



Surface-mount Fuses

2410 Very Fast-Acting Fuses



The 2410(6125) is Wire-in Air SMD Fuse which is very suitable for secondary level overcurrent protection applications.

These lead-free surface mount devices offer more reliability and have no end cap falling off risk. Straight wire element in air performs consistent fusing and cutting characteristics.



Benefits

- Very fast acting at 200% overload current level
- Excellent inrush current withstanding capability
- High reliability and resilience
- Strong arc suppression characteristics
- Copper terminal with nickel and tin plated

Features

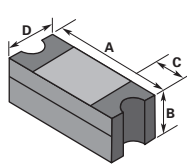
- Halogen free, RoHS compliant and 100% lead-free
- Copper or copper alloy composite fuse link
- Fiberglass enforced epoxy fuse body
- Wide range of current rating
- -55°C to +125°C operating temperature range (with de-rating)

Applications

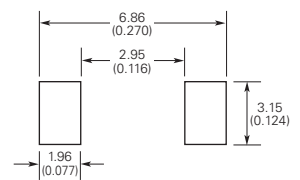
- | | | |
|------------------------|------------------|----------------|
| • Industrial equipment | • Power supplier | • Game systems |
| • LCD/PDP TV | • Telecom system | • White goods |
| • Backlight inverter | • Networking | • Automotive |

Table SFV1 Clear Time Characteristics for 2410 Very Fast-Acting Fuses

% of rated current	Clear time at 25°C	
100%	4 hours (min.)	
200% (0.5A-10.0A)	0.01 second (min.)	5 seconds (max.)
200% (12.0A-20.0A)	0.01 second (min.)	20 seconds (max.)

