COOPER Bussmann

Chip Fuses

CC06H Series High I²t 0603 Size Fuse

HALOGEN HF FREE

RoHS 2002/95/EC



Surface Mount Device

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 I²t 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

- c UL us Recognized Card: (1A-5A) Guide JDXY2, File E19180

Part Numbering System: CC06H 1A -TR

Fuse Series
Amp Rating
Packaging Code Suffix

Packaging

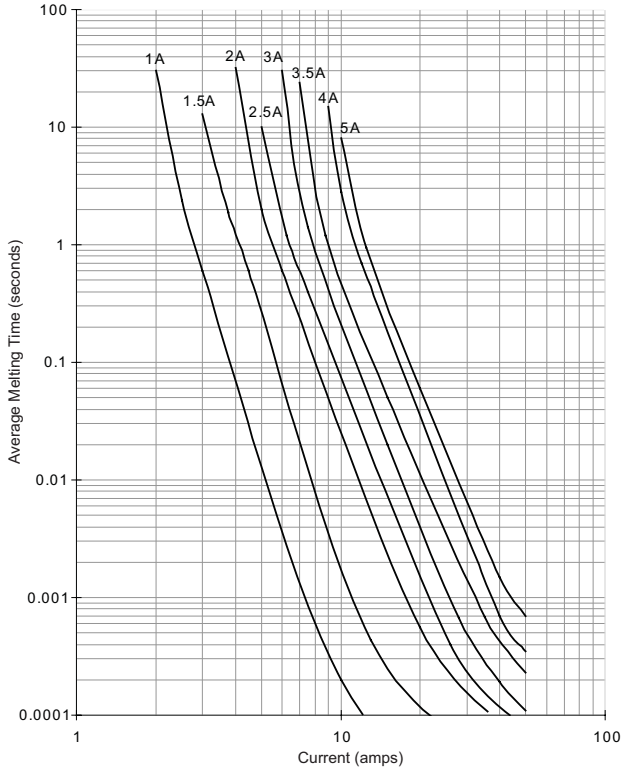
- TR - Packaging code suffix for tape-and-reel (8mm wide tape on 178mm diameter reel - specification EIA 481-1)
- Quantity = 5000 fuses

Specifications

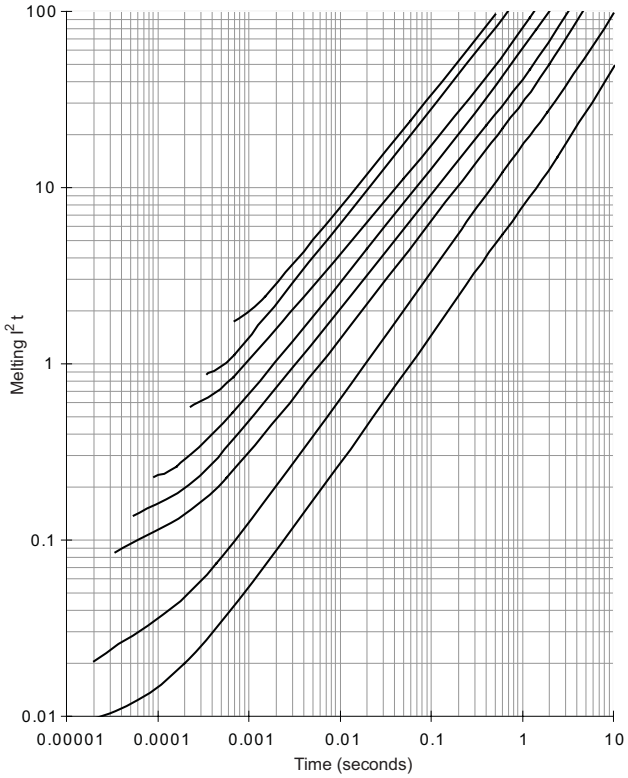
Catalog Number	Amp Rating[5]	Alpha Marking	Voltage Rating Vdc	Interrupting Rating (amps)[1,4]	Typical Resistance (Ω)[2]	Typical Melt I²t[3]	Typical Voltage Drop (V)	Typical Power Loss (W)	Agency Approvals cRUus
CC06H1A	1	B	32	50	0.225	0.02	0.295	0.30	x
CC06H1.5A	1.5	H	32	50	0.122	0.07	0.220	0.33	x
CC06H2A	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 20ºC - FOR REFERENCE ONLY - CONTROLLED VALUES HELD BY PLANT AND SUBJECT TO CHANGE WITHOUT NOTICE.
3. Typical Pre-arching I²t are measured at $10I_n$ 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.

