



功得電子工業股份有限公司
CONQUER ELECTRONICS CO.,LTD.

規格書

Spec. No. SFA501

Specification For Approval

Very Fast-Acting Surface Mount Thin Film Chip

Fuse

快速型薄膜晶片保險絲

Part Number : CRU 12CF series

www.conquer.com.tw

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Contents

1.Features	Page3
2.Applications	Page3
3.Applicables Standards	Page3
4.Dimension and Markings	Page3
5.Part Number Description	Page3
6.Ratings	Page4
7.Temperature Derating curve	Page4
8.Clear Time Curve (I vs t curve)	Page5
9.Standing Pulse (I^2t v.s t curve)	Page6
10.Joule-integral values	Page7
11.Recommended Soldering (Reflow)	Page8
12.Product Characteristics & Reliability Tests	Page9
13.Standard substrate for test	Page10
14.Packing	Page10
15.Quantity Per Reel	Page11
16.Storage conditions & Shelf Life	Page11

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1.Features

- Suitable for thin products thickness 0.65 ± 0.2 mm
- Excellent in endurance against soldering-heat.

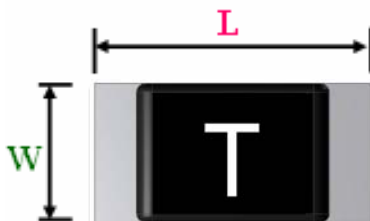
2.Applications

- LCD Display... 【Monitor,Notebook】
- PC Appliance... 【Laptop Computer,Word Processor,CD Drive,MO Drive,Laser Printer and Ink Jet Print】
- Portable Communication Machinery... 【PDA,Mobile Phone and Battery Charge for them】
- AV Appliances... 【DVC,8mm VC,Digital Camera,Mini Disk Player,Personal Audio Equipment】
- Amusement Machine... 【Game equipment,Handy Game equipment】

