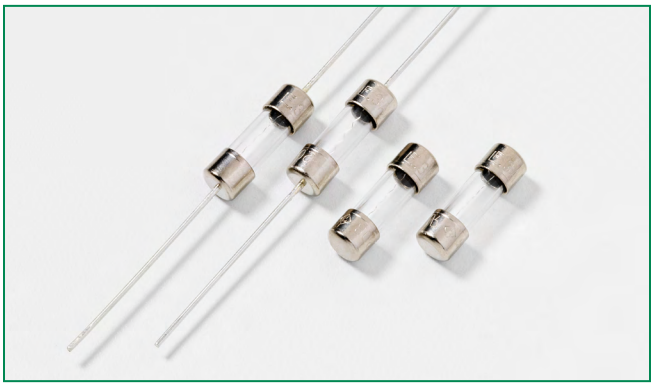
220 Series, Lead-Free 2AG Special Fuse



Description

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

Features

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

Agency Approvals

Agency	Agency File Number	Ampere Range
UL	E10480	0003,0004,0010,0011, 0025,0029,0030,0031, 0036
VDE	E10480	0007,0012,0013,0019, 0044,0045,0059,0060, 0061
PSE	NBK200405-E10480A/B/C/D NBK110512-E10480A/B NBK210405-E10480E/F	1A - 3.5A 4A - 5A 6A - 7A
CSA	29862	0003,0004,0007,0010, 0011,0013,0019,0029, 0044
CE		0003-0061

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%	0025,0030,0038,0040, 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

Additional Information

Datasheet | Resources | Samples | Accessories

For recommended fuse accessories for this product series, see 'Recommended Accessories' section.

Revised: 06/23/16

Axial Lead & Cartridge Fuses

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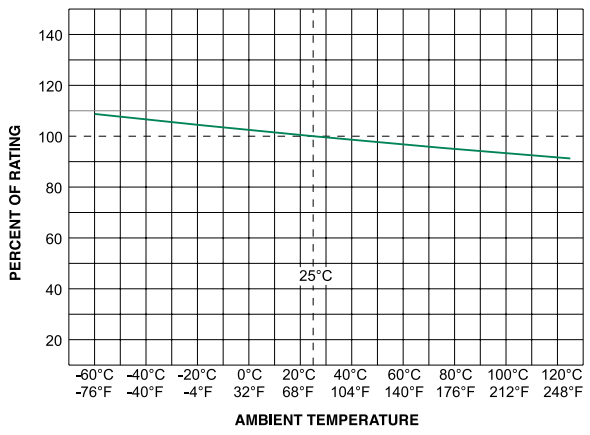
Electrical Characteristics

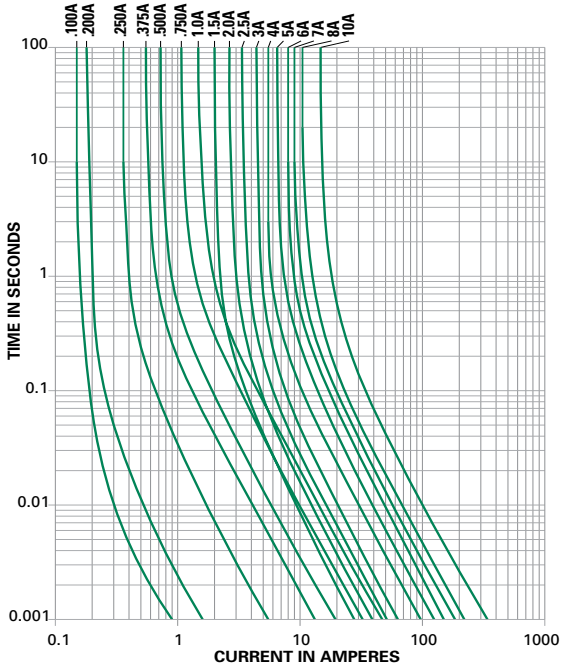
Ampere Rating (A)	Amp Code	Max Voltage Rating (V)	Interrupting Rating	Nominal Cold Resistance (Ohms)	Nominal Melting I^2t (A^2 sec)	Agency Approvals				
						UL			CSA	CE
0.35	0003	250	35A@250Vac, 10KA@125Vac	1.3100	0.490	X			X	X
0.35	0004	250		1.3100	0.490	X			X	X
3	0007	350	100A@350Vac, 60A@530Vac	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	17.0		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

Temperature Re-rating Curve



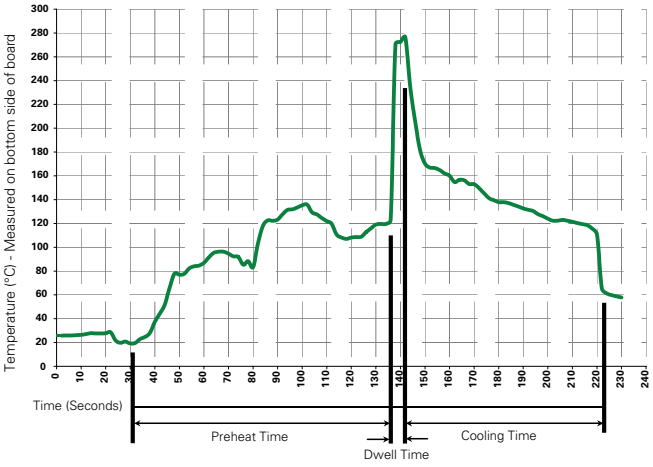
Note:
Rerating depicted in this curve is in addition to the standard derating of 25% for continuous operation.

Average Time Current Curves



Revised: 06/23/16

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.

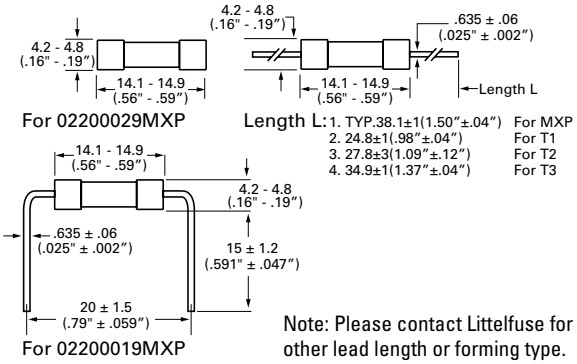
Product Characteristics

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

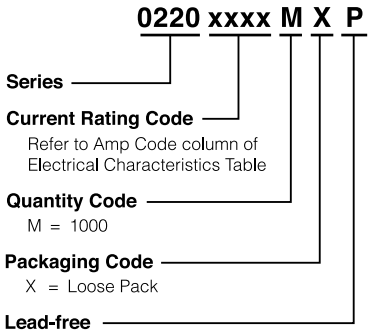
Dimensions

220 000P Series



Note: Please contact Littelfuse for other lead length or forming type.

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")

Revised: 06/23/16

Axial Lead & Cartridge Fuses

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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.

Revised: 06/23/16