

**PRODUCT
DATASHEET**



SMFF2410 Series Surface Mount Fuses Devices

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Description

Polytronics SMFF2410 series square shape surface mount fast-acting fuses adopt Wire-In-Air (WIR) construction. Small footprint with wide range of available current rating makes the fuse ideal for over-current protection applications, in both AC and DC circuits using surface mount technology. SMFF2410 series is also RoHS compliant and halogen-free to meet global environmental standard.

Features





- Fast acting, inrush withstand capability
- Wire-In-Air performance
- Wide operating temperature rang
- Wide range of current rating available
- Higher temperature profiles
- Excellent environmental integrity

Application



- Battery pack
- Storage system
- Power supply
- PC related equipment / peripherals
- Industrial equipment
- Game console
- Telecom system
- Cooling fan system
- Wireless base station
- LCD monitor and modules





Agency Approval and Environmental Compliance

Agency	File Number	Regulation	Standard
	UL/CSA:E331807		2011/65/EU
	PSE19021486(1~5A) PSE19021485(6.3~10A)		IEC 61249-2-21:2003

Electrical Characteristics

Part Number	Marking	Current Rating (A)	Voltage Rating	Interrupting Rating	Typical Cold DCR [†] (mΩ)	Nominal Melting I ² T [‡] (A ² S)	Agency Approval	
								
SMFF2410P100	100	1.00	125V	UL 50A 125V AC 160V DC	80	0.56	✓	✓
SMFF2410P125	125	1.25			60	0.84	✓	✓
SMFF2410P160	160	1.60			38	1.23	✓	✓
SMFF2410P200	200	2.00			30	1.34	✓	✓
SMFF2410P250	250	2.50			27	1.43	✓	✓
SMFF2410P300	300	3.00			22	1.88	✓	
SMFF2410P315	315	3.15			21	2.05	✓	✓
SMFF2410P400	400	4.00			16	3.44	✓	✓
SMFF2410P500	500	5.00			14	4.84	✓	✓
SMFF2410P630	630	6.30			10	10.55	✓	✓
SMFF2410P700	700	7.00			9.4	10.58	✓	✓
SMFF2410P800	800	8.00			7.4	17.62	✓	✓
SMFF2410P1000	10	10.00			5.9	30.30	✓	✓

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Part Number	Marking	Current Rating (A)	Voltage Rating	Interrupting Rating	Typical Cold DCR† (mΩ)	Nominal Melting I ² T‡ (A ² S)	Agency Approval	
							 US	
SMFF2410P1200	12	12.00	65V	UL	4.8	42.22	✓	
SMFF2410P1500	15	15.00		50A	3.7	69.75	✓	
SMFF2410P2000	20	20.00		65V AC/DC	3.0	132.04	✓	

† Measured at ≤ 10% rated current and 25°C

‡ Melting I²T at 10 times of rated current

Electrical Specification

Ampere Rating	% of Current Rating	Opening Time
1A~20A	100%	4 Hours Min.
1A~10A	200%	5 Seconds Max.
1A~10A	125%	1 Hours Min.
12A~20A	200%	20 Seconds Max.

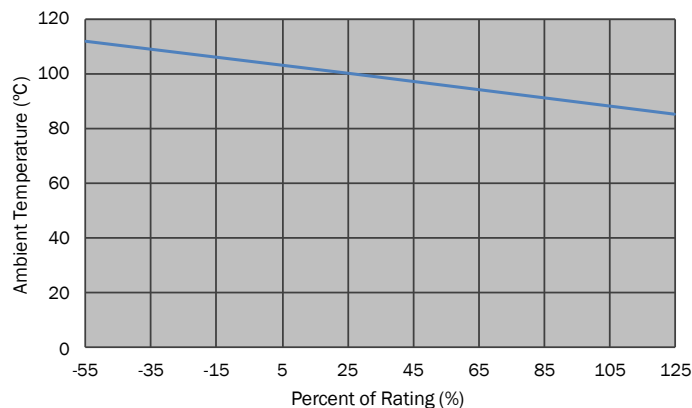
Physical Specifications

Materials	Substrate: Ceramic Terminations: Au Plated Brass Cap Element: Nickel alloy or Copper Alloy
Solderability	MIL-STD-202
Soldering Parameters	Wave Solder: 260°C, 10 seconds max. Reflow Solder: 260°C, 20 seconds max. Hand Solder: 300°C, 2 seconds max. (Soldering iron avoid touch Brass Cap.)