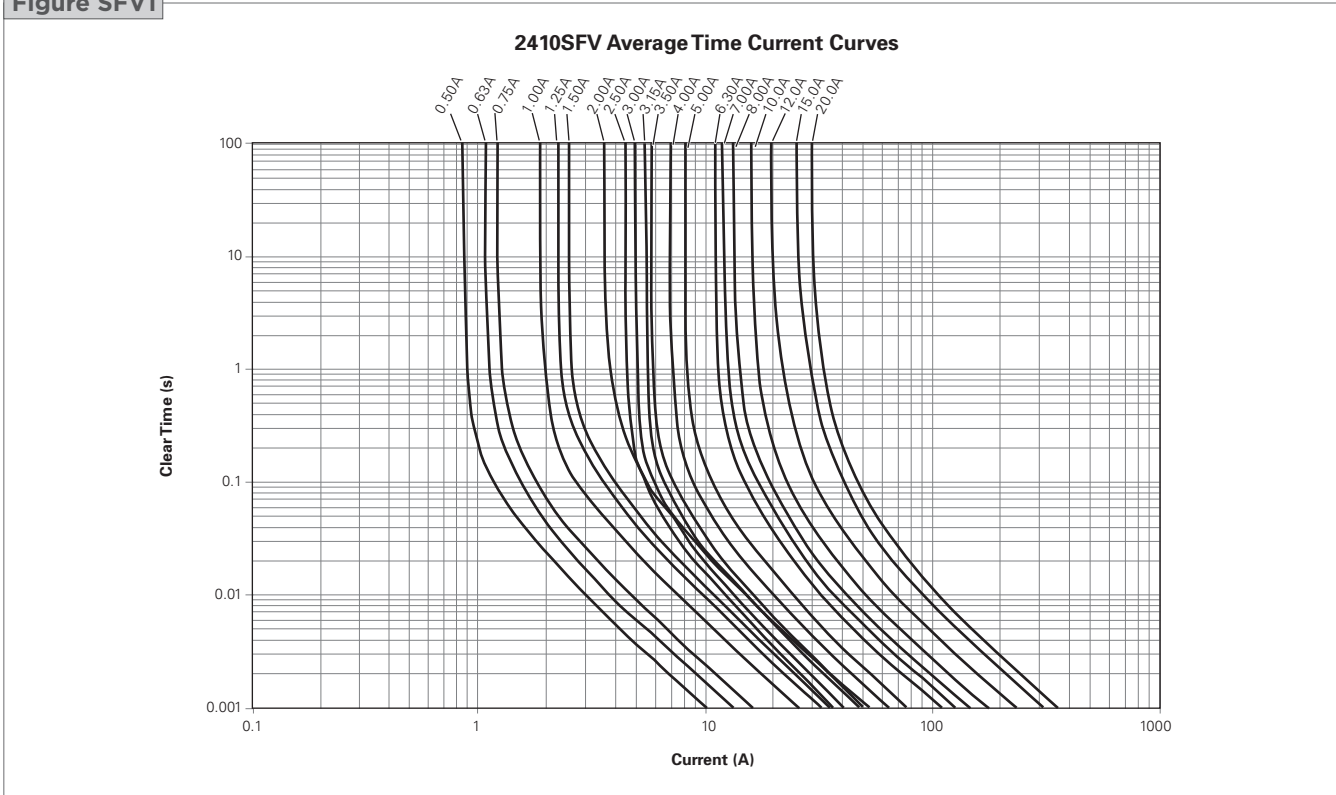
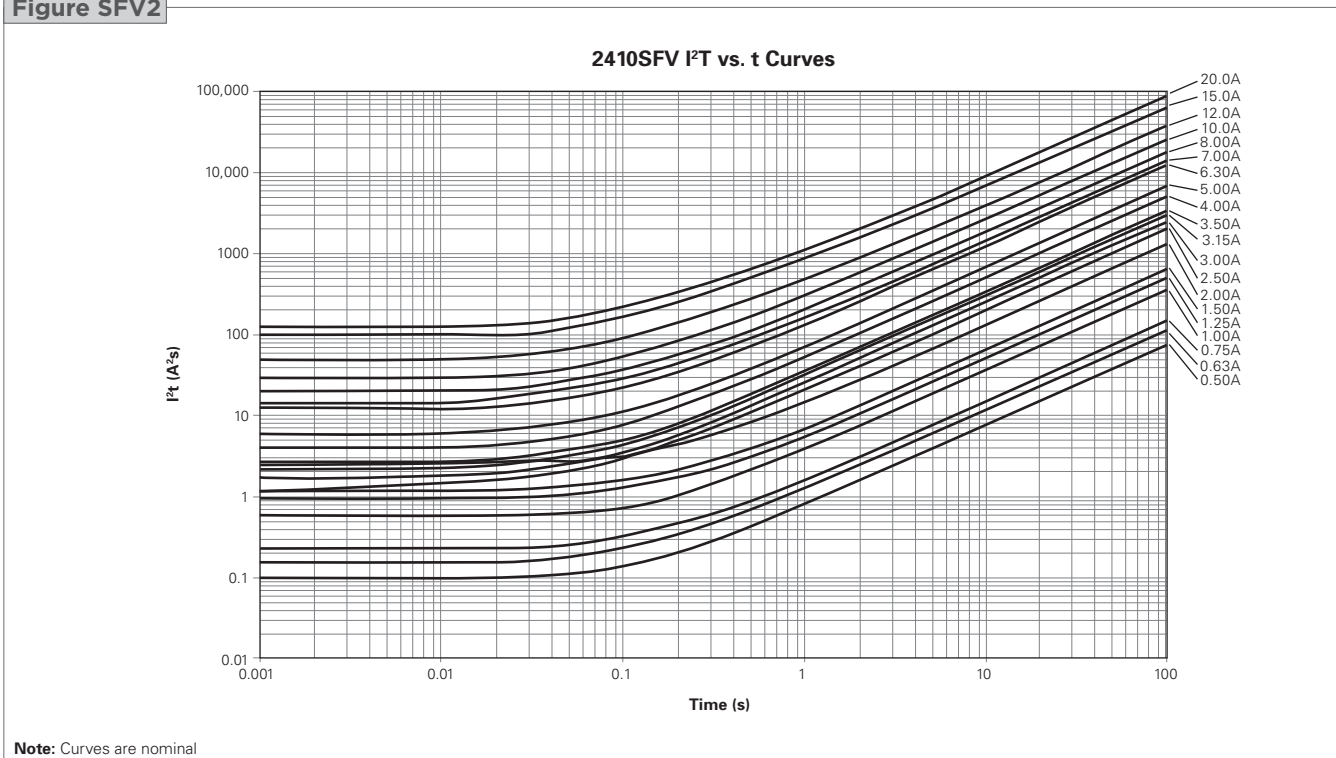
Table SFV2 Typical Electrical Characteristics, Dimensions and Recommended Pad Layout for 2410 Very Fast-Acting Fuses
2410 (6125 mm) Very Fast-Acting Fuse
Shape and Dimensions
mm (Inch)


