

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



Environmental compliance



- Values less than 1 A are not lead free

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

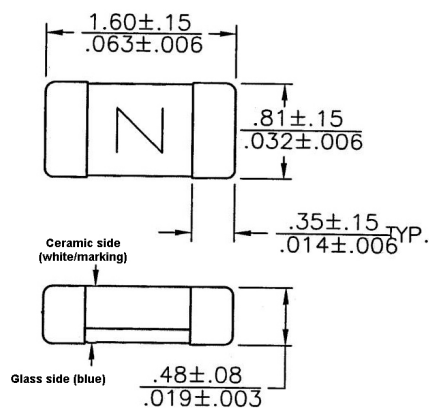
Amp Rating	% of Amp Rating	Opening Time
500 mA – 1.5 A	100%	4 hours minimum
500 mA – 1.5 A	200%	60 seconds maximum

Product specifications

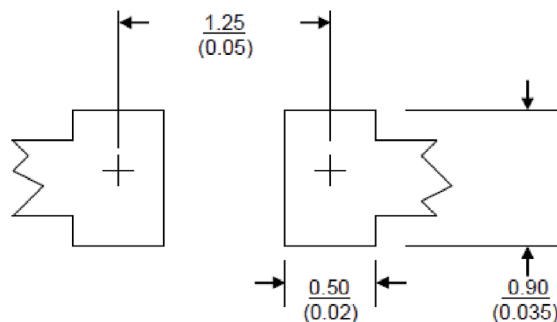
Part Number ⁵	Current rating (A)	Voltage rating (Vdc)	Interrupting rating ¹ (A)	Typical DC cold resistance ² (Ω)	Typical pre-arcing ³ I^2t (A ² s)	Typical voltage drop (V)	Part marking
CC06FA500mA	0.5	63	50	1.025	0.0019	0.60	F
CC06FA750mA	0.75	63	50	0.510	0.003	0.50	G
CC06FA1A	1	63	50	0.150	0.007	0.211	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^2t 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

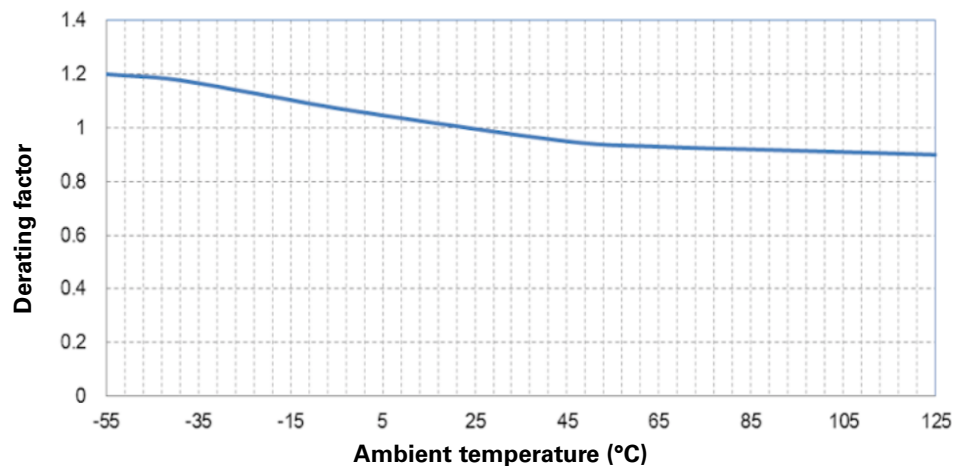


Recommended pad layout



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

Temperature derating curve



Environmental data

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

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

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

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

Terminal strength test: Force of 1.8 kg for 60 seconds

Board 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%)

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

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

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

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

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

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

Solderability: ANSI/J-STD-002,

Dip and look test: Test B

Wetting balance test: Test F

Resistance to dissolution of metalization test: Test D

Ordering codes

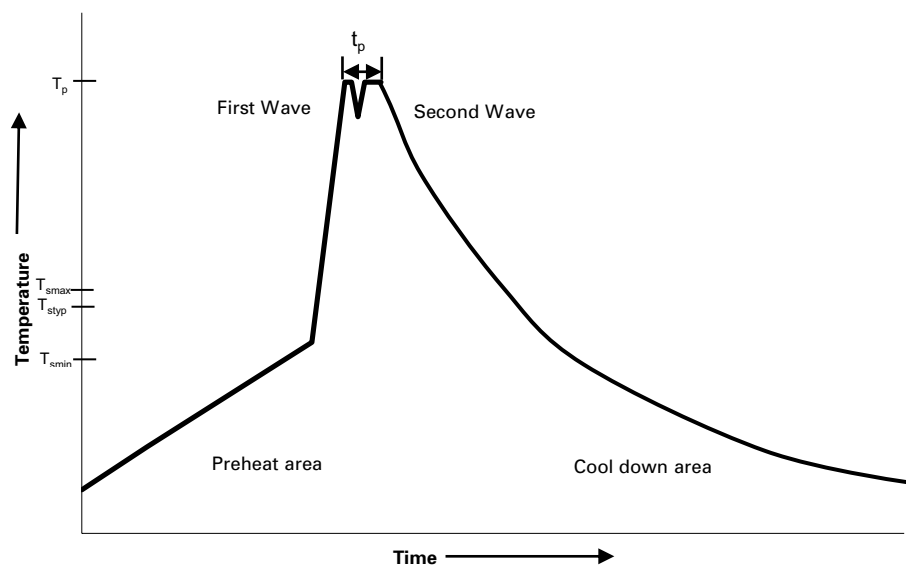
The ordering code is the part number replacing the "." with a "-" plus adding the packaging suffix.

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
Δ 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

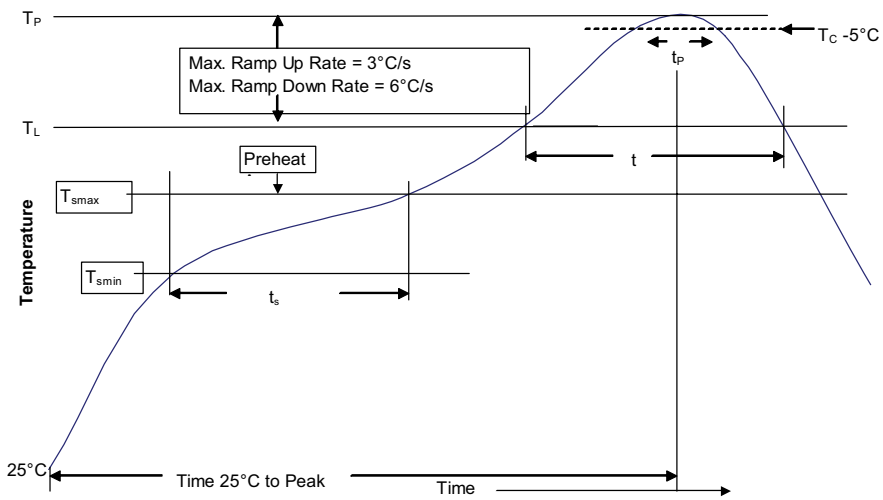


Table 1 - Standard SnPb solder (T_C)

Package thickness	Volume mm ³ <350	Volume mm ³ ≥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 ³ <350	Volume mm ³ 350 - 2000	Volume mm ³ >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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