RZ	--	--	--	--	--	--

* : **Dimensional equivalent. Functional identical.** ** : **Dimensional smaller. Functional identical.**

Pad Layouts、Solder Reflow Recommendations

The dimensions in the table below provide the recommended pad layout for Surface Mount Device in different footprints.



Pad dimensions (Millimeter)			
Device	A Nominal	B Nominal	C Nominal
All 2920 Series	5.10	2.30	5.60
All 1812 Series	3.45	1.78	3.50
All 1210 Series	2.00	1.00	2.80
All 1206 Series	2.00	1.00	1.90
All 0805 Series	1.20	1.00	1.50

Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (Tsmax to Tp)	3 ℃/second max.
Preheat : Temperature Min (Tsmin) Temperature Max (Tsmax) Time (tsmin to tsmax)	 150 ℃ 200 ℃ 60-180 seconds
Time maintained above: Temperature(T_L) Time (t_L)	 217 ℃ 60-150 seconds
Peak/Classification Temperature(Tp) :	260 ℃
Time within 5℃ of actual Peak : Temperature (tp)	 20-40 seconds
Ramp-Down Rate :	6 ℃/second max.
Time 25 ℃ to Peak Temperature :	8 minutes max.

Note 1: All temperatures refer to the package, measured on the package body surface.

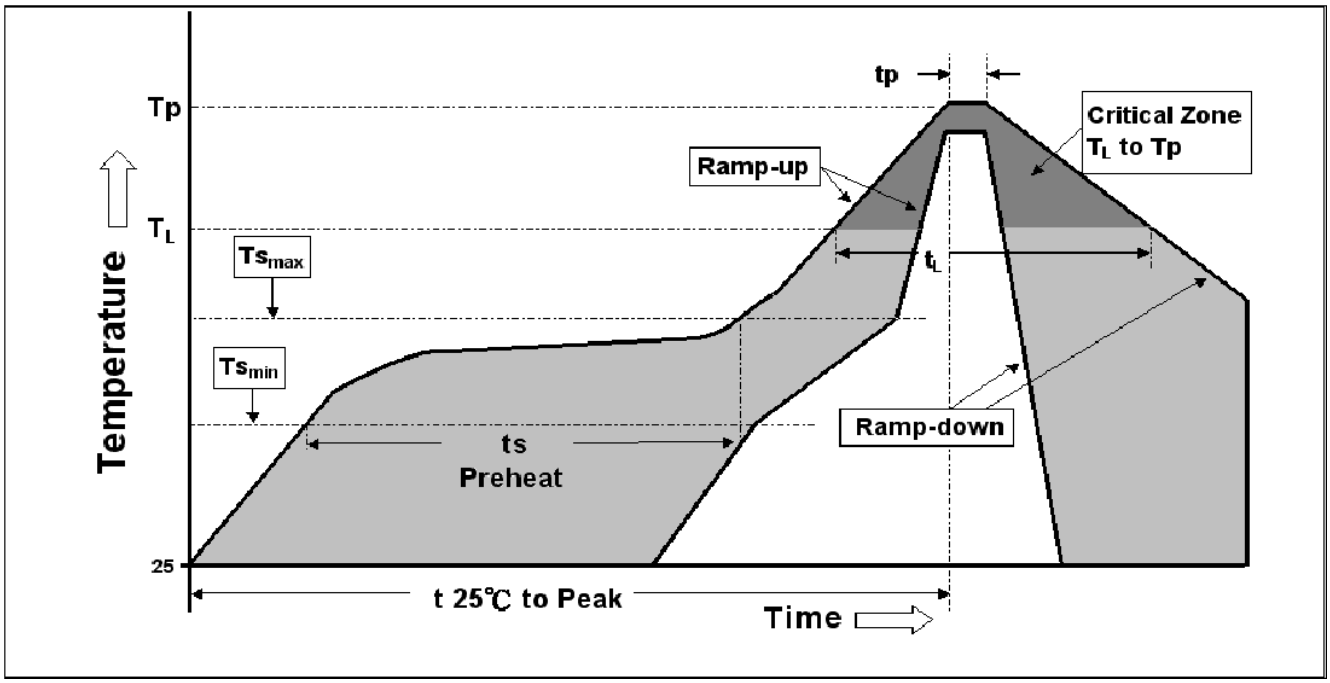
Solder reflow

※ Due to “Lead Free” nature, Temperature and Dwelling Time for the soldering zone is higher than those for Regular. This may cause damage to other components.

