



THE DATASHEET OF CC12M15A



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|----------------------|---|-----------------------------|----------|
| Document No.: | EPS-CC12M | | |
| Title: | CC12M Engineering Product Specification | | |
| Created By: | M. Joiner | Engineering Approval | V. Kalra |
| Date: | Sept 1, 2006 | Sheet 1 of 9 | |



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| Rev. | Revision Description | Date | ECN | Author | Appr. |
|------|---|---------|---------|-----------|----------|
| D | Added CC12M10A , CC12M12A | 8/17/07 | H07083 | Jian.Gong | SD |
| C | Added the tolerance of dimension, item5.2 | 6/7/07 | H07028 | Jian.Gong | SD |
| B | Added ' Lead-Free' description, item 2.0 ; Changed the resistance and I ² t, item 6.1 ; Updated Agency Approvals, item 7.0 | 4/6/07 | H07024 | Jian.Gong | SD |
| A | Added CC12M15A, changed voltage to 24V | 9/01/06 | SB06315 | M. Joiner | V. Kalra |
| -- | Initial Release | 12/9/05 | n/a | | |

Form 202B-TGW01-IPS, Rev. 3/04

Engineering Product Specification

CC12M Series VRM Overcurrent Protection

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1.0 Scope

This Engineering Product Specification (EPS) is intended to provide end customers with information regarding Bussmann's CC12M VRM Overcurrent Protection Product Series overcurrent protection devices.

2.0 General Information

The Bussmann CC12M VRM Overcurrent Protection Device is a RoHS compliant & Lead-Free, one-time fuse based on Bussmann's SolidMatrix technology. It is designed to provide superior protection from short circuit overcurrent events common to high-current Voltage Regulator Module (VRM) equipment. This device is designed to be compatible with wave and IR soldering processes and allow end users to protect their VRM circuits.

3.0 Manufacturer and Production Facility

Manufacturer

Cooper Bussmann, Inc.
P.O. Box 14460
St. Louis, MO 63178-4460

Production Facilities

- A) Cooper Electronic Shanghai, Ltd
955 Sheng Li Road
Pudong, Shanghai, China

- B) Silver Victory (Donguan) Plant
Xin Min Industrial Estate
Changang Donguan
Guangdong Province, China

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4.0 Part Numbering System

4.1.1 Catalog Symbol

Example: CC12M20A

| | | | |
|-----------|-----------|----------|------------|
| <u>CC</u> | <u>12</u> | <u>M</u> | <u>20A</u> |
| 1 | 2 | 3 | 4 |

- 1) Technology CC (Ceramic CHIP™Fuse)
- 2) Footprint 12 (1206)
- 3) Family: M (VRM Protection Device)
- 4) Amp Rating: 20A

4.1.2 Available Amperage Ratings

| Catalog Symbol | Amperage Rating |
|----------------|-----------------|
| CC12M10A | 10A |
| CC12M12A | 12A |
| CC12M15A | 15A |
| CC12M20A | 20A |

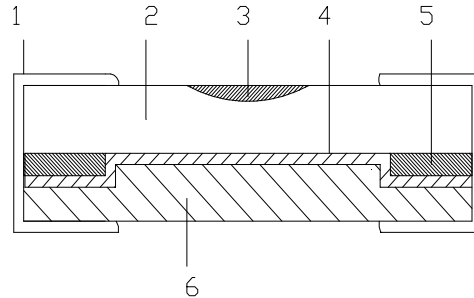
Note: Amperage rating established in test conditions using 10 AWG wire. Thermal management in end-use application must be taken into consideration.

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5.0 Mechanical Requirements

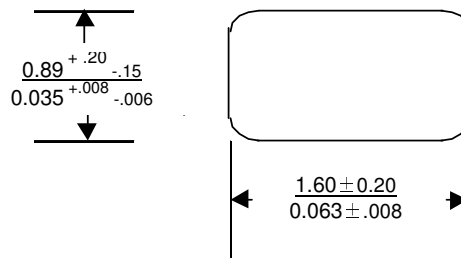
5.1 Construction (not to scale)



1. End Termination
 - a. Nickel Undercoat
 - b. Tin Overcoat
2. Ceramic Substrate (white)
3. Numeric Ampere Rating
4. Metal Film Fusible Element
5. Silver Termination Pad
6. Fused Glass Cover (green)

