



# Lead Free Metal Foil Chip Fuse

## AEC-Q200 Tested



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IEC 60127-7  
EN 60127-1  
IEC 60127-1  
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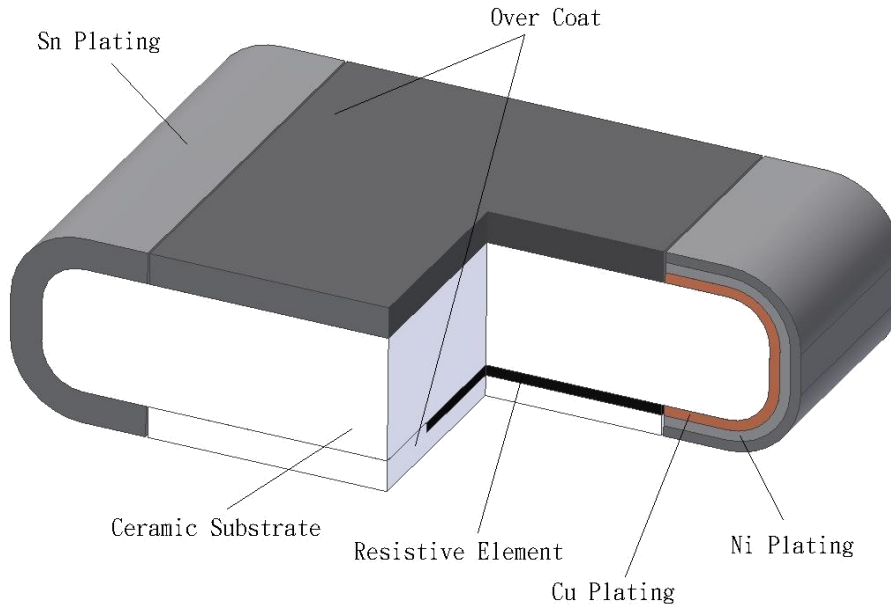


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### 1. Scope

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

### 2. Construction



### 3. Type Designation

<b>CFM</b>	<b>06</b>	<b>V6</b>	<b>T</b>	<b>6R00</b>
Chip Fuse	Size	Rated Voltage	Packaging	Rated Current
	06:0603(1608)	V2:24V(UL / IEC) V3:32V(UL / IEC) V5:50V(UL / IEC) V6:63V(UL)	T: Paper Tape (5K)	1R00:1.0A 1R50:1.5A 2R00:2.0A 3R00:3.0A 4R00:4.0A 5R00:5.0A 6R00:6.0A 7R00:7.0A 8R00:8.0A



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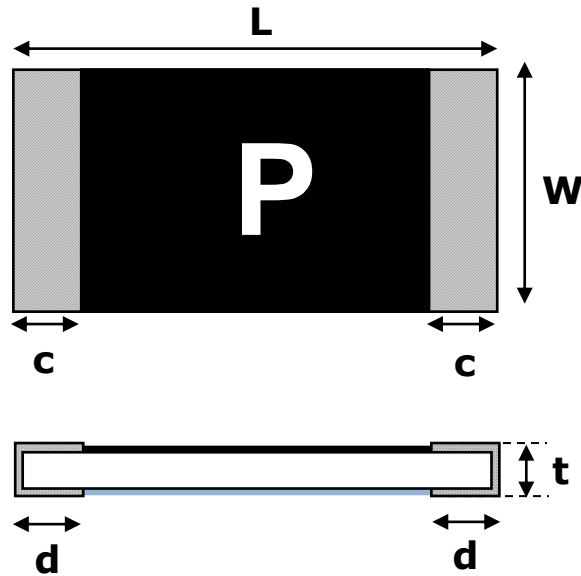


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### 4. Dimensions



Series	L	W	C	d	t
CFM06	1.6±0.1	0.80±0.1	0.3±0.2	0.3±0.1	0.6±0.10

UNIT: mm

### 5. Applications and ratings

Part Designation	Marking	Rated Current	Resistance(mΩ) Tolerance±25%	<sup>(1)</sup> Typical I <sup>2</sup> t (A <sup>2</sup> s)	Fusing Time	<sup>(2)</sup> Rated Voltage	Breaking Capacity	Body Temperature rising
CFM06V6T1R00	L	1.00A	115.00	0.059	Open within 1~120sec. at 200% rated current	DC 63V DC 50V	DC 63V DC 50V 50A	< 75°C at 100% rate current
CFM06V6T1R50	P	1.50A	59.00	0.130				
CFM06V6T2R00	S	2.00A	33.00	0.210				
CFM06V6T3R00	3	3.00A	15.90	0.710				
CFM06V6T4R00	W	4.00A	10.00	0.960				
CFM06V6T5R00	Y	5.00A	6.77	2.050				
CFM06V6T6R00	6	6.00A	6.30	3.470				
CFM06V6T7R00	7	7.00A	4.70	5.040				
CFM06V6T8R00	8	8.00A	4.30	6.500				

