

## 477 Series, 5x20 mm, Time-Lag Fuse



### Description

400Vdc/500Vac rated, 5x20mm, time-lag, surge withstand ceramic body cartridge fuse.

### Features

- Designed to International (IEC) Standard for use globally.
- Follow the IEC 60127-2, Sheet 5 specification for time-lag fuses
- Available in cartridge and axial lead form
- RoHS compliant and lead-free

### Applications

High energy and power efficient applications.

### Agency Approvals

Agency	Agency File Number	Ampere Range
	Cartridge: NBK040609-JP1021A NBK040609-JP1021C NBK100408-JP1021A	1A – 5A 6.3A – 12A 16A
	Leaded: NBK040609-JP1021B NBK040609-JP1021D NBK100408-JP1021B	1A – 5A 6.3A – 12A 16A
	1219190	0.500A – 8A
	E10480	0.5A – 5A(600VAC) 0.5A – 16A(400VDC) 6.3A – 16A(500VAC)
	40025413	1A, 3.15A (500VAC) 1A, 3.15A (400VDC)
	J50248089	10A/12A/16A
	N/A	0.500A – 16A

### Electrical Characteristics for Series

% of Ampere Rating	Ampere Rating	Opening Time
150%	.5 - .8	60 minutes, Minimum
	1 - 3.15	60 minutes, Minimum
	4 - 6.3	60 minutes, Minimum
210%	.5 - .8	30 minutes, Minimum
	1 - 3.15	30 minutes, Minimum
	4 - 6.3	30 minutes, Minimum
275%	.5 - .8	.25 sec., Min.; 80 sec. Max.
	1 - 3.15	.75 sec., Min.; 80 sec. Max.
	4 - 6.3	.75 sec., Min.; 80 sec. Max.
400%	.5 - .8	.75 sec., Min.; 80 sec. Max.
	1 - 3.15	.05 sec., Min.; 5 sec. Max.
	4 - 6.3	.095 sec., Min.; 5 sec. Max.
1000%	.5 - .8	.15 sec., Min.; 5 sec. Max.
	1 - 3.15	.15 sec., Min.; 5 sec. Max.
	4 - 6.3	.15 sec., Min.; 5 sec. Max.
1000%	.5 - .8	.005 sec., Min.; .15 sec. Max.
	1 - 3.15	.01 sec., Min.; .15 sec. Max.
	4 - 6.3	.01 sec., Min.; .15 sec. Max.
1000%	.5 - .8	.01 sec., Min.; .15 sec. Max.
	1 - 3.15	.01 sec., Min.; .15 sec. Max.
	4 - 6.3	.01 sec., Min.; .15 sec. Max.
1000%	.5 - .8	.01 sec., Min.; .15 sec. Max.
	1 - 3.15	.01 sec., Min.; .15 sec. Max.
	4 - 6.3	.01 sec., Min.; .15 sec. Max.
1000%	.5 - .8	.01 sec., Min.; .15 sec. Max.
	1 - 3.15	.01 sec., Min.; .15 sec. Max.
	4 - 6.3	.01 sec., Min.; .15 sec. Max.

### Additional Information



Datasheet



Resources



Samples

### Electrical Characteristic

Amp Code	Amp Rating	Max Voltage Rating (V)		Interrupting Rating	Nominal Cold Resistance (Milli-ohms)	Nominal Melting $I^2t$ (A <sup>2</sup> sec.)	Agency Approvals				
		AC	DC				PS E	C UL US	S	△	VDE
.500	0.5	500	400	100A@500VAC 1500A@400VDC	1055.900	0.300		X*	X**		
.800	0.8	500	400		430.000	0.909		X*	X**		
001.	1	500	400		139.400	1.800	X	X*	X**		X
002.	2	500	400		55.200	9.120	X	X*	X**		
3.15	3.15	500	400		27.700	50.109	X	X*	X**		X
004.	4	500	400	100A@500VAC 500A@400VDC	17.200	52.480	X	X*	X**		
005.	5	500	400		13.700	76.500	X	X*	X**		
06.3	6.3	500	400		10.970	121.451	X	X	X**		
008.	8	500	400		8.305	203.520	X	X	X**		
010.	10	500	400		4.950	509.000	X	X		X	
012.	12	500	400		4.730	576.000	X	X		X	
016.	16	500	400		100A@500VAC 400A@400VDC	3.100	1331.200	X	X		X***

