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

COOPER Bussmann

114 Old State Rd. Ellisville, MO 63021

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^2t, 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

Table of Contents

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

4.0 Part Numbering System

4.1.1 Catalog Symbol

Example: CC12M20A

CC	12	M	20A
1	2	3	4

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

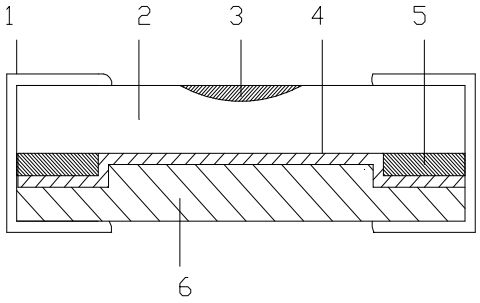
4.1.2 Available Amperage Ratings

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.

5.0 Mechanical Requirements

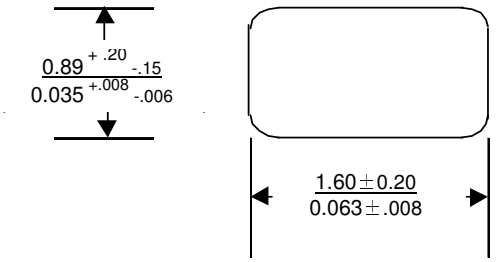
5.1 Construction (not to scale)



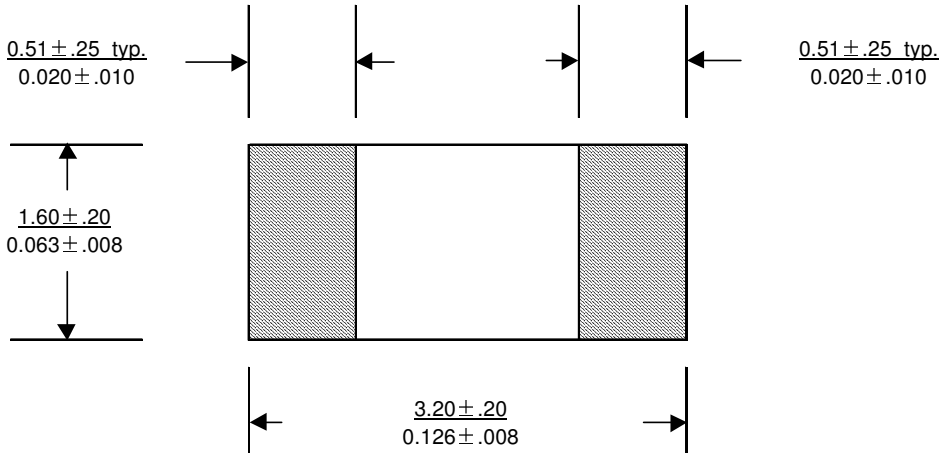
1. End Termination
    a. Nickel Undercoat
    b. Tin Overcoat
2. Ceramic Substrate (white)
3. Numeric Ampere Rating
4. Metal Film Fusible Element
5. Silver Termination Pad
6. Fused Glass Cover (green)

5.2 Nominal Dimensions

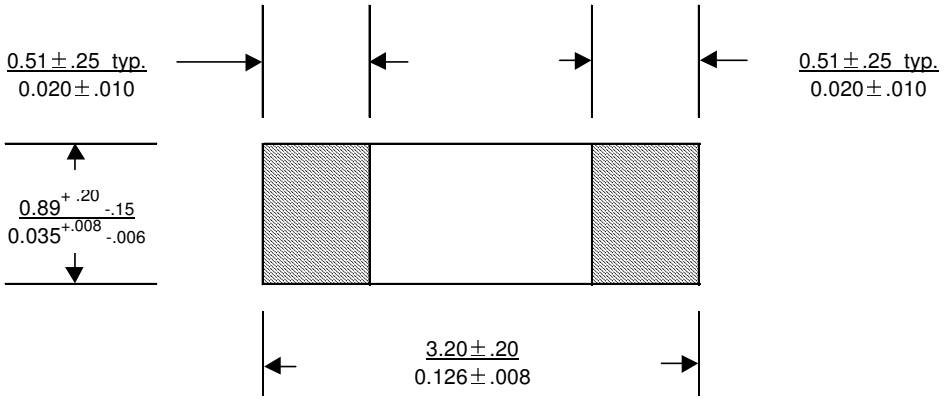
5.2.1 End View (mm/inches)



