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PRODUCT DATASHEET

PTC Devices

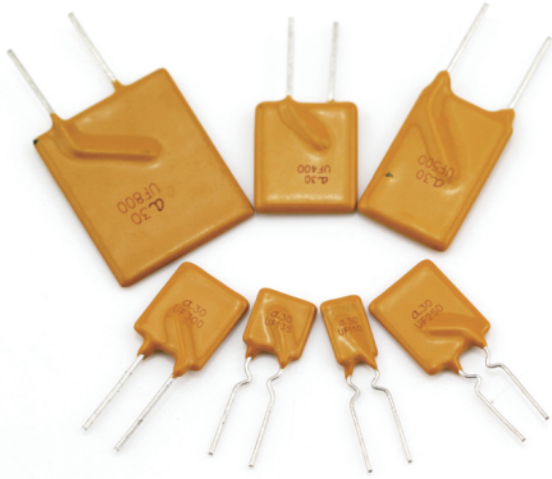
A30 Series PTC Devices

Description

The JDTFUSE A30 Series radial leaded device is designed to provide overcurrent protection for low voltage ($\leq 30V$) applications where space is not a concern and resettable protection is preferred.

Features

- Cured, flame retardant epoxy polymer insulating material meets UL 94V-0 requirements
- Fast time-to-trip
- RoHS compliant, Lead-Free and Halogen-Free*





Agency Approvals

| Agency | File Number |
|---|-------------|
|  | E472196 |

Applications

- USB hubs, ports and peripherals
- Computers & peripherals
- Motor protection
- General electronics
- Automotive applications

| Regulation | Standard |
|---|------------|
|  | 2002/95/EC |
|  | EN14582 |

Performance Specification

| Model | V _{max} (V _{dc}) | I _{max} (A) | I _{hold} @25°C (A) | I _{trip} @25°C (A) | P _d Typ. (W) | Maximum Time To Trip | | Resistance | |
|---------|--|-------------------------|-----------------------------------|-----------------------------------|-------------------------------|----------------------|---------------|---------------------------|--------------------------|
| | | | | | | Current (A) | Time (Sec) | R _{i min} (Ω) | R _{1max} (Ω) |
| A30-030 | 30 | 40 | 0.30 | 0.60 | 0.44 | 1.50 | 3.00 | 0.300 | 1.600 |
| A30-040 | 30 | 40 | 0.40 | 0.80 | 0.45 | 2.00 | 5.00 | 0.200 | 1.300 |
| A30-050 | 30 | 40 | 0.50 | 1.00 | 1.00 | 2.50 | 10.0 | 0.290 | 1.100 |
| A30-070 | 30 | 40 | 0.70 | 1.40 | 1.00 | 3.50 | 10.0 | 0.140 | 0.450 |
| A30-075 | 30 | 40 | 0.75 | 1.50 | 1.00 | 3.75 | 10.0 | 0.120 | 0.400 |
| A30-090 | 30 | 40 | 0.90 | 2.00 | 1.00 | 4.50 | 10.0 | 0.070 | 0.180 |
| A30-110 | 30 | 40 | 1.10 | 2.50 | 1.00 | 5.50 | 10.0 | 0.050 | 0.150 |
| A30-135 | 30 | 40 | 1.35 | 2.70 | 1.00 | 6.75 | 10.0 | 0.040 | 0.120 |
| A30-160 | 30 | 40 | 1.60 | 3.20 | 1.00 | 8.00 | 10.0 | 0.030 | 0.105 |
| A30-185 | 30 | 40 | 1.85 | 3.70 | 1.00 | 9.25 | 10.0 | 0.030 | 0.090 |
| A30-200 | 30 | 40 | 2.00 | 4.00 | 1.50 | 10.0 | 12.0 | 0.030 | 0.085 |
| A30-250 | 30 | 40 | 2.50 | 5.50 | 1.20 | 12.5 | 10.3 | 0.020 | 0.060 |
| A30-300 | 30 | 40 | 3.00 | 6.00 | 2.00 | 15.0 | 10.8 | 0.020 | 0.075 |
| A30-400 | 30 | 40 | 4.00 | 8.00 | 2.50 | 20.0 | 12.7 | 0.010 | 0.045 |
| A30-500 | 30 | 40 | 5.00 | 10.00 | 3.00 | 25.0 | 14.5 | 0.010 | 0.045 |
| A30-600 | 30 | 40 | 6.00 | 12.00 | 3.50 | 30.0 | 16.0 | 0.005 | 0.030 |
| A30-700 | 30 | 40 | 7.00 | 14.00 | 3.80 | 35.0 | 17.5 | 0.005 | 0.030 |
| A30-800 | 30 | 40 | 8.00 | 16.00 | 4.00 | 40.0 | 18.8 | 0.005 | 0.030 |
| A30-900 | 30 | 40 | 9.00 | 18.00 | 4.20 | 40.0 | 30.0 | 0.005 | 0.015 |