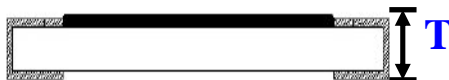
3.Applicable Standards

Recognized to meet UL cRU. File No:E82636

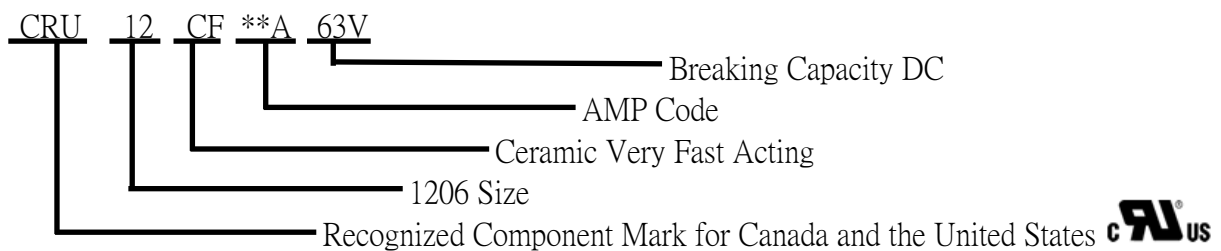
4.Dimension and Marking



Type	1206
L	3.1 ± 0.2 mm
W	1.6 ± 0.1 mm
T	0.65 ± 0.2 mm



5.Part Number Description



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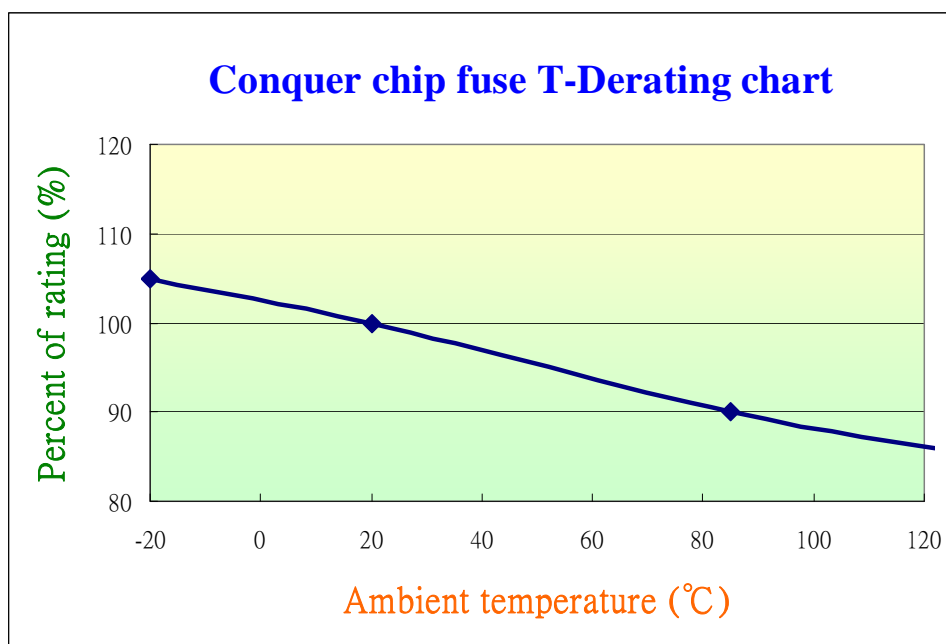
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6. Ratings (Include clear-time, Marking code, internal Resistance, Interrupting Rating and Category Temperature range.)

Type	12CF Series											
Rate Current(A)	0.2A	0.5A	0.75A	1A	1.25A	1.5A	2A	2.5A	3A	4A	5A	7A
Marking Code	C	F	G	H	J	K	N	O	P	S	T	U
Internal R(mΩ)at 25°C max.	2400	500	220	155	90	59	34	28	20	14	10	7
Nominal Melting I ² t(A ² Sec)	0.002	0.022	0.032	0.052	0.072	0.100	0.210	0.320	0.405	0.745	1.350	2.870
Fusing Current/Fusing Time (at 25°C)	Rated Current X 100% / 4 hours min.											
	Rated Current X 200% / 5 Seconds max.											
	Rated Current X 300% / 0.2 Seconds max.											
Rated Voltage (Open Circuit Voltage)	32V AC / 63V DC											
Interrupting Rating (at Rated Voltage)	50A											
Category Temp. Range (Operating Temp. Range)	-55°C to +125°C											

7. Temperature Derating curve



*Ambient temperature on current-carrying capacity.

*For circuit, current rating shall be derated in accordance with the figure.

