

INDIVIDUAL SPECIFICATION SHEET

Product Name: 1206 Fast Acting SMD Fuses**Part Number: F12Fx****Revision: A/2****Dongguan TLC Electronic Technology Co., LTD**

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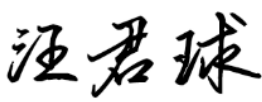
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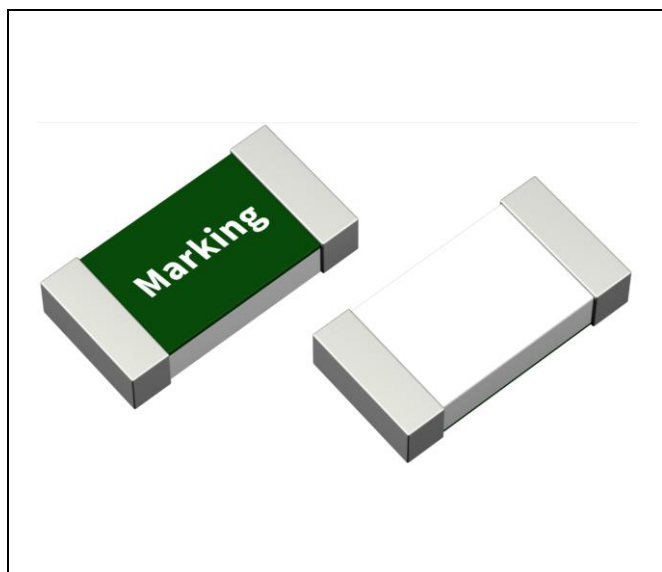
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Rev.	Effective Date	Changed Contents
A/0	2020-9-25	New Release
A/1	2021-3-11	Update Specifications
A/2	2022-9-22	Update Template

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Description

- Thick film manufacturing method, ceramic substrate.
- Fast Acting SMD Fuses for general circuit protection.
- Ultra small physical size, 3.20mm×1.6mm .
- Excellent heat and shock tolerant.
- -55℃~125℃ operating temperature.

Application

- Power supply and battery pack
- Lamps and LED
- Power tools
- PC related equipment and peripherals (Hard driver, Printer, etc.)
- Digital camera (Digital still camera)
- Game equipment
- LCD monitor and LCD modules
- Wireless base station
- Medical device

Electrical Characteristics

Operating Characteristics			
Model	250%I _n	350%I _n	100 %I _n
F12F 0.25-5	5s Max	—	4 hrs Min
F12F 6-40	—	5s Max	4 hrs Min

I_n : Rating Current

Specifications

Part No.	Rated Voltage	Rated Current(A)	Breaking Capacity ¹	Typical Cold Resistance ² (mΩ)	Typical Voltage Drop (mV)	Typical Pre-Arcing I ² t (A ² Sec) ³	Marking
F12F0.25	72V DC	0.25	50A@72Vdc 150A@32Vdc 300A@24Vdc	3608	1407	0.0004	.25
F12F0.375	72V DC	0.375		1882	718	0.0008	E
F12F0.5	72V DC	0.5		1028	650	0.0022	0.5
F12F0.75	72V DC	0.75		601	616	0.0057	0.75
F12F1	72V DC	1		490	510	0.1	H
F12F1.25	72V DC	1.25		330	500	0.15	H
F12F1.5	72V DC	1.5		240	367	0.15	K
F12F2	72V DC	2		132	316	0.41	N

Part No.	Rated Voltage	Rated Current	Breaking Capacity ¹	Typical Cold Resistance ² (mΩ)	Typical Voltage Drop (mV)	Typical Pre-Arcing I ² t (A ² Sec) ³	Marking
F12F2.5	72V DC	2.5	50A@72Vdc 150A@32Vdc 300A@24Vdc	77	240	0.65	O
F12F3	72V DC	3		48	187	1.39	P
F12F3.5	72V DC	3.5		40	180	1.68	R
F12F4	72V DC	4		35	173	1.73	S
F12F4.5	32V DC	4.5	150A@32Vdc 300A@24Vdc	30	164	2.62	X
F12F5	32V DC	5		25	141	3.401	T
F12F6	32V DC	6		16.5	142	11	F
F12F7	32V DC	7		12	140	12.5	7
F12F8	32V DC	8		8.5	110	14	M
F12F10	32V DC	10		6.8	100	20	U
F12F12	32V DC	12		5	85	11.5	12
F12F15	32V DC	15		3.9	78	16.5	15
F12F20	32V DC	20		1.8	60	47	20
F12F25	32V DC	25		1.5	57	32	25
F12F30	32V DC	30		1.25	68	43	30
F12F40	24V DC	40	140A@24Vdc	0.85	49.3	240	XL

