

## FRVL Series



**RoHS Compliant & Lead Free**



**Application** : Line Voltage Power Supply, Transformer and Appliances Product

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

**Maximum Operation Current** : 0.10A~3.75A

**Maximum Voltage** : 120V<sub>AC/DC</sub>

**Maximum Interrupt Voltage** : 135V<sub>AC/DC</sub>

**Temperature Range** : -40°C to 85°C

**Agency Recognition** : UL (E211981)

C-UL (E211981)

TÜV (R50122733)

## Electrical Characteristics (23°C)

Part Number	Hold Current I <sub>H</sub> , A	Trip Current I <sub>T</sub> , A	Max.Time to Trip at 5xI <sub>H</sub> ,S	Max. Current I <sub>MAX</sub> , A	Max. Oper. Voltage V <sub>MAX</sub> , V <sub>AC/DC</sub>	Max. Int. Voltage V <sub>I-MAX</sub> , V <sub>AC/DC</sub>	Typ. Power Pd, W	Resistance	
								R <sub>MIN</sub> Ohms	R <sub>1MAX</sub> 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: FRVL010-120F~FRVL017-120F Tin plated copper, 24AWG.

FRVL020-120F~FRVL070-120F and FRVL090-120F Tin plated copper, 22AWG.

FRVL075-120F and FRVL100-120F~FRVL375-120F Tin plated copper, 20AWG.

Soldering characteristics: MIL-STD-202, Method 208E.

Insulating coating: Flame retardant epoxy, meets UL-94V-0 requirement.

## Thermal Derating for PPTC Device at Various Ambient Temperatures

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

## FRVL Product Dimensions (mm)

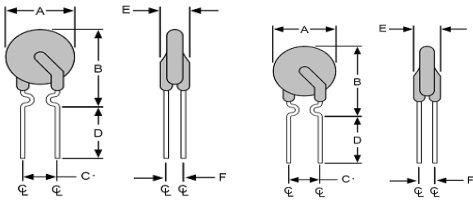


Fig.1  
Lead S size :24AWG  
Φ 0.51 mm Diameter

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

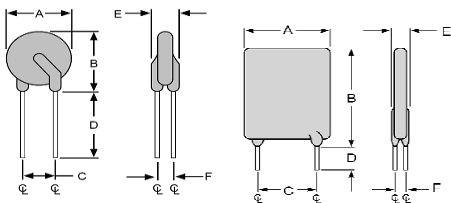


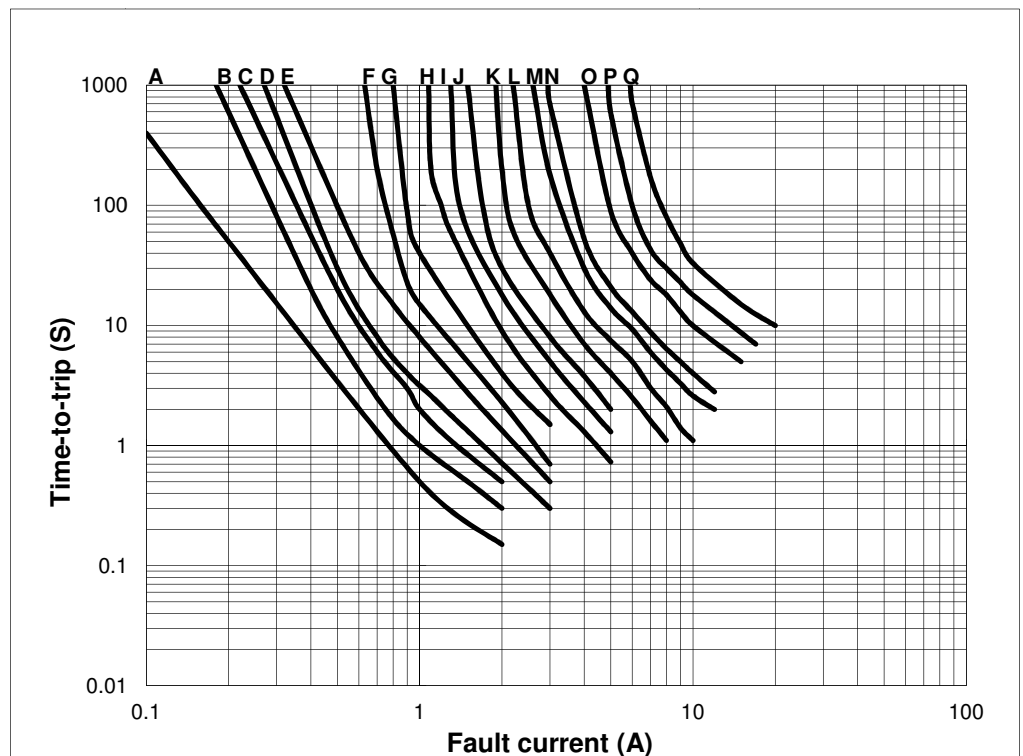
Fig.3  
Lead Size :20AWG  
Φ 0.81 mm Diameter