	A		B		C		D	
	Min	Max	Min	Max	Min	Max	Min	Max
mm	5.95	6.25	1.96	2.36	0.97	1.73	2.34	2.64
in	(0.234)	(0.246)	(0.077)	(0.093)	(0.038)	(0.068)	(0.092)	(0.104)

Recommended Pad Layout
mm (Inch)

Typical Electrical Characteristics
Max. Interrupt Ratings

Part Number	Marking Code	Rated Current (A)	Nominal Cold DCR (Ω)*	Nominal I ² t (A ² sec)	Voltage		Current (A)
					(V _{AC})	(V _{DC})	
2410SFV0.50FM/125-2	C	0.5	0.2310	0.10	250	125	50A @ 250V _{AC} 50A @ 125V _{DC} 300A @ 32V _{DC}
2410SFV0.63FM/125-2	S	0.6	0.1740	0.16	250	125	
2410SFV0.75FM/125-2	D	0.8	0.1480	0.23	250	125	
2410SFV1.00FM/125-2	E	1.0	0.0930	0.59	250	125	
2410SFV1.25FM/125-2	F	1.3	0.0700	0.96	250	125	
2410SFV1.50FM/125-2	G	1.5	0.0620	1.19	125	125	50A @ 125V _{AC} 50A @ 125V _{DC} 300A @ 32V _{DC}
2410SFV2.00FM/125-2	I	2.0	0.0420	2.75	125	125	
2410SFV2.50FM/125-2	J	2.5	0.0310	1.21	125	125	
2410SFV3.00FM/125-2	K	3.0	0.0249	1.73	125	125	
2410SFV3.15FM/125-2	V	3.2	0.0232	2.20	125	125	
2410SFV3.50FM/125-2	L	3.5	0.0220	2.50	125	125	
2410SFV4.00FM/125-2	M	4.0	0.0172	4.10	125	125	
2410SFV5.00FM/125-2	N	5.0	0.0143	5.90	125	125	
2410SFV6.30FM/125-2	O	6.3	0.0100	12.50	125	125	
2410SFV7.00FM/125-2	P	7.0	0.0094	14.20	125	125	
2410SFV8.00FM/125-2	R	8.0	0.0086	20.30	125	125	35A @ 125V _{AC} 50A @ 125V _{DC} 300A @ 32V _{DC}
2410SFV10.0FM/125-2	Q	10.0	0.0066	29.20	125	125	
2410SFV12.0FM/065-2	X	12.0	0.0053	49.20	65	65	
2410SFV15.0FM/065-2	Y	15.0	0.0038	102.50	65	65	
2410SFV20.0FM/065-2	Z	20.0	0.0034	126.20	65	65	50A @ 65V _{AC} 50A @ 65V _{DC} 300A @ 32V _{DC}

* Measured at ≤10% of rated current and 25°C ambient temperature.

Figure SFV1-SFV2 Family Performance Curves for 2410 Very Fast-Acting Fuses
Figure SFV1

Figure SFV2


→ Please go to page 97 for more information for 2410 Fast-Acting Fuses.