Environmental Specifications

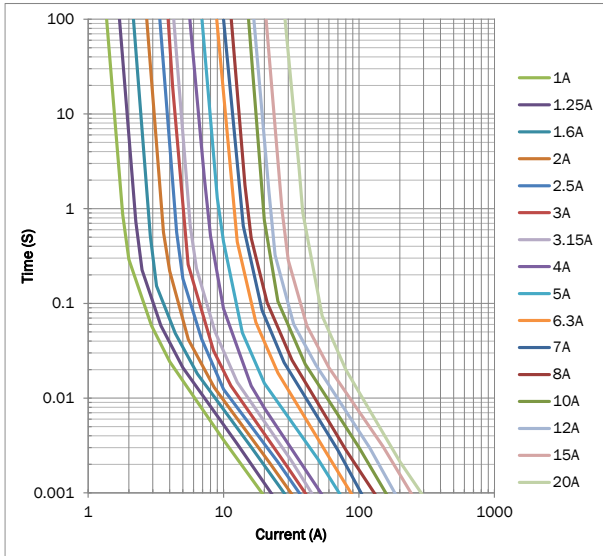
Operating Temperature	-55°C to 125 °C
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Thermal Derating Curve

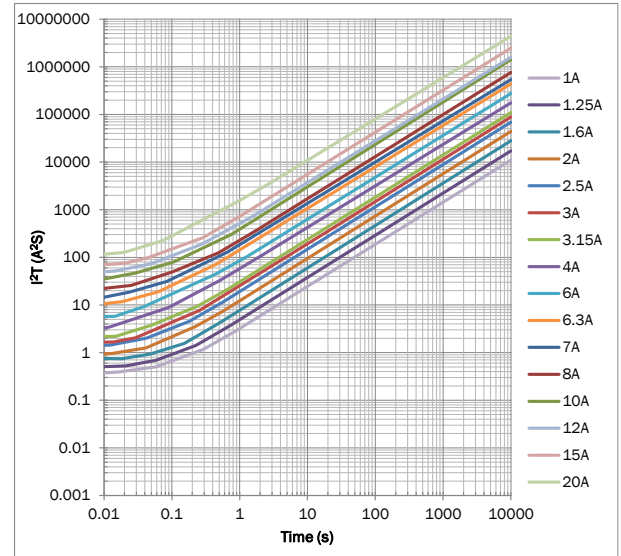


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Time-Current Curve



I²T vs Time Curve



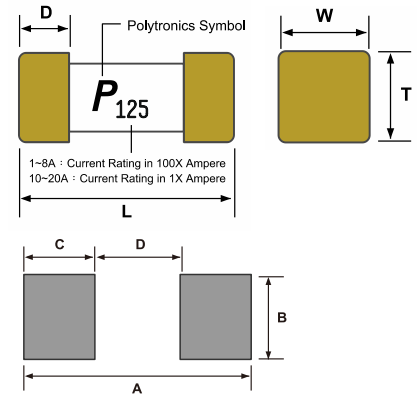
Physical Dimensions (mm.)

Dimensions (mm)

L	W	T	D
6.10±0.20	2.5±0.10	2.5±0.10	1.4±0.10

Recommended Solder Pad Dimension (mm)

A	B	C	D
8.0±0.3	3.0±0.3	2.5±0.3	3.0±0.3

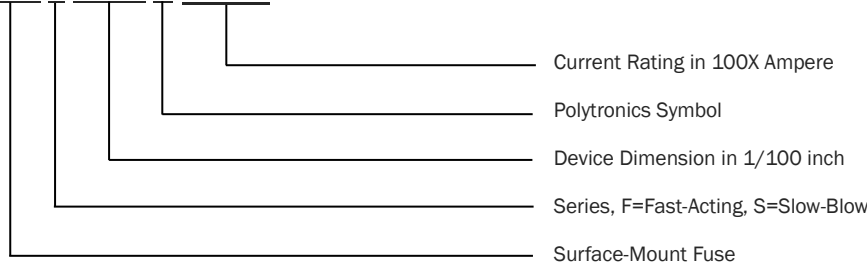


Dimensions of Standard Test Board (mm)

Ampere Rating	Board Thickness	Copper Layer Thickness	Copper Trace Width
1A~6.3A	1.6	0.035	5
7A~10A	1.6	0.070	7.5
12A~20A	1.6	0.080	10

Part Number System

SMF F 2410 P □□□



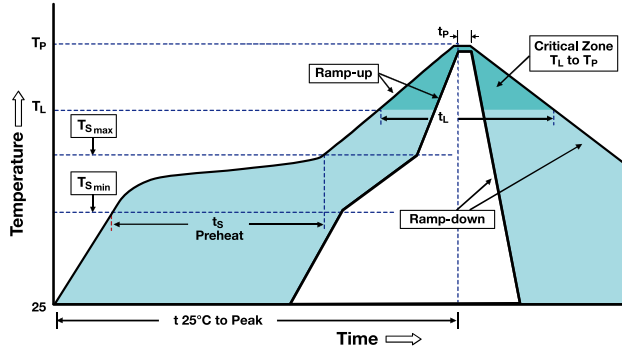
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Reliability Test