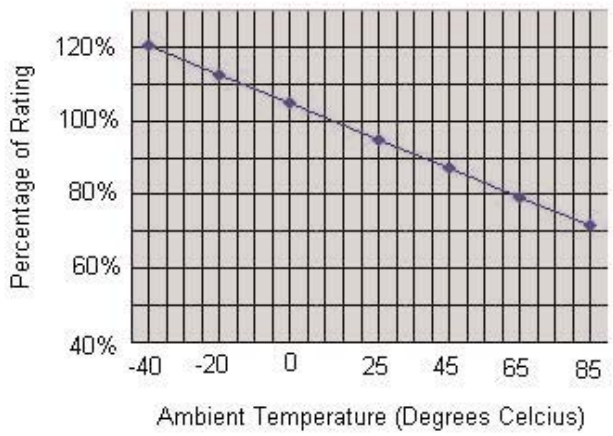
Time-Current Curves



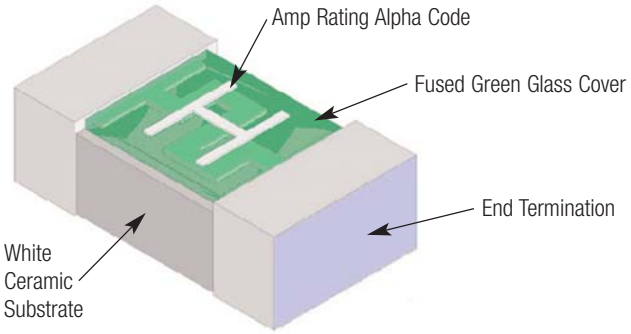
Melting I²t Curves

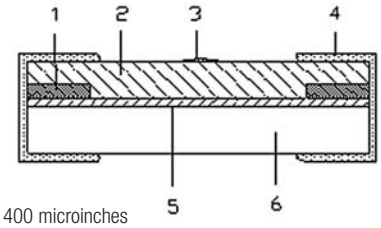


Temperature Derating Curve



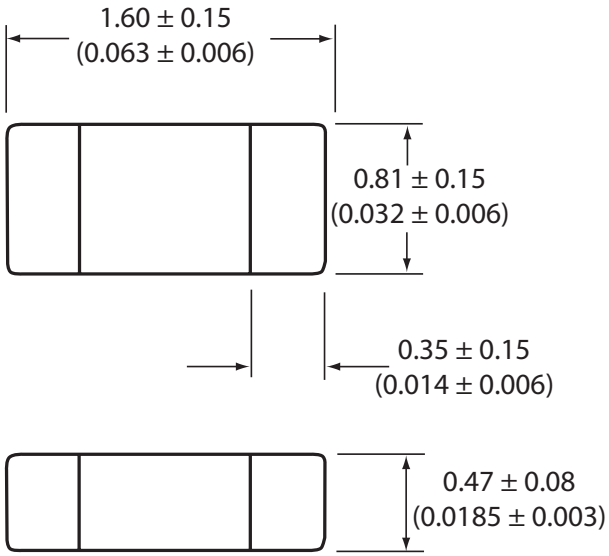
Construction



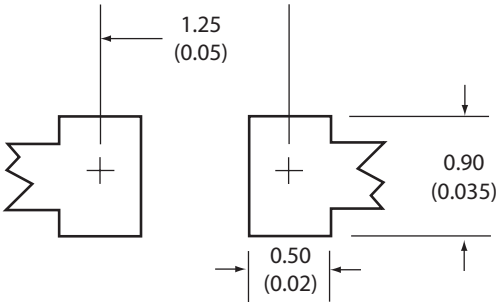


1 = Silver termination pad
2 = Green fused glass cover
3 = Alpha code marking
4 = End termination:
A) Nickel underplate - 200 to 400 microinches
B) 100% Tin plate - 300 to 600 microinches
5 = Metal film fusible element
6 = White ceramic substrate

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

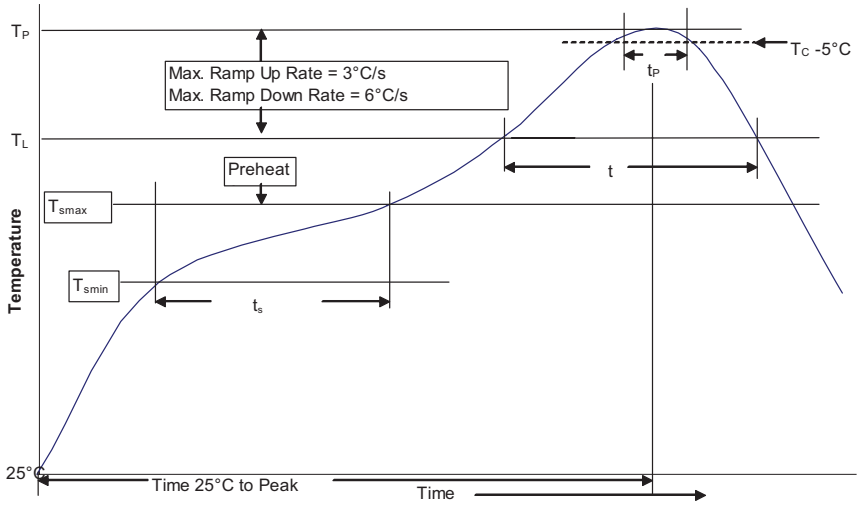


Table 1 - Standard SnPb Solder (T_C)

Package Thickness	Volume mm³ <350	Volume mm³ ≥350
<2.5mm	235°C	220°C
≥2.5mm	220°C	220°C

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

Package Thickness	Volume mm³ <350	Volume mm³ 350 - 2000	Volume mm³ >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) Time at liquidous (t_L)		183°C 60-150 Seconds	217°C 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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