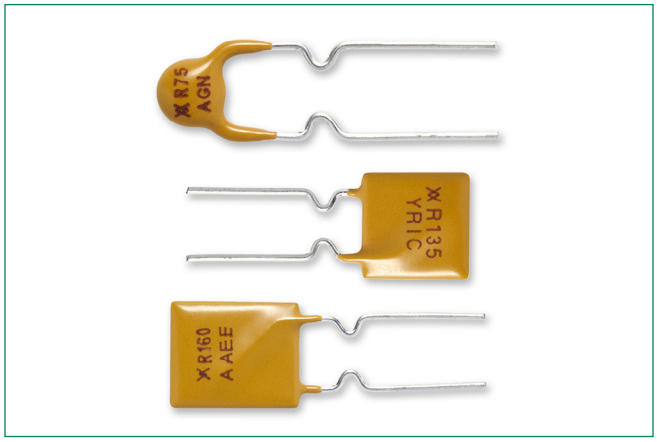
RUSBF Series
Radial Leaded



Description

Littelfuse PolySwitch radial-leaded devices represent the most comprehensive and complete set of PPTC products available in the industry today. RUSBF series is for fast time-to-trip and low-resistance computer applications.

Features & Benefits

- Resettable and single-use overcurrent devices
- Wide range of form factor and termination methods
- Devices compatible with high-volume electronics assembly
- RoHS compliant, Lead-Free and Halogen-Free

Applications

- Satellite video receivers
- Industrial controls
- Transformers
- Computer motherboards
- Modems
- USB hubs, ports and peripherals
- IEEE 1394 ports
- CD-ROMs
- Game machines
- Battery packs
- Phones
- Fax machines
- Analog and digital line cards
- Printers

Additional Information

Resources | Accessories | Samples

Agency Approvals

Agency	Agency File Number
	E74889
	78165
	72161784

Electrical Characteristics

Part Number	Ordering Part Number	I_H	I_T	V_{MAX}		I_{MAX}		$P_{D\ Typ}$	Max Time-to-trip		R_{MIN}	R_{MAX}	R_{1MAX}	Lead Size (mm^2/AWG)
		(A)	(A)	(V_{DC})	($V_{AC\ RMS}$)	(DC_{ADC})	(AC_{ARMS})	(W)	(A)	(s)	(Ω)	(Ω)	(Ω)	
RUSBF – 6V														
RUSBF075	RF3379-000	0.75	1.30	6	—	40	—	0.3	8.0	0.4	0.110	0.1750	0.23	0.205/24
RUSBF120	RF3386-000	1.20	2.00	6	—	40	—	0.6	8.0	0.5	0.070	0.0975	0.14	0.205/24
RUSBF155	RF3391-000	1.55	2.65	6	—	40	—	0.6	7.8	2.2	0.040	0.0705	0.10	0.205/24
RUSBF – 16V														
RUSBF090	RF3382-000	0.90	1.8	16	—	40	—	0.6	8.0	1.2	0.070	0.120	0.180	0.205/24
RUSBF110	RF3384-000	1.10	2.2	16	—	40	—	0.7	8.0	2.3	0.050	0.095	0.140	0.205/24
RUSBF135	RF3388-000	1.35	2.7	16	—	40	—	0.8	8.0	4.5	0.040	0.074	0.112	0.205/24
RUSBF160	RF3394-000	1.60	3.2	16	—	40	—	0.9	8.0	9.0	0.030	0.061	0.110	0.205/24
RUSBF185	RF3212-000	1.85	3.7	16	—	40	—	1.0	8.0	10.0	0.030	0.051	0.090	0.205/24
RUSBF250	RF3398-000	2.50	5.0	16	—	40	—	1.2	8.0	40.0	0.020	0.036	0.060	0.205/24

Notes:

I_H : Hold current: maximum current device will pass without interruption in 20°C still air.

I_T : Trip current: minimum current that will switch the device from low resistance to high resistance in 20°C still air.

V_{MAX} : Maximum continuous voltage device can withstand without damage at rated current.

I_{MAX} : Maximum fault current device can withstand without damage at rated voltage.

P_D : Power dissipated from device when in the tripped state in 20°C still air.

R_{MIN} : Minimum resistance of device as supplied at 20°C unless otherwise specified.

