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

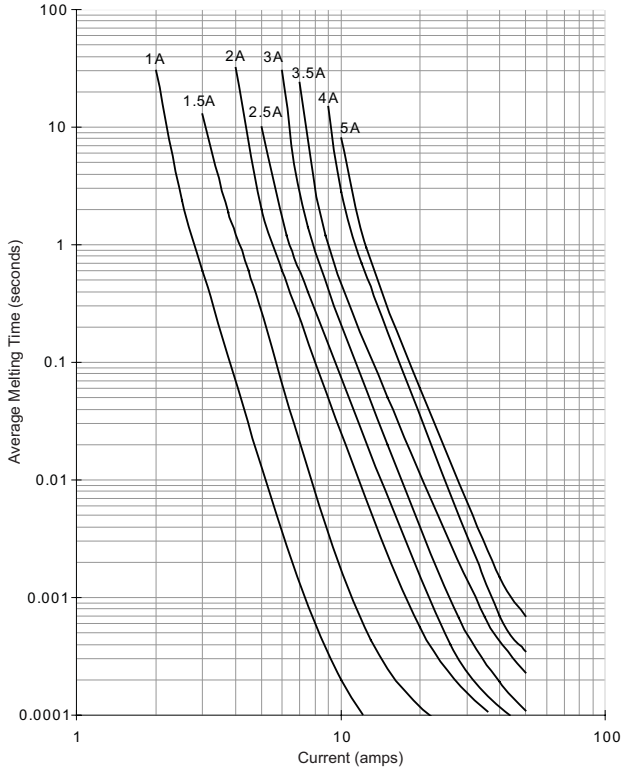
- TR - Packaging code suffix for tape-and-reel (8mm wide tape on 178mm diameter reel - specification EIA 481-1)
- Quantity = 5000 fuses

Specifications

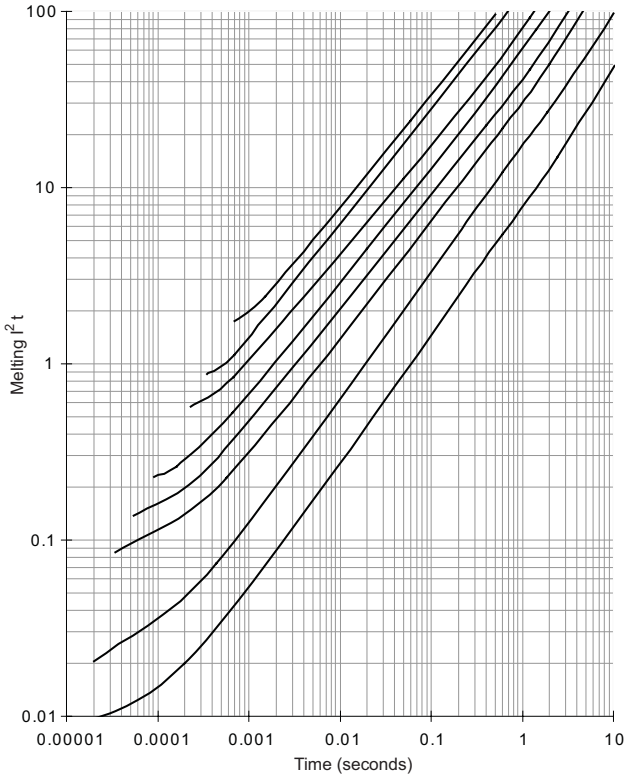
Catalog Number	Amp Rating[5]	Alpha Marking	Voltage Rating Vdc	Interrupting Rating (amps)[1,4]	Typical Resistance (Ω)[2]	Typical Melt I²t[3]	Typical Voltage Drop (V)	Typical Power Loss (W)	Agency Approvals cRUus
CC06H1A	1	B	32	50	0.225	0.02	0.295	0.30	x
CC06H1.5A	1.5	H	32	50	0.122	0.07	0.220	0.33	x
CC06H2A	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.

