

220 Series, Lead-Free 2AG Special Fuse



Description

The 220 Series is a 2AG special fuse with various voltage ratings that provide special electric performance as required.

Features

- In accordance with Underwriters Laboratories Standard UL/CSA/NMX 248-14
- Available in cartridge and axial lead format with various forming dimensions
- RoHS compliant and Lead-free
- Conforms to DENAN's Appendix 3

Applications

Used as supplementary protection in appliance or utilization equipment to provide individual protection for components or internal circuits.

Agency Approvals

Agency	Agency File Number	Ampere Range
	E10480	0003,0004,0010,0011, 0025,0029,0030,0031,0036
	E10480	0007,0012,0013,0019, 0044,0045,0059,0060,0061
	Cartridge Version NBK200405-E10480A NBK200405-E10480C NBK110512-E10480A NBK190619-E10480A	1A 1.25A - 3.5A 4A - 5A 6A - 7A
	Axial Leaded Version NBK200405-E10480B NBK200405-E10480D NBK110512-E10480B NBK190619-E10480B	1A 1.25A - 3.5A 4A - 5A 6A - 7A
	29862	0003,0004,0007,0010, 0011,0013,0019,0029,0044
	N/A	0003-0061

Additional Information



Datasheet



Resources



Samples



Accessories

For recommended fuse accessories for this product series, see '[Recommended Accessories](#)' section.

Electrical Characteristics for Series

% of Ampere Rating	Amp code	Opening Time
100%	0007,0012,0013,0019, 0031,0036,0037,0044, 0054,0060,0061	4 hours, Minimum
135%		1 hour, Maximum
200%		1 sec., Maximum

% of Ampere Rating	Amp code	Opening Time
100%	0025,0030,0038,0040, 0045,0059	4 hours, Minimum
135%		1 hour, Maximum
200%		3 secs., Minimum
		20 secs., Maximum

% of Ampere Rating/ Overload Current	Amp code	Opening Time
100%	0010	4 hours, Minimum
150%		15 mins, Maximum
0.9A		90 secs., Maximum

Overload Current	Amp code	Opening Time
0.6A	0003,0004,0011	90 secs., Maximum

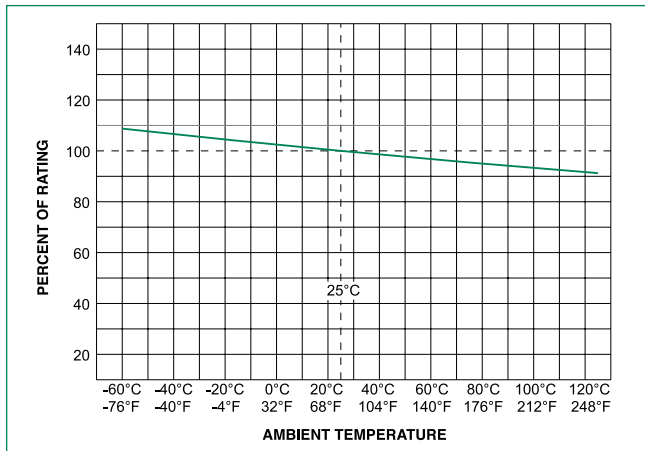
Overload Current	Amp code	Opening Time
0.6A	0029	90 secs., Maximum
2A		2 secs., Maximum
6A		0.5 sec., Maximum

