

PRODUCT
DATASHEET



SMFFH2410 Series Surface Mount Fuses Devices

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Description

Polytronics SMFFH2410 series square shape surface mount High Inrush 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. SMFFH2410 series is also RoHS compliant and halogen-free to meet global environmental standard.






Features

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


Application

- Battery pack
- Power supply
- Industrial equipment
- Telecom system
- LCD monitors and modules
- PC related equipment / peripherals
- Medical equipment
- Wireless base station

Agency Approval and Environmental Compliance

Agency	File Number	Regulation	Standard
	UL/CSA:E331807		2011/65/EU
			IEC 61249-2-21:2003

Electrical Characteristics

Part Number	Current Rating (A)	Voltage Rating	Interrupting Rating	Typical Cold DCR [†] (mΩ)	Nominal Melting I ² T [‡] (A ² S)	Agency Approval
						
SMFFH2410P100	1.00	125V	UL 50A / 125V AC 50A / 125V DC	115	3.12	✓
SMFFH2410P125	1.25			85	4.21	✓
SMFFH2410P150	1.50			78	4.98	✓
SMFFH2410P160	1.60			68	5.85	✓
SMFFH2410P200	2.00			52	7.20	✓
SMFFH2410P250	2.50			36	14.05	✓
SMFFH2410P300	3.00			28	16.92	✓
SMFFH2410P315	3.15			24	18.68	✓
SMFFH2410P350	3.50			22	21.95	✓
SMFFH2410P400	4.00			20	32.80	✓
SMFFH2410P500	5.00			12	37.57	✓

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

[‡] Melting I²T at 10 times of rated current

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Electrical Specification

Ampere Rating	% of Current Rating	Opening Time
1A~5A	100%	4 Hours Min.
1A~5A	200%	120 Seconds Max.

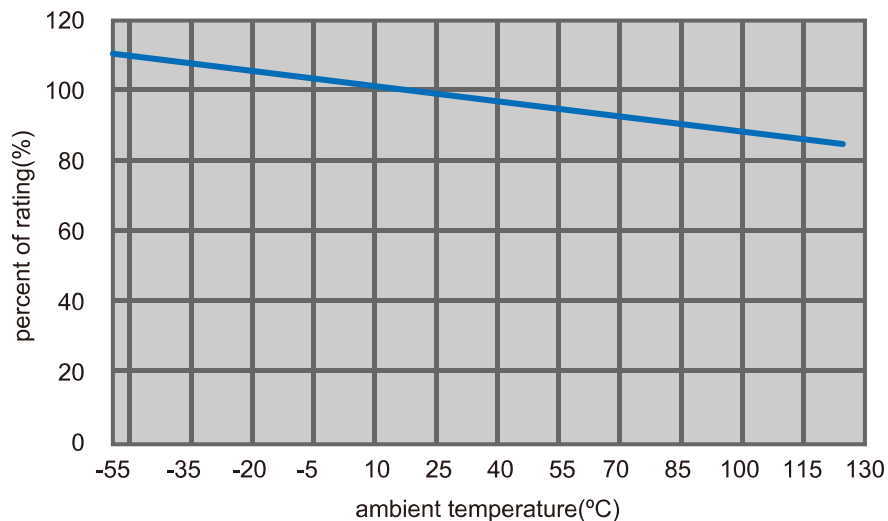
Physical Specifications

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, 5 seconds max. (Thickness of solder paste: 0.2mm Max) Hand Solder: 300°C, 2 seconds max. (Soldering iron avoid touch Brass Cap.)

