



High Current Metal Foil Chip Fuse

AEC-Q200/ C  US

Document No TCFM-120S001D

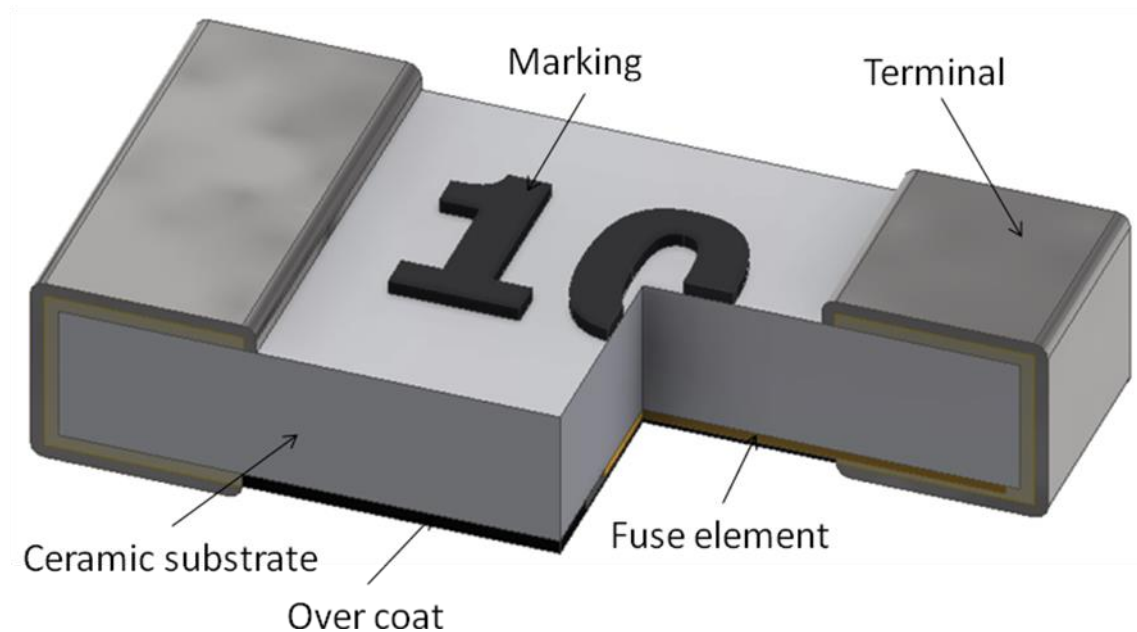
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1.Scope

This specification applies for the high current chip fuse series of surface mount fuse made by TA-I.

2.Construction



3.Type Designation

CFM	12	V3	T	10R0
Metal foil Chip Fuse	Size	Rated Voltage	Packaging	Rated Current
Chip Fuse	12:1206(3216)	V2:24V V3:32V	T: Paper Tape (5K)	10A 12A 15A 20A

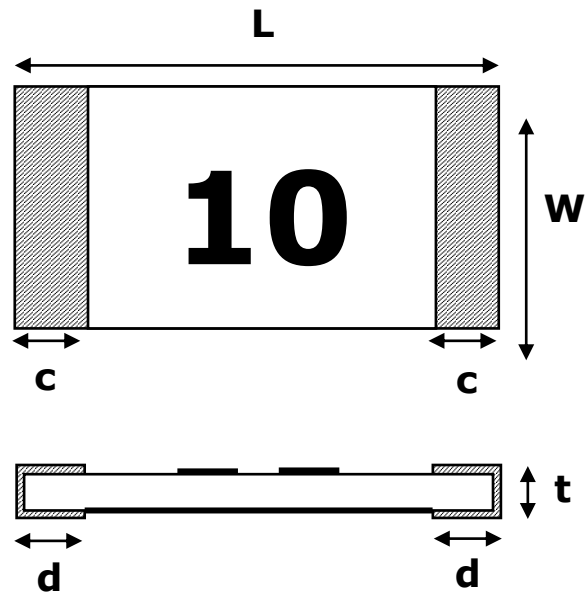


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4. Dimensions



Series	L	W	C	d	t
CFM12 (10-20A)	3.20±0.20	1.65±0.20	0.65±0.20	0.65±0.20	0.70±0.20