I_{hold} = Hold Current. Maximum current device will not trip in 23°C still air.

I_{trip} = Trip Current. Minimum current at which the device will always trip in 23°C still air.

V_{max} = Maximum operating voltage device can withstand without damage at rated current (I_{max}).

I_{max} = Maximum fault current device can withstand without damage at rated voltage (V_{max}).

P_d = Power dissipation when device is in the tripped state in 23°C still air environment at rated voltage.

R_{i min/max} = Minimum/Maximum device resistance prior to tripping at 23°C.

R_{1max} = Maximum device resistance is measured one hour post reflow.

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

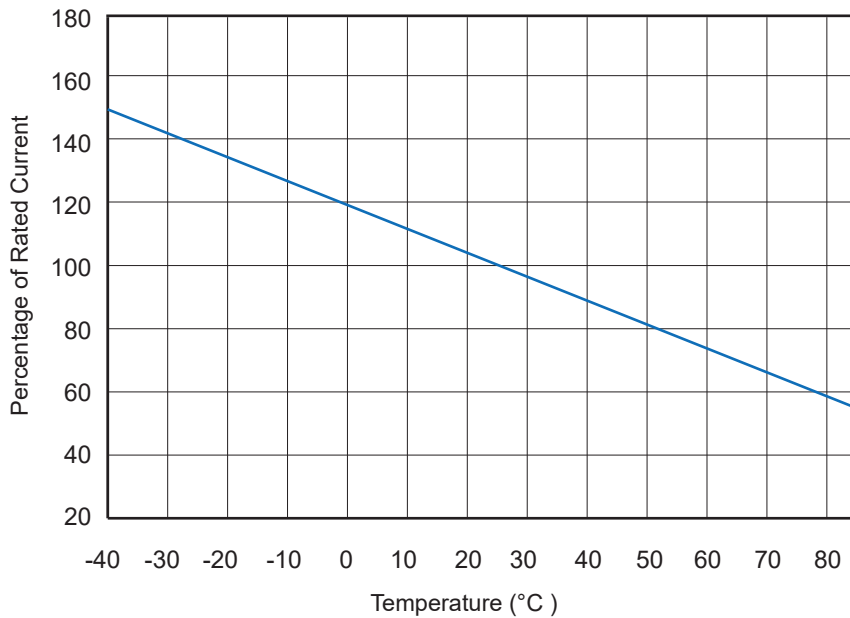
Environmental Specifications

| 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 |

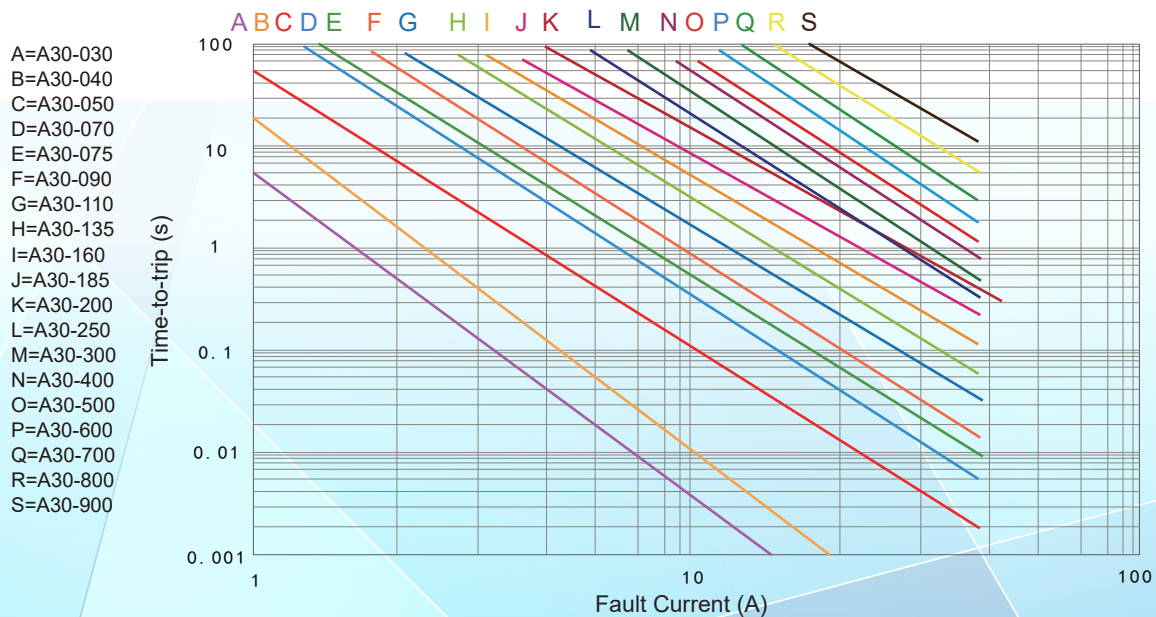
Ambient operating conditions : - 40 °C to +85 °C