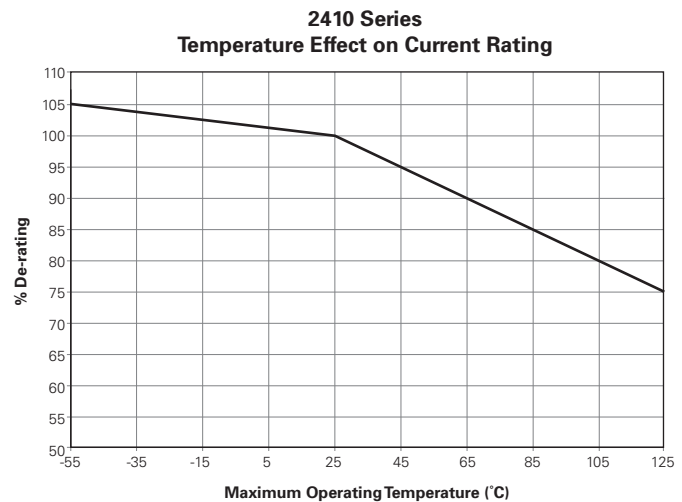
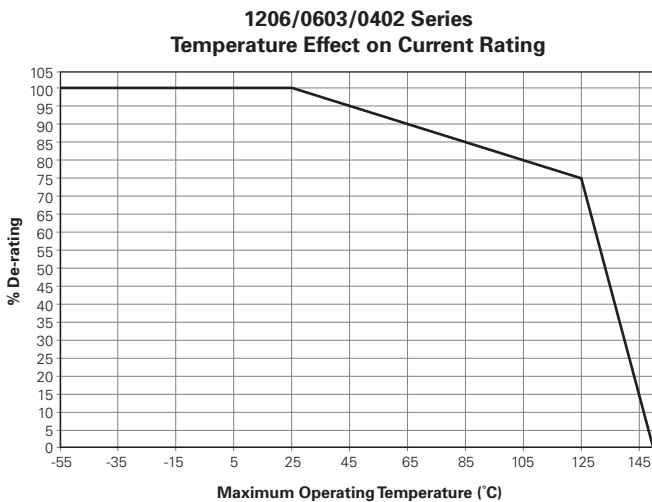
Specifications, Packaging Information, Agency Approvals and Part Numbering Systems for All Fuses

Table F1 Environmental Specifications for All Fuses

Operating temperature	-55°C to +125°C
Mechanical vibration	Withstands 5-3000 Hz at 30 Gs when evaluated per Method 204 of MIL-STD-202
Mechanical shock	Withstands 1500 Gs, 0.5 millisecond half-sine pulses when evaluated per Method 213 of MIL-STD-202
Thermal shock	Withstands 100 cycles from -65°C to +125°C when evaluated per Method 107 of MIL-STD-202
Resistance to soldering heat	Withstands 60 seconds at +260°C when evaluated per Method 210 of MIL-STD-202
Solderability	Meets 95% minimum coverage requirement when evaluated per Method 208 of MIL-STD-202
Moisture resistance	Withstands 10 cycles when evaluated per Method 106 of MIL-STD-202
Salt spray	Withstands 48-hour exposure when evaluated per Method 101 of MIL-STD-202
Storage temperature	≤30°C/ 85% RH
Storage humidity	Per MIL-STD-202F, Method 106F

Table F2 Material Specifications for All Fuses

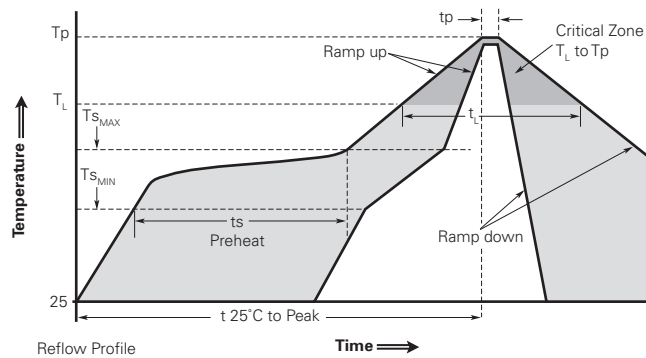
Construction body material	Ceramic (1206/0603/0402); Fiberglass/Epoxy (2410)
Termination material	Silver, Nickel, Tin
Fuse element	Silver(1206/0603/0402); Copper/Copper Alloy (2410)

Figure F1 Thermal Derating Current for All Fuses

Table F3 Electrical Specifications for All Fuses

Insulation resistance after opening	20,000Ω minimum @ rated voltage. Fuse clearing under low voltage conditions may result in lower - post-clearing insulation values. Under normal fault conditions TE Circuit Protection fuses provide sufficient insulation resistance for circuit protection.
Current carrying capacity	Withstands 100% rated current at +25°C ambient for 4 hours when evaluated per MIL-PRF-23419.