5.2 Nominal Dimensions

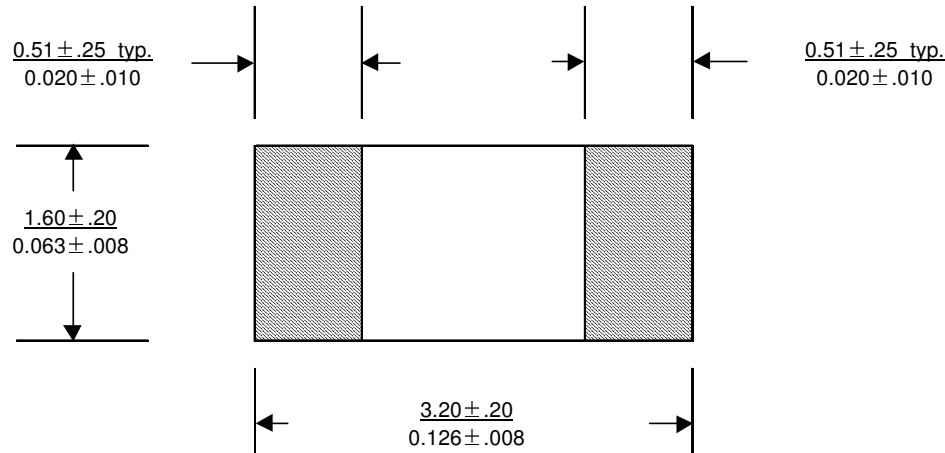
5.2.1 End View (mm/inches)



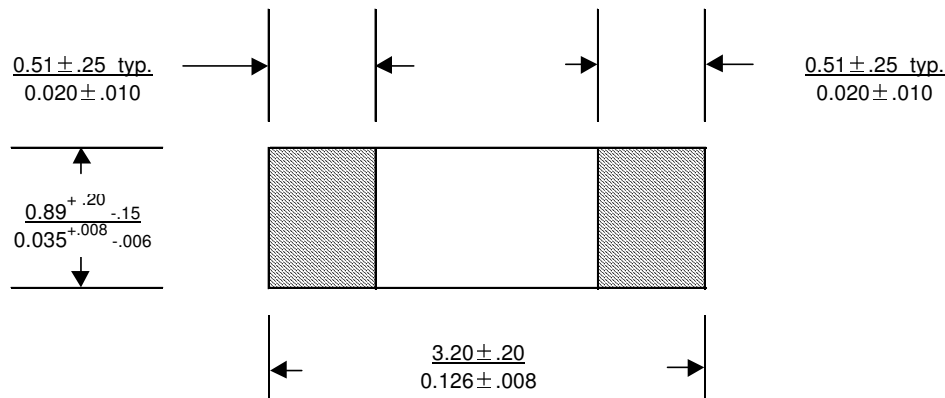
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5.2.2 Top View (mm/inches)



5.2.3 Side View (mm/inches)



6.0 Electrical Specifications

6.1 Table of Electrical Specifications

| Catalog Number | Ampere Rating | Voltage Rating | Interrupting Rating* | Typical Resistance** (ohms) | Typical I ² T |
|----------------|---------------|----------------|----------------------|-----------------------------|--------------------------|
| CC12M10A | 10A | 24Vdc | 150A | 0.0045 | 2.0 |
| CC12M12A | 12A | 24vdc | 150A | 0.0039 | 7.0 |
| CC12M15A | 15A | 24Vdc | 150A | 0.0031 | 25.5 |
| CC12M20A | 20A | 24Vdc | 150A | 0.0018 | 48.6 |

*Measured at designated voltage, rise time of less than 50 microseconds, battery source