5. Applications and ratings

Part Designation	Marking	Rated Current	Resistance(mΩ) Tolerance±25%	Typical I ² t (A ² s)	Fusing Time	Rated Voltage	Breaking Capacity
CFM12V3T10R0	10	10A	4.00	21.3	250% rated current < 5 sec 350% rated current < 1 sec	DC 32V	32V/100A
CFM12V3T12R0	12	12A	3.20	29.7			
CFM12V3T15R0	15	15A	2.60	49.1			
CFM12V3T20R0	20	20A	2.15	70.9			

Note:

1. Typical I²t value is measured at 10x-rated current, Application with surge over 10x-rated current.



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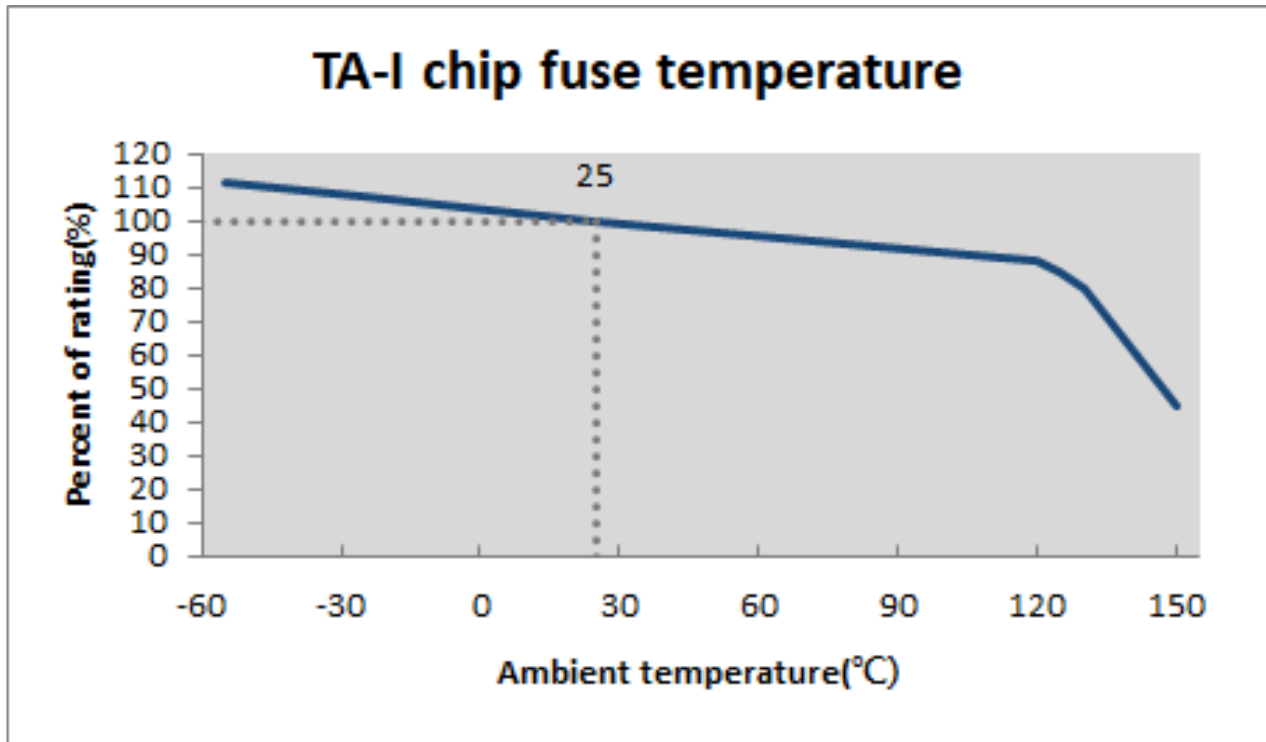
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6. Temperature Derating Curve

