

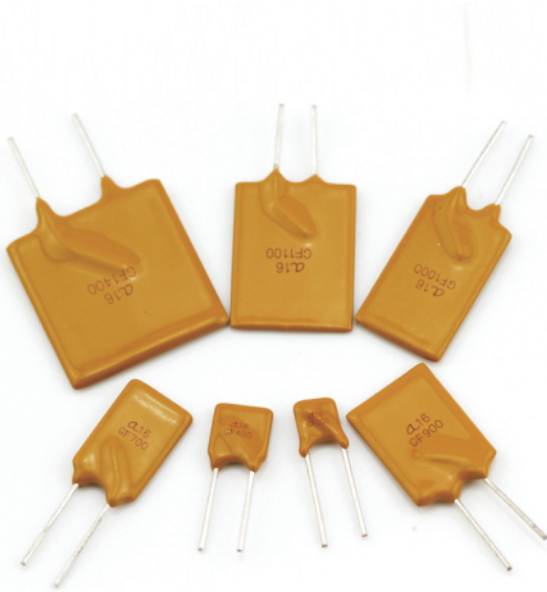


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PRODUCT DATASHEET

PTC Devices

## A16 Series PTC Devices



### Description

JDTFUSE A16 Series Radial Leaded PTCs are designed to provide resettable overcurrent protection serving a wide range of electronics applications. With maximum 16 voltage and maximum 40-ampere short circuit rating, they offer an ideal solution for USB protection.

### Features



- 100A short circuit rating
- 16V Operating voltages
- Fast time-to-trip
- Meets all USB protection requirements
- RoHS compliant, Lead-Free and Halogen-Free\*

### Agency Approvals

Agency	File Number
	E472196

### Applications

- Computers & peripherals
- Any USB applications
- Motor protection
- General Electronics

Regulation	Standard
	2002/95/EC
	EN14582

## Performance Specification

Model	V <sub>max</sub> (V <sub>dc</sub> )	I <sub>max</sub> (A)	I <sub>hold</sub> @25°C (A)	I <sub>trip</sub> @25°C (A)	P <sub>d</sub> Typ. (W)	Maximum Time To Trip		Resistance	
						Current (A)	Time (Sec)	R <sub>i min</sub> (Ω)	R <sub>1max</sub> (Ω)
A16-030	16	40	0.30	0.60	1.0	1.50	5.0	0.300	0.900
A16-050	16	40	0.50	1.00	1.0	2.50	5.0	0.200	0.750
A16-065	16	40	0.65	1.30	1.0	3.25	5.0	0.120	0.270
A16-075	16	40	0.75	1.50	1.0	3.75	5.0	0.100	0.255
A16-090	16	40	0.90	1.80	1.0	4.50	5.0	0.090	0.240
A16-100	16	40	1.00	2.00	1.0	5.00	5.0	0.070	0.225
A16-110	16	40	1.10	2.20	1.0	5.50	5.0	0.080	0.225
A16-120	16	40	1.20	2.40	1.0	6.00	5.0	0.070	0.225
A16-135	16	40	1.35	2.70	1.3	6.75	5.0	0.040	0.180
A16-160	16	40	1.60	3.20	1.5	8.00	10.0	0.030	0.105
A16-185	16	40	1.85	3.70	2.0	9.25	10.0	0.030	0.135
A16-200	16	40	2.00	4.00	2.0	10.0	10.0	0.018	0.090
A16-250	16	40	2.50	5.00	2.5	12.5	5.0	0.020	0.075
A16-300	16	40	3.00	6.00	2.5	15.0	2.0	0.038	0.105
A16-400	16	40	4.00	8.00	2.8	20.0	3.5	0.021	0.060
A16-500	16	100	5.00	10.00	3.0	25.0	3.6	0.015	0.038
A16-600	16	100	6.00	12.00	3.2	30.0	5.8	0.010	0.030
A16-700	16	100	7.00	14.00	3.5	35.0	8.0	0.008	0.023
A16-800	16	100	8.00	16.00	3.5	40.0	9.0	0.006	0.018
A16-900	16	100	9.00	18.00	3.8	45.0	12.0	0.005	0.017
A16-1000	16	100	10.00	20.00	4.0	50.0	12.5	0.004	0.014
A16-1100	16	100	11.00	22.00	4.0	55.0	13.5	0.004	0.012
A16-1200	16	100	12.00	24.00	4.2	60.0	16.0	0.004	0.011
A16-1400	16	100	14.00	28.00	4.8	70.0	20.0	0.003	0.008
A16-1500	16	100	15.00	30.00	5.0	75.0	20.0	0.003	0.008

I<sub>hold</sub> = Hold Current. Maximum current device will not trip in 25°C still air.