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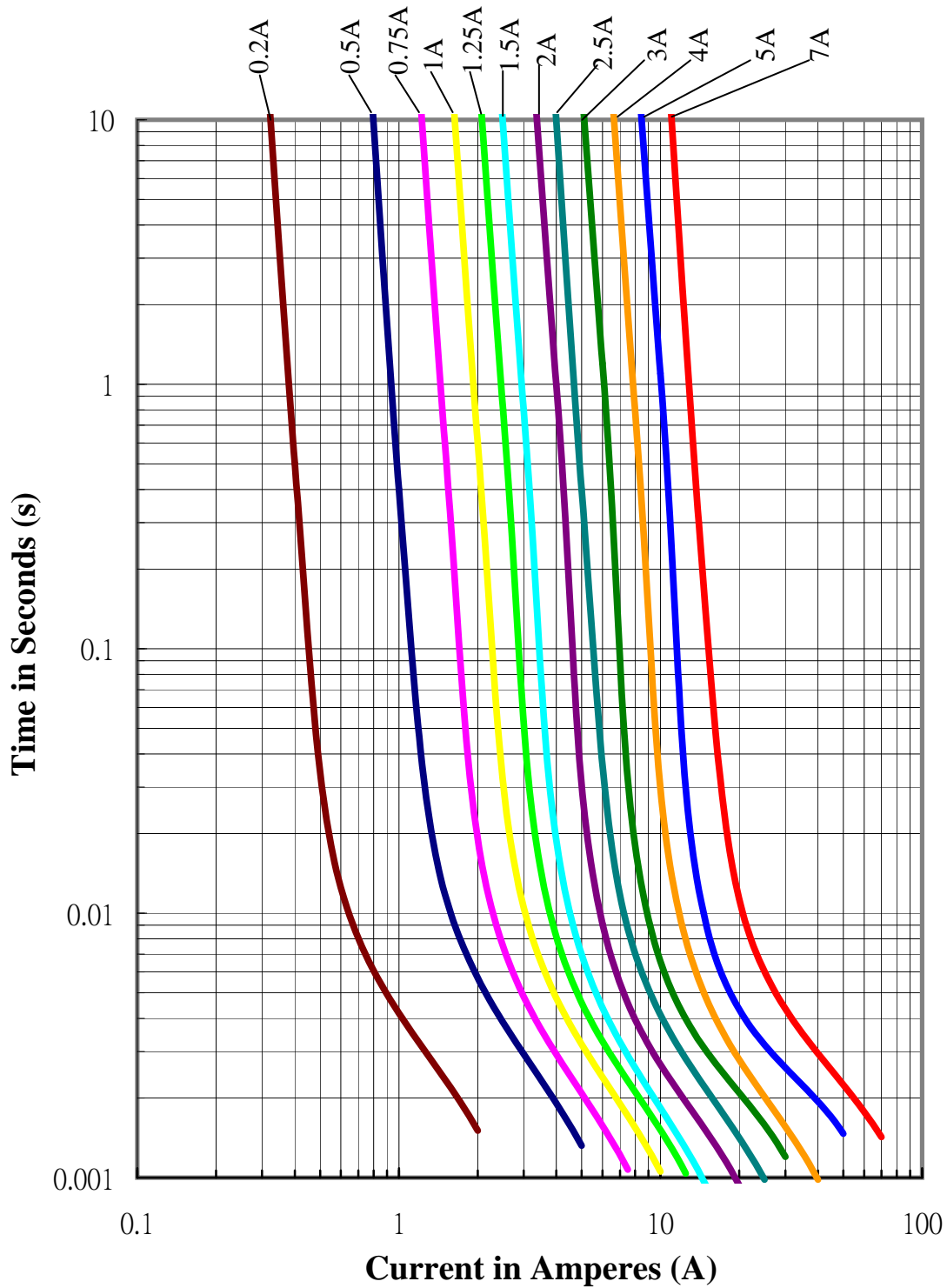
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8. Clear Time Curve(I vs t curve)

