

# CC06FA

## Automotive grade fast-acting chip fuse



### Product features

- AEC-Q200 qualified
- 0603 (1608 metric) compact design utilizes less board space
- Rapid interruption of excessive current
- Compatible with reflow and wave solder
- Rugged ceramic and glass construction
- Excellent environmental integrity
- One time positive disconnect
- High breaking capacity up to 63 V
- Moisture sensitivity level (MSL) :1

### Applications

Automotive

- Battery management systems (BMS)
- Central body control module
- Doors, window lift and seat control
- Digital instrument cluster
- In-vehicle infotainment (IVI) and navigation
- Electric pumps, motor control and auxiliaries
- Powertrain control module (PCU)/engine control unit (ECU)
- Transmission control unit (TCU)

### Agency information

- UL Recognized File: File E19180
- AEC-Q200 qualified

### Ordering

- Use ordering codes (see page 3 for details)

### Packaging suffixes

- -TR (5,000 parts in paper tape on a 178 mm (7") reel)

### Electrical characteristics

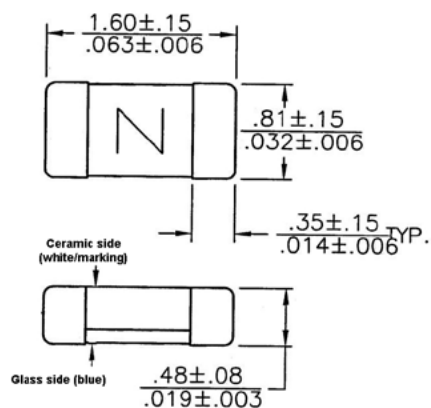
Amp Rating	% of Amp Rating	Opening Time
500 mA – 1.5 A	100%	4 hours minimum
500 mA – 1.5 A	200%	60 seconds maximum

### Product specifications

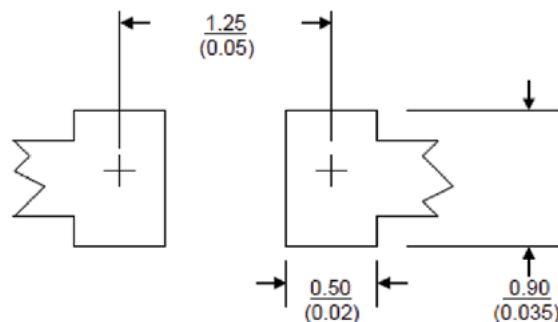
Part Number <sup>5</sup>	Current rating (A)	Voltage rating (Vdc)	Interrupting rating <sup>1</sup> (A)	Typical DC cold resistance <sup>2</sup> ( $\Omega$ )	Typical pre-arcing <sup>3</sup> I <sup>2</sup> t (A <sup>2</sup> s)	Typical voltage drop (V)	Part marking
CC06FA500mA	0.5	63	50	1.025	0.0019	0.60	F
CC06FA750mA	0.75	63	50	0.510	0.003	0.50	G
CC06FA1A	1	63	50	0.150	0.007	0.211	H
CC06FA1.25A	1.25	63	50	0.132	0.008	0.201	J
CC06FA1.5A	1.5	63	50	0.086	0.0319	0.138	K

- DC interrupting rating measured at rated voltage, time constant less than 50 microseconds, battery source
- DC cold resistance measured at <10% of rated current
- Typical pre-arcing I<sup>2</sup>t measured with a battery bank at rated dc voltage, 10x-rated current, not to exceed IR, time constant of calibrated circuit less than 50 microsecond
- Typical voltage drop measured at rated current after temperature stabilizes
- Part Number Definition: CC06FAxxx-R  
CC06FA = Product code and size  
xxx - Ampere rating (mA or A)