6.1 Normal Ambient Temperature: 25°C

6.2 Operating Temperature: -55°C~150°C, whit proper Derating factor as below:





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7. Reliability Tests

No.	Parameter	Reference Standard	Test Method	Requirement
#1	Solderability	J-STD-002	Aging 4 hours at 155 °C dry heat Lead-free solder bath at (1) Method B1: 245 ±5°C solder, 5±0.5 sec dwell. (2) Method D: 260 ±5°C solder, 30 ±0.5 sec dwell.	95% coverage minimum
#2	Resistance to solder Heat	MIL-STD-202 Method 210	Condition K: 250±5°C solder, 30±5 sec dwell. Time above 217 °C, 60~150 sec.	±10%
#3	Mechanical Shock	MIL-STD-202, Method 213,	Wave Form: Tolerance for half sine shock pulse. Peak value is 100g's. Normal duration(D) is 6(ms)	±10%
#4	Vibration	MIL-STD-202, Method 204	5 g's for 20 min., 12 cycles each of 3 orientations. (Note: Test from 10-2000 Hz.)	±10%
#5	Terminal Strength	AEC-Q200-006	Force of 1.8kg for 1206/0603 Force of 1.0kg for 0402	±10%
#6	High Temperature Storage	MIL-STD-202, Method 108	With exemptions 1000 hrs. @ T=150°C. Unpowered.	±20%
#7	Temperature Cycling	JESD22-A-104	1000 Cycles (-40°C to +125°C), 30min maximum dwell time at each temperature extreme. Measurement at 24±4 hours after test conclusion.	±10%
#8	Humidity Bias	MIL-STD-202, Method 103	1000 hours 85°C/85%RH. Note: Specified conditions: 10% of operating current. Measurement at 24±2 hours after test conclusion.	±10%
#9	Operational Life	MIL-STD-202 Method 108	1000 hours TA=85°C at 70% rated current. Measurement at 24±2 hours after test conclusion	±10%
#10	Resistance to Solvent	MIL-STD-202 Method 215	a:Isopropyl Alcohol : Mineral Spirits= 1 : 3 b:Terpene Defluxer c:Deionized water : Propylene Glycol : Monomethyl Ether : monoethanolamine = 42 : 1 : 1	No evident damages on protective coating
#11	Board Flex (Bending)	AEC-Q200-005	3mm deflection	±10%
#12	Carrying capacity	UL248-14	Rated current ,4hr	±10%
#13	Fusing Time	UL248-14	200% of its rated current	1~120 sec
#14	Interrupting Ability	UL248-14	After the fuse is interrupted, rated voltage applied for 30sec again	No mechanical damages
#15	Temperature Rise	UL248-14	100% of its rated current, Measure of surface temperature	ΔT<75°C
#16	Residual Resistance	UL248-14	Measure DC resistance after fusing	10kΩ and more
#17	Low Temperature Storage	JESD22-A119	1000 hrs. @ T=-55°C. Unpowered. Measurement at 24±2 hours after test conclusion.	±10%
#18	High Temperature Operating Life	MIL-STD-202 Method 108	1,000 hours, 150°C. Biased at the derated nominal 45% of fuse current rating. Measurement at 24±2 hours after test conclusion.	±20%
#19	Flammability	UL-94	V-0 or V-1 are acceptable. Electrical test not required.	V-0 or V-1
#20	External Visual	MIL-STD-883 Method 2009	Inspect device construction, marking and workmanship. Pre and Post Electrical Test not required	
#21	Physical Dimensions	JESD22-B100	Verify physical dimensions to the applicable component specification. Pre and Post Electrical Test not required.	