**Measured at $\leq 10\%$ of rated current

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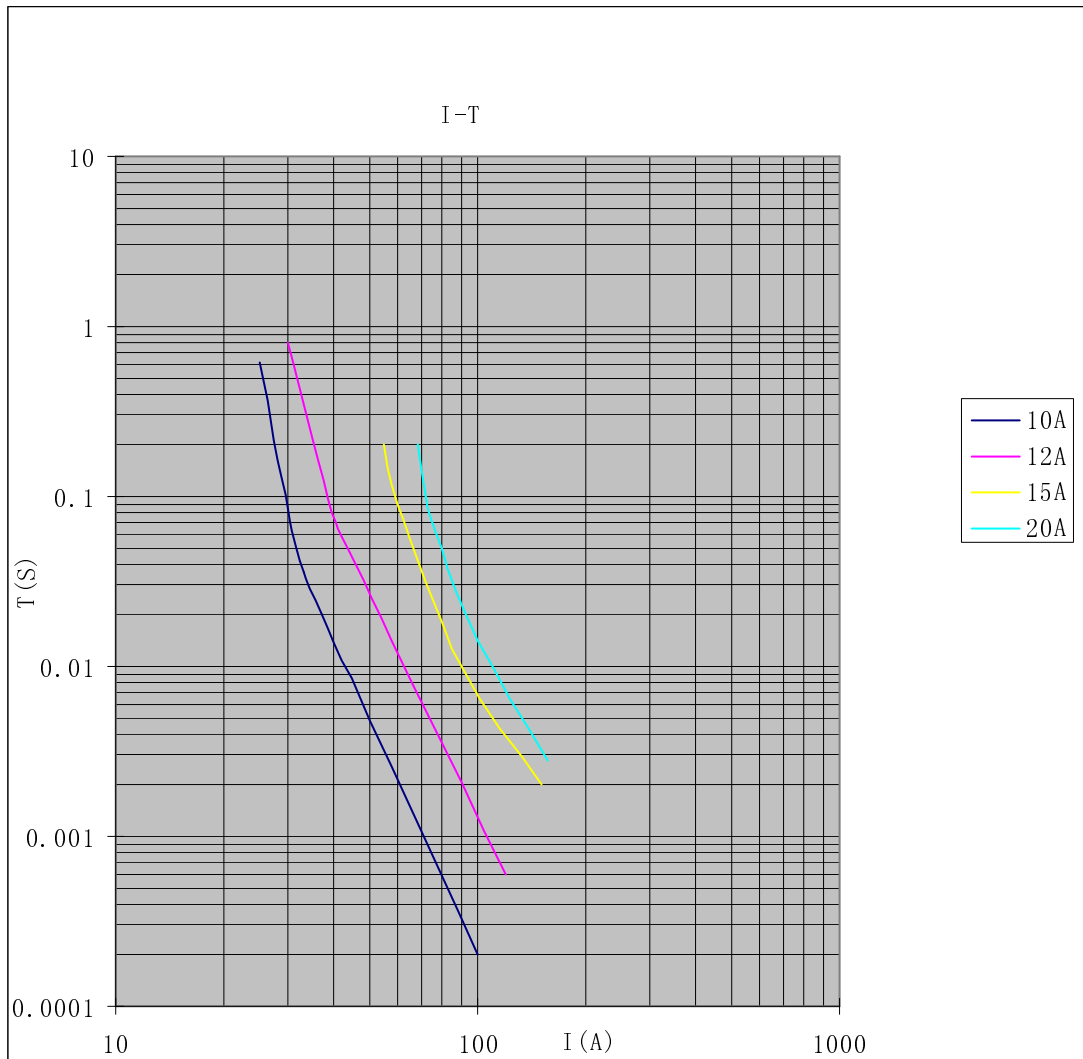
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6.2 Operating Time Requirements

| % of Rated Current | Operating Time Requirement |
|--------------------|----------------------------|
| 100% | 4 hours minimum |
| 350% | 5 second maximum |

Due to the high current rating of the fuse, solder pads and trace and/or wire sizes and placement can significantly affect operating times. Application testing is required.

6.3 Time Current Curve



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7.0 Agency Approvals



UL Recognition for US and Canada – File E19180

8.0 Marking Specification

8.1 Ampere rating to be marked on ceramic (white) side of fuse. Glass (green) side to be unmarked.

8.1.1 Table of device markings

| Catalog Symbol | Marking |
|-----------------------|----------------|
| CC12M10A | 10 |
| CC12M12A | 12 |
| CC12M15A | 15 |
| CC12M20A | 20 |

9.0 Soldering Recommendation(s)

9.1 Wave Solder

9.1.1 Reservoir Temperature: 260°C (500°F)

9.1.2 Time in Reservoir: 10 second maximum

9.2 Infrared Reflow

9.2.1 Reservoir Temperature: 260°C (500°F)

9.2.2 Time in Reservoir: 30 second maximum

10.0 Packaging Specification(s)

10.1 3,000 fuses on 8mm tape and reeled on a 7 inch (178mm) reel per EIA Standard RS481.

10.2 The fuses are oriented in embossed pockets with the ceramic (white) side facing up to facilitate proper mounting. It is recommended that fuses are mounted with the ceramic (white) side facing up.