#### Note:

1. Typical I<sup>2</sup>t value is measured at 10x-rated current, Application with surge over 10x-rated current. Please confirm with us.
2. Agencies for Maximum Voltage:  
UL: 63VDC / IEC: 50VDC



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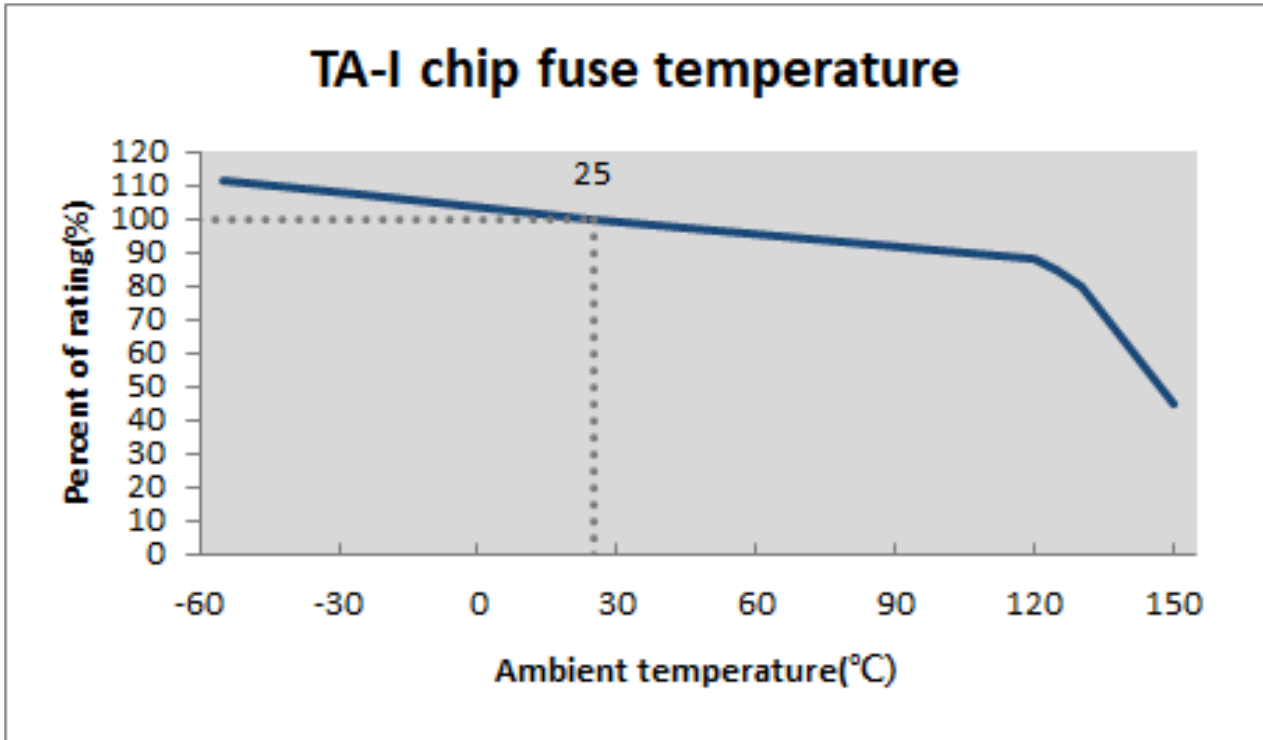


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## 6. Temperature Derating Curve

6.1 Normal Ambient Temperature: 25°C

6.2 Operating Temperature: -55°C~150°C, with 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 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, for 60 seconds	±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.	

Note: MSL= Level 1.