R_{MAX} : Maximum resistance of device as supplied at 20°C unless otherwise specified.

R_{1MAX} : Maximum resistance of device when measured one hour post reflow (surface-mount device) or one hour post trip (radial-leaded device) at 20°C unless otherwise specified.

* Electrical characteristics determined at 25°C.

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RUSBF Series
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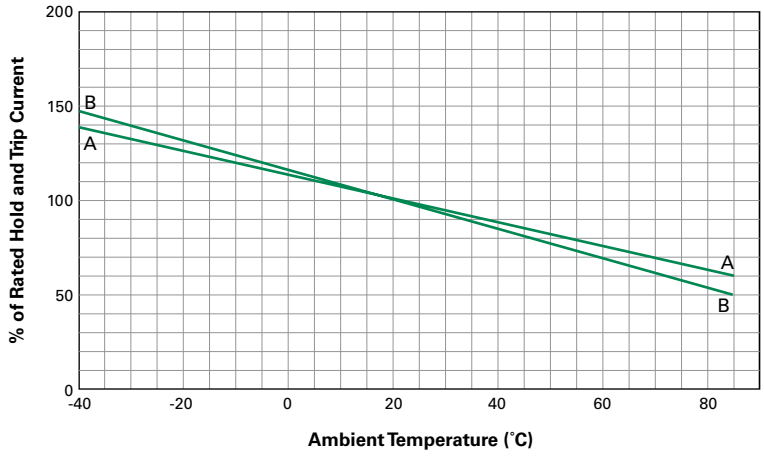
Temperature Rerating

Maximum Ambient Temperature										
	-40°C	-20°C	0°C	20°C	25°C	40°C	50°C	60°C	70°C	85°C
Hold Current (A)										
RUSBF – 6V										
RUSBF075	1.05	0.95	0.85	0.75	0.73	0.65	0.60	0.55	0.50	0.43
RUSBF120	1.69	1.52	1.36	1.20	1.16	1.04	0.96	0.88	0.80	0.68
RUSBF155	2.17	1.96	1.75	1.55	1.50	1.34	1.24	1.14	1.03	0.88
RUSBF – 16V										
RUSBF090	1.31	1.17	1.04	0.90	0.87	0.75	0.69	0.61	0.55	0.47
RUSBF110	1.60	1.43	1.27	1.10	1.07	1.00	0.92	0.75	0.67	0.57
RUSBF135	1.96	1.76	1.55	1.35	1.31	1.12	1.04	0.92	0.82	0.70
RUSBF160	2.32	2.08	1.84	1.60	1.55	1.33	1.23	1.09	0.98	0.83
RUSBF185	2.68	2.41	2.13	1.85	1.79	1.54	1.42	1.26	1.13	0.96
RUSBF250	3.63	3.25	2.88	2.50	2.43	2.08	1.93	1.70	1.53	1.30

Temperature Rerating Curve

A = RUSBF075, RUSBF120, RUSBF155
B = all other RUSBF



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RUSBF Series
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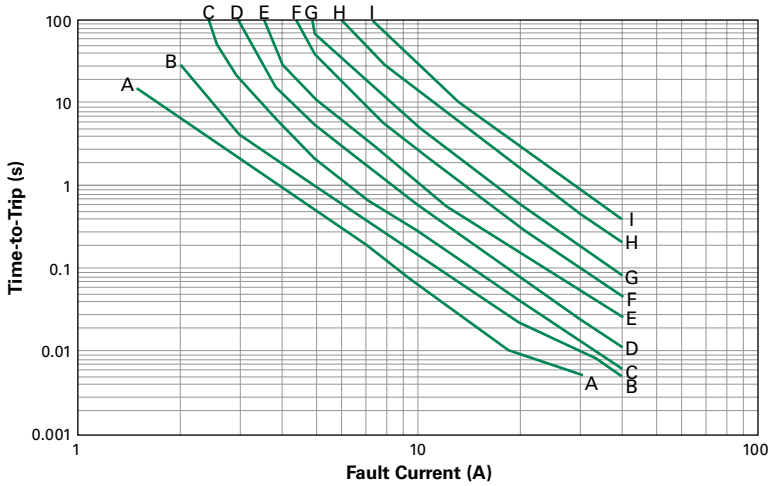
Typical Time-to-Trip Curves at 20°C