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

Thermal Derating Curve



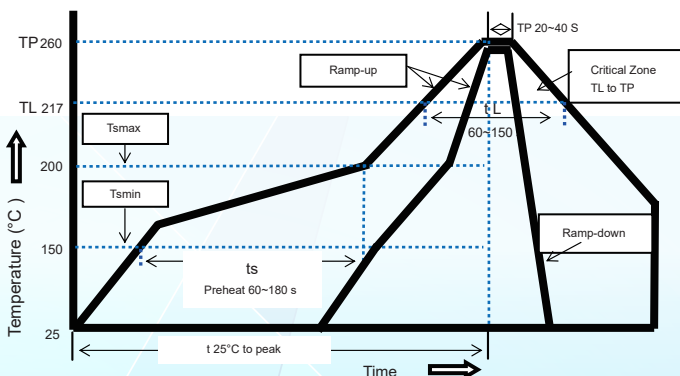
Average Time-Current Curve



I_{hold} Versus Temperature

| Model | Maximum ambient operating temperature (T _{mao}) vs. hold current (I _{hold}) | | | | | | | | | |
|---------|---|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| | - 40°C | - 20°C | 0°C | 23°C | 30°C | 40°C | 50°C | 60°C | 70°C | 85°C |
| A30-030 | 0.435 | 0.402 | 0.348 | 0.300 | 0.276 | 0.252 | 0.228 | 0.210 | 0.183 | 0.150 |
| A30-040 | 0.580 | 0.536 | 0.464 | 0.400 | 0.368 | 0.336 | 0.304 | 0.280 | 0.244 | 0.200 |
| A30-050 | 0.725 | 0.650 | 0.575 | 0.500 | 0.460 | 0.420 | 0.380 | 0.350 | 0.305 | 0.250 |
| A30-070 | 1.015 | 0.910 | 0.805 | 0.700 | 0.644 | 0.588 | 0.532 | 0.490 | 0.427 | 0.350 |
| A30-075 | 1.088 | 0.975 | 0.863 | 0.750 | 0.690 | 0.630 | 0.570 | 0.525 | 0.458 | 0.375 |
| A30-090 | 1.305 | 1.170 | 1.035 | 0.900 | 0.828 | 0.756 | 0.684 | 0.630 | 0.549 | 0.450 |
| A30-110 | 1.595 | 1.430 | 1.265 | 1.100 | 1.012 | 0.924 | 0.836 | 0.770 | 0.671 | 0.550 |
| A30-135 | 1.958 | 1.755 | 1.553 | 1.350 | 1.242 | 1.134 | 1.026 | 0.945 | 0.824 | 0.675 |
| A30-160 | 2.320 | 2.080 | 1.840 | 1.600 | 1.472 | 1.344 | 1.216 | 1.120 | 0.976 | 0.800 |
| A30-185 | 2.683 | 2.405 | 2.128 | 1.850 | 1.702 | 1.554 | 1.406 | 1.295 | 1.129 | 0.925 |
| A30-200 | 2.900 | 2.680 | 2.320 | 2.000 | 1.840 | 1.680 | 1.520 | 1.400 | 1.220 | 1.000 |
| A30-250 | 3.625 | 3.250 | 2.875 | 2.500 | 2.300 | 2.100 | 1.900 | 1.750 | 1.525 | 1.250 |
| A30-300 | 4.350 | 3.900 | 3.450 | 3.000 | 2.760 | 2.520 | 2.280 | 2.100 | 1.830 | 1.500 |
| A30-400 | 5.800 | 5.200 | 4.600 | 4.000 | 3.680 | 3.360 | 3.040 | 2.800 | 2.440 | 2.000 |
| A30-500 | 7.250 | 6.500 | 5.750 | 5.000 | 4.600 | 4.200 | 3.800 | 3.500 | 3.050 | 2.500 |
| A30-600 | 8.700 | 7.800 | 6.900 | 6.000 | 5.520 | 5.040 | 4.560 | 4.200 | 3.660 | 3.000 |
| A30-700 | 10.15 | 9.100 | 8.050 | 7.000 | 6.440 | 5.880 | 5.320 | 4.900 | 4.270 | 3.500 |
| A30-800 | 11.60 | 10.40 | 9.200 | 8.000 | 7.360 | 6.720 | 6.080 | 5.600 | 4.880 | 4.000 |
| A30-900 | 13.05 | 11.70 | 10.35 | 9.000 | 8.280 | 7.560 | 6.840 | 6.300 | 5.490 | 4.500 |

Soldering Parameters



Recommended reflow methods: IR, vapor phase oven, hot air oven, N₂ 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

Average Ramp-Up Rate
(T_s max to T_p)

Preheat

- Temperature Min(T_s min)
- Temperature Max(T_s max)
- Time(T_s min to T_s max)

Time maintained above:

- Temperature(T_L)
- Time(t_L)

Peak Temperature(T_p)

Ramp-Down Rate

Time 25°C to Peak Temperature

Storage Condition

Pb-Free Assembly

3°C/second max.

150°C

200°C

60~180 seconds

217°C

60~150 seconds

260°C

6°C/second max.

8 minutes max

0°C~35°C, ≤70%RH

Physical Dimensions(mm.)