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### 8. Marking

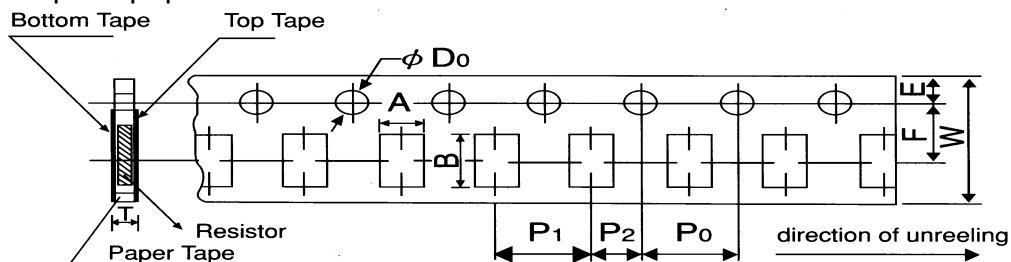
Symbol for Rating Current

Symbol	L	P	S	3	W	Y	6	7	8
Rating Current(A)	1.0	1.5	2.0	3.0	4.0	5.0	6.0	7.0	8.0

### 9. Taping & Reel

#### 9.1 Taping Dimensions

4mm pitch paper

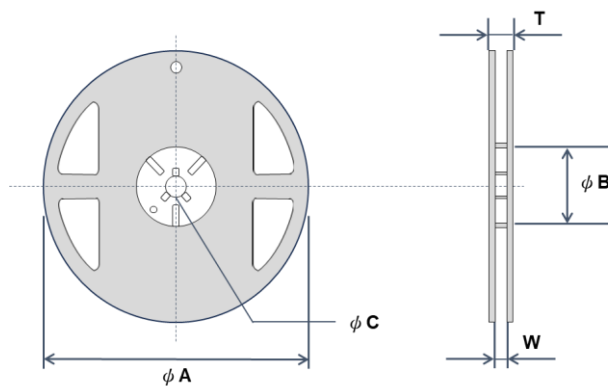


Packing	Type	A	B	W	F	E	P <sub>1</sub>	P <sub>2</sub>	P <sub>0</sub>	D <sub>0</sub>	T
Paper Tape	CFM06	1.1±0.1	1.9±0.1	8.0±0.2	3.5±0.05	1.75±0.1	4.0±0.1	2.0±0.05	4.0±0.1	ψ1.5 +0.1 -0	0.64±0.1

Unit: mm

Type series		Paper Tape
		4 mm pitch
		180mm/R
CFM	06	5000

#### 9.2 Reel Specifications



Unit: mm

Series	ψA	ψB	ψC	W	T
CFM06	178±2.0	60.0±1.0	13.0±1.0	9.0±1.0	11.4±2.0



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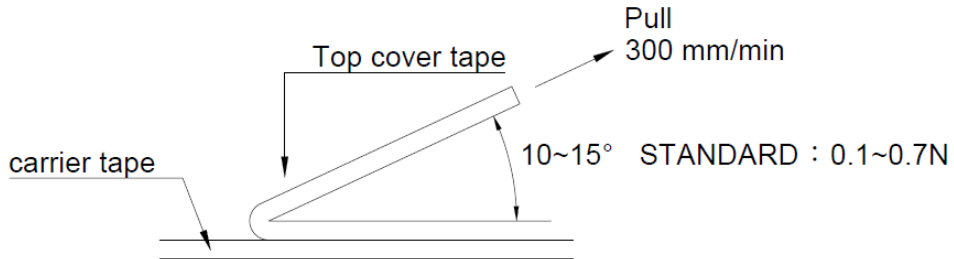


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### 9.3 Peel –off force:



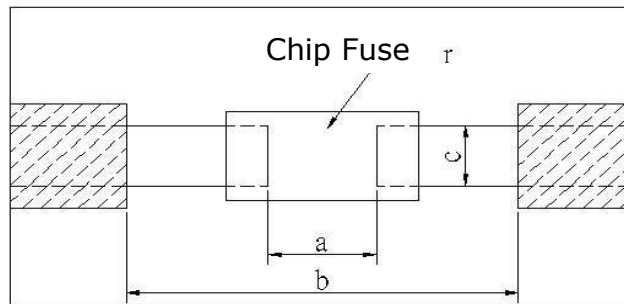
### 10. Storage Conditions:

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

### 11. Shelf Life:

2 years from manufacturing date.