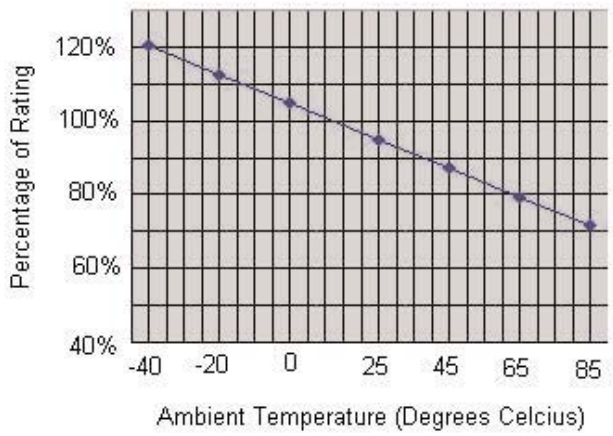
Time-Current Curves



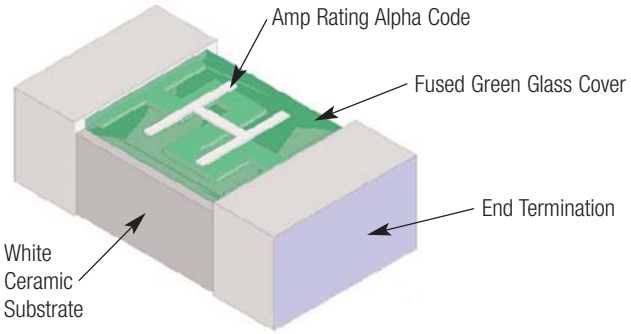
Melting I²t Curves

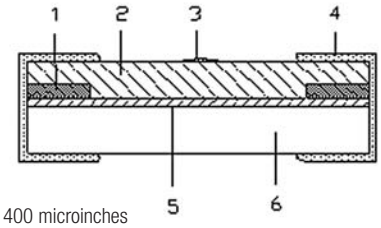


Temperature Derating Curve



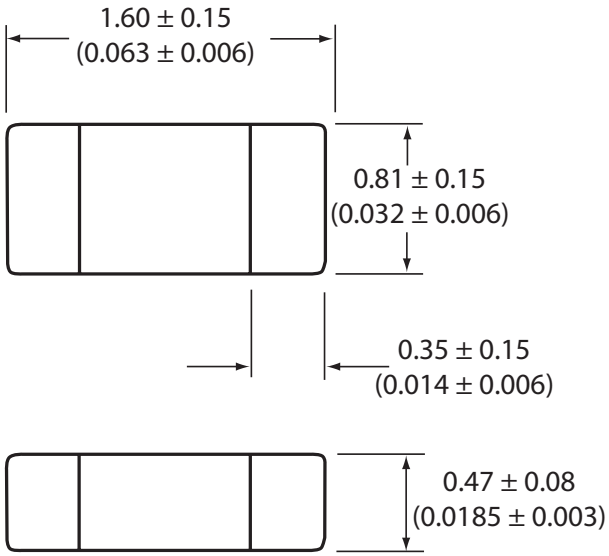
Construction



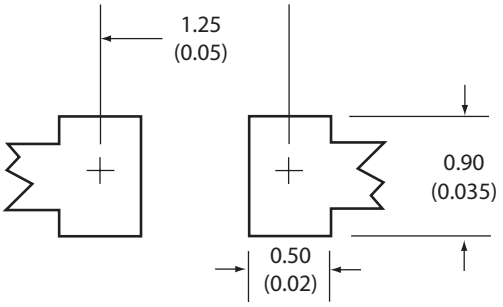


1 = Silver termination pad
2 = Green fused glass cover
3 = Alpha code marking
4 = End termination:
A) Nickel underplate - 200 to 400 microinches
B) 100% Tin plate - 300 to 600 microinches
5 = Metal film fusible element
6 = White ceramic substrate

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

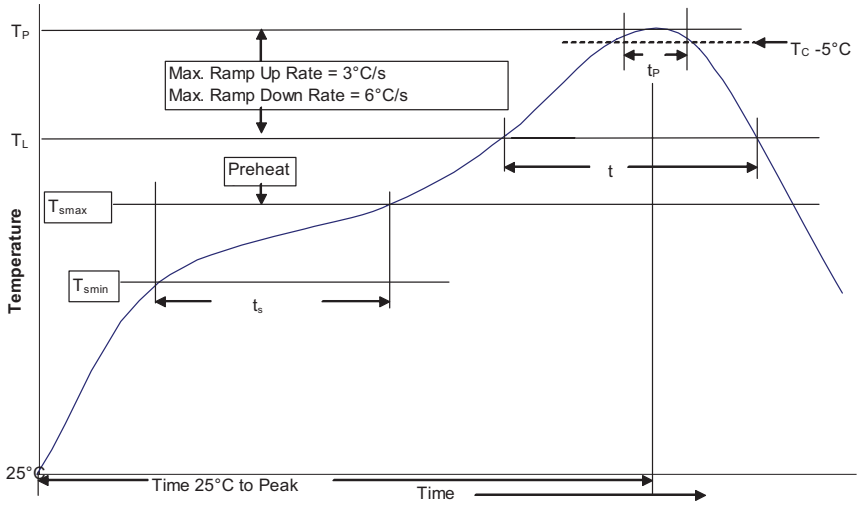


Table 1 - Standard SnPb Solder (T_C)

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.

The only controlled copy of this Data Sheet is the electronic read-only version located on the Cooper Bussmann Network Drive. All other copies of this document are by definition uncontrolled. This bulletin is intended to clearly present comprehensive product data and provide technical information that will help the end user with design applications. Cooper Bussmann reserves the right, without notice, to change design or construction of any products and to discontinue or limit distribution of any products. Cooper Bussmann also reserves the right to change or update, without notice, any technical information contained in this bulletin. Once a product has been selected, it should be tested by the user in all possible applications.

Life Support Policy: Cooper Bussmann does not authorize the use of any of its products for use in life support devices or systems without the express written approval of an officer of the Company. Life support systems are devices which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.

© 2009 Cooper Bussmann
St. Louis, MO 63178
www.cooperbussmann.com

COILTRONICS® COOPER Bussmann® PowerStor®