I<sub>trip</sub> = Trip Current. Minimum current at which the device will always trip in 25°C still air.

V<sub>max</sub> = Maximum operating voltage device can withstand without damage at rated current (I<sub>max</sub>).

I<sub>max</sub> = Maximum fault current device can withstand without damage at rated voltage (V<sub>max</sub>).

P<sub>d</sub> = Power dissipation when device is in the tripped state in 25°C still air environment at rated voltage.

R<sub>i min/max</sub> = Minimum/Maximum device resistance prior to tripping at 25°C.

R<sub>1max</sub> = Maximum device resistance is measured one hour post reflow.

CAUTION : Operation beyond the specified ratings may result in damage and possible arcing and flame.

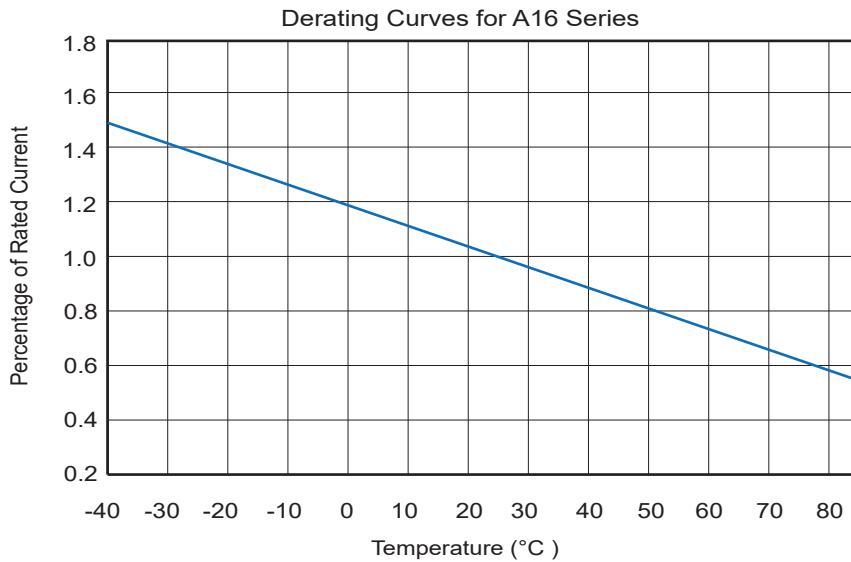
## Environmental Specifications

Test	Conditions	Resistance change
Passive aging	+85°C, 1000 hrs.	±5% typical
Humidity aging	+85°C, 85% R.H. , 168 hours	±5% typical
Thermal shock	+85°C to -40°C, 20 times	±33% typical
Resistance to solvent	MIL-STD-202,Method 215	No change
Vibration	MIL-STD-202,Method 201	No change

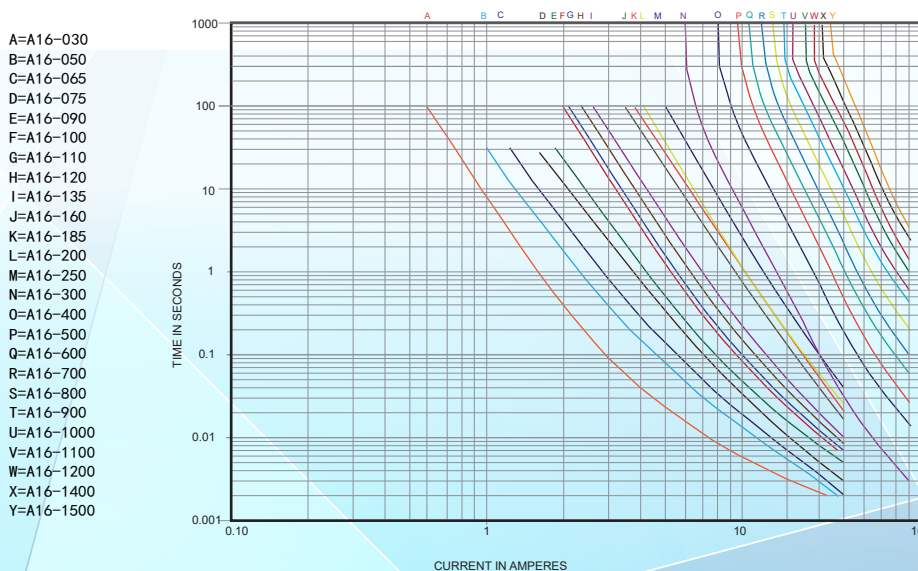
Ambient operating conditions : - 40 °C to +85 °C