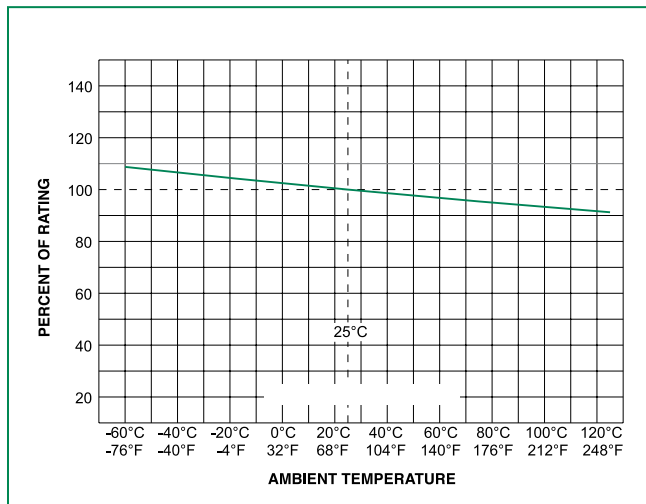
\*100A @ 600Vac also available. Add suffix "MXE6P". Example: 0477004.MXE6P.

\*\*Semko approval for 100A@500Vac & 200A@400Vdc.

$I^2t$  test at 10x rated current.

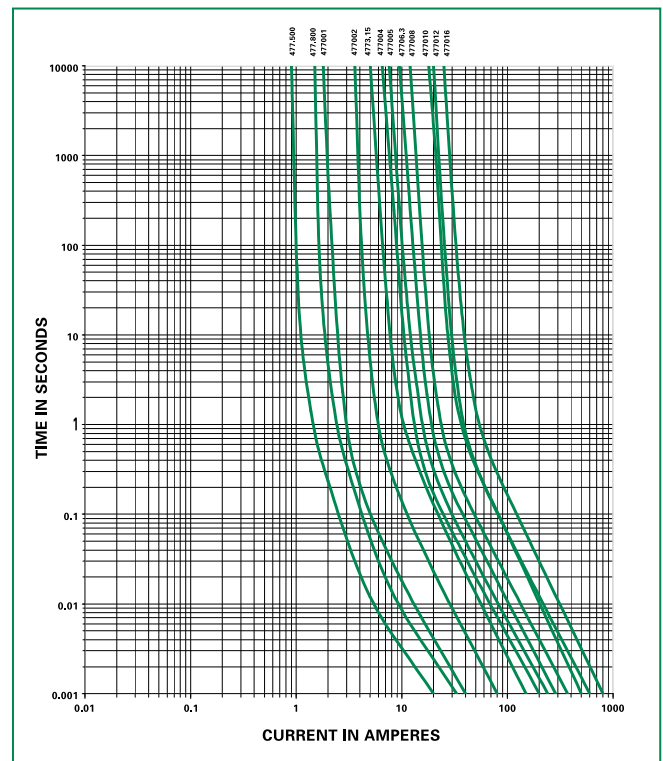
\*\*\*100A@ 500Vac and 300A@400Vdc for 16A