Table F4 Packaging Information for All Fuses

Size	Reel Quantity (pcs)	Reel Diameter	Reel Width	Carrier Tape Size	Tape Type	Reels per Outside Shipment Box	Outside Shipment Boxes per Overpack
0402(1005)	10,000	178mm white plastic	9.0 ± 0.5mm	8.00 ± 0.10mm	Paper	5	1 to 10
0603(1608)	4,000	178mm white plastic	9.0 ± 0.5mm	8.00 ± 0.10mm	Paper	5	1 to 10
0603SFV(1608)	6,000	178mm white plastic	9.0 ± 0.5mm	8.00 ± 0.10mm	Paper	5	1 to 10
1206(3216)	3,000	178mm white plastic	9.0 ± 0.5mm	8.00 ± 0.10mm	Plastic	5	1 to 10
2410(6125)	2,000	178mm white plastic	13.4 ± 0.5mm	12.00 ± 0.10mm	Plastic	4	1 to 10

Figure F2 Recommended Soldering Temperature Profile for All Fuses

Classification Reflow Profiles

Profile Feature	1206/0603/0402	2410
Average ramp up rate (Ts_{MAX} to Tp)	3°C/second max.	3°C/second max.
Preheat		
• Temperature min. (Ts _{MIN})	150°C	150°C
• Temperature max. (Ts _{MAX})	200°C	200°C
• Time (ts _{MIN} to ts _{MAX})	60-180 seconds	40-100 seconds
Time maintained above:		
• Temperature (TL)	217°C	200°C
• Time (tL)	60-150 seconds	30-90 seconds
Peak/Classification temperature (Tp)	260°C max.	250°C max.
Time within 5°C of actual peak temperature		
Time (tp)	20-40 seconds	30-40 seconds
From 25°C to preheating (150°C)	8 minutes max.	40-100 seconds
Ramp down rate	4°C/second max.	Natural cooling

Recommended conditions for hand soldering:

- Using hot air rework station that can reflow the solder on both terminations at the same time is strongly recommended, do not directly contact the chip termination with the tip of soldering iron.
- Preheating: 150°C, 60s (min).
Appropriate temperature (max) of soldering iron tip/soldering time (max): 280°C / 10s or 350°C / 3s.

Table F5 Tape and Reel Specifications for All Fuses

Mark	Dimension in inches (mm)				
	0402 (1005)	0603 (1608)	1206 (3216)	0603SFV (1608)	2410 (6125)
E ₁	0.069 ± 0.004 (1.75 ± 0.10)	0.069 ± 0.004 (1.75 ± 0.10)	0.069 ± 0.004 (1.75 ± 0.10)	0.069 ± 0.004 (1.75 ± 0.10)	0.069 ± 0.004 (1.75 ± 0.10)
F	0.138 ± 0.002 (3.50 ± 0.05)	0.138 ± 0.002 (3.50 ± 0.05)	0.138 ± 0.002 (3.50 ± 0.05)	0.138 ± 0.002 (3.50 ± 0.05)	0.217 ± 0.004 (5.50 ± 0.10)
W	0.315 ± 0.004 (8.00 ± 0.10)	0.315 ± 0.004 (8.00 ± 0.10)	0.315 ± 0.004 (8.00 ± 0.10)	0.315 ± 0.004 (8.00 ± 0.10)	0.472 ± 0.004 (12.00 ± 0.10)
P ₁	0.079 ± 0.004 (2.00 ± 0.10)	0.157 ± 0.004 (4.00 ± 0.10)	0.157 ± 0.004 (4.00 ± 0.10)	0.157 ± 0.004 (4.00 ± 0.10)	0.157 ± 0.004 (4.00 ± 0.10)
P ₀	0.157 ± 0.004 (4.00 ± 0.10)	0.157 ± 0.004 (4.00 ± 0.10)	0.157 ± 0.004 (4.00 ± 0.10)	0.157 ± 0.004 (4.00 ± 0.10)	0.157 ± 0.004 (4.00 ± 0.10)
P ₂	0.079 ± 0.002 (2.00 ± 0.05)	0.079 ± 0.002 (2.00 ± 0.05)	0.079 ± 0.002 (2.00 ± 0.05)	0.079 ± 0.002 (2.00 ± 0.05)	0.079 ± 0.004 (2.00 ± 0.10)
D ₀	0.059 ± 0.004 (1.50+0.10/-0.00)	0.059 ± 0.004 (1.50+0.10/-0.00)	0.059 ± 0.004 (1.50+0.10/-0.00)	0.059 ± 0.004 (1.50+0.10/-0.00)	0.059 ± 0.004 (1.50+0.10/-0.00)
D ₁	—	—	0.039 max (1.00 max)	—	0.61 ± 0.004 (1.55 ± 0.10)
t	—	—	0.009 ± 0.001 (0.23 ± 0.02)	—	0.010 ± 0.002 (0.25 ± 0.05)
A ₀	0.026 ± 0.004 (0.67 ± 0.10)	0.039 ± 0.004 (0.98 ± 0.10)	0.071 ± 0.004 (1.80 ± 0.10)	0.039 ± 0.004 (0.98 ± 0.10)	0.112 ± 0.004 (2.85 ± 0.10)
B ₀	0.046 ± 0.004 (1.17 ± 0.10)	0.071 ± 0.004 (1.80 ± 0.10)	0.138 ± 0.004 (3.50 ± 0.10)	0.071 ± 0.004 (1.80 ± 0.10)	0.252 ± 0.004 (6.40 ± 0.10)
K ₀	0.025 ± 0.004 (0.63 ± 0.10)	0.037 ± 0.003 (0.95 ± 0.08)	0.050 ± 0.004 (1.27 ± 0.10)	0.024 ± 0.003 (0.60 ± 0.08)	0.093 ± 0.004 (2.35 ± 0.10)

