

Blade Fuses - Illuminated



ATO

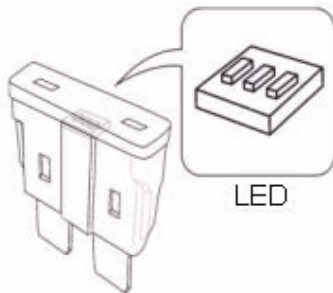
Photo Fuse



Features:

- The photo fuse is designed for the automobile and electrical industry.
- It has become the original equipment circuit protection standard for automobiles, trucks and low power system.
- The newer blade type is designed to include an indicating LED, which will be lighted as soon as fuse blew.
- Easy to find blown fuses in any location, quick to identify and fast to replace to save your precious time and man-power.
- Long life 1000 hours at least for LED life time.
- Safety (prevent resin melting) low temperature.
- Lower current under 5mA.
- Color coding : fuses are color coded for easy ampere identification.
- Materials : resin with zinc zloy termination.

Construction



Characteristics of Zinc Alloy

Termination : Zinc Alloy.

Test Specifications

Mechanical Testing Characteristic	Method	Limits		Actual Data
		Minimum	Maximum	
UTS (ksi)	ASTM ES	22.0	32.0	29.5



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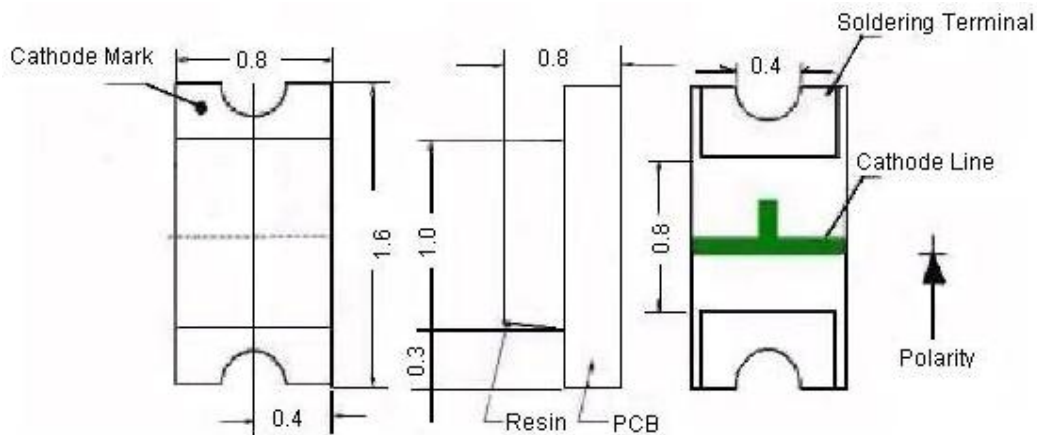
Test Specifications

Chemical Testing Characteristic	Method	Limits		Actual Data
		Minimum	Maximum	
Copper (Cu), ppm	Emission Spectroscopy	5000	7000	5440
Titanium (Ti)		1200	1800	1522
Lead (Pb)		-	100	18
Cadmium (Cd)		-	50	<5
Iron (Fe)		-	100	6
Aluminum (Al)		-	10	<5
Magnesium (Mg)		-	5	
Manganese (Mn)		-	50	
Nickel (Ni)		-	10	
Tin (Sn)		-	10	
Zinc (Zn)		N/A	Balance	-

Characteristics of LED

Voltage Rating : 12V dc, 24V dc and 32V dc.

Life Time : Around 1000 hours at 60 celsius. The resin won't be melted under 130 celsius.



Dimensions : Millimetres



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Reliability Test

Item	Frequency/Lots/Samples/ Failures	Standards Reference	Conditions
Precondition	For all reliability monitoring tests according to JEDEC Level 2	J-STD-020	Baking at 85°C for 24 hours. Moisture storage at 85°C/60% R.H. for 168 hours.
Solderability	1Q/1/22/0	JESD22-B102-B	Accelerated aging 155°C/24 hours. Tinning speed : 2.5+0.5cm/s. Tinning : A: 215°C/3+1s or B: 260°C/10+1s.
Resistance to soldering heat	1/100/0	And CNS-5068	3 x IR-reflow-soldering according to soldering profile.
Operating life test	1Q/1/40/0	JESD22-A113	Precondition : 85°C baking for 24 hours. 85°C/60%R.H. for 168 hours. T _{amb} 25°C; I _F = 20mA; duration 1000 hours.
High humidity, high temperature bias	1Q/1/45/0	CNS-11829	T _{amb} : 85°C. Humidity : 85% R.H., I _F = 5mA. Duration : 1000 hours.
High temperature bias	1Q/1/20/0	JESD-A101-B	T _{amb} : 55°C; I _F = 20mA. Duration : 1000 hours.
Pulse life test	1Q/1/40/0	HT specs.	T _{amb} = 25°C, I _f = 20mA, I _p = 100mA, Duty cycle = 0.125 (tp = 125µs, T = 1 second). Duration 500 hours).
Temperature cycle	1Q/1/76/0	JESD-A104-A	A cycle : -40 degree C, 15 minutes; +85 degree C, 15 minutes Thermal steady within 5 minutes. 300 cycles 2 chamber/air-to-air type.
High humidity storage test	1Q/1/40/0	IEC 68-2-14, Nb	60+3°C. 90+5/-10% R.H. for 500 hours.
High temperature storage test	1Q/1/40/0	CNS-6117	100+10°C for 500 hours.
Low temperature storage test	1Q/1/40/0	CNS-554	-40+5°C for 500 hours.