Maximum surface temperature of the device in the tripped state is 125 °C

## Thermal Derating Curve



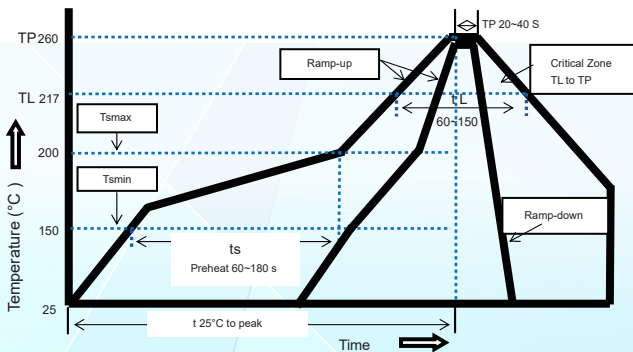
## Average Time-Current Curve



## I<sub>hold</sub> Versus Temperature

Model	Maximum ambient operating temperature (T <sub>mao</sub> ) vs. hold current (I <sub>hold</sub> )									
	- 40°C	- 20°C	0°C	23°C	30°C	40°C	50°C	60°C	70°C	85°C
A16-030	0.444	0.396	0.348	0.300	0.273	0.252	0.228	0.207	0.183	0.144
A16-050	0.740	0.660	0.580	0.500	0.455	0.420	0.380	0.345	0.300	0.240
A16-065	0.962	0.858	0.754	0.650	0.592	0.546	0.494	0.449	0.390	0.312
A16-075	1.110	0.990	0.870	0.750	0.683	0.630	0.570	0.518	0.450	0.360
A16-090	1.332	1.188	1.044	0.900	0.819	0.756	0.684	0.621	0.540	0.432
A16-100	1.480	1.320	1.160	1.000	0.910	0.840	0.760	0.690	0.600	0.480
A16-110	1.628	1.452	1.276	1.100	1.001	0.924	0.836	0.759	0.660	0.528
A16-120	1.776	1.584	1.392	1.200	1.092	1.008	0.912	0.828	0.720	0.576
A16-135	1.998	1.782	1.566	1.350	1.229	1.134	1.026	0.932	0.810	0.648
A16-160	2.368	2.112	1.856	1.600	1.456	1.344	1.216	1.104	0.960	0.768
A16-185	2.738	2.442	2.146	1.850	1.684	1.554	1.406	1.277	1.110	0.888
A16-200	2.960	2.640	2.320	2.000	1.820	1.680	1.520	1.380	1.200	0.960
A16-250	3.700	3.300	2.900	2.500	2.275	2.100	1.900	1.725	1.500	1.200
A16-300	4.440	3.960	3.480	3.000	2.730	2.520	2.280	2.070	1.800	1.440
A16-400	5.920	5.280	4.640	4.000	3.640	3.360	3.040	2.760	2.400	1.920
A16-500	7.400	6.600	5.800	5.000	4.550	4.200	3.800	3.450	3.000	2.400
A16-600	8.880	7.920	6.960	6.000	5.460	5.040	4.560	4.140	3.600	2.880
A16-700	10.36	9.240	8.120	7.000	6.370	5.880	5.320	4.830	4.200	3.360
A16-800	11.84	10.56	9.280	8.000	7.280	6.720	6.080	5.520	4.800	3.840
A16-900	13.32	11.88	10.44	9.000	8.190	7.560	6.840	6.210	5.400	4.320
A16-1000	14.80	13.20	11.60	10.00	9.100	8.400	7.600	6.900	6.000	4.800
A16-1100	16.28	14.52	12.76	11.00	10.01	9.240	8.360	7.590	6.600	5.280
A16-1200	17.76	15.84	13.92	12.00	10.92	10.08	9.120	8.280	7.200	5.760
A16-1400	20.72	18.48	16.24	14.00	12.74	11.76	10.64	9.660	8.400	6.720
A16-1500	22.20	19.80	17.40	15.00	13.65	12.60	11.40	10.35	9.000	7.500