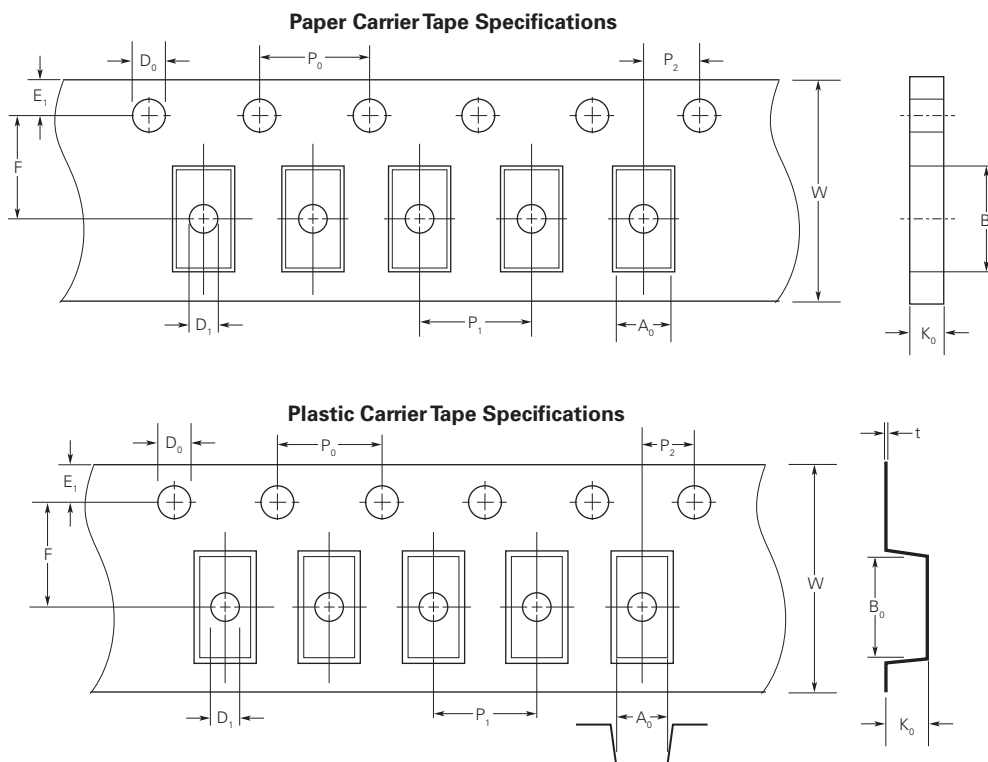
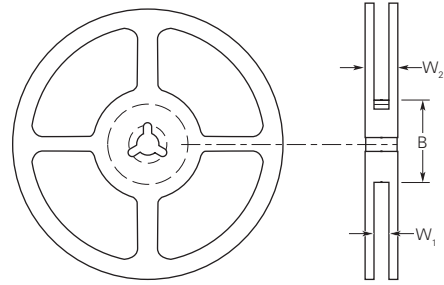
Figure F3 Component Tape Dimensions for All Fuses


