

Features Typical



- Multilayer monolithic structure with glass ceramic body and silver fusing element
- Silver termination with nickel and pure-tin solder plating,
- providing excellent solderability
- Compatible with both wave and reflow soldering processes
- Operating temperature range: -55°C to +125°C
- Designed to UL E311435

0402WCF

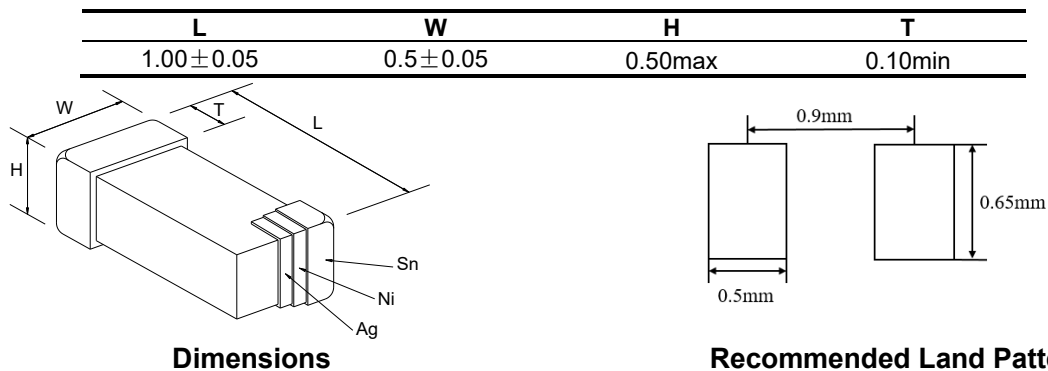
series(Rev: D)

SMD Chip

Applications

Circuit Protecting in LCD monitors, PC cards, disk drives, portable communication products, PDAs, digital cameras, DVDs, TVs, cell phones, rechargeable battery packs, battery chargers, etc.

Product Dimensions and Recommended Land Pattern (mm)



Dimensions

Recommended Land Pattern

Electrical Characteristics

Part number	Current Rating	Voltage Rating	Interrupting Ratings	Nominal Cold DCR	Nominal I ² t	UL
	A	VDC	A	mΩ	(A ² s)	
0402WCF050A032V	0.5	32/24	35	380	0.004	-
0402WCF050A024V				210	0.014	√
0402WCF075A032V	0.75					
0402WCF075A024V				49	0.07	√
0402WCF100A032V	1.0					
0402WCF100A024V				18	0.49	√
0402WCF150A032V	1.5					
0402WCF150A024V				8	1.2	√
0402WCF200A032V	2.0					
0402WCF200A024V				3.0	8	1.2
0402WCF300A032V	3.0					
0402WCF300A024V				4.0	8	1.2
0402WCF400A032V	4.0					
0402WCF400A024V				5.0	8	1.2
0402WCF500A032V	5.0					
0402WCF500A024V						

Notice: 1. Measured at ≤ 10% rated current and 25°C ambient.
2. Melting I²t at 0.001 second pre-arcing time.

Clear-Time Characteristics

% of current rating	Clear-time at 25 °C
100%	4 hours min.
250%	5 seconds max.
400%	0.05 seconds max.

Part Numbering

0402 WCF @A#V&

(1) (2) (3)