## Soldering Parameters



Recommended reflow methods: IR, vapor phase oven, hot air oven, N<sub>2</sub> environment for lead-free

Recommended maximum paste thickness is 0.25mm

Devices can be cleaned using standard industry methods and solvents.

Note 1: All temperature refer to topside of the package, measured on the package body surface.

Note 2: If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (T <sub>s</sub> max to T <sub>p</sub> )	3°C/second max.
Preheat	
- Temperature Min(T <sub>s</sub> min)	150°C
- Temperature Max(T <sub>s</sub> max)	200°C
- Time(T <sub>s</sub> min to T <sub>s</sub> max)	60~180 seconds
Time maintained above:	
- Temperature(TL)	217°C
- Time(tL)	60~150 seconds
Peak Temperature(T <sub>p</sub> )	260°C
Ramp-Down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max
Storage Condition	0°C~35°C, ≤70%RH

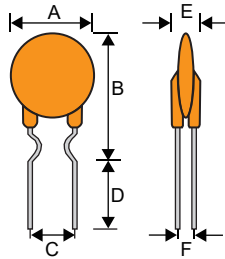
**Physical Dimensions(mm.)**


FIG 1

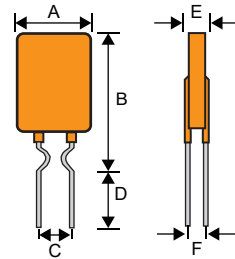


FIG 2

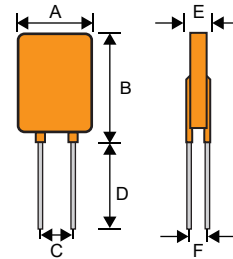


FIG 3

Model	A Max.	B Max.	C Typ.	D Min.	E Max.	F Typ.	Lead $\phi$	FIG
A16-030	7.40	13.0	5.1±0.5	7.6	3.00	0.80	0.5	1
A16-050	7.40	13.0	5.1±0.5	7.6	3.00	0.80	0.5	1
A16-065	7.40	13.0	5.1±0.5	7.6	3.00	0.80	0.5	1
A16-075	7.40	13.0	5.1±0.5	7.6	3.00	0.80	0.5	1
A16-090	7.40	14.4	5.1±0.5	7.6	3.00	0.80	0.5	2
A16-100	7.40	13.0	5.1±0.5	7.6	3.00	0.80	0.5	1
A16-110	7.40	14.4	5.1±0.5	7.6	3.00	0.80	0.5	2
A16-120	7.40	14.4	5.1±0.5	7.6	3.00	0.80	0.5	2
A16-135	8.90	15.9	5.1±0.5	7.6	3.00	0.90	0.6	2
A16-160	8.90	19.0	5.1±0.5	7.6	3.00	0.90	0.6	2
A16-185	10.7	19.0	5.1±0.5	7.6	3.00	0.90	0.6	2
A16-200	9.00	13.5	5.1±0.5	7.6	3.00	0.90	0.6	2
A16-250	8.90	19.0	5.1±0.5	7.6	3.00	0.90	0.6	2
A16-300	7.10	11.5	5.1±0.5	7.6	3.00	1.20	0.8	3
A16-400	8.90	13.5	5.1±0.5	7.6	3.00	1.20	0.8	3
A16-500	10.5	15.1	5.1±0.5	7.6	3.00	1.20	0.8	3
A16-600	11.0	17.8	5.1±0.5	7.6	3.00	1.20	0.8	3
A16-700	11.2	20.2	5.1±0.5	7.6	3.00	1.20	0.8	3
A16-800	14.0	22.5	5.1±0.5	7.6	3.00	1.20	0.8	3
A16-900	14.0	22.5	5.1±0.5	7.6	3.00	1.20	0.8	3
A16-1000	16.5	26.7	5.1±0.5	7.6	3.00	1.20	0.8	3
A16-1100	18.0	28.0	5.1±0.5	7.6	3.00	1.20	0.8	3
A16-1200	18.0	28.0	5.1±0.5	7.6	3.50	1.40	0.8	3
A16-1400	25.0	30.5	10.2±0.5	7.6	3.50	1.40	0.8	3
A16-1500	25.0	30.5	10.2±0.5	7.6	3.50	1.40	0.8	3

**PHYSICAL SPECIFICATIONS :**

Materials :

Leads : Tin plated copper-clad steel.