### 12. Recommended land patterns



Type	Size	Land pattern		
		Dimension		
		a	b	c
CFM	06 (0603)	0.7~0.9	2.0~2.2	0.8~1.0



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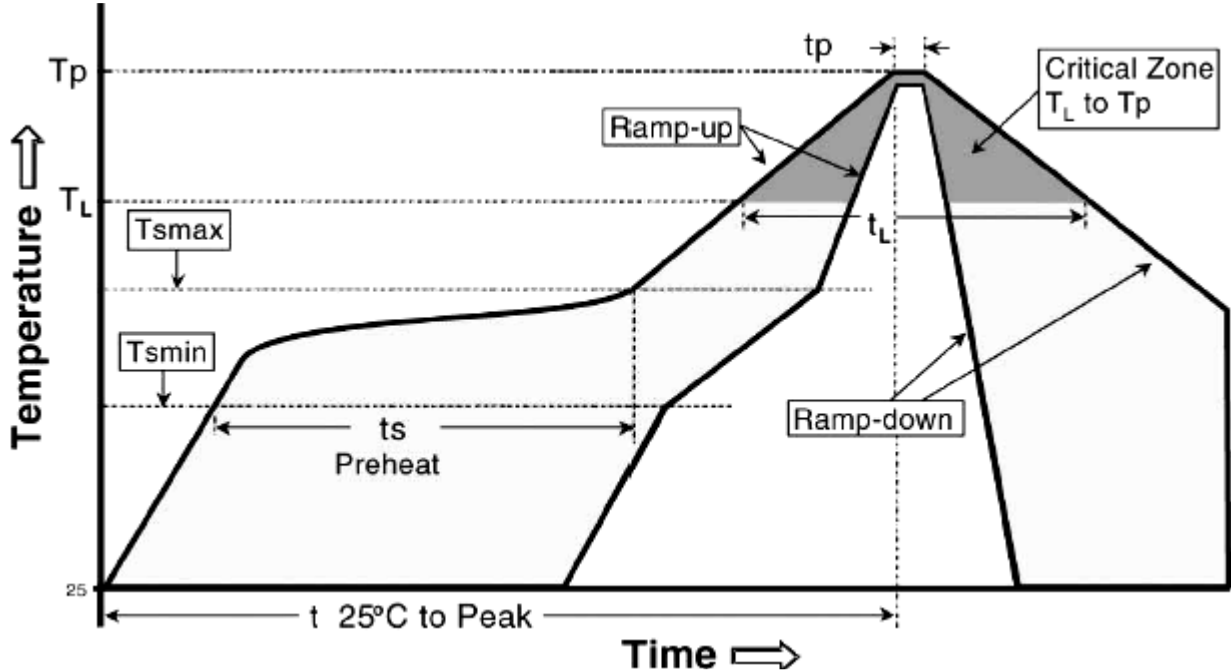


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### 13. Recommend IR – Reflow profile: (solder: Sn96.5 / Ag3 / Cu0.5)



Profile Feature	Lead (Pb)-Free Assembly
Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> )	3°C / second max.
Preheat <ul style="list-style-type: none"> <li>- Temperature Min (T<sub>Amin</sub>)</li> <li>- Temperature Max (T<sub>smax</sub>)</li> <li>- Time (T<sub>Amin</sub> to T<sub>smax</sub>) (t<sub>s</sub>)</li> </ul>	150°C 200°C 60 -120 seconds
Time maintained above: <ul style="list-style-type: none"> <li>- Temperature (T<sub>l</sub>)</li> <li>- Time (T<sub>l</sub>)</li> </ul>	217°C 60-150 seconds
Peak Temperature (T <sub>p</sub> )	MAX:260°C
Time within $\begin{matrix} +0 \\ -5 \end{matrix}$ °C of actual Peak Temperature (t <sub>p</sub> ) <sup>2</sup>	30 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

Allowed Re-flow times: 3 times

Remark: To avoid discoloration phenomena of chip on terminal electrodes, please use N2 Re-flow furnace.



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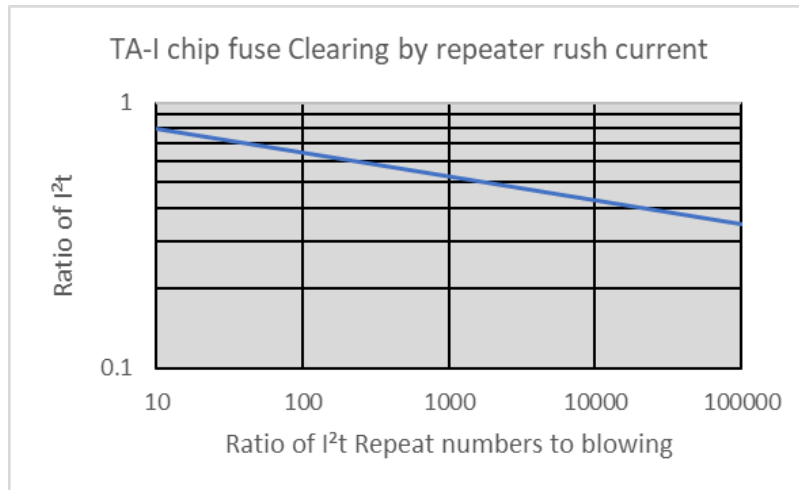