(1) 0402: Standard EIA Chip Size

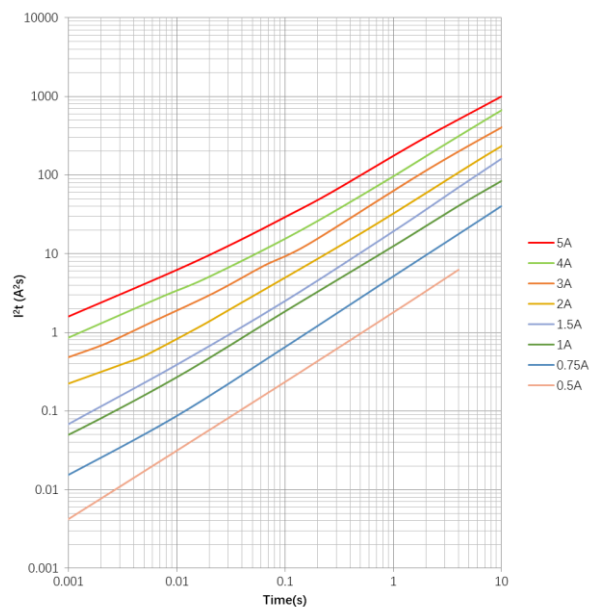
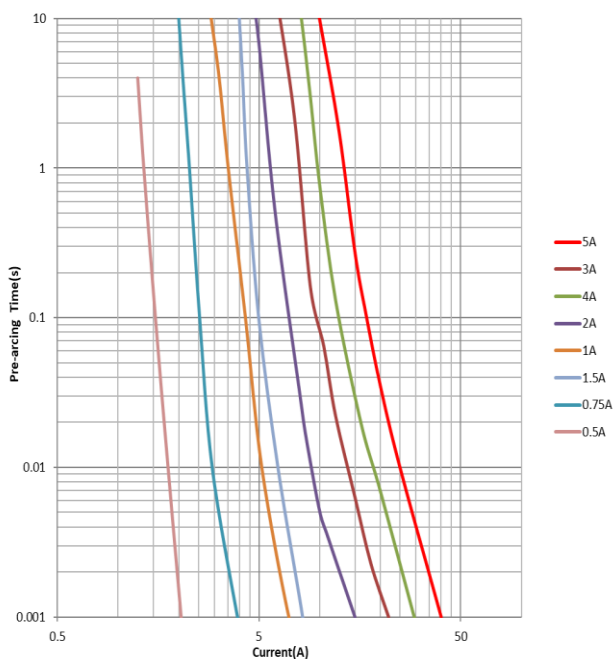
(2) WCF: Wayon Chip Fuse

(3) “@” represents ampere maybe 050-500 means 0.50A-5A. “#” represents voltage 024/032. Maybe followed by “&” is empty or “-XX” denoting customer code or package code.

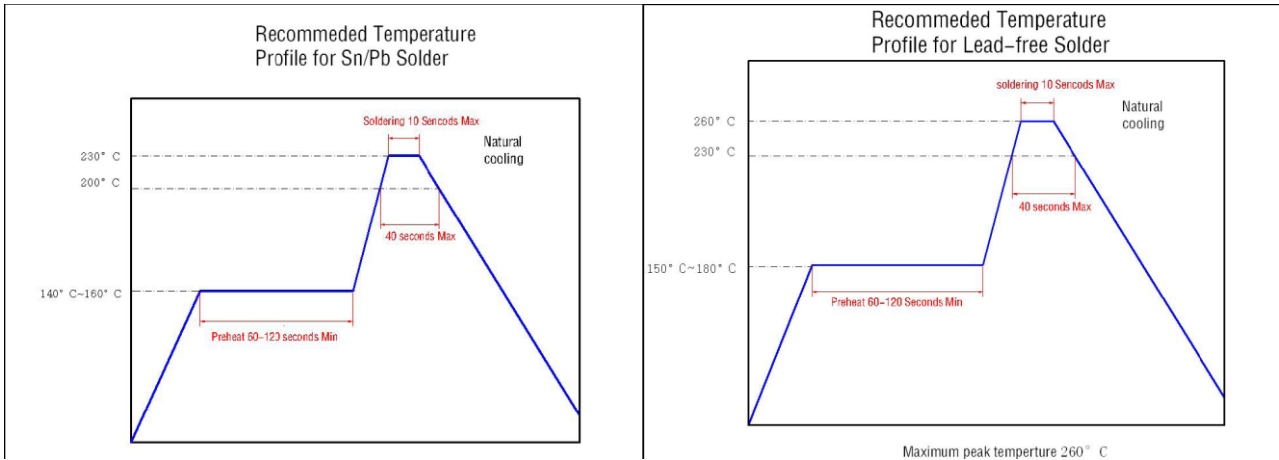
Agency Approval

Recognized Under the Components Program of UL. File Number: UL NO. E311435

Average Clear-Time Curves And I²t vs. t Curves



Solder Reflow Recommendations



Recommended conditions for hand soldering:

1. Preheating: 150°C, 60s (min) Appropriate temperature (max) of soldering iron tip/soldering time (max): 280°C /10s or 350°C / 3s Maximum temperature of soldering iron tip/soldering time : 350°C /9s or 400°C / 8s
2. Using hot air rework station with tip that can melt the solder on both terminations of the same time is strongly recommended, don't directly contact the chip termination with the tip of soldering iron

Reliability Tests:

No.	Test	Requirement	Test condition	Test reference
1	Soldering heat resistance	DCR change $\leq \pm 10\%$ No mechanical damage	One dip at 260°C for 60 sec	MIL-STD-202 Method 210
2	Solderability	Minimum 95% coverage	One dip at 235°C for 5sec	MIL-STD-202 Method 208
3	Thermal shock	DCR change $\leq \pm 10\%$ No mechanical damage	100 cycles between -65 °C and +125°C	MIL-STD-202 Method 107
4	Moisture resistance	DCR change $\leq \pm 15\%$ No mechanical damage	10 cycles	MIL-STD-202 Method 106
5	Salt spray	DCR change $\leq \pm 10\%$ No mechanical damage	48 hours exposure	MIL-STD-202 Method 101
6	Mechanical vibration	DCR change $\leq \pm 10\%$ No mechanical damage	0.4" D.A. or 30 G between 5- 3000 Hz	MIL-STD-202 Method 204
7	Mechanical shock	DCR change $\leq \pm 10\%$ No mechanical damage	1500 G, 0.5 ms, half-sine shocks	MIL-STD-202 Method 213
8	Terminal strength	DCR change $\leq \pm 10\%$ No mechanical damage	30 sec. hanging for 1206 (1.5kg) and 0603 (0.5KG)	Refer to WAYON Standard
9	Life	No electrical "opens" during testing voltage drop change shall be less than $\pm 20\%$ of initial value	80% Rated current ambient temperature +25°C to +28 °C, 2000 hours	Refer to WAYON Standard
10	Bending	No electrical "opens" during testing	2 mm bending , more than 5 seconds	Refer to WAYON Standard

Electrical Specifications:

Clear-Time Characteristics:

Same as specified on the Short Form Data Sheet

Insulation Resistance after Opening:

20,000 ohms minimum when cleared with rated voltage applied. Fuse clearing under low voltage conditions may result in lower after clearing insulation resistance values. (Note: Under normal fault conditions (low or rated voltage conditions), WAYON chip fuses provide sufficient after clearing insulation resistance values for circuit protection.)

Current Carrying Capacity:

100% rated current at +25°C ambient for 4 hours minimum when evaluated per MIL-PRF-23419

Interrupt Ratings:

Same as specified on the Short Form Data Sheet

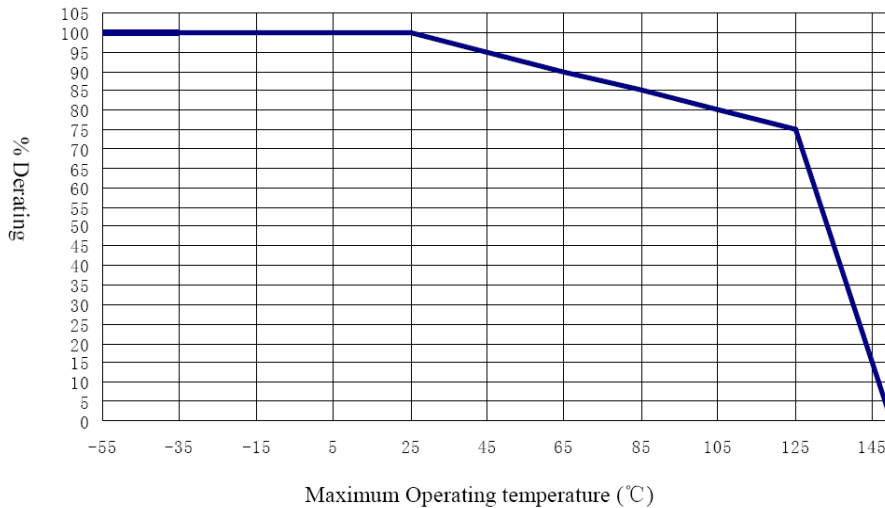
Fuse Selection and Temperature De-rating Guideline:

The ambient temperature affects the current carrying capacity of fuses. When a fuse is operating at a temperature higher than 25°C, the fuse shall be "de-rated".

To select a fuse from the catalog, the following rule may be followed: Catalog Fuse Current Rating = Nominal Operating Current / 0.75 / % De-rating at the maximum operating temperature.

Example: At maximum operating temperature of 65°C, % De-rating is 90%. The nominal operating current is 4A. The current rating for fuse selected from the catalog shall be:

$$4 / 0.75 / 90\% = 5.9 \text{ or } 6A.$$



Packaging and Storage:

Packaging

WAYON's chip fuse are provided on tape-and-reel for use in pick-and-place machines or in bulk for special applications. Both tape-and-reel and bulk products are sealed in plastic bags with desiccant. The reel size can be 7 inches or 13 inches, depending on customers' preference.

Packaging Data

Chip Size	Parts on	7 inch (178 mm) Reel
0402		10,000pcs
0603		4,000pcs
1206		3,000pcs

Storage

The maximum ambient temperature shall not exceed 40°C. Storage temperatures higher than 40°C could result in the deformation of packaging materials. The maximum relative humidity recommended for storage is 70%. High humidity with high temperature can accelerate the oxidation of the solder plating on the termination and reduce the solderability of the components. Sealed plastic bags with desiccant shall be used to reduce the oxidation of the termination and shall only be opened prior to use. The products shall not be stored in areas where harmful gases containing sulfur or chlorine are present.

■ Cautions and warnings:

1、 Handling

- CHIP FUSE must not be dropped. Chip-offs must not be caused during handling of FUSEs.
- Components must not be touched with bare hands. Gloves are recommended.
- Avoid contamination of fuse surface during handling.

2、 Soldering

- Use resin-type flux or non-activated flux.
- Insufficient preheating may cause ceramic cracks.
- Rapid cooling by dipping in solvent is not recommended.
- Complete removal of flux is recommended.

3、 Mounting

- Electrode must not be scratched before/during/after the mounting process.
- Contacts and housings used for assembly with fuses have to be clean before mounting.
- During operation, the fuse's surface temperature can be very high (ICL). Ensure that adjacent components are placed at a sufficient distance from the fuse to allow for proper cooling of the fuses.
- Ensure that adjacent materials are designed for operation at temperatures comparable to the surface temperature of the fuse. Be sure that surrounding parts and materials can withstand this temperature.
- Avoid contamination of fuse surface during processing.

4、 Operation

- Use fuses only within the specified operating temperature range.
- Environmental conditions must not harm the fuses. Use fuses only in normal atmospheric conditions.
- Contact of chip fuses with any liquids and solvents should be prevented. It must be ensured that no water enters the chip fuse (e.g. through plug terminals). For measurement purposes (checking the specified resistance vs. temperature), the component must not be immersed in water but in suitable liquids (e.g. Galden).
- Avoid dewing and condensation.

■ Notice:

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