Lead Solderability : MIL-STD-202, Method 208E.

Device Labeling : Device is marked with Logo, amperage rating, voltage rating &amp; date code.



**Packaging Quantity**

Model	Reel QTY	Bag QTY
A16-030 ~ A16-600	3000	500
A16-700 ~ A16-900	1500	500
A16-1000 ~ A16-1500	-	500

Tape & Reel packaging per EIA468-B standard.

**Cross Reference**

Model	Cross Reference		
	Tyco / PolySwitch®	Bourns / POLY-FUSE®	Polytronics / EVERFUSE®
A16-030	-	-	-
A16-050	-	-	-
A16-065	-	-	-
A16-075	-	MF-RHT070	-
A16-090	RUEF090	MF-RHT090	RLD16P090BF
A16-110	RUEF110	-	RLD16P110BF
A16-120	RUEF120	-	-
A16-135	RUEF135	-	RLD16P135BF
A16-160	RUEF160	-	RLD16P160BF
A16-185	RUEF185	-	RLD16P185BF
A16-250	RUSBF250/RUEF250	-	RLD16P250BF
A16-300	RUEF300	MF-RG300	RLD16P300BF
A16-400	RUEF400	MF-RHT450	RLD16P400BF
A16-500	RUEF500	MF-RG500	RLD16P500BF
A16-600	RUEF600	MF-RHT650	RLD16P600BF
A16-700	RUEF700	MF-RHT750	RLD16P700BF
A16-800	RUEF800	-	RLD16P800BF
A16-900	RUEF900	-	RLD16P900BF
A16-1000	RUEF1000	-	RLD16P1000BF
A16-1100	RUEF1100	MF-R1100	RLD16P1100BF
A16-1200	RUEF1200	-	RLD16P1200BF
A16-1400	RUEF1400	MF-RHT1300	RLD16P1400BF

“PolySwitch” is a registered trademark of Tyco Electronics.

“POLY-FUSE” is a registered trademark of Littelfuse, Inc.

“EVERFUSE” is a registered trademark of Polytronics Technology Corp.

## Application Notice

1. Operation of these PPTC devices beyond the stated maximum ratings could result in damage to the devices and lead to electrical arcing and/or fire;

PPTC 器件在超过规定的最大值额定值运行可能会导致器件损坏以及导致电弧和/或火焰。

2. These PPTC devices are intended to protect against the effects of temporary over-current or over-temperature conditions and shall not be taken for use as switch.

PPTC 的作用是防止临时的过流或过温造成的不良影响，不能当作开关使用。

3. Exposure to lubricants, silicon-based oils, solvents, gels, electrolytes, acids, and other related or similar materials may adversely affect the performance of PPTC devices.

PPTC 接触润滑剂、硅基油、溶剂、凝胶、电解质、酸和其他相关或类似材料可能会对 PPTC 器件的性能有不利影响。

4. Circuits with inductance may generate a voltage above the rated voltage of the PPTC device and should be thoroughly evaluated within the user's application during the PPTC selection and qualification process.

带有电感的电路可能产生高于 PPTC 额定电压的电压，因此客户在选型和认定过程中应进行彻底的评估。

5. Please do not smash, clamp, pull, dent or twist by tool during assembling process, as they may result in the PPTC damage.

在装配过程中，避免有砸、挤、拉、扭等方式外力作用于 PPTC 本体上，因为它们可能导致 PPTC 损坏。

6. P T C is a secondary protection element, only used in sporadic, accidental overcurrent or overheating situations, and should not be used in continuous or repeated fault situations.

P T C是二级保护元件，仅用于零星、意外过流或过温等情况，持续或重复的故障情况不得使用。

7. It is not recommended to install in environments with limited space, as this will suppress its performance.

不建议将 安装在空间受到限制的环境中，这将会抑制其 性能。