Characteristics	Test condition / Methods	Requirement	Test Reference
Time/Current	100% In	No Fusing; 4hours min.	UL248-14
	200% In	1~10A <5 seconds 12~20A <20 seconds	Refer to Spec
	1000% In	1ms~10ms	IEC60127-4
Voltage Drop	100% In	1~6.3A <300mV 7~10A <220mV 12A~20A <150mV	IEC 60127-4
Endurance Test	Repeating 100 cycles of 1In for 1 h and switching off for 15min, following by 1 h at 1.25In and testing temperature rise	ΔR : <10% 1A~6.3A <75°C 7A~10A <95°C	IEC 60127-4
	1 In for 4h, then testing Temperature rise	ΔR : <10% 12A~20A <105°C	UL248-14
Interrupting Ability	1A~10A: 50A 125V AC 50A 160V DC 100A 100V AC (Except 3A) 12~20A: 50A 65V AC 50A 65V DC	Without permanent arcing, ignition, and bursting of fuse link	UL 248-14 IEC60127-4
Solderability	240°C ± 5°C, 3sec ± 0.5sec	95% coverage min	IEC 60127-4 IEC 60068-2-20 MIL-STD-202
Resistance to Soldering	260°C ± 5°C, 10sec ± 0.5sec	ΔR : <10%	MIL-STD-202 Method210
High Temperature Operating Life	96 hours, 70°C ± 2°C at 0.6 In.	ΔR : <10%	MIL-STD-202 Method 108
Humidity (Steady State)	1000 hours at 40°C ± 2°C 90~95%RH	ΔR : <10%	MIL-STD-202 Method 103
Low Temperature Storage	96 hours at -55°C ± 3°C.	ΔR : <10%	IEC60068-2-1
High temperature Storage	96 hours at 125°C ± 2°C.	ΔR : <10%	IEC60068-2-2
Salt Spray	5% salt solution, 48 hours	ΔR : <10%	MIL-STD-202 Method 101
Thermal Shock	100 cycles between -65°C /+125°C 30 minutes at each extreme zone	I ΔR I: <(10%R+0.005Ω)	IEC 60068-2-14

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Soldering Parameters



Average Ramp-Up Rate (Ts _{max} to T _P)	3°C/second max.
Preheat	
-Temperature Min (Ts _{min})	150°C
-Temperature Max (Ts _{max})	200°C
-Time (Ts _{min} to Ts _{max})	60-120 seconds
Time maintained above:	
-Temperature (T _L)	217°C
-Time (t _L)	60-150 seconds
Peak Temperature (T _P)	260°C
Time within 5°C of actual Peak Temperature (t _P)	20 seconds
Ramp-Down Rate	6°C /second max.
Time 25°C to Peak Temperature	8 minutes max.

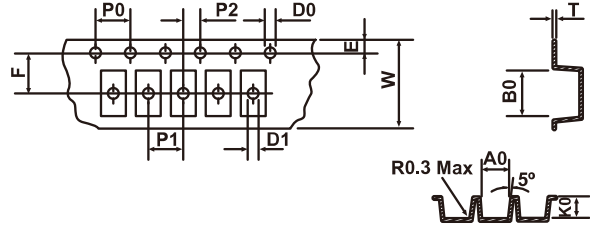
Note 1: All temperature refer to topside of the package, measured on the package body surface.

Note 2: If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

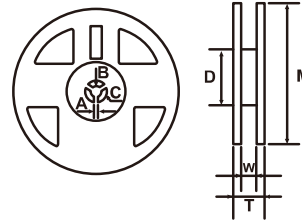
Packaging Quantity

Part Number	Tape & Reel Quantity
SMFF2410PXXX	1000

Tape & Reel Specification (mm.)



A0	2.70 ± 0.10	E	1.75 ± 0.10
B0	6.40 ± 0.10	F	5.50 ± 0.10
K0	2.70 ± 0.10	D0	∅ 1.50 ± 0.10
P0	4.00 ± 0.10	D1	1.50 ± 0.25
P1	4.00 ± 0.10	W	12.00 ± 0.15
P2	2.00 ± 0.10	T	0.25 ± 0.05



M	∅ 178.0 ± 2.0
W	12.5 ± 1.0
T	14.5 ± 1.5
A	2.0 ± 0.5
B	∅ 13.0 ± 0.5
C	∅ 21.0 ± 0.5
D	∅ 58.0 ± 2.0

Storage

- The ambient temperature recommended for storage shall be between 5 °C ~30 °C.
- The relative humidity recommended for storage shall be between 25%RH~60%RH.
- The products shall not be stored in areas where harmful gases containing sulfur or chlorine are present.

Warning

- Fuse product is not recommended for any type of coating. Polytronics is not responsible for any damage directly or indirectly related to the coating.
- For copper layer thickness or copper trace width different from the standard test board, fusing characteristics needs to be verified to ensure product performance meet user requirement.