

## Chip Fuses

### CC06H Series High I<sup>2</sup>t 0603 Size Fuse



#### Electrical Characteristics

Amp Rating	% of Amp Rating	Opening Time
1-5A	100	4 Hours
1-5A	200	1-60 Seconds
1-5A	250	5 Seconds Maximum

#### Description

The Chip™ CC06H Series high I<sup>2</sup>t fuse is a very small surface mount fuse (0603 size) designed to protect low voltage circuits from the harmful effects of short-circuits. The technology of this series combines the robust Cooper Bussmann® solid matrix fuse construction with advanced fuse element design to deliver state-of-the-art overcurrent protection on circuits subject to inrush currents.

#### Features

- Halogen free
- High inrush withstand capability
- Fast-acting performance
- RoHS compliant
- Lead free
- Ampacity alpha mark on fuse for easy identification
- Standard termination design for easy solderability
- Compatible with standard lead-free solder reflow and wave soldering processes
- Excellent environmental integrity

#### Applications

For secondary protection in space constrained applications such as:

- LCD backlight inverters
- Digital cameras
- DVD players
- Bluetooth headsets
- Battery packs

#### Agency Information

- **cRUus** Recognized Card: (1A-5A) Guide JDXY2, File E19180

#### Part Numbering System: CC06H 1A -TR

Fuse Series \_\_\_\_\_  
Amp Rating \_\_\_\_\_  
Packaging Code Suffix \_\_\_\_\_

#### Packaging

- TR - Packaging code suffix for tape-and-reel (8mm wide tape on 178mm diameter reel - specification EIA 481-1)
- Quantity = 5000 fuses

#### Specifications

Catalog Number	Amp Rating <sup>3</sup>	Alpha Marking	Voltage Rating Vdc	Interrupting Rating (amps) <sup>1,4</sup>	Typical Resistance (Ω) <sup>2</sup>	Typical Melt I <sup>2</sup> t <sup>3</sup>	Typical Voltage Drop (V)	Typical Power Loss (W)	Agency Approvals
									cRUus
CC06H1A	1	B	32	50	0.225	0.02	0.295	0.30	x
CC06H1.5A	1.5	H	32	50	0.122	0.07	0.220	0.33	x
CC06H2A	2	K	32	50	0.061	0.20	0.160	0.32	x
CC06H2.5A	2.5	L	32	50	0.045	0.25	0.145	0.36	x
CC06H3A	3	O	32	50	0.027	0.30	0.110	0.33	x
CC06H3.5A	3.5	R	32	50	0.021	0.60	0.100	0.35	x
CC06H4A	4	S	32	50	0.018	1	0.100	0.40	x
CC06H5A	5	T	32	50	0.013	2	0.088	0.44	x

1. DC Interrupting Rating (measured at rated voltage, time constant of less than 50 microseconds, battery source).

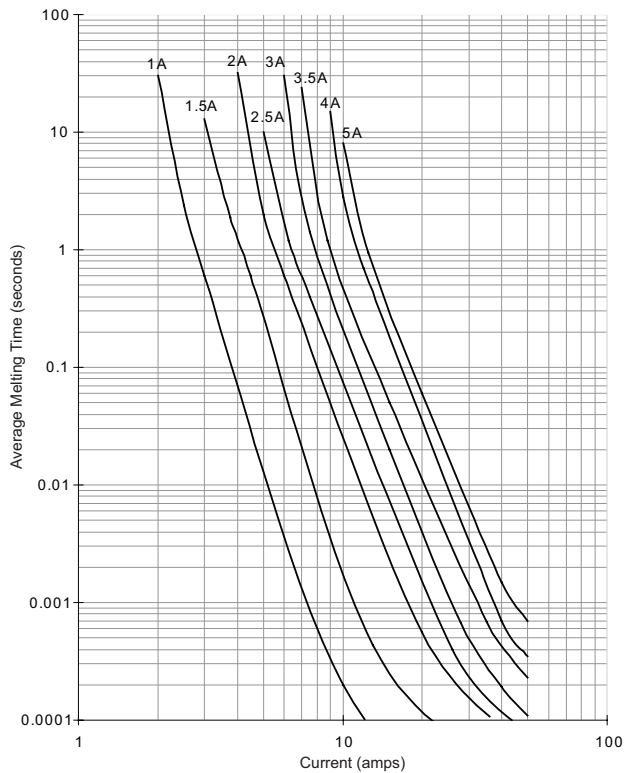
2. DC Cold Resistance are measured at <10% of rated current in ambient temperature of 20°C - FOR REFERENCE ONLY - CONTROLLED VALUES HELD BY PLANT AND SUBJECT TO CHANGE WITHOUT NOTICE.