### Dimensions—mm in

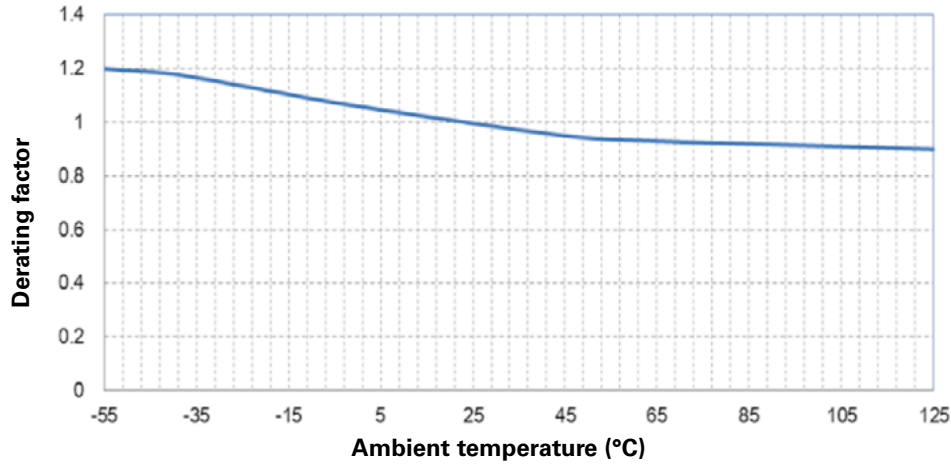


### Recommended pad layout



Fuse to be installed with ceramic side up (white/markings)

**Temperature derating curve**



**Environmental data**

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Operating temperature: -55 °C to +125 °C (with derating)

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Storage temperature (component): -55 °C to +125 °C

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Life test: MIL-STD-202, Method 108A, except circulating air environment at +125 °C ±2 °C, apply 60% rated current for 1000 hours

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Load humidity test: MIL-STD-202, Method 103B except: environmental chamber 85%+2% relative humidity at +85 °C ±2 °C, 10% of rated dc current, at any voltage less than or equal to rated voltage for 1000 hours

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Terminal strength test: Force of 1.8 kg for 60 seconds

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TBoard flex test: Downward force is applied to cause a 2 mm deflection for 1 minute (no physical evidence of mechanical or physical damage, change in resistance < 5%)

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Thermal shock test: MIL-STD-202, Method 107D, -55 °C to +125 °C, 200 cycles

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Mechanical shock test: MIL-STD-202, Method 213 condition C, 100 g's half-sine for 6 seconds

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High frequency vibration test: MIL-STD-202, Method 204, 5 g's for 20 minutes, 12 cycles each of 3 orientations, 10 to 2000 Hz

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Resistance to solvents test: MIL-STD-202, Method 215A

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High temperature exposure: 1000 hours at +125 °C unpowered

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Resistance to solder heat: MIL-STD-202 Method 210 condition B

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Solderability: ANSI/J-STD-002,  
Dip and look test: Test B  
Wetting balance test: Test F  
Resistance to dissolution of metalization test: Test D

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**Ordering codes**

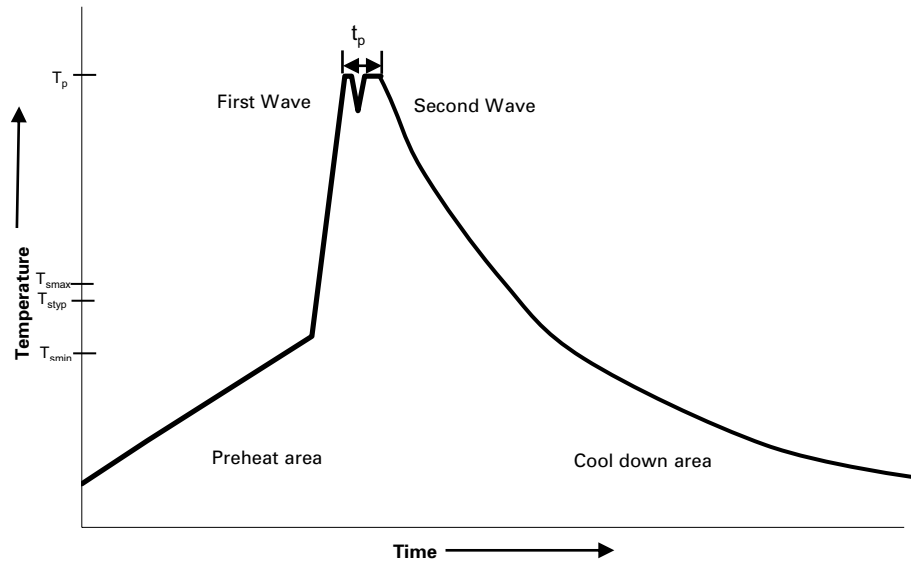
The ordering code is the part number replacing the “:” with a “-” plus adding the packaging suffix.