12CF Series Clear Time Curve



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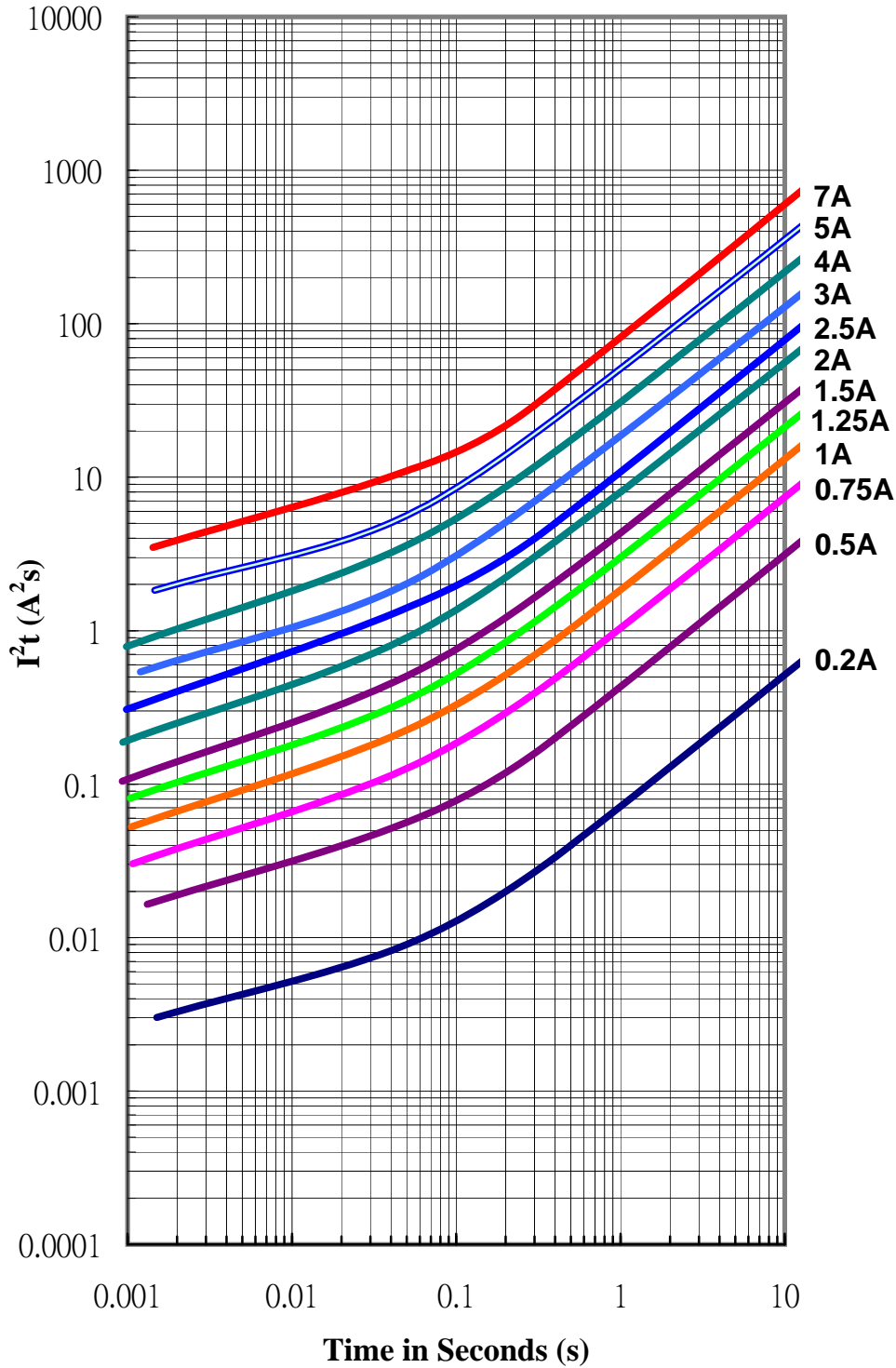
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9.Standing Pulse(I^2t vs t curve)

CRU 12CF Series Average I^2t VS. t Curve



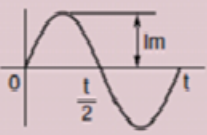
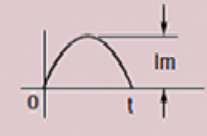
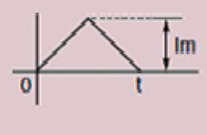
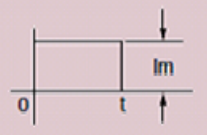

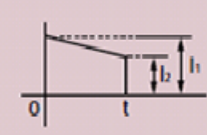

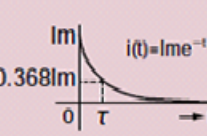
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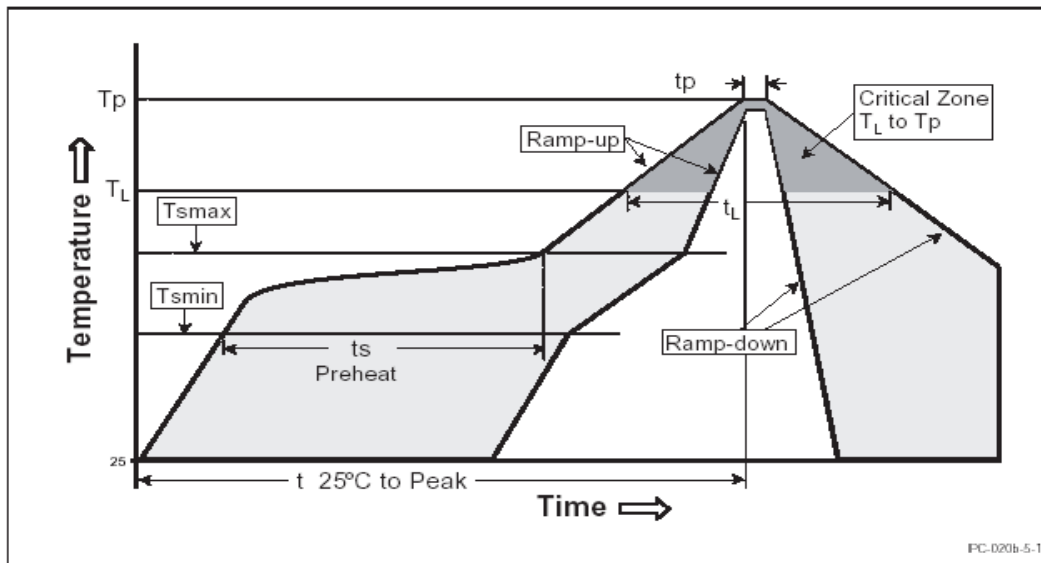
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10. Joule-integral Values