Characteristics of Fuse

Electrical Characteristics

Ampere Rating (%)	Current Rating (Ampere)	Operating Time	
		Minimum	Maximum
110	3 to 40	100 Hours	-
135		0.75 Seconds	1800 Seconds
200		0.15 Seconds	5 Seconds
350		0.08 Seconds	0.25 Seconds
600		-	0.15 Seconds



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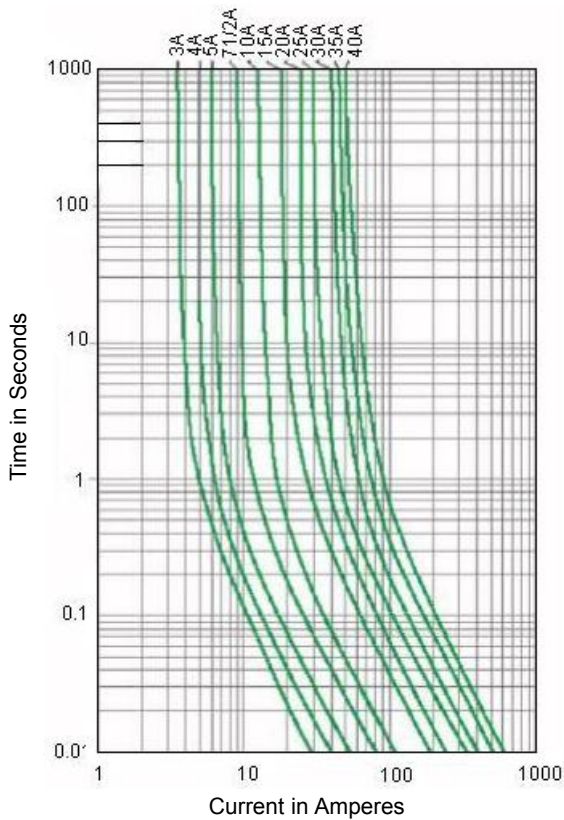
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Color Coding

Body Color Code	Ampere Rating (A)	Voltage Rating (V dc)	Normal Cold Resistance (Ohms)
Violet	3.0	32	0.0310
Pink	4.0		0.0230
Tan	5.0		0.0180
Brown	7.5		0.0110
Red	10.0		0.0077
Blue	15.0		0.0048
Yellow	20.0		0.0033
Natural	25.0		0.0025
Green	30.0		0.0018
Blue Green	35.0		0.0016
Amber	40.0		0.0014

Remarks: Measuring fuse zinc alloy resistance by MO-2002 series digital/milliohm meter.

Average Time Current Curve

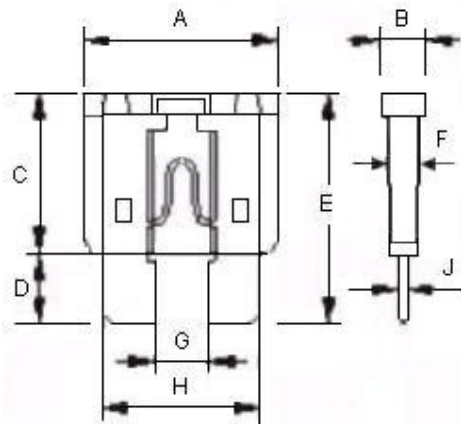


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Outline Dimensions



A	18.87 to 19.30
B	4.99 to 5.25
C	12.54 (Maximum)
D	6.17 to 6.67
E	18.41 to 19.05
F	3.59 to 3.80
G	3.90 to 4.13
H	14.35 to 14.61
J	0.61 to 0.69

Dimensions : Millimetres

Characteristics of Resin

Body : Plastic (130°C)

Test Specifications

Properties	Basic	Test Conditions
Specific gravity	1.20	23/23°C
Light transmission	88	3.0m/m thick
Flexural strength	23,000	23°C
Impact strength	85	1/8 inch
Heat distortion temperature	132°C	18.6 Kg/cm ² 120°C/hr
Mold shrinkage	0.5 to 0.7%	Parallel
Flammability	V-2	1/16 inch

Remarks: Under 24V dc power input and LED "ON" condition, the body housing is normal, not be melted under 130 celsius.



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Part Number Table

Description	Part Number
Fuse, Automotive, ATO, 5A	MCATP-L-E 5A
Fuse, Automotive, ATO, 7.5	MCATP-L-E 7.5A
Fuse, Automotive, ATO, 10A	MCATP-L-E 10A
Fuse, Automotive, ATO, 15A	MCATP-L-E 15A
Fuse, Automotive, ATO, 20A	MCATP-L-E 20A
Fuse, Automotive, ATO, 25A	MCATP-L-E 25A
Fuse, Automotive, ATO, 30A	MCATP-L-E 30A



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Notes:

International Sales Offices:

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