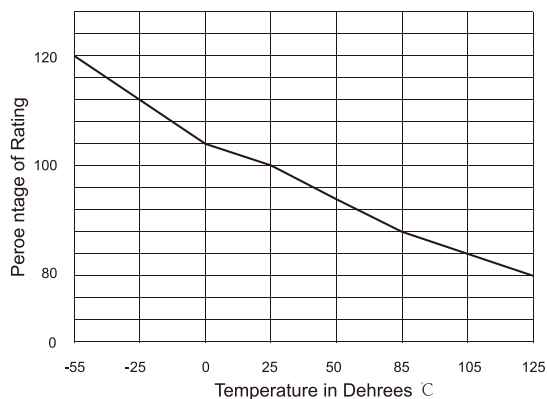
Note

- 1.DC Interrupting Rating (Measured at rated voltage, time constant of less than 50 microseconds, battery source)
- 2.DC Cold Resistance are measured at <10% of rated current in ambient temperature of 25℃
- 3.Typical Pre-arcing I²t are measured at 10In Current

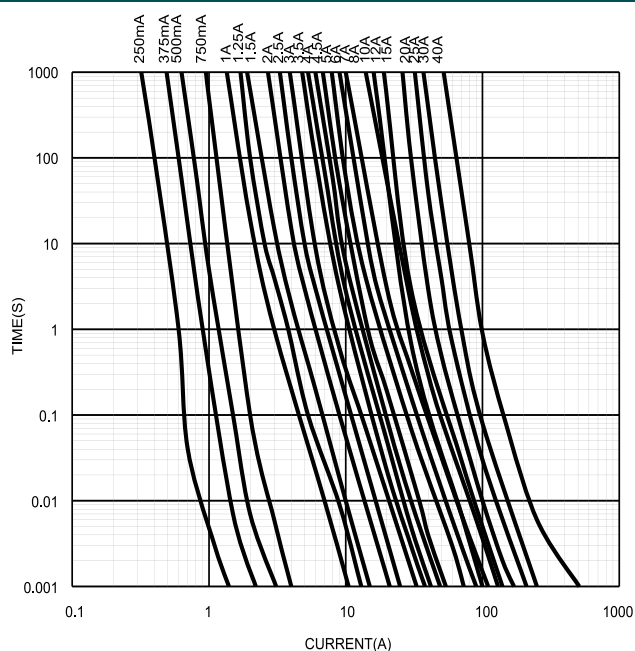
Temperature-Current Curve

When choosing the fuse's specification, if the operating environmental temperature beyond the scope from 20~26℃, you should consider the environmental temperature's affection to fuses.

please refer Temperature-Current curve:



Pre-Arcing Time-Current Characteristics

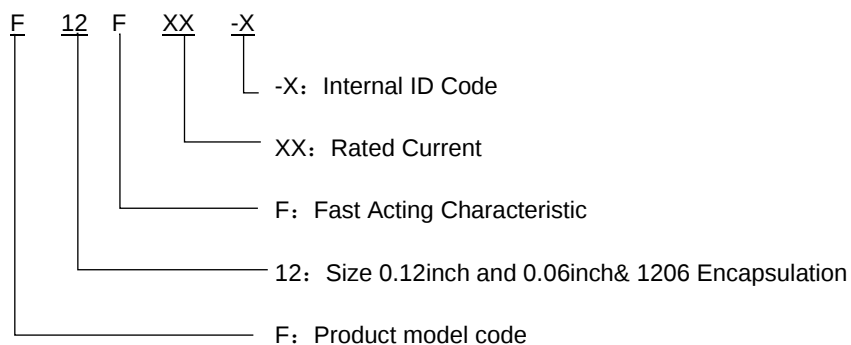


Product structure and materials

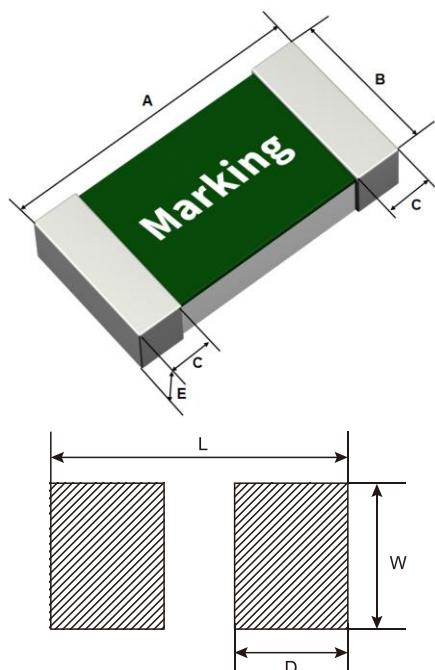


No.	Component	Materials
①	Terminal & pad	Ag / Ni / Sn
②	Substrate	Alumina Ceramic
③	Protective Overglaze	Glass
④	Marking	Glass
⑤	Fuse element	Silver

Product Model and Code



Shape & Dimensions



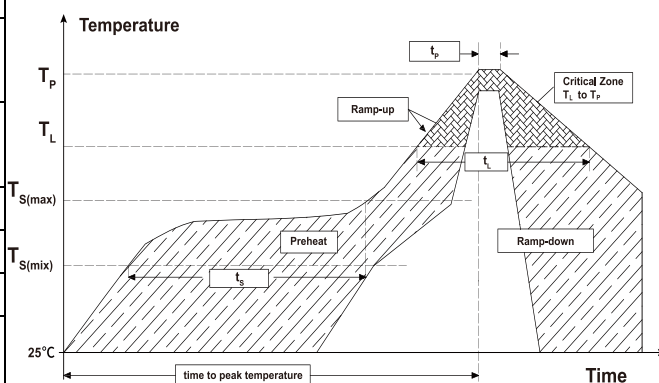
Model	F12F series
A	3.20 ± 0.20 mm
B	1.60 ± 0.20 mm
C	0.50 ± 0.20 mm
E	0.70 ± 0.20 mm