Figure F4 Reel Dimensions for All Fuses

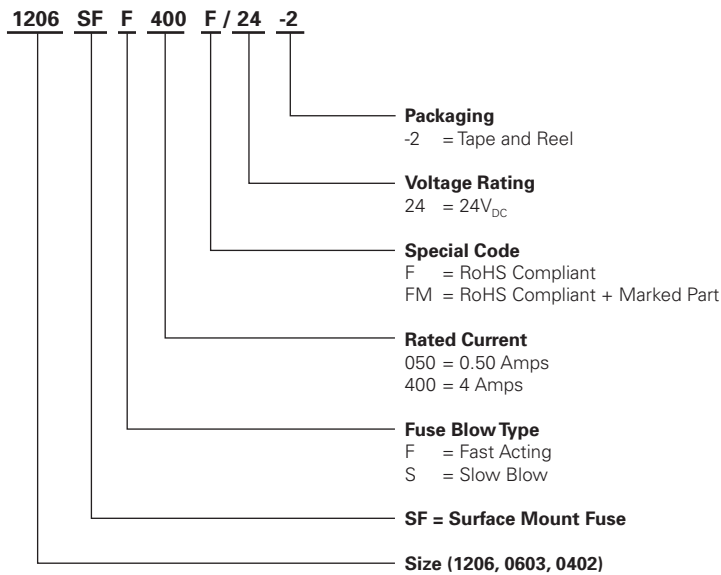
Dimension Description	Mark	Dimension (mm)	
		1206/0603/0402	2410
Hub outer diameter	B	60	60.2
Reel inside width	W ₁	9	13.4
Reel outside width	W ₂	11.4	16
Tape width		8	



Agency Approvals for All Fuses

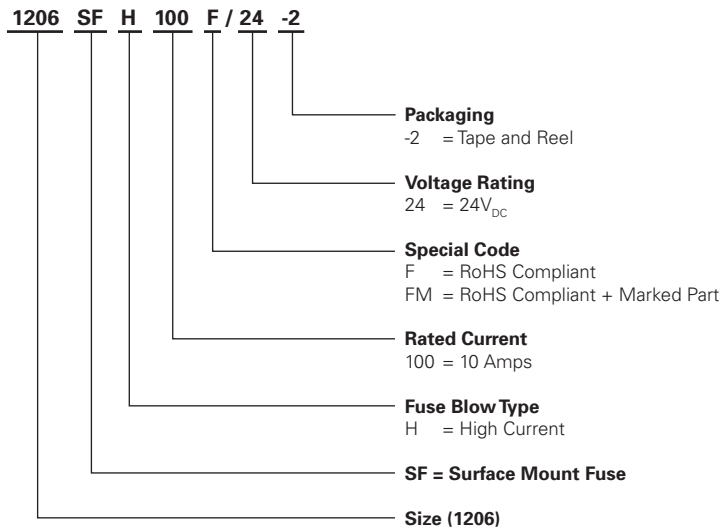
UL File # E197536

Part Numbering System for Fast-Acting, Slow-Blow And 0603 Very Fast-Acting Chip Fuses

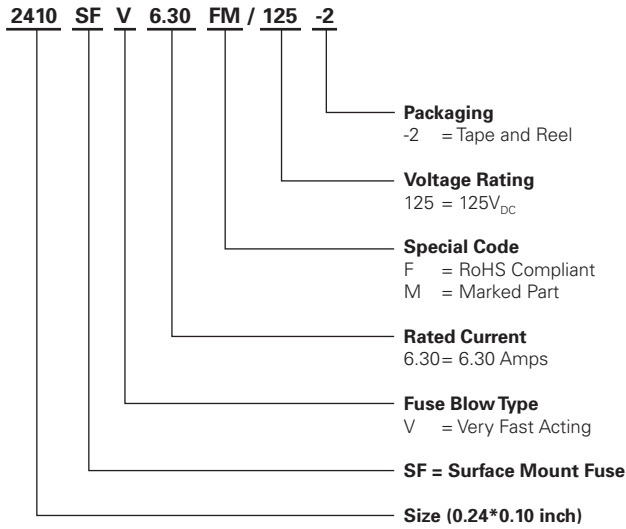


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Part Numbering System for High-Current-Rated Chip Fuses



Part Numbering System for 2410 Very Fast-Acting Fuses



Warning :

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