

2AG > Time Lag > 229/230 Series

229/230 Series 2AG, Slo-Blo® Fuse with Indicating Option Rots @ @ @ A @ <> (E



Agency Approvals				
Agency	Agency File Number	Ampere Range		
(ŲL)	E10480	0.250A - 3.5A		
S∯ -	29862	0.250A - 3.5A		
A L	E10480	4A - 7A		
۹.	29862	4A - 7A		
PS	229 (Cartridge Form) NBK200405-E10480C NBK110512-E10480A NBK190619-E10480A	1A - 3.5A 4A - 5A 6A - 7A		
E	230 (Axial Leaded Form) NBK200405-E10480D NBK110512-E10480B NBK190619-E10480B	1A - 3.5A 4A - 5A 6A - 7A		
Œ	N/A	0.250A - 7A		

Electrical Characteristics for Series

% of Ampere Rating	OpeningTime
100%	4 hours, Minimum
135%	1 hour, Maximum
200%	3 seconds, Minimum
	20 seconds, Maximum

Description

Littelfuse 229/230 series Slo-Blo[®] Fuses are available in 2AG size cartridge or axial lead form, offer tripped fuse indicating option, and offer features designed to meet rigorous Telecom industry requirements.

229/230 series product ordered with the tripped fuse indicating option show discoloration of the glass body immediately after trip. They offer the same performance characteristics as standard product, and help to reduce time locating the tripped fuse and troubleshooting circuit issues.

The 229/230 series 0.25A - 1.25A range combines conventional overcurrent protection with ability to withstand high current, short duration pulses which complies to short circuit requirements of UL 60950-1/ UL 62368-1 for telephone equipment. Insulating sleeve option is also available. R efer to the Surge Withstand Specifications section of this document for additional information.

Features

- Available in cartridge and axial lead form, and a wide range of lead forming dimension and packaging options
- In accordance with UL/ CSA/NMX Standard 248-14
- RoHS compliant and Lead-free
- Tripped fuse indicating option (add suffix 'S' to part number)
- Fuses are available for board washable with the additional sealing process (add suffix 'A' to part number)
- Sleeved fuse option available (contact Littelfuse for additional information)

Additional Information



Datasheet

229 Series

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Resources 229 Series





Resources 230 Series Samples 230 Series

For recommended fuse accessories for this product series, see '<u>Recommended Accessories</u>' section.







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Electr	lectrical Characteristic Specification by Item										
	Ampere	Voltage			Nominal		Agency Approvals				
Amp Code	Rating (A)	Rating (V)	Interrupting Rating	Nominal Cold Resistance (Ohms)	Melting I ² t (A ² sec)	(UL)	77	PSE	SP.	۹.	CE
.250	0.25	250		2.4300	0.339	х			х		х
.350	0.35	250	_	1.3100	0.640	х			х		х
.375	0.375	250	35A@250Vac	1.1685	0.820	х			х		х
.500	0.5	250	10KA@125Vac	0.6935	1.64	х			x		х
.600	0.6	250	10KA@125Vdc	0.4805	1.75	х			х		х
.750	0.75	250	80A@310Vac	0.3430	2.95	х			х		х
.800	0.8	250		0.3060	3.45	х			х		х
001.	1	250		0.2120	5.64	х		х	x		х
1.25	1.25	250		0.1460	16.8	х		х	х		х
01.5	1.5	250	100A@250Vac	0.1077	20.0	х		х	х		х
002.	2	250	10KA@125Vac	0.0698	30.0	х		х	х		х
2.25	2.25	250	10KA@125Vdc	0.0567	39.0	х		х	х		х
02.5	2.5	250	80A@310Vac	0.0502	50.0	х		x	х		х
003.	3	250		0.0383	77.0	х		х	х		х
03.5	3.5	250	100A@250Vac 10KA@125Vac 10KA@125Vdc	0.0312	110.0	х		x	x		x
004.	4	125		0.0258	148.0		x	x		х	х
005.	5	125	400A@125Vac	0.0186	267		х	х		х	х
006.	6	125	400A@125Vdc	0.0141	380		x	х		х	х
007.	7	125		0.0116	464		х	х		х	х

Surge Withstand Specificatons

Peak Withstand Current(Ip): These fuses will withstand 50 repetitions of a double exponential impulse wave having peak currents(Ip) and peak voltages as listed.