Name	Waveform	Joule-integral Values
正弦波 Sinusoidal waveform (1cycle)		$\frac{1}{2} I_m^2 t$
正弦波 Sinusoidal waveform (1/2 cycle)		$\frac{1}{2} I_m^2 t$
三角波 Triangle waveform		$\frac{1}{3} I_m^2 t$
方形波 Rectangular waveform		$I_m^2 t$
台形波 Trapezoidal waveform		$\frac{1}{3} I_m^2 t_1 + I_m^2 (t_2 - t_1) + \frac{1}{3} I_m^2 (t_3 - t_2)$
變形波 1 Various waveform 1		$h_1 h_2 t + \frac{1}{3} (h_1 - h_2)^2 t$
變形波 2 Various waveform 2		$\frac{1}{3} h_1^2 t_1 + \{h_1 h_2 + \frac{1}{3} (h_1 - h_2)^2\} (t_2 - t_1) + \frac{1}{3} h_2^2 (t_3 - t_2)$
充、放電波形 Charge/Discharge waveform		$\frac{1}{2} I_m^2 \tau$

11.Recommended Soldering(Reflow soldering)



Reflow Condition		Pb-free assembly
Pre Heat	Temperature Min (T_s (min))	150°C
	Temperature Max (T_s (max))	200°C
	Time (Min to Max) (t_s)	60-180 seconds
Average Ramp-up Rate (Liquidus Temp (T_L) to peak)		3°C/second max
T_s (max) to T_L -Ramp-up Rate		5°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Time (t_L)	60-150 seconds
Peak Temperature (T_p)		260 ^{+0/-5} °C
Time within 5°C of actual peak Temperature (t_p)		10-30 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature ($t_{25^\circ\text{C to peak}}$)		8 minutes max
Do not exceed		260°C

Soldering Method

*Reflow Soldering : 260°C, 30Sec. max.

*Wave Soldering : 260°C, 10Sec. max.

*Hand Soldering : 350°C, 3Sec. max.



12. Product Characteristics & Reliability Tests

Solderability	ANSI/J-STD 002C Test G1 Wetting balance globule test lead-free solder, time to buoyancy corrected zero, Criteria ≤ 1 second.
Bending test	IEC 60127-4 90mm Between holding points. Bending 3mm, 3times. Continue holding 30sec/time. No mechanical damages.
Resistance to Solder Heat	MIL-STD-202, Method 210 Max 260 \pm 5 $^{\circ}$ C, 10 \pm 1 Sec, $\Delta R < 15\%$
Moisture Resistance	MIL-STD-202, Method 106 High Humidity (95 \pm 1% RH), Heat (40 \pm 0.5 $^{\circ}$ C) 10days, $\Delta R < 15\%$
ON /OFF Cycle Test	Refer to Conquer File Surge current and 60% rated current; 1min ON, 2min OFF, 1000 Cycles, tolerance $\Delta R < 20\%$
Salt spray	MIL-STD-202 Method 101 $\Delta R < 15\%$, No excessive corrosion, 48 hours exposure.
Thermal Shock	MIL-STD-202, Method 107 -40 $^{\circ}$ C~125 $^{\circ}$ C, 100 cycles, $\Delta R < 15\%$
Vibration	MIL-STD-202, Method 201A 10~55~10 Hz 1Min/cycle, X Y Z 120 cycles, 6 hours $\Delta R < 15\%$