RUSBF

A = RUSBF075
B = RUSBF090
C = RUSBF110
D = RUSBF120
E = RUSBF135
F = RUSBF155
G = RUSBF160
H = RUSBF185
I = RUSBF250



Physical Specifications

Lead Material	RUSBF075: Tin-plated Nickel-copper Alloy, 0.205mm² (24AWG), ø0.51mm/0.020in RUSBF090 to RUSBF250: Tin-plated Copper-clad Steel, 0.205mm² (24AWG), ø0.51mm/0.020in
Soldering Characteristics	Solderability per ANSI/J-STD-002 Category 3 Except RUSBF075 Meet ANSI/J-STD-002 Category 1
Solder Heat Withstand	RUSBF120: per IEC 60068-2-20, Test Tb, Method 1; Can withstand 5s at 260°C ±5°C All Others : per IEC 60068-2-20, Test Tb, Method 1; Can withstand 10s at 260°C ±5°C
Insulating Material	Cured, Flame-retardant Epoxy Polymer; Meets UL 94V-0
Operation Temperature	-40°C~85°C

Note: Devices are not designed to be placed through a reflow process.

Environmental Specifications

Test	Conditions	Resistance Change
Passive Aging	70°C, 1000 hrs 85°C, 1000 hrs	±5% ±5%
Humidity Aging	85°C, 85% R.H., 1000 hrs	±5%
Thermal Shock	85°C, -40°C (10 Times)	±5%
Solvent Resistance	MIL-STD-202, Method 215F	No change

Moisture Resistance Level	Level 1, J-STD-020
Storage Conditions	40°C max, 70% RH max; devices should remain in original sealed bags prior to use. Devices may not meet specified values if these storage conditions are exceeded.

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Dimension Figures

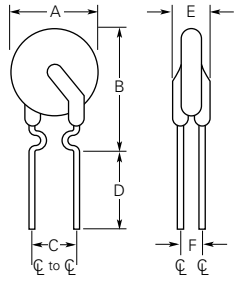

Figure 1

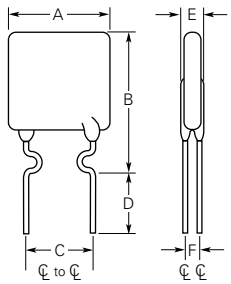

Figure 2

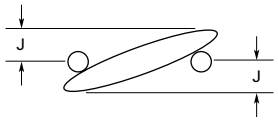

Figure 3

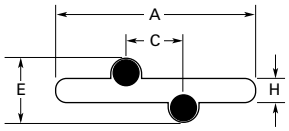

Figure 4

Dimensions and Weights

Part Number	Dimensions in Millimeters (Inches)												Figure	Device Mass (g) (Only for Reference)
	A		B		C		D		E		H	J		
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Typ	Typ		
RUSBF – 6V														
RUSBF075	—	6.9 (0.27)	—	11.4 (0.45)	4.3 (0.17)	5.9 (0.23)	7.6 (0.30)	—	—	3.1 (0.12)	0.91 (0.036)	1.0 (0.04)	1,3,4	0.123
RUSBF120	—	6.9 (0.27)	—	11.7 (0.46)	4.3 (0.17)	5.9 (0.23)	7.6 (0.30)	—	—	3.1 (0.12)	0.91 (0.036)	1.0 (0.04)	1,3,4	0.111
RUSBF155	—	6.9 (0.27)	—	11.7 (0.46)	4.3 (0.17)	5.9 (0.23)	7.6 (0.30)	—	—	3.1 (0.12)	0.91 (0.036)	1.0 (0.04)	1,3,4	0.135
RUSBF – 16V														
RUSBF090	—	7.4 (0.29)	—	12.2 (0.48)	4.3 (0.17)	5.8 (0.23)	7.6 (0.30)	—	—	3.1 (0.12)	0.89 (0.035)	0.8 (0.03)	2,3,4	0.183
RUSBF110	—	7.4 (0.29)	—	14.2 (0.56)	4.3 (0.17)	5.8 (0.23)	7.6 (0.30)	—	—	3.0 (0.12)	0.89 (0.035)	0.8 (0.03)	2,3,4	0.204
RUSBF135	—	8.9 (0.35)	—	13.5 (0.53)	4.3 (0.17)	5.8 (0.23)	7.6 (0.30)	—	—	3.0 (0.12)	0.89 (0.035)	1.0 (0.04)	2,3,4	0.240
RUSBF160	—	8.9 (0.35)	—	15.2 (0.60)	4.3 (0.17)	5.8 (0.23)	7.6 (0.30)	—	—	3.0 (0.12)	0.89 (0.035)	1.0 (0.04)	2,3,4	0.300
RUSBF185	—	10.2 (0.40)	—	15.7 (0.62)	4.3 (0.17)	5.8 (0.23)	7.6 (0.30)	—	—	3.0 (0.12)	0.89 (0.035)	1.0 (0.04)	2,3,4	0.368
RUSBF250	—	11.4 (0.45)	—	18.3 (0.72)	4.3 (0.17)	5.8 (0.23)	7.6 (0.30)	—	—	3.0 (0.12)	0.89 (0.035)	1.2 (0.05)	2,3,4	0.467