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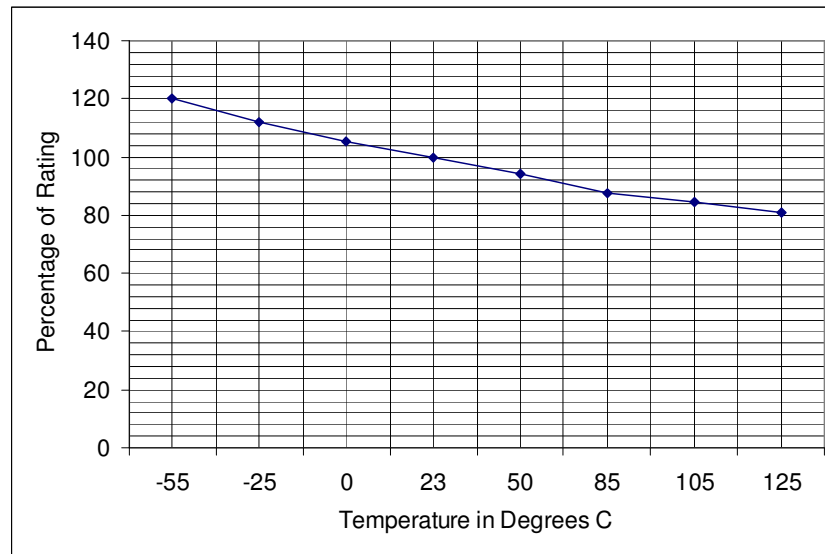
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11.0 Temperature De-Rating Curve

11.1 Normal Ambient Temperature: $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$ ($74^{\circ}\text{F} \pm 3.6^{\circ}\text{F}$)

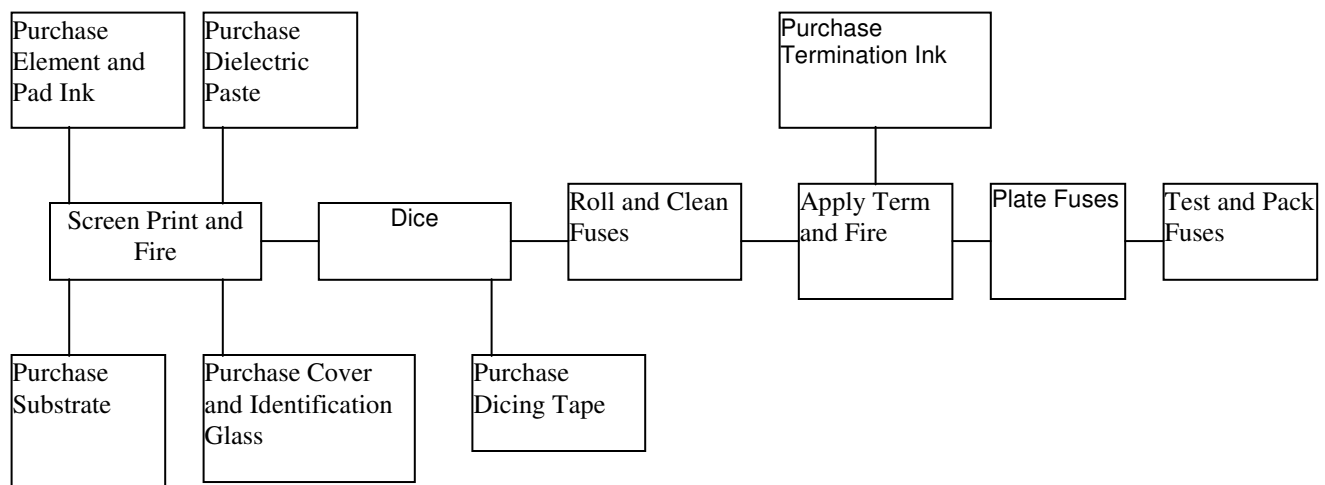
11.2 Operating Temperature: -55°C to 125°C , with proper correction factor applied

11.2.1 Chart of Correction Factor



11.3 Storage Temperature: -55°C to 125°C

12 Process Flow Chart



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13 Environmental (Reliability) Data (based on CHIP Fuse Qualification Program)

13.1 Thermal Shock - MIL-STD-202, Method 107, Test Condition B (-65°C to 125°C)

13.2 Vibration - MIL-STD-202, Method 204, Test Condition C (55 to 2000 Hz, 10G)

13.3 Moisture Resistance - MIL-STD-202, Method 106, 10 day cycle

13.4 Solderability - ANSI/J-STD-002, Test B

14 End

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