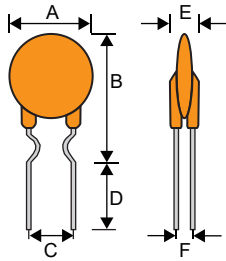


FIG 1

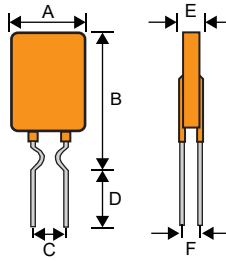


FIG 2

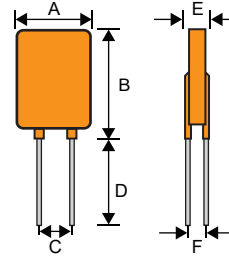


FIG 3

| Model | A Max. | B Max. | C Typ. | D Min. | E Max. | F Typ. | Lead ϕ | FIG |
|---------|--------|--------|----------|--------|--------|--------|-------------|-----|
| A30-030 | 7.00 | 12.80 | 5.1±0.5 | 7.6 | 4.40 | 1.00 | 0.6 | 1 |
| A30-040 | 7.00 | 12.80 | 5.1±0.5 | 7.6 | 4.40 | 1.00 | 0.6 | 1 |
| A30-050 | 7.40 | 14.00 | 5.1±0.5 | 7.6 | 3.00 | 1.00 | 0.5 | 1 |
| A30-070 | 7.40 | 15.00 | 5.1±0.5 | 7.6 | 3.00 | 1.00 | 0.5 | 2 |
| A30-075 | 7.40 | 15.00 | 5.1±0.5 | 7.6 | 3.00 | 1.00 | 0.5 | 2 |
| A30-090 | 7.40 | 16.50 | 5.1±0.5 | 7.6 | 3.00 | 1.00 | 0.5 | 2 |
| A30-110 | 7.40 | 16.50 | 5.1±0.5 | 7.6 | 3.00 | 1.00 | 0.5 | 2 |
| A30-135 | 8.90 | 15.50 | 5.1±0.5 | 7.6 | 3.00 | 1.10 | 0.6 | 2 |
| A30-160 | 8.90 | 17.30 | 5.1±0.5 | 7.6 | 3.00 | 1.10 | 0.6 | 2 |
| A30-185 | 10.20 | 18.20 | 5.1±0.5 | 7.6 | 3.00 | 1.10 | 0.6 | 2 |
| A30-200 | 9.00 | 15.50 | 5.1±0.5 | 7.6 | 4.40 | 1.10 | 0.6 | 2 |
| A30-250 | 11.40 | 20.40 | 5.1±0.5 | 7.6 | 3.00 | 1.10 | 0.6 | 2 |
| A30-300 | 11.40 | 17.30 | 5.1±0.5 | 7.6 | 3.00 | 1.30 | 0.8 | 3 |
| A30-400 | 14.00 | 20.20 | 5.1±0.5 | 7.6 | 3.00 | 1.30 | 0.8 | 3 |
| A30-500 | 14.00 | 25.00 | 10.2±0.5 | 7.6 | 3.00 | 1.30 | 0.8 | 3 |
| A30-600 | 16.50 | 25.10 | 10.2±0.5 | 7.6 | 3.00 | 1.30 | 0.8 | 3 |
| A30-700 | 19.10 | 27.80 | 10.2±0.5 | 7.6 | 3.00 | 1.30 | 0.8 | 3 |