Amp Code	Ampere Rating (A)	Interrupting Rating	Nominal Cold Resistance (Ohms)	Nominal Melting I²t (A² sec)	10×160 μs 1500V	10×560 μs 800V	10×1000 µs 1000V
.250	0.25		2.4300	0.339	23.0A	16.6A	12.4A
.350	0.35		1.3100	0.640	34.0A	25.8A	19.3A
.375	0.375		1.1685	0.820	40.0A	25.4A	19.0A
.500	0.5	60A@600Vac	0.6935	1.64	60.0A	37.7A	28.2A
.600	0.6	40A@600Vac 7A@600Vac	0.4805	1.75	71.0A	47.2A	35.3A
.750	0.75	2.2A@600Vac	0.3430	2.95	91.0A	65.5A	49.0A
.800	0.8		0.3060	3.45	104.0A	68.9A	51.6A
001.	1		0.2120	5.64	130A	88.6A	66.3A
1.25	1.25*		0.1460	16.8	162.0A	118.1A	100.0A

* 500A peak, 2500V, 2×10 microseconds, 20 repetitions



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Temperature Re-rating Curve



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

Soldering Parameters - Wave Soldering

Average Time Current Curves



30 280 Temperature (°C) - Measured on bottom side of board 260 240 220 200 180 160 140 120 100 80 60 40 20 ٥ţ 10-40-50-230-60-70-80-90-100-110-20-30-50-60-170-180-200-210-Time (Seconds) Preheat Time Cooling Time → ► Dwell Time

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 Maximum
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.



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Product Characteristics

Materials	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 cycles65°C to 125°C)
Vibration	MIL-STD-202, Method 201
Humidity	MILSTD-202, Method 103, Test Condition A: High RH (95%) and Elevated temperature (40°C) for 240 hours
Salt Spray	MIL-STD-202, Method 101, Test Condition B

Dimensions Part Numbering System 230 000P Series 229 000P Series 4.2 - 4.8 _0.635 ± 0.06 (0.16" - 0.19") Series-(0.025" ± 0.002") 0229 = Cartridge 4.2 - 4.8 \square (0.16" - 0.19" 0230 = Axial Leaded 1 t 14.1 - 14.9 14.1 - 14.9 38.1 ± 1 (1.50" ± 0.04") TYP. (0.56" - 0.59") (0.56" - 0.59") Amp Code-Refer to Amp Code column of **Electrical Characteristics Table**



Lead-free

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

Notes:

Do not use in applications above rating.
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.

Packaging				
Packaging Option	Packaging Specification	Quantity	Quantity & Packaging Code	Taping Width
		229 Series		
Bulk	N/A	5	VX	N/A
Bulk	N/A	5	VXS	N/A
Bulk	N/A	100	HX	N/A



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Packaging Option	Packaging Specification	Quantity	Quantity &	Taping Width
			Packaging Code	
		229 Series (con		
Bulk	N/A	100	HXS	N/A
Bulk	N/A	1000	MX	N/A
Bulk	N/A	1000	MXS	N/A
		230 Series		
Bulk	N/A	5	VX	N/A
Bulk	N/A	5	VXS	N/A
Bulk	N/A	100	HX	N/A
Bulk	N/A	100	HXS	N/A
Bulk	N/A	1000	MX	N/A
Bulk	N/A	1000	MXE	N/A
Bulk	N/A	1000	MXF1	N/A
Bulk	N/A	1000	MXF16	N/A
Bulk	N/A	1000	MXF16O	N/A
Bulk	N/A	1000	MXF17	N/A
Bulk	N/A	1000	MXF17O	N/A
Bulk	N/A	1000	MXF23	N/A
Bulk	N/A	1000	MXF23O	N/A
Bulk	N/A	1000	MXF32	N/A
Bulk	N/A	1000	MXO	N/A
Bulk	N/A	1000	MXS	N/A
Reel and Tape	EIA 296-E	1500	DRT2	T2=63mm (2.500")
Reel and Tape	EIA 296-E	1500	DRT2S	T2=63mm (2.500")
Reel and Tape	EIA 296-E	1500	DRT4	N/A
Reel and Tape	EIA 296-E	2500	ERT2	T2=63mm (2.500")
Reel and Tape	EIA 296-E	2500	ERT2S	T2=63mm (2.500")
Reel and Tape	EIA 296-E	1000	MRT1E	T1=53mm (2.087")
Reel and Tape	EIA 296-E	1500	DAT1	T1=53mm (2.087")
Reel and Tape	EIA 296-E	1500	DAT10	T1=53mm (2.087")
Reel and Tape	EIA 296-E	1500	DRT1	T1=53mm (2.087")
Reel and Tape	EIA 296-E	1500	DRT1S	T1=53mm (2.087")
Reel and Tape	EIA 296-E	1500	DRT1SS	T1=53mm (2.087")
Reel and Tape	EIA 296-E	1500	DRT3	T3=73mm (2.874")
Reel and Tape	EIA 296-E	1500	DRT3S	T3=73mm (2.874")
Reel and Tape	EIA 296-E	2500	ERT1	T1=53mm (2.087")
Reel and Tape	EIA 296-E	2500	ERT1S	T1=53mm (2.087")
Reel and Tape	EIA 296-E	2500	ERT3	T3=73mm (2.874")
Reel and Tape	EIA 296-E	2500	ERT3S	T3=73mm (2.874")

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