**Packaging suffix**

-TR (5,000 parts in paper tape on a 178 mm (7”) reel)

Part Number	Ordering code
	-TR option
CC06FA500mA	CC06FA500mA-TR
CC06FA750mA	CC06FA750mA-TR
CC06FA1A	CC06FA1A-TR
CC06FA1.25A	CC06FA1-25A-TR
CC06FA1.5A	CC06FA1-5A-TR

**Wave solder profile**



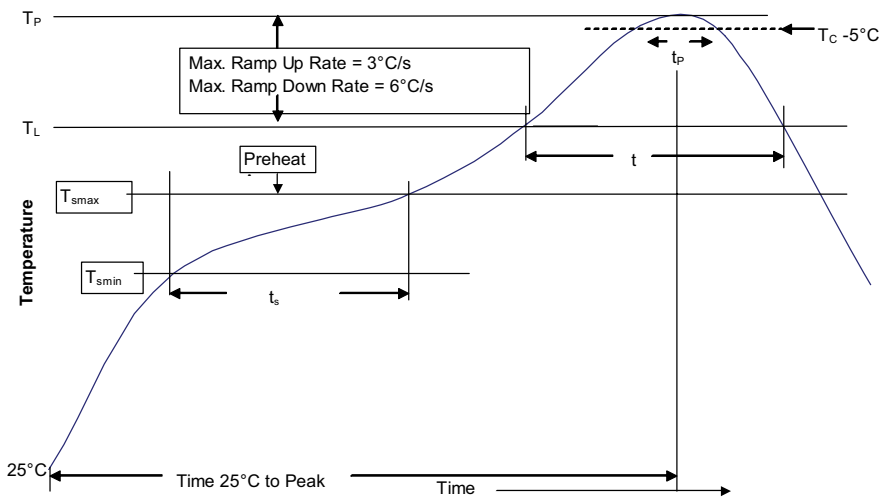
**Reference EN 61760-1:2006**

Profile feature	Standard SnPb solder	Lead (Pb) free solder
Preheat		
• Temperature min. ( $T_{smin}$ )	100 °C	100 °C
• Temperature typ. ( $T_{styp}$ )	120 °C	120 °C
• Temperature max. ( $T_{smax}$ )	130 °C	130 °C
• Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	70 seconds	70 seconds
$\Delta$ preheat to max Temperature	150 °C max.	150 °C max.
Peak temperature ( $T_p$ )*	235 °C – 260 °C	250 °C – 260 °C
Time at peak temperature ( $t_p$ )	10 seconds max 5 seconds max each wave	10 seconds max 5 seconds max each wave
Ramp-down rate	~ 2 K/s min ~3.5 K/s typ ~5 K/s max	~ 2 K/s min ~3.5 K/s typ ~5 K/s max
Time 25°C to 25°C	4 minutes	4 minutes

**Manual solder**

+350 °C (4-5 seconds by soldering iron), generally manual/hand soldering is not recommended

**Solder reflow profile**



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

Package thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	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
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

**Reference J-STD-020**

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
Ramp up rate $T_L$ to $T_p$	3 °C/ second max.	3 °C/ second max.
Liquidous temperature ( $T_L$ )	183 °C	217 °C
Time ( $t_L$ ) maintained above $T_L$	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*
Ramp-down rate ( $T_p$ to $T_L$ )	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.

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