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

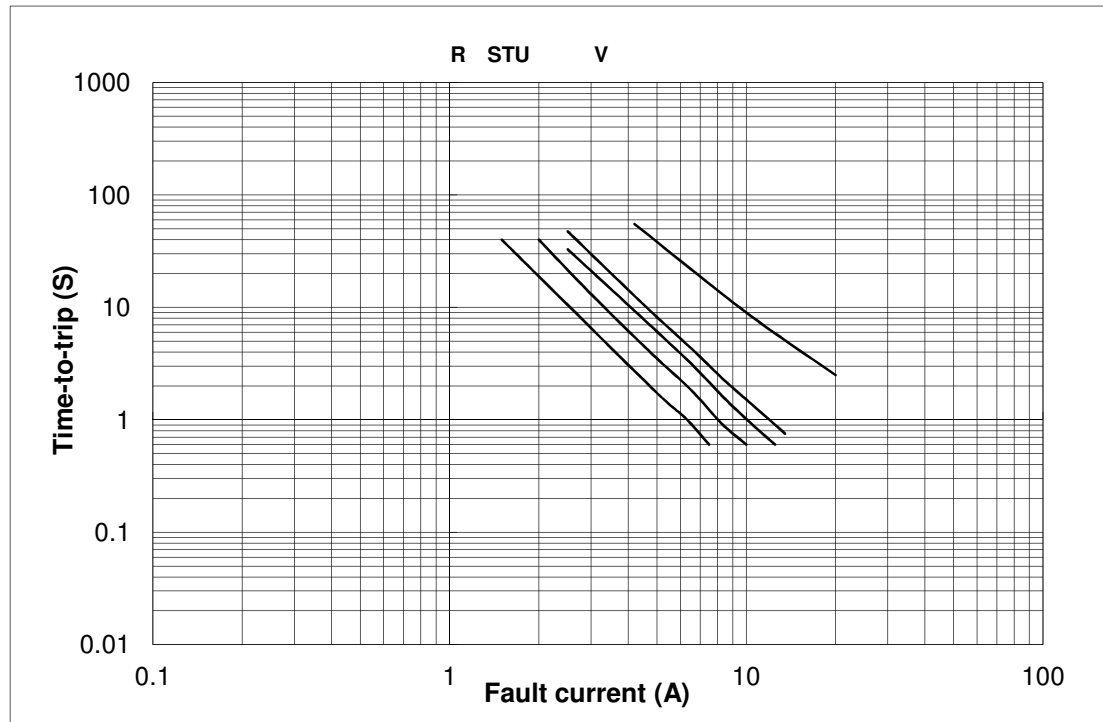
Part Number	Fig	A	B	C	D	E	F
		Max	Max	Typ	Min	Max	Typ
FRVL010-120F	1	7.9	13.0	5.1	7.6	3.8	2.2
FRVL017-120F	1	7.9	13.0	5.1	7.6	3.8	2.2
FRVL020-120F	2	7.9	13.0	5.1	7.6	3.8	2.2
FRVL025-120F	2	7.9	13.0	5.1	7.6	3.8	2.2
FRVL030-120F	2	7.9	13.0	5.1	7.6	3.8	2.2
FRVL040-120F	2	8.2	14.2	5.1	7.6	3.8	2.2
FRVL050-120F	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°C

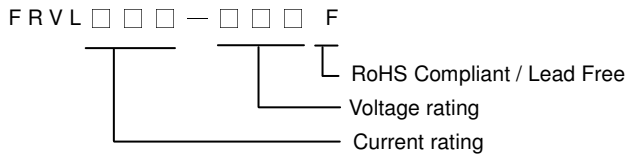
- A =FRVL010-120F
- B =FRVL017-120F
- C =FRVL020-120F
- D =FRVL025-120F
- E =FRVL030-120F
- F =FRVL040-120F
- G =FRVL050-120F
- H =FRVL065-120F
- I =FRVL070-120F
- J =FRVL090-120F
- K =FRVL110-120F
- L =FRVL130-120F
- M =FRVL160-120F
- N =FRVL185-120F
- O =FRVL250-120F
- P =FRVL300-120F
- Q =FRVL375-120F



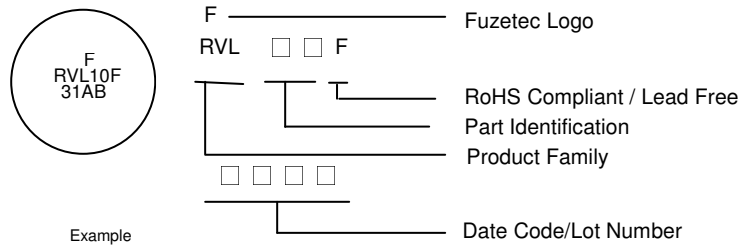
- R=FRVL075-120F
- S=FRVL100-120F
- T=FRVL125-120F
- U=FRVL135-120F
- V=FRVL200-120F



### 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.

