



## Features

- Fast switching
- Automatic reset
- SMB package
- Suitable for industrial lighting environments
- RoHS compliant\*

## Applications

- LED streetlights
- LCD backlighting
- Display lighting
- Intrinsically safe lighting

# LSP Series LED Shunt Protector

## General Information

Bourns® LSP Series protectors are electronic shunts that provide a current bypass when an LED element in an LED string fails open circuit. This ensures the remaining string of LEDs will continue to function. There are many cases where high reliability of the LED lighting must be maintained, such as LCD backlighting, transport lighting, avionics, intrinsically safe and low maintenance lighting.

The LSP Series is available in surface mount package DO-214AA (SMB) size format.



## Absolute Maximum Ratings (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

Rating		Symbol	Value	Unit
Repetitive peak off-state voltage	LSP0600	V <sub>DRM</sub>	6	V
	LSP0900		9	
	LSP1300		13	
	LSP1800		18	
Average on-state current (Note 1)		I <sub>T</sub>	350	mA
Operating junction temperature		T <sub>J</sub>	-40 to +150	°C
Storage temperature		T <sub>S</sub>	-65 to +150	°C
Lead temperature, soldering (10 s)			260	°C

Notes:

1. Using 75 mm x 75 mm 4-Layer PCB (EIA/JESD51-7), I<sub>T</sub> = 1.0 A

## Electrical Characteristics (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

Parameter	Test Conditions	Min.	Nom.	Max.	Unit
I <sub>DRM</sub> Repetitive peak off-state current	V <sub>D</sub> = V <sub>DRM</sub>			10	μA
V <sub>(BO)</sub> Breakover voltage	dv/dt = 750 V/ms, R <sub>SOURCE</sub> = 300	LSP0600	6	16	V
		LSP0900	9	18	
		LSP1300	13	26	
		LSP1800	18	33	
I <sub>H</sub> Holding current	I <sub>T</sub> = 1 A, di/dt = 30 mA/ms	5	30		mA
I <sub>BO</sub> Breakover current	di/dt = 0.8 A/ms			75	mA
V <sub>T</sub> On-state voltage	I <sub>T</sub> = 1 A			1.2	V

## Thermal Characteristics (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

Parameter	Test Conditions	Min.	Nom.	Max.	Unit
Junction to free air thermal resistance	EIA/JESD51-3 PCB, I <sub>T</sub> = 350 mA, T <sub>A</sub> = 25 °C		170		°C/W
Junction to free air thermal resistance	EIA/JESD51-7, 75 mm x 75 mm 4-Layer PCB, I <sub>T</sub> = 1.0 A, T <sub>A</sub> = 25 °C		90		°C/W

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\*RoHS Directive 2002/95/EC Jan 27, 2003 including Annex.