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^2T
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

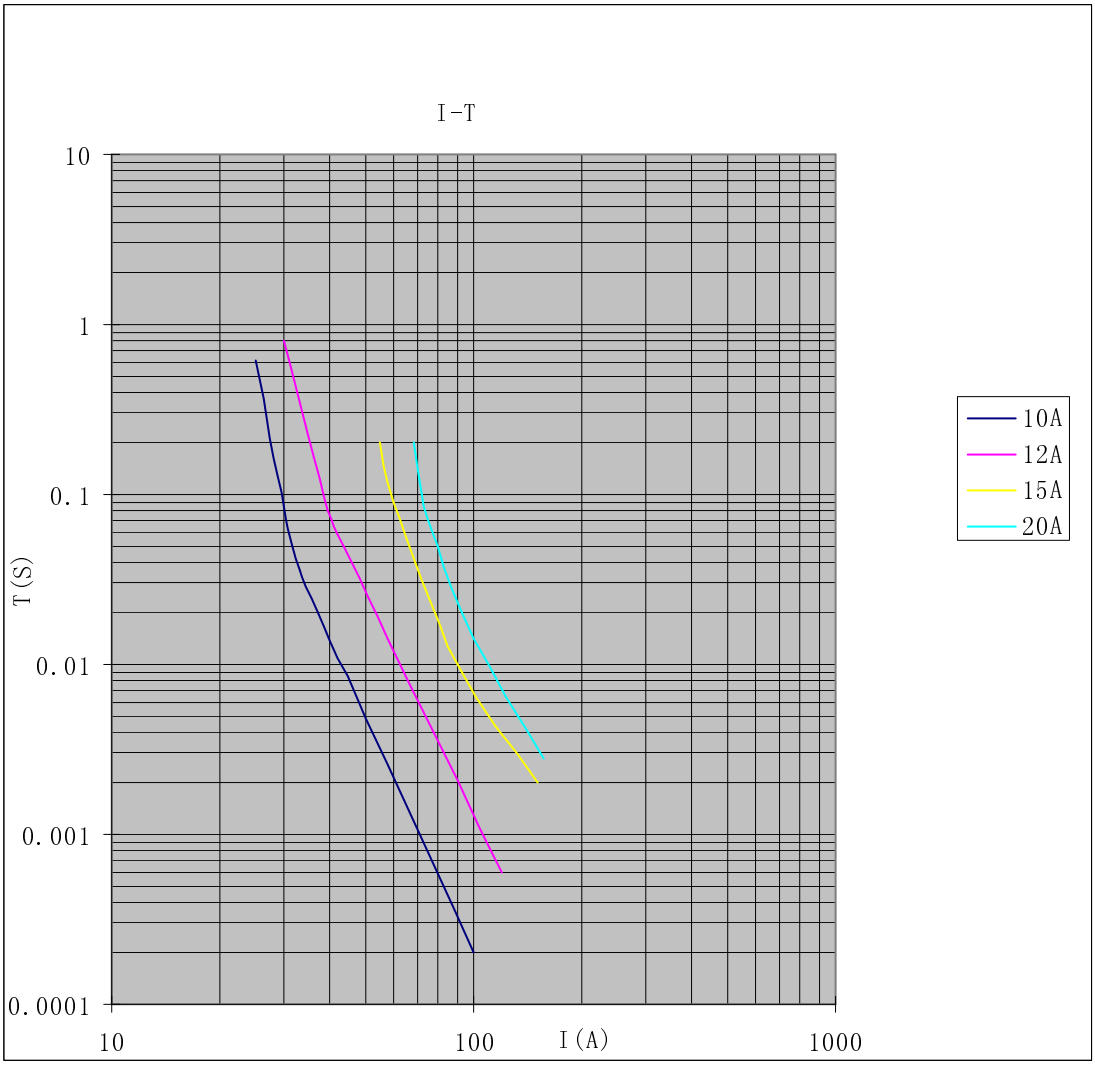
*Measured at designated voltage, rise time of less than 50 microseconds, battery source
**Measured at $\leq$ 10% of rated current

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



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.

