






RoHS  **220 Series, Lead-Free 2AG Special Fuse**



### Agency Approvals

Agency	Agency File Number	Ampere Range
	E10480	0003,0004,0010,0011,0025,0029,0031,0036
	E10480	0007,0012,0013,0019,0037,0044,0045,0059,0060,0061
	NBK200405-E10480 NBK060405-E10480 NBK210405-E10480	Cartridge: 0007,0012,0013,0019,0044 Pigtail: 0007,0012,0013,0019,0044 Cartridge & Pigtail: 0025,0045,0059
	LR29862	0003,0004,0007,0010,0011,0012,0013,0019,0025,0029,0031,0044,0045,0059
		0003-0061

### Description

The 2AG Special Fuses with various voltage ratings, provide special electric performance as required.

### Features

- In accordance with underwriter's Laboratories Standard UL 248-14
- Available in cartridge and axial lead format with various forming dimensions
- RoHS compliant and Lead-free

### Applications

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

### 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%	0025,0038,0040,0045,0059	4 hours, Minimum
135%		1 hour, Maximum
200%		3 secs., Minimum 20 secs., Maximum

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

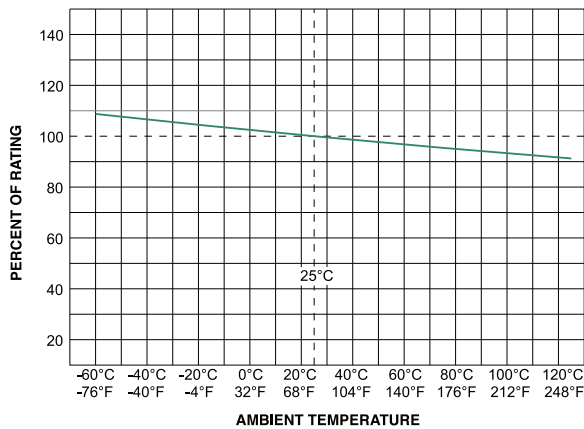
% of Ampere Rating	Amp code	Opening Time
0.6A	0003,0004,0011	90 secs., Maximum

% of Ampere Rating	Amp code	Opening Time
0.6A	0029	90 secs., Maximum
2A		2 secs., Maximum
6A		0.5 sec., Maximum

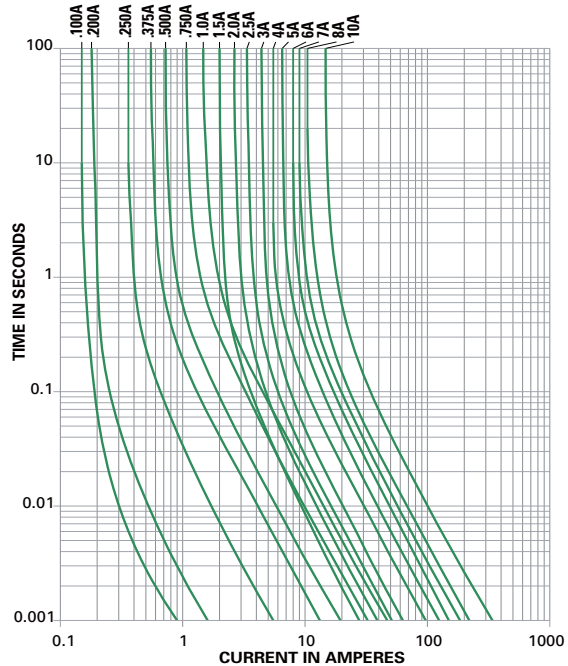
### Electrical Characteristics

Ampere Rating (A)	Amp Code	Max Voltage Rating (V)	Interrupting Rating	Nominal Cold Resistance (Ohms)	Nominal Melting I <sup>2</sup> t (A <sup>2</sup> sec)	Agency Approvals				
						UL	RU	PS E	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	1.16	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	X
5	0013	300		0.0186	170		X	X	X	X
3	0019	350	100A@350Vac, 100A@125Vac	0.0317	4.62		X	X	X	X
1.25	0025	250	100A@250Vac, 10KA@125Vac, 10KA@125 Vac	0.1460	9.80	X		X	X	X
0.35	0029	250	35@250Vac, 10KA@125Vac	1.3100	0.490	X			X	X
0.375	0030	250	35A@250Vac, 10KA@125Vac, 10KA@125Vdc	1.1685	0.580					X
0.3	0031	250		0.5900	0.0300	X			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			X
5	0038	250	50A@250Vac	0.0186	267					X
0.5	0040	250	35A@250Vac, 10KA@125Vac, 10KA@125Vdc	0.6935	1.16					X
1	0044	350	100A@350Vac	0.1027	2.22		X	X	X	X
2	0045	350	100A@250Vac, 100@350Vac, 10KA@125Vac, 10KA@125Vdc	0.0698	30.0		X	X	X	X
7	0059	350	100A@350Vac / 160A@140Vdc	0.0116	464		X	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

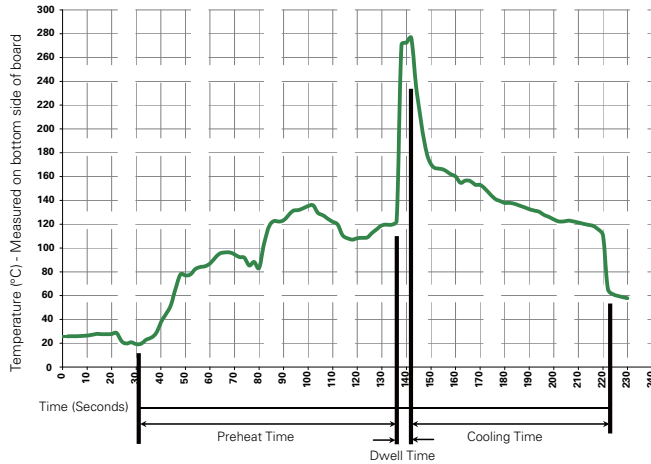
### Temperature Derating Curve



### 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 Max.
<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.**

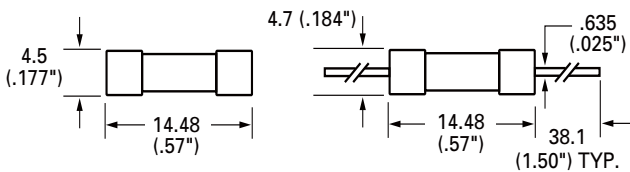
### Product Characteristics

<b>Material</b>	Body: Glass Cap: Nickel-plated brass Leads: Tin-plated Copper
<b>Terminal Strength</b>	MIL-STD-202G, Method 211A, Test Condition A
<b>Solderability</b>	Reference IEC 60127 Second Edition 2003-01 Annex A
<b>Product Marking</b>	Cap1: Brand logo, current and voltage ratings Cap2: Series and agency approval marks

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

### Dimensions

#### 220 000P Series



### Part Numbering System

#### 0220 xxxx M X P

<b>Series</b>	0220
<b>Current Rating Code</b>	xxxx
Refer to Amp Code column of Electrical Characteristics Table	
<b>Quantity Code</b>	M
M = 1000	
<b>Packaging Code</b>	X
X = Loose Pack	
<b>Lead-free</b>	P

## 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	52mm (2.062")
Reel and Tape	EIA 296-E	1500	DAT1	52mm (2.062")
Reel and Tape	EIA 296-E	1500	DRT1	52mm (2.062")
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	52mm (2.062")