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Packaging and Marking Information

Part Number	Bag Quantity	Tape and Reel Quantity	Ammo Pack Quantity	Standard Package Quantity	Part Marking	Agency Recognition
RUSBF – 6V						
RUSBF075	500	—	—	10,000	R75	UL, CSA, TÜV
RUSBF075-2	—	3,000	—	15,000	R75	UL, CSA, TÜV
RUSBF075-AP	—	—	2,000	10,000	R75	UL, CSA, TÜV
RUSBF120	500	—	—	10,000	R120	UL, CSA, TÜV
RUSBF120-2	—	3,000	—	15,000	R120	UL, CSA, TÜV
RUSBF120-AP	—	—	2,000	10,000	R120	UL, CSA, TÜV
RUSBF155	500	—	—	10,000	R155	UL, CSA, TÜV
RUSBF155-2	—	3,000	—	15,000	R155	UL, CSA, TÜV
RUSBF155-AP	—	—	2,000	10,000	R155	UL, CSA, TÜV
RUSBF160	500	—	—	10,000	R160	UL, CSA, TÜV
RUSBF160-2	—	3,000	—	15,000	R160	UL, CSA, TÜV
RUSBF160-AP	—	—	2,000	10,000	R160	UL, CSA, TÜV
RUSBF – 16V						
RUSBF090	500	—	—	10,000	R90	UL, CSA, TÜV
RUSBF090-2	—	3,000	—	15,000	R90	UL, CSA, TÜV
RUSBF090-AP	—	—	2,000	10,000	R90	UL, CSA, TÜV
RUSBF110	500	—	—	10,000	R110	UL, CSA, TÜV
RUSBF110-2	—	3,000	—	15,000	R110	UL, CSA, TÜV
RUSBF110-AP	—	—	2,000	10,000	R110	UL, CSA, TÜV
RUSBF135	500	—	—	10,000	R135	UL, CSA, TÜV
RUSBF135-2	—	3,000	—	15,000	R135	UL, CSA, TÜV
RUSBF135-AP	—	—	2,000	10,000	R135	UL, CSA, TÜV
RUSBF160	500	—	—	10,000	R160	UL, CSA, TÜV
RUSBF160-2	—	3,000	—	15,000	R160	UL, CSA, TÜV
RUSBF160-AP	—	—	2,000	10,000	R160	UL, CSA, TÜV
RUSBF185	500	—	—	10,000	R185	UL, CSA, TÜV
RUSBF185-2	—	3,000	—	15,000	R185	UL, CSA, TÜV
RUSBF185-AP	—	—	2,000	10,000	R185	UL, CSA, TÜV
RUSBF250	500	—	—	10,000	R250	UL, CSA, TÜV
RUSBF250-2	—	3,000	—	15,000	R250	UL, CSA, TÜV
RUSBF250-AP	—	—	2,000	10,000	R250	UL, CSA, TÜV