Environmental Specifications

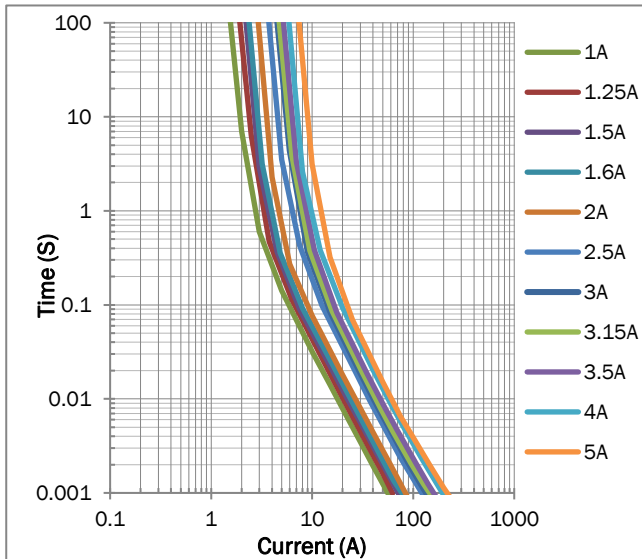
Operating Temperature	-55°C to 125 °C
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Thermal Derating Curve

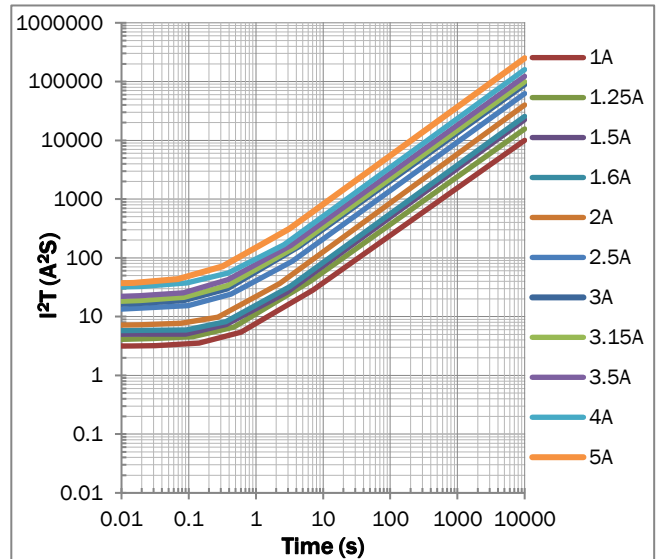


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Time-Current Curve



I²T vs Time Curve



Physical Dimensions (mm.)

Dimensions (mm)

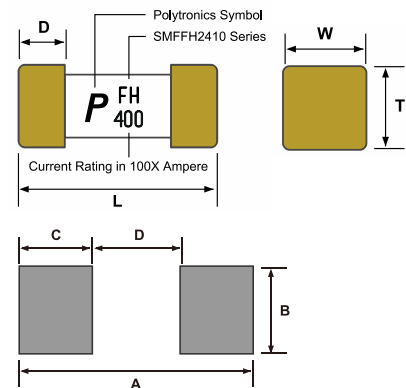
L	W	T	D
6.10±0.20	2.5±0.10	2.5±0.10	1.4±0.10

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

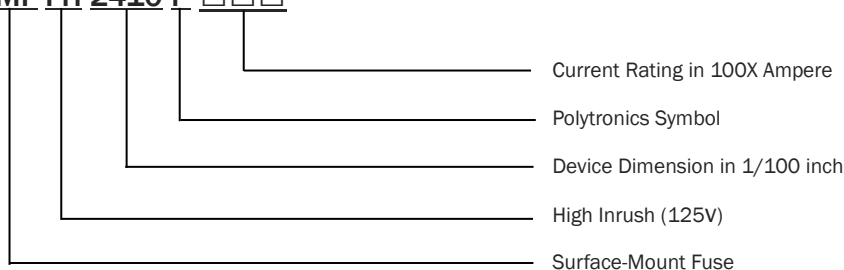
Dimensions of Standard Test Board (mm)

Ampere Rating	Board Thickness	Copper Layer Thickness	Copper Trace Width
1A~5A	1.6	0.035	5