Electrical Characteristics

Ampere Rating (A)	Amp Code	Max Voltage Rating (V)	Interrupting Rating*	Nominal Cold Resistance (Ohms)	Nominal Melting I ² t (A ² sec)	Agency Approvals				
						UL	RU	PS	SP	CE
0.35	0003	250	35A@250Vac, 10KA@125Vac	1.3100	0.490	X	-	-	X	X
0.35	0004	250		1.3100	0.490	X	-	-	X	X
3	0007	350	100A@350Vac, 60A@530Vac	0.0317	4.62	-	X	X	X	X
0.55	0010	250	35A@250Vac, 10KA@125Vac, 10KA@125Vdc	0.4945	2.04	X	-	-	X	X
0.35	0011	250	35A@250Vac, 10KA@125Vac	1.3100	0.49	X	-	-	X	X
2	0012	350	100A@350Vac	0.0497	1.50	-	X	X	-	X
5	0013	300		0.0186	170	-	X	X	X	X
3	0019	350	100A@350Vac, 100A@125Vdc	0.0317	4.62	-	X	X	X	X
1.25	0025	250	100A@250Vac, 10KA@125Vac, 10KA@125 Vdc	0.1460	15.4	X	-	X	-	X
0.35	0029	250	35A@250Vac, 10KA@125Vac	1.3100	0.490	X	-	-	X	X
0.375	0030	250	35A@250Vac, 10KA@125Vac, 10KA@125Vdc	1.1685	0.82	X	-	-	-	X
0.3	0031	250		0.5900	0.0300	X	-	-	-	X
0.5	0036	300	35A@300Vac, 10KA@125Vac	0.2650	0.365	X	-	-	-	X
0.75	0037	300		0.1520	1.05	-	-	-	-	X
5	0038	250	50A@250Vac	0.0186	267	-	-	-	-	X
0.5	0040	250	35A@250Vac, 10KA@125Vac, 10KA@125Vdc	0.6935	1.58	-	-	-	-	X
1	0044	350	100A@350Vac	0.1027	2.22	-	X	X	X	X
2	0045	350	100A@250Vac, 100A@350Vac, 10KA@125Vac, 10KA@125Vdc	0.0698	30.0	-	X	X	-	X
7	0059	350	100A@350Vac / 160A@140Vdc	0.0116	464	-	X	X	-	X
0.5	0060	350	35A@350Vac	0.2650	0.365	-	X	-	-	X
0.75	0061	350		0.1520	1.05	-	X	-	-	X

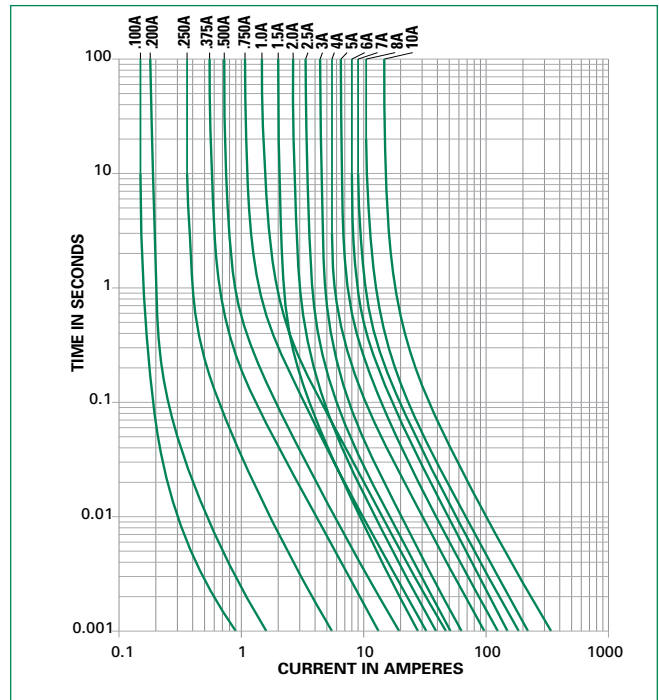
Note
*: Interrupting Rating may differ based on Agency Approval. See Agency Approval certificate for more details.