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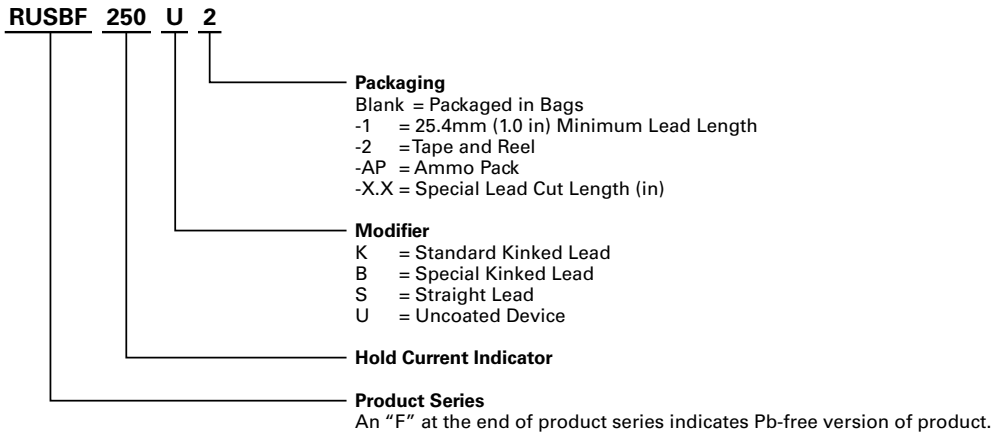
Part Ordering Number System



Note: Kinked parts are recommended to control the height of the part on the PCB in non-auto PCB applications.

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RUSBF Series
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Tape and Reel Specifications

RUSBF devices are available in tape and reel packaging per EIA468–B/IEC60286–2 standards.
See Figures 1 and 2 for details.

Description	EIA Mark	Dimension (mm)	Tolerance
Carrier Tape Width	W	18	-0.5/+1.0
Hold-down Tape Width	W_4	11	Minimum
Top Distance between Tape Edges	W_6	3	Maximum
Sprocket Hole Position	W_5	9	-0.5/+0.75
Sprocket Hole Diameter	W_0	4	± 0.2
Abscissa to Plane (Straight Lead)*	H	18.5	± 2.5
Abscissa to Plane (Kinked Lead) (RUSBF075 to RUSBF250)	H_0	16.0	± 0.5
Abscissa to Top (RUSBF075 to RUSBF250)	H_1	32.2	Maximum
Abscissa to Top*	H_1	45.0	Maximum
Overall Width with Lead Protrusion (RUSBF075 to RUSBF250)	C_1	43.2	Maximum
Overall Width with Lead Protrusion	C_1	56	Maximum
Overall Width without Lead Protrusion (RUSBF075 to RUSBF250)	C_2	42.5	Maximum
Overall Width without Lead Protrusion	C_2	56	Maximum
Lead Protrusion	L_1	1.0	Maximum
Protrusion of Cut-out	L	11	Maximum
Protrusion beyond Hold-down Tape	I_2	Not Specified	—
Sprocket Hole Pitch	P_0	12.7	± 0.3
Device Pitch (RUSBF075 to RUSBF250)	—	12.7	± 0.3
Device Pitch	—	25.4	± 0.6
Pitch Tolerance	—	20 Consecutive	± 1
Tape Thickness	T	0.9	Maximum
Overall Tape and Lead Thickness (RUSBF075 to RUSBF250)	T_1	1.5	Maximum
Overall Tape and Lead Thickness*	T_1	2.3	Maximum
Splice Sprocket Hole Alignment	—	0	± 0.3
Body Lateral Deviation	Δh	0	± 1.0
Body Tape Plane Deviation	Δp	0	± 1.3
Ordinate to Adjacent Component Lead (RUSBF075 to RUSBF250)	P_1	3.81	± 0.7
Ordinate to Adjacent Component Lead	P_1	7.62	± 0.7
Lead Spacing* (RUSBF075 to RUSBF250)	F	5.05	± 0.75
Lead Spacing*	F	10.15	± 0.75
Reel Width (RUSBF075 to RUSBF250)	W_2	56.0	Maximum
Reel Width	W_2	63.5	Maximum
Reel Diameter	A	370.0	Maximum
Space between Flanges* (RUSBF075 to RUSBF250)	W_1	48.0	Maximum
Space between Flanges*	W_1	55.0	Maximum
Arbor Hold Diameter	C	26.0	± 12.0
Core Diameter*	N	91.0	Maximum
Box	—	64/372/362	Maximum
Consecutive Missing Places	—	None	—
Empty Places per Reel	—	0.1%	Maximum

*Differs from EIA specification.