3. Typical Pre-arcing I<sup>2</sup>t are measured at 10I<sub>N</sub> current.

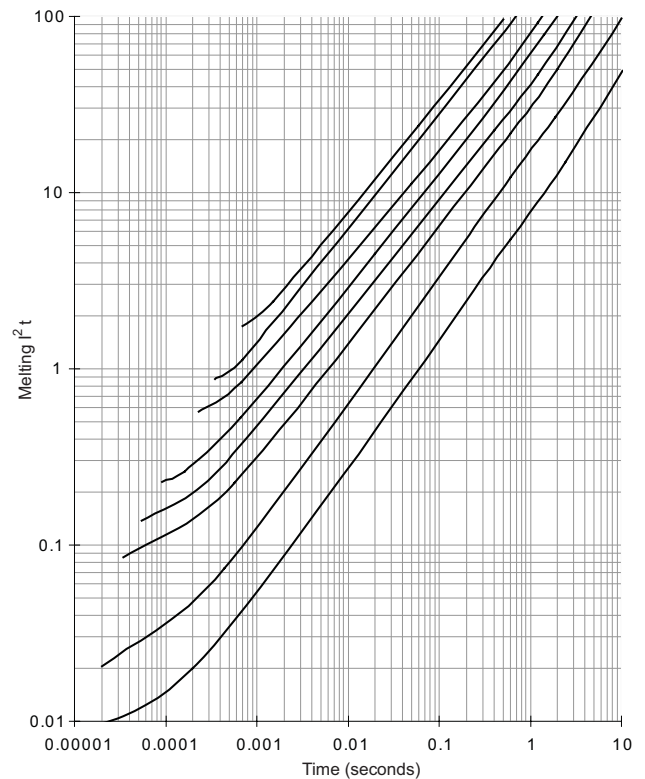
4. The insulation resistance after breaking capacity test is higher than 0.1MΩ when measured by 2X rated voltage.

5. Device designed to carry rated current for 4 hours minimum. An operating current 80% or less of rated current is recommended, with further design derating required at elevated ambient temperature. See Temperature Derating Curve on next page.