Recommended Size of the Pad			
L	W	D	t
4.56mm	2.03mm	1.52mm	$\geq 35\mu\text{m}$

t : Thickness of pad metal

Soldering Parameters

Reflow Methods		
Reflow Condition		Lead (Pb) free solder
Preheat and soak	Temperature min. T_s (min)	150°C
	Temperature max. T_s (max)	200°C
	Time (T_s min to T_s max) (t_s)	60 - 180 Seconds
Average ramp up rate T_s (max) to T_L		5 °C / Second Max.
Reflow	Liquidous temperature (T_L)	217°C
	Time at liquidous (t_L)	60 - 150 Seconds
Peak package body temperature (T_p)		$260 \pm 5^\circ\text{C}$
Time within 5°C of actual peak temperature (t_p)		10-30 Seconds
Average ramp-down rate		6°C / Second Max.
Time (25°C to Peak Temperature)		8 Minutes Max.
Do not exceed		260°C



Soldering iron welding:

Soldering iron temperature: 350°C
 Welding time: 3 seconds maximum

Wave solder

Reservoir temperature: 260°C
 Time in reservoir: 10 seconds maximum

Packing Information & Storage Conditions

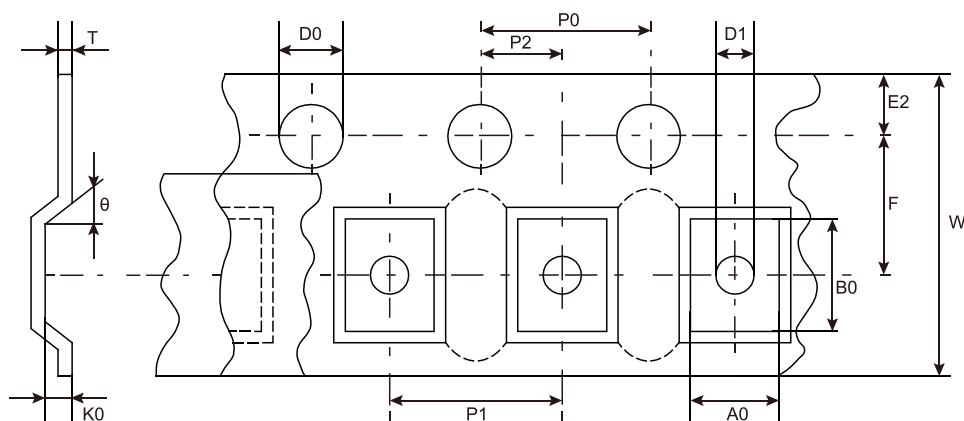
Quantity & Weight		
Part No.	Quantity	Weight
F12Fx Series	3000pcs/Reel	97±25 (g)

Storage Conditions

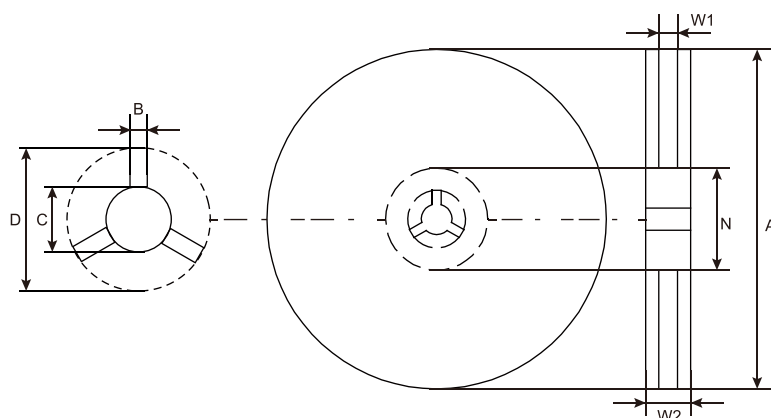
Under airtight in temperature 10℃~40℃, relative humidity $\leq 75\%$ can store 2 years.

Without dew in temperature 10℃~40℃, relative humidity be 95% maximum value for 30 days.

Tape and Reel Specification



Item	A0	B0	D0	D1	E2	F	K0
Spec.(mm)	1.92±0.10	3.62±0.10	1.5 ^{+0.1} ₀	1.0 min	1.75 ± 0.10	3.50 ± 0.05	0.87±0.10
Item	P0	P1	P2	T	W	θ	
Spec.(mm)	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	0.25 ± 0.05	8.00 ± 0.30	6° Max.	



Item	A	B	C	D	N	W1	W2
Spec.(mm)	178±5	1.6 Min.	12.8 Min.	20.8 Min.	58±2	8.4 Min.	12.4 Max.