| A30-800 | 21.60 | 29.90 | 10.2±0.5 | 7.6 | 3.00 | 1.30 | 0.8 | 3 |
| A30-900 | 25.50 | 29.90 | 10.2±0.5 | 7.6 | 3.00 | 1.30 | 0.8 | 3 |

PHYSICAL SPECIFICATIONS :

Lead Materials : A30-050~A30-185:Tinned copper clad steel wire (CP wire);
A360-250~A30-900:Tinned copper wire.

Lead Solderability: MIL-STD-202.

Encapsulation: Flame retardant epoxy resin, This meets the requirements of UL-94V-0.

Packaging Quantity

| Model | Bag QTY |
|--|---------|
| A30 Series | 500 |
| Tape & Reel packaging per EIA468-B standard. | |

Cross Reference

| Model | Cross Reference | | |
|---------|--------------------|---------------------|-------------------------|
| | Tyco / PolySwitch® | Bourns / POLY-FUSE® | Polytronics / EVERFUSE® |
| A30-030 | - | - | - |
| A30-040 | - | - | - |
| A30-050 | - | - | - |
| A30-065 | - | - | - |
| A30-075 | - | - | - |
| A30-075 | - | - | - |
| A30-090 | RUEF090 | MF-R090-0-9 | RLD30P090UF |
| A30-110 | RUEF110 | MF-R110 | RLD30P110UF |
| A30-135 | RUEF135 | MF-R135 | RLD30P135UF |
| A30-160 | RUEF160 | MF-R160 | RLD30P160UF |
| A30-185 | RUEF185 | MF-R185 | RLD30P185UF |
| A30-250 | RUEF250 | MF-R250 | RLD30P250UF |
| A30-300 | RUEF300 | MF-R300 | RLD30P300UF |
| A30-400 | RUEF400 | MF-R400 | RLD30P400UF |
| A30-500 | RUEF500 | MF-R500 | RLD30P500UF |
| A30-600 | RUEF600 | MF-R600 | RLD30P600UF |
| A30-700 | RUEF700 | MF-R700 | RLD30P700UF |
| A30-800 | RUEF800 | MF-R800 | RLD30P800UF |
| A30-900 | RUEF900 | MF-R900 | RLD30P900UF |

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