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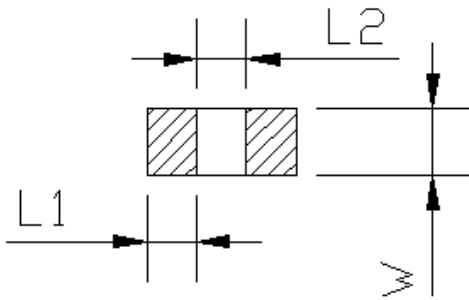
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13. Standard Substrate for Test

Recommended Landing Pattern

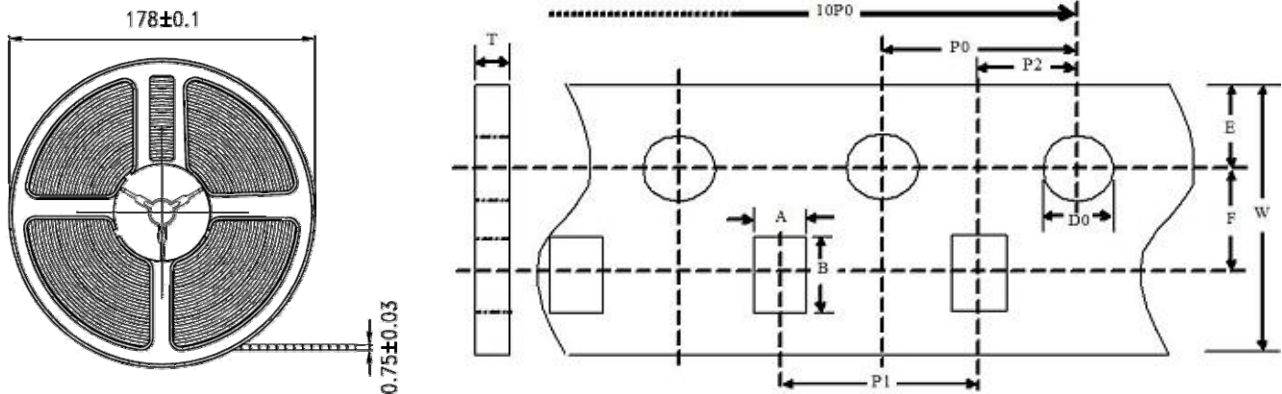


Unit: mm

L1	L2	W
1.1	1.52	1.78

14. Packing

- Surface mount chip fuses are provided on tape-and-reel for use in pick-and-place machines or in bulk for special applications. Both tape-and-reel and bulk products are sealed in plastic bags with desiccant.
- Tape Dimensions: mm



Item	A	B	W	E	F	P_0	P_1	P_2	D_0	T	$10P_0$
Criterion	2.000	3.500	8.000	1.750	3.500	4.000	4.000	2.000	1.550	0.750	40.000
	0.050	0.050	0.100	0.050	0.050	0.100	0.100	0.050	0.050	0.030	0.100
	-0.050	-0.050	-0.100	-0.050	-0.050	-0.100	-0.100	-0.050	-0.050	-0.030	-0.100
Max.	2.050	3.550	8.100	1.800	3.550	4.100	4.100	2.050	1.600	0.780	40.100
Min.	1.950	3.450	7.900	1.700	3.450	3.900	3.900	1.950	1.500	0.720	39.900



15.Quantity Per Reel

Reel Size	Parts on 178mm Reel
1206	5000 PCS

***Other sizes and chip quantities can be provided upon customer's request.**

16.Storage Conditions & Shelf Life

- The Maximum ambient temperature shall not exceed 40°C
- The Maximum relative humidity recommended for storage is 70%.
- one year from manufacturing date.

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