### Temperature Re-rating Curve

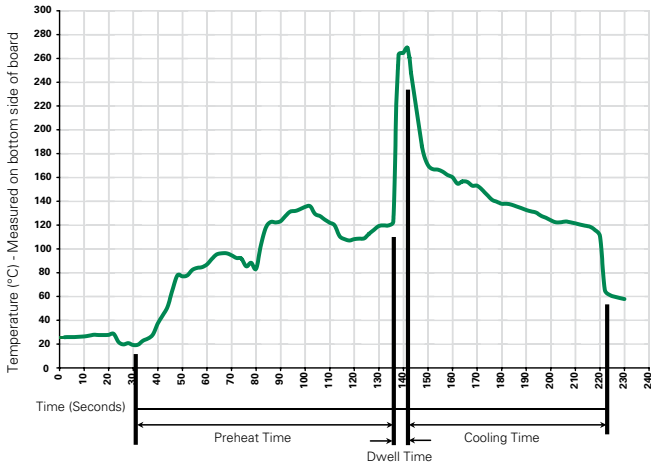


Note:  
Derating depicted in this curve is in addition to the standard derating of 25% for continuous operation.

### Average Time Current Curves



### Soldering Parameters - Wave Soldering



### Recommended Process Parameters:

Wave Parameter	Lead-Free Recommendation
<b>Preheat:</b> (Depends on Flux Activation Temperature)	(Typical Industry Recommendation)
Temperature Minimum:	100°C
Temperature Maximum:	150°C
Preheat Time:	60-180 seconds
<b>Solder Pot Temperature:</b>	260°C Maximum
<b>Solder Dwell Time:</b>	2-5 seconds

### Recommended Hand-Solder Parameters:

Solder Iron Temperature: 350°C +/- 5°C  
Heating Time: 5 seconds max.

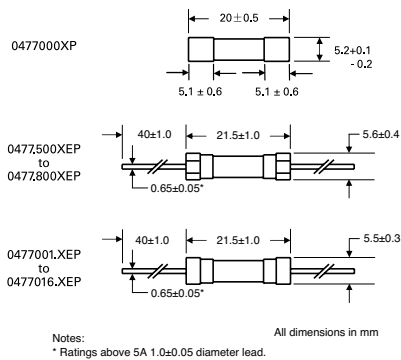
**Note: These devices are not recommended for IR or Convection Reflow process.**

### Product Characteristics

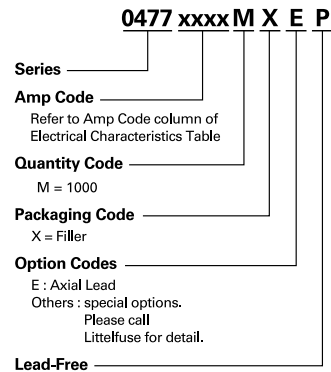
<b>Materials</b>	<b>Body:</b> Ceramic <b>Cap:</b> Nickel-plated Brass <b>Leads:</b> Tin-plated Copper
<b>Terminal Strength</b>	MIL-STD-202, Method 211, Test Condition A
<b>Solderability</b>	MIL-STD-202 Method 208
<b>Product Marking</b>	<b>Cap 1:</b> Brand logo, current and voltage ratings <b>Cap 2:</b> Series and agency approval markings
<b>Packaging</b>	Available in Bulk (M=1000 pcs/pkg)

<b>Operating Temperature</b>	-55°C to +125°C
<b>Thermal Shock</b>	MIL-STD-202, Method 107, Test Condition B (5 cycles, -65°C to +125°C)
<b>Vibration</b>	MIL-STD-202, Method 201
<b>Humidity</b>	MIL-STD-202, Method 103, Test Condition A (High RH (95%) and elevated temp (40°C) for 240 hours)
<b>Salt Spray</b>	MIL-STD-202, Method 101, Test Condition B

### Dimensions



### Part Numbering System



### Packaging

Packaging Option	Packaging Specification	Quantity	Quantity & Packaging Code	Reel Size
<b>477 Series</b>				
Bulk	N/A	1000	MX	N/A
Bulk	N/A	1000	MXE	N/A
Reel and Tape	N/A	1000	MRET1	T1=53mm (2.087")