Part Number

SMF FH 2410 P □ □ □



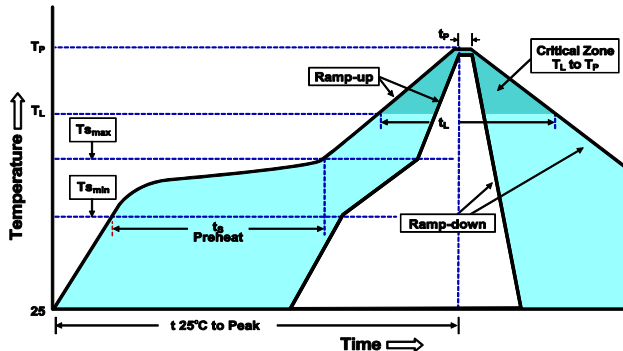
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Reliability Test

Characteristics	Test condition / Methods	Requirement	Test Reference
Time/Current	100% In	No Fusing; 4hours min.	UL248-14
	200% In	<120sec	Refer to Spec
	1000% In	>10ms	IEC60127-4
Voltage Drop	100% In	< 300mV	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	\Delta R : <10% $\Delta T < 75^{\circ}\text{C}$	IEC 60127-4
Interrupting Ability	50A@125V AC 50A@125V 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	\Delta R : <10%	MIL-STD-202 Method 210
High Temperature Operating Life	96 hours, 70°C ± 2°C at 0.6 In.	\Delta R : <10%	MIL-STD-202 Method 108
Humidity (Steady State)	1000 hours at 40°C ± 2°C 90~95%RH	\Delta R : <10%	MIL-STD-202 Method 103
Low Temperature Storage	96 hours at -55°C ± 3°C.	\Delta R : <10%	IEC60068-2-1
High temperature Storage	96 hours at 125°C ± 2°C.	\Delta R : <10%	IEC60068-2-2
Salt Spray	5% salt solution, 48 hours	\Delta R : <10%	MIL-STD-202 Method 101
Thermal Shock	100 cycles between -65°C /+125°C 30 minutes at each extreme zone	\Delta R I: <(10%R+0.005\Omega)	IEC 60068-2-14

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Soldering Parameters



Average Ramp-Up Rate (T _{smax} to T _p)	3°C/second max.
Preheat	
-Temperature Min (T _{smin})	150°C
-Temperature Max (T _{smax})	200°C
-Time (T _{smin} to T _{smax})	60-120 seconds
Time maintained above:	
-Temperature (T _l)	217°C
-Time (t _l)	20-40 seconds
Peak Temperature (T _p)	260°C
Time within 5°C of actual Peak Temperature (t _p)	5 seconds
Ramp-Down Rate	6°C /second max.
Time 25°C to Peak Temperature	8 minutes max.

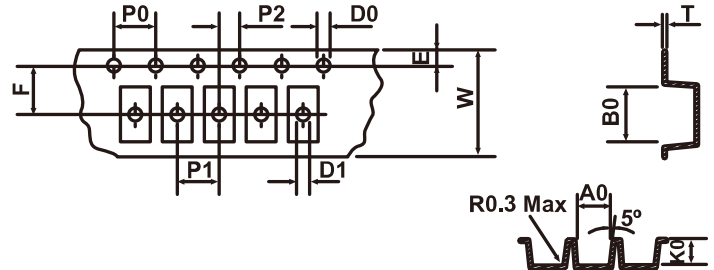
Note 1: All temperature refer to topside of the package, measured on the package body surface.

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

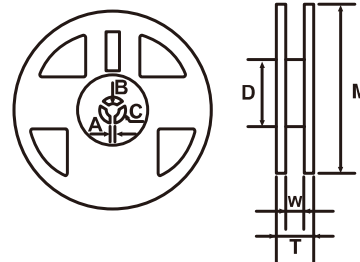
Packaging Quantity

Part Number	Tape & Reel Quantity
SMFFH2410PXXX	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.