1. Recommended max paste thickness > 0.25mm.
2. Devices can be cleaned using standard methods and aqueous solvent.
3. Rework use standard industry practices.
4. Storage Environment : < 30℃ / 60%RH

Caution:

1. If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.
2. Devices are not designed to be wave soldered to the bottom side of the board



Fill in the following BLANKS to help us out in suggesting the **"Right"** product for your applications.

1. Determine the followings to define your circuit operation parameter,

Normal operating current :_____. Typical fault current:_____.

Normal operating voltage :_____. Required opening time at fault:_____

Maximum interrupt current: _____. Form factor: _____.

Maximum operating voltage: _____.

Maximum Ambient Temperature/ Derating : Between _____℃ and _____℃

Typical resistance (in circuit):_____Agency approvals:_____

2. Select the appropriate Fuzetec series from the table listed below:_____

Fuzetec Family	Voltage	Hold Current	Form factor	Application
FRX	60V**DC**	0.05A~3.75A	Radial Leaded	Wide Variety of Electronic Equipment
FRK	60V**DC**	0.50A~5.00A	Radial Leaded	Wide Variety of Electronic Equipment
FRX90V	72V**DC**/90V**DC**	0.10A~3.75A	Radial Leaded	Wide Variety of Electronic Equipment
FRU	30 V_{DC}	0.90A~9.00A	Radial Leaded	Wide Variety of Electronic Equipment
FRT	36V_{DC}	0.50A~2.50A	Radial Leaded	IEEE1394 Firewire & Consumer Electronics
FUSB	16V_{DC}/30V_{DC}	0.75A~2.50A	Radial Leaded	Low Voltage USB Equipment
FRG	16V_{DC}	2.5A~14.0A	Radial Leaded	Wide Variety of Electronic Equipment
FHT	16V_{DC}/30V_{DC}	0.50A~15.00A	Radial Leaded	Wide operating temperatures up to 125℃.
FRHV	100V/250V/600V_{DC}	0.08A~0.18A	Radial Leaded	Telecommunication and Network
FRVL	120$V_{AC/DC}$	0.10A ~3.75A	Radial Leaded	Line Voltage Application
FRV	240$V_{AC/DC}$	0.50A~2.00A	Radial Leaded	Line Voltage Application
FSMD2920	6V~60V_{DC}	0.30A~3.00A	Surface Mount	All High-Density Board
FSMD1812	6V~60V_{DC}	0.10A~3.00A	Surface Mount	All High-Density Board
FSMD1210	6V~60V_{DC}	0.05A ~2.00A	Surface Mount	All High-Density Board
FSMD1206	6V~60V_{DC}	0.05A ~2.00A	Surface Mount	All High-Density Board
FSMD0805	6V~15V_{DC}	0.10A~1.00A	Surface Mount	All High-Density Board
FVL	12V_{DC}	1.70A~2.30 A	Axial Leaded	Rechargeable Battery Packs, Lithium Cell and Battery Packs
FVT	16V_{DC}	1.10A~2.40 A	Axial Leaded	Rechargeable Battery Packs, Lithium Cell and Battery Packs
FSR	15V_{DC}/30V_{DC}	1.20A~4.20A	Axial Leaded	Rechargeable Battery Packs
FLR	15V_{DC}/20V_{DC}	1.90A~7.30A	Axial Leaded	Rechargeable Battery Packs
Lo Rho FSMD1812	6V_{DC}	1.40A~3.70A	Surface Mount	Ultra Low Resistance
Lo Rho FSMD1210	6V_{DC}	1.75A ~3.50A	Surface Mount	Ultra Low Resistance
Lo Rho FSMD1206	6V_{DC}	1.10A ~2.00A	Surface Mount	Ultra Low Resistance
Lo Rho FSMD0805	6V_{DC}	0.75A~1.25A	Surface Mount	Ultra Low Resistance
Lo Rho Strap FSL	6V_{DC}	1.40A~4.50A	Axial Leaded	Ultra Low Resistance for Portable Electronics Rechargeable Battery Packs Protection

3. Fill in the followings:

a) Quantity of samples requested:_____

b) Application Type:_____

c) Company name:_____

_____

d) Address:_____

Contact Person:_____Position :_____

Tel:_____Fax:_____

E-mail: _____Website:_____

e) Type of Business:_____