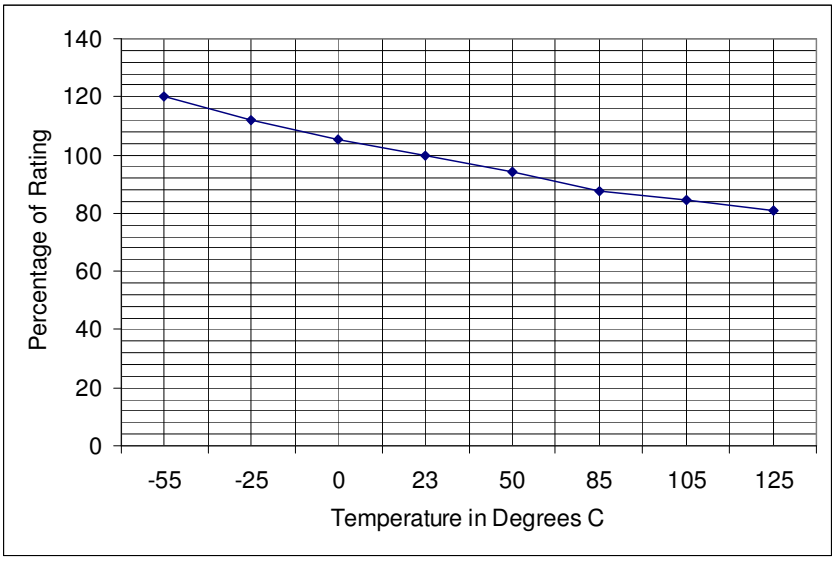
10.2 The fuses are oriented in embossed pockets with the ceramic (white) side facing up to facilitate proper mounting. It is recommended that fuses are mounted with the ceramic (white) side facing up.

11.0 Temperature De-Rating Curve

11.1 Normal Ambient Temperature: 23°C ± 3°C (74°F±3.6°F)

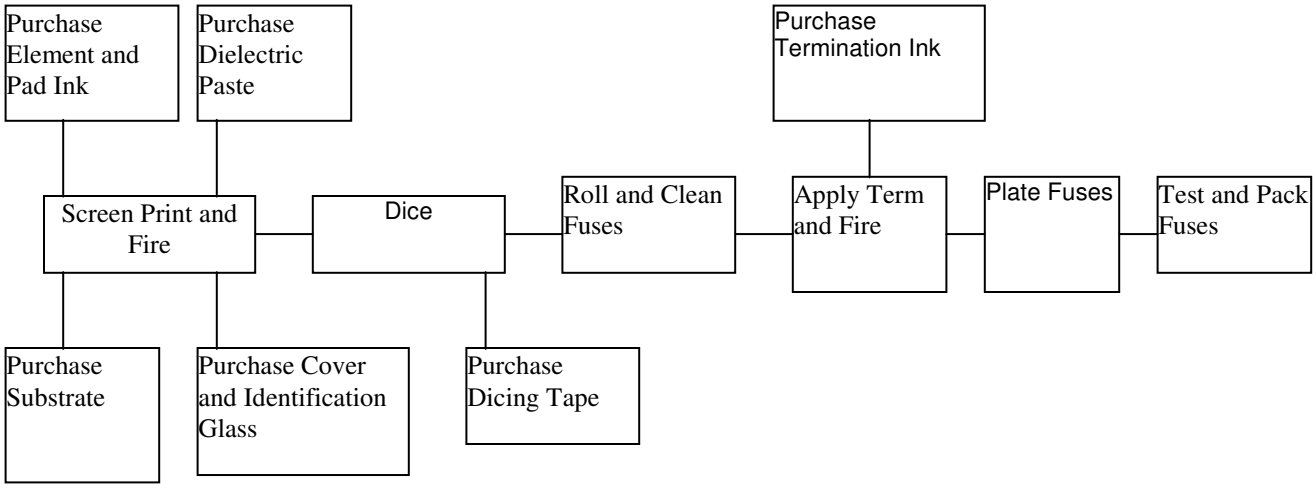
11.2 Operating Temperature: -55°C to 125°C, with proper correction factor applied

11.2.1 Chart of Correction Factor



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

12 Process Flow Chart



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