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### 14. Approval by UL248-14

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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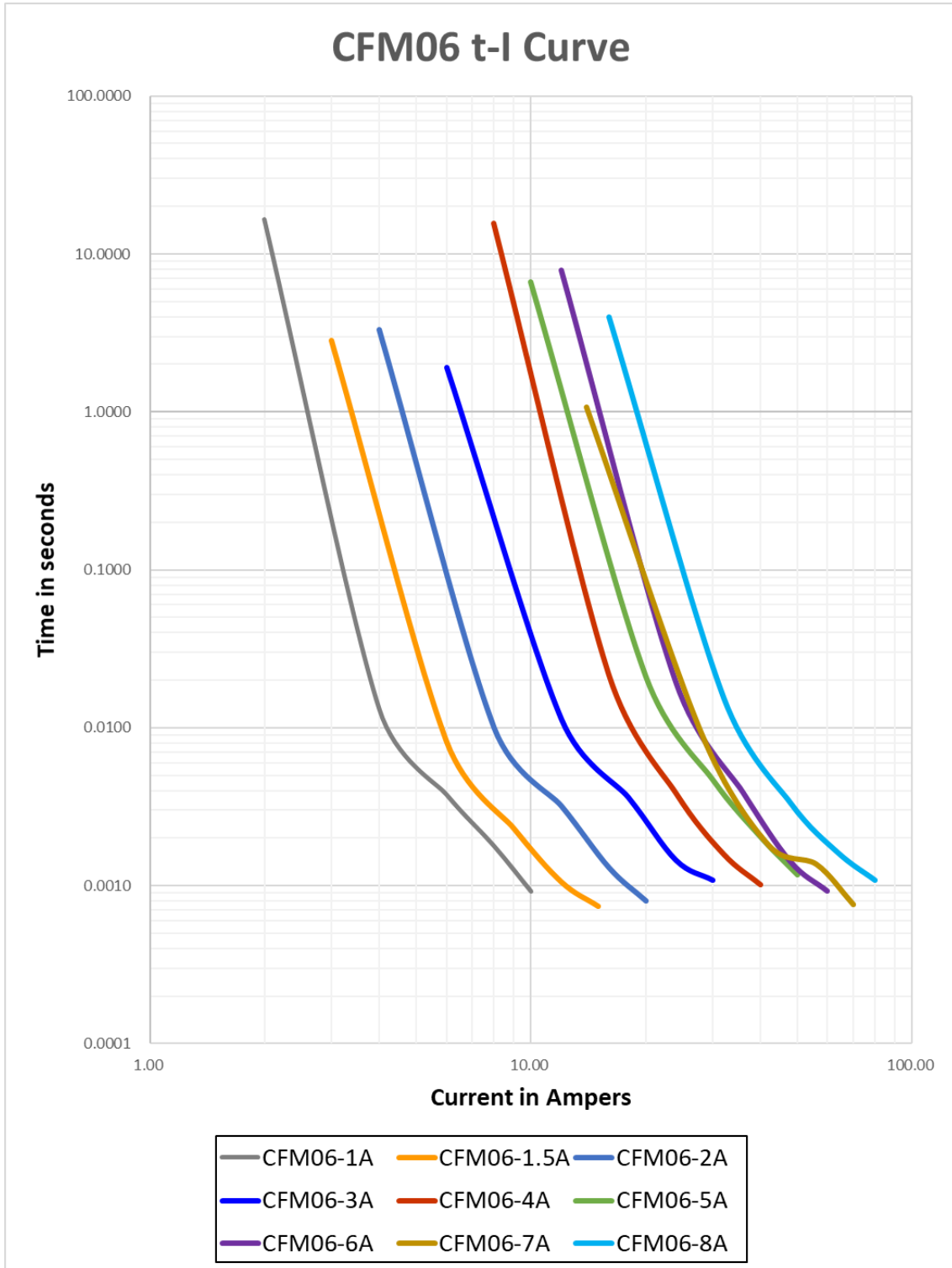


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### 17. TA-I 0603 Metal Foil Chip Fuse I-t Curve:





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## 18. TA-I 0603 Metal Foil Chip Fuse I2-t Curve