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8. Marking

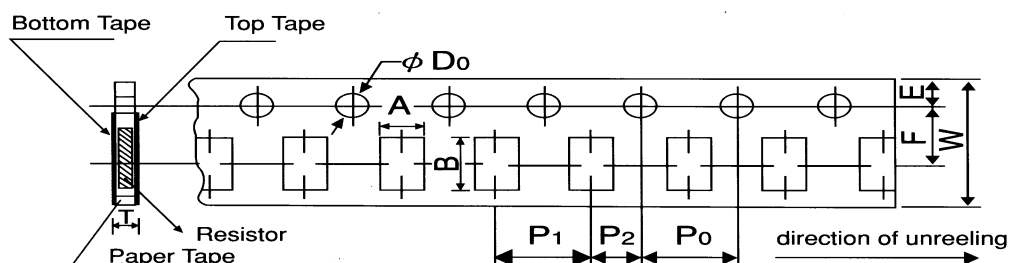
Symbol for Rating Current

Symbol	10	12	15	20
Rating Current(A)	10.0	20.0	15.0	20.0

9. Taping & Reel

9.1 Taping Dimensions

4mm pitch paper

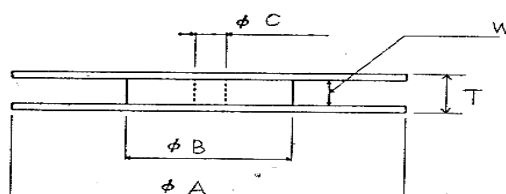
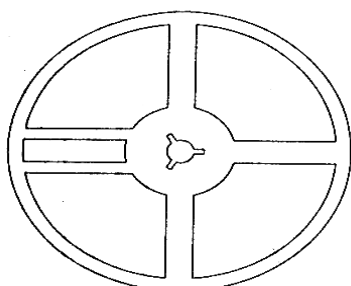


Packing	Type	A	B	W	F	E	P ₁	P ₂	P ₀	D ₀	T
Paper Tape	CFM12	2.0±0.15	3.6±0.2	8.0±0.2	3.5±0.05	1.75±0.1	4.0±0.1	2.0±0.05	4.0±0.1	$\psi 1.5^{+0.1}_{-0}$	0.84±0.1

Unit: mm

Type series		Paper Tape
		4 mm pitch
		180mm/R
CFM	12	5000

9.2 Reel Specifications



Series	ψA	ψB	ψC	W	T
CFM12	178±2.0	60.0±1.0	13.0±1.0	9.0±1.0	11.4±2.0

Unit: mm



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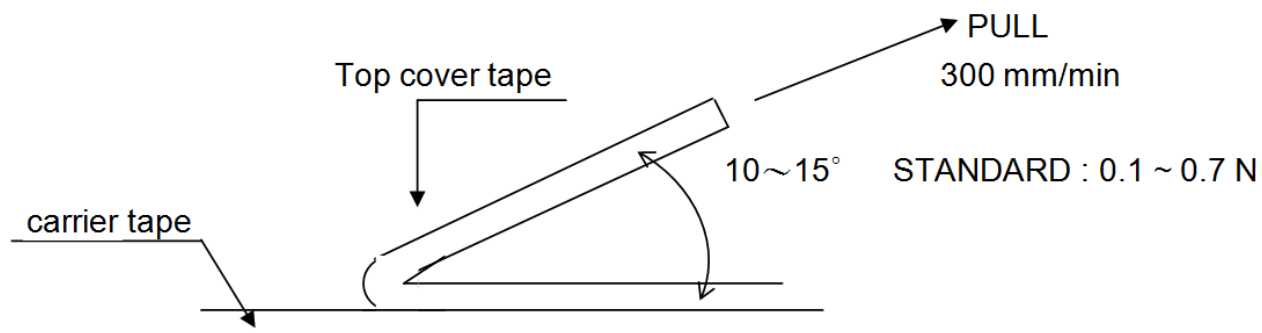
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9.3 Peel –off force:



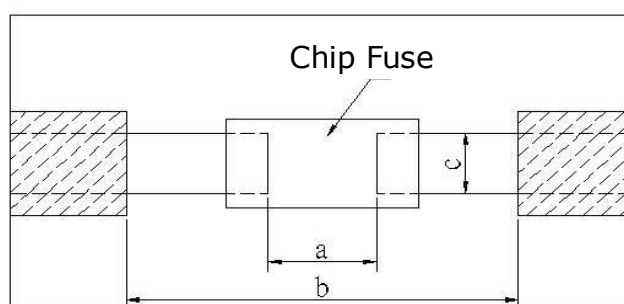
10.Storage Conditions:

Temperature: 5°C~35°C, Humidity: 40%~75%

11.Shelf Life:

2 years from manufacturing date

12.Recommended land patterns



Type	Land pattern Size	Dimension		
		a	b	c
CFM	12 (1206)	2.0~2.4	4.4~5.0	1.5~1.8

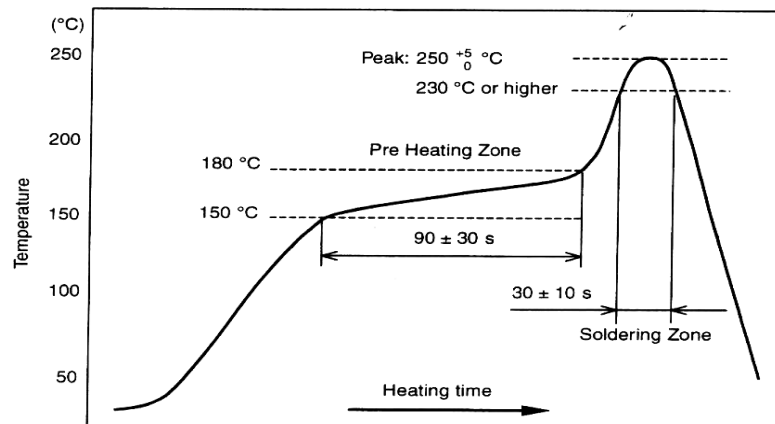


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13.Recommend IR – Reflow profile : (solder : Sn96.5 / Ag3 / Cu0.5)



Peak : 250°C +5°C/-0°C , 5 sec

Pre – heat Zone : 150 to 180 °C, 90±30 sec

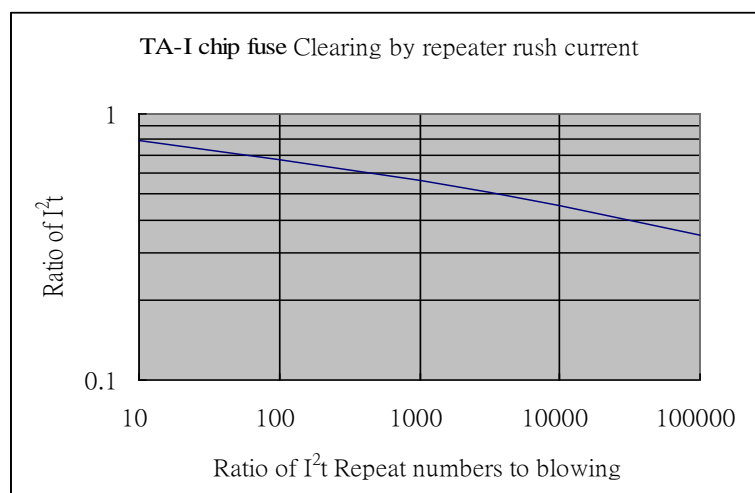
Soldering Zone : 230°C or higher , 30±10 sec

14.Approval by UL248-14

The fuses have been approved by UL.

File No. of UL Recognition is E241710

15.Pulses derating curve:



16.ECN

Engineering Change Notice: The customer will be informed with ECN if there is significant modification on the characteristics and materials described in Approval Sheet.