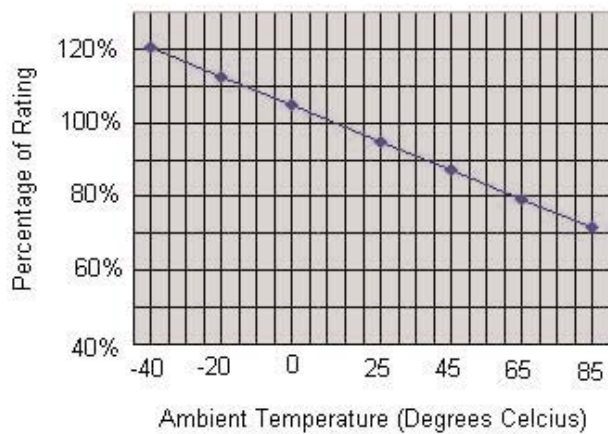
### Time-Current Curves



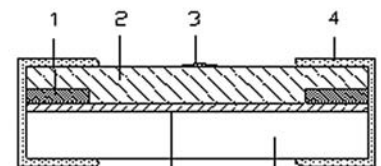
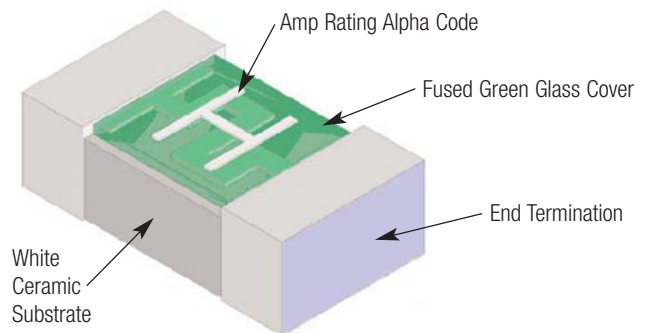
### Melting I²t Curves



### Temperature Derating Curve

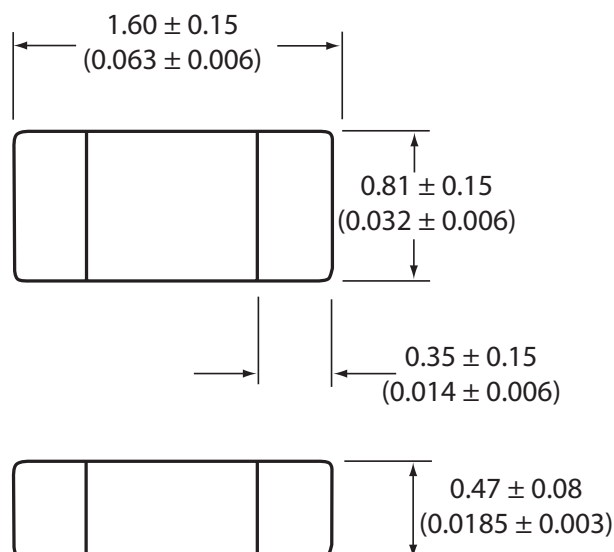


### Construction

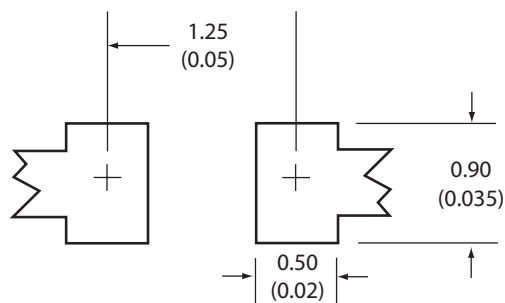


- 1 = Silver termination pad
- 2 = Green fused glass cover
- 3 = Alpha code marking
- 4 = End termination:
- A) Nickel underplate - 200 to 400 microinches
- B) 100% Tin plate - 300 to 600 microinches
- 5 = Metal film fusible element
- 6 = White ceramic substrate

## Dimensions - mm (in)



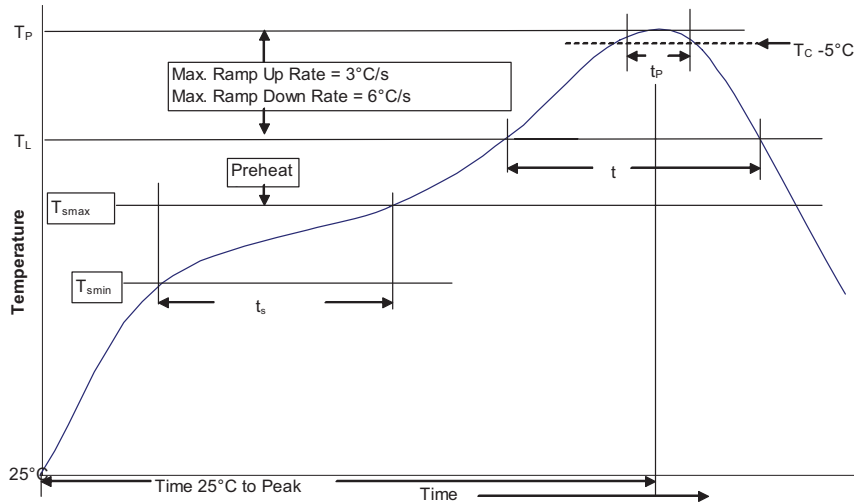
## Recommended Pad Layout - mm (in)