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Tape and Reel Diagrams

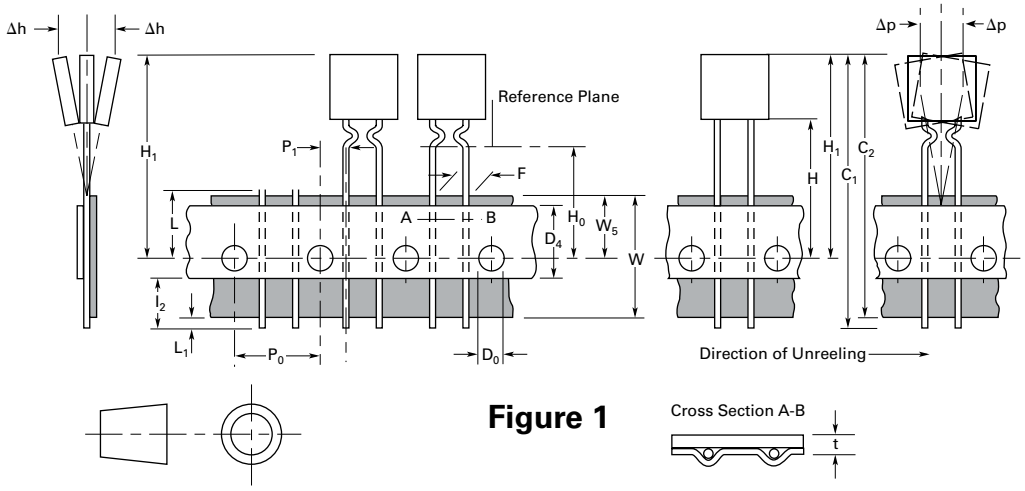

Figure 1

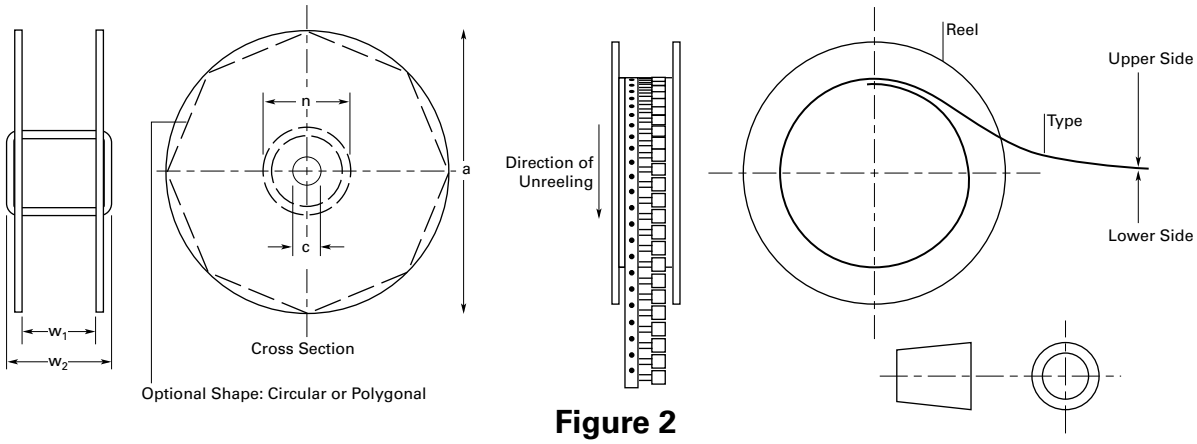

Figure 2

Warning

- Users should independently evaluate the suitability of and test each product selected for their own application.
- Operation beyond the maximum ratings or improper use may result in device damage and possible electrical arcing and flame.
- These devices are intended for protection against damage caused by occasional overcurrent or overtemperature fault conditions and should not be used when repeated fault conditions or prolonged trip events are anticipated.
- Contamination of the PPTC material with certain silicone-based oils or some aggressive solvents can adversely impact the performance of the devices.
- Device performance can be impacted negatively if devices are handled in a manner inconsistent with recommended electronic, thermal, and mechanical procedures for electronic components.
- PPTC devices are not recommended for installation in applications where the device is constrained such that its PTC properties are inhibited, for example in rigid potting materials or in rigid housings, which lack adequate clearance to accommodate device expansion.
- Operation in circuits with a large inductance can generate a circuit voltage (Ldi/dt) above the rated voltage of the device.

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