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17.Manufacturing Country & City :

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(2) TA-I TECHNOLOGY ELECTRONIC (DONGGUAN) CO., LTD. (China –Dongguan)

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(3) FORTUNE TASK ENTERPRISES LIMITED (China – Dongguan)

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(4) TAI OHM ELECTRONICS (M) SDN. BHD. (Malaysia – Penang)

Tel : (+60) 4- 3900480 Fax : (+60) 4-3901481

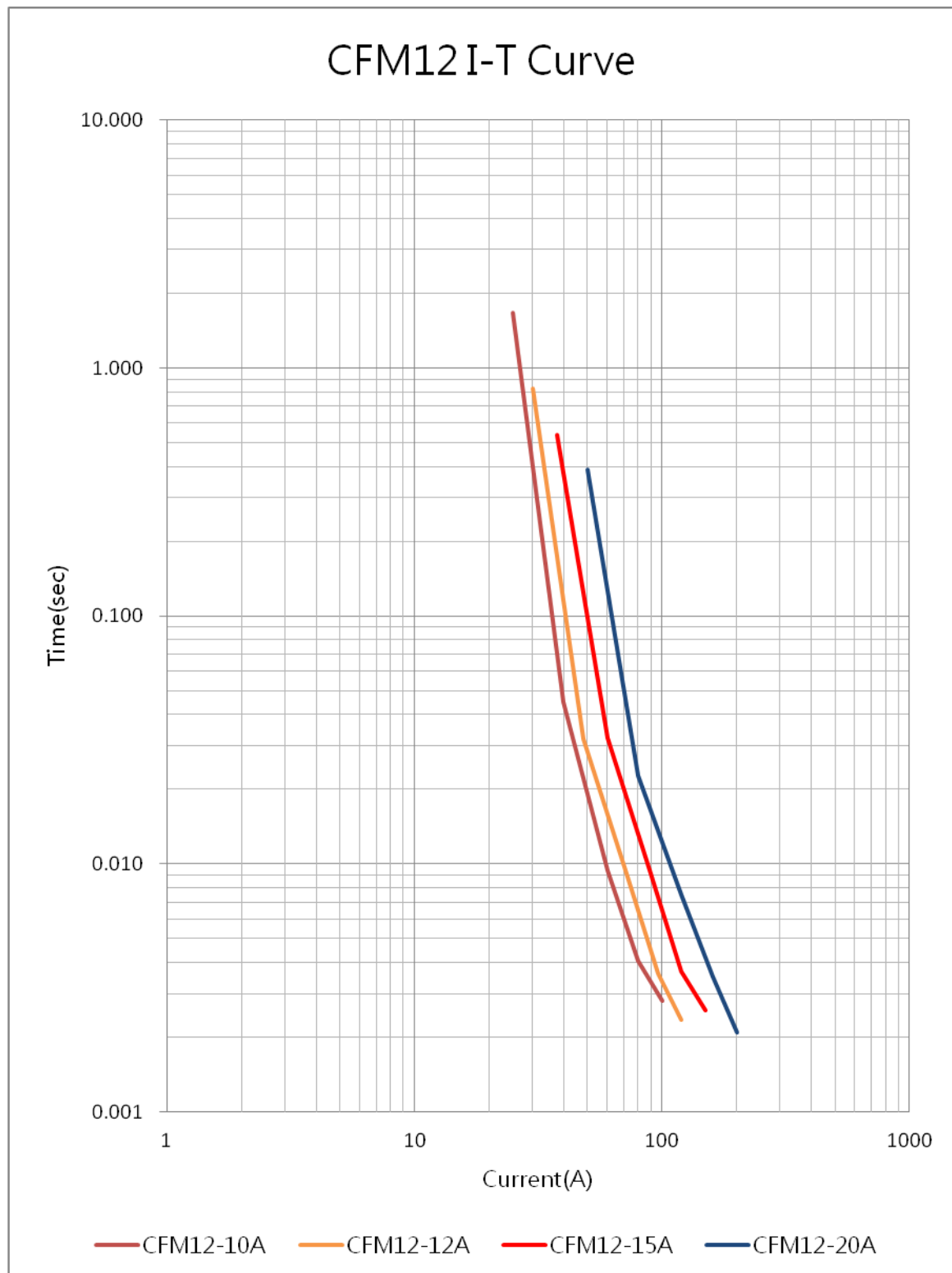


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18.TA-I 1206 Chip Fuse I-t Curve





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19.TA-I 1206 Chip Fuse I²t Curve