## Product Characteristics

Operating Temperature	-40°C to 85°C , with proper derating factor applied
Storage Temperature	-40°C to 85°C
Load Humidity	MIL-STD-202G, Method 103B (1000 hr @ 85°C / 85% RH & 10% rated current)
Moisture Resistance	MIL-STD-202, Method 106E (50 cycles)
Thermal Shock	MIL-STD-202, Method 107D (-65°C to +125°C, 100 cycles)
Vibration Test	MIL-STD-202, Method 204D, Test Condition D (10-2,000Hz)
Mechanical Shock Resistance	MIL-STD-202, Method 213B (3000G / 0.3ms)
Salt Spray Resistance	MIL-STD-202, Method 101, Test Condition B (48 hr exposure)
Insulation Resistance	The insulation resistance after breaking capacity test is higher than 0.1MΩ when measured by 2X rated voltage
Solderability	J-STD-002C Method B1 (Dip and Look Test), Method G1 (Wetting Balance Test), Method D (Resistance to Dissolution / Dewetting of Metalization)
Resistance to Soldering Heat	MIL-STD-202, Method 210F (Solder dip - 260°C, 60 seconds / Solder Iron - 350°C, 3-5 seconds)
High Temperature Life Test	MIL-STD-202G, Method 108A (1000 Hours @ 70°C & 60% rated current)
Board Flex Test	AEC-Q200 Method 005 (2mm deflection for 60 seconds)
Terminal Strength	AEC-Q200 Method 006 (5N force for 60 seconds)
Resistance to Solvents	MIL-STD-202, Method 215K

## Solder Reflow Profile



**Table 1 - Standard SnPb Solder ( $T_C$ )**

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5mm	235°C	220°C
≥2.5mm	220°C	220°C

**Table 2 - Lead (Pb) Free Solder ( $T_C$ )**

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350 - 2000	Volume mm <sup>3</sup> >2000
<1.6mm	260°C	260°C	260°C
1.6 - 2.5mm	260°C	250°C	245°C
>2.5mm	250°C	245°C	245°C

Manual solder (rework only): solder tip 350°C maximum, 5 seconds maximum.

## Reference JDEC J-STD-020D

Profile Feature	Standard SnPb Solder	Lead (Pb) Free Solder
Preheat and Soak		
• Temperature min. ( $T_{smin}$ )	100°C	150°C
• Temperature max. ( $T_{smax}$ )	150°C	200°C
• Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	60-120 Seconds	60-120 Seconds
Average ramp up rate $T_{smax}$ to $T_P$	3°C/ Second Max.	3°C/ Second Max.
Liquidous temperature ( $T_L$ )	183°C	217°C
Time at liquidous ( $t_L$ )	60-150 Seconds	60-150 Seconds
Peak package body temperature ( $T_P$ )*	Table 1	Table 2
Time ( $t_p$ )** within 5 °C of the specified classification temperature ( $T_C$ )	20 Seconds**	30 Seconds**
Average ramp-down rate ( $T_P$ to $T_{smax}$ )	6°C/ Second Max.	6°C/ Second Max.
Time 25°C to Peak Temperature	6 Minutes Max.	8 Minutes Max.

\* Tolerance for peak profile temperature ( $T_P$ ) is defined as a supplier minimum and a user maximum.

\*\* Tolerance for time at peak profile temperature ( $t_p$ ) is defined as a supplier minimum and a user maximum.

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