Temperature Re-rating Curve

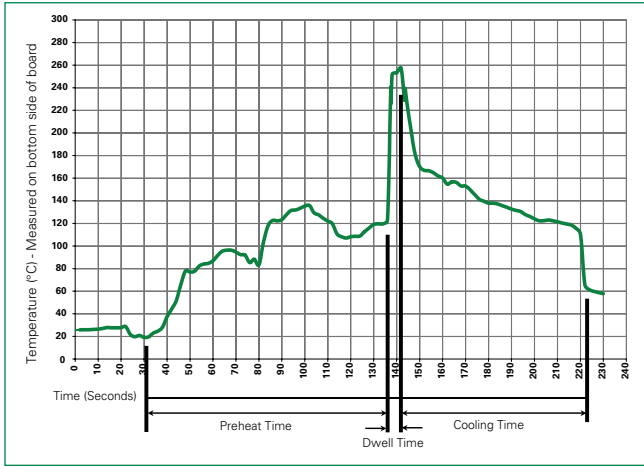


Note:
Rerating depicted in this curve is in addition to the standard derating of 25% for continuous operation.

Average Time Current Curves



Soldering Parameters - Wave Soldering



Recommended Process Parameters:

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

Recommended Hand-Solder Parameters:

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

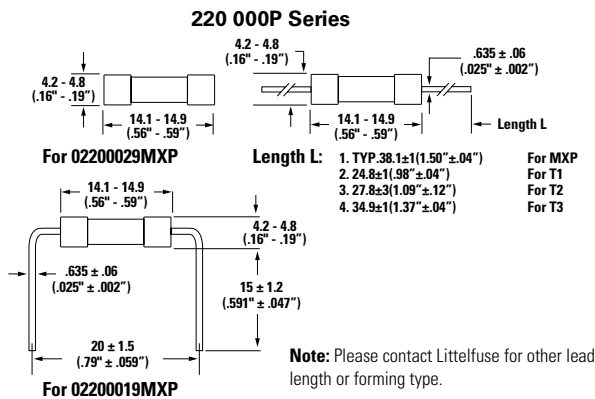
Note: These devices are not recommended for IR or Convection Reflow process.

Product Characteristics

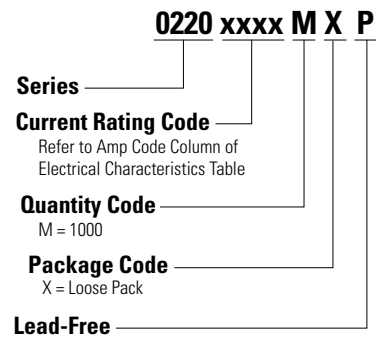
Material	Body: Glass Cap: Nickel-plated brass Leads: Tin-plated Copper
Terminal Strength	MIL-STD-202, Method 211, Test Condition A
Solderability	MIL-STD-202 method 208
Product Marking	Cap1: Brand logo, current and voltage ratings Cap2: Series and agency approval marks

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

Dimensions



Part Numbering System



Packaging

Packaging Option	Packaging Specification	Quantity	Quantity & Packaging Code	Reel Size
Bulk	N/A	1000	MX	N/A
Bulk	N/A	1000	MXSL	N/A
Reel and Tape	EIA 296-E	1000	MRT1	53mm (2.087")
Reel and Tape	EIA 296-E	1500	DAT1	53mm (2.087")
Reel and Tape	EIA 296-E	1500	DRT1	53mm (2.087")
Reel and Tape	EIA 296-E	1500	DRT2	63mm (2.500")
Reel and Tape	EIA 296-E	1500	DRT3	73mm (2.874")
Reel and Tape	EIA 296-E	2500	ERT1	53mm (2.087")

Recommended Accessories

Accessory Type	Series	Description	Max Application Voltage	Max Application Amperage
Holder	245	Panel Mount Shock-Safe Fuseholder	300	10
	150	In-Line Fuseholder	350	10
	286	Panel Mount Flip-Top Shock-Safe Fuseholder	250	10
Block	254	OMNI-BLOK® Fuse Block	400	10
Clip	111	PC Board Mount Fuse Clip	250	10

Notes:

1. Do not use in applications above rating.
2. Please refer to fuseholder data sheet for specific re-rating information.
3. Please contact factory for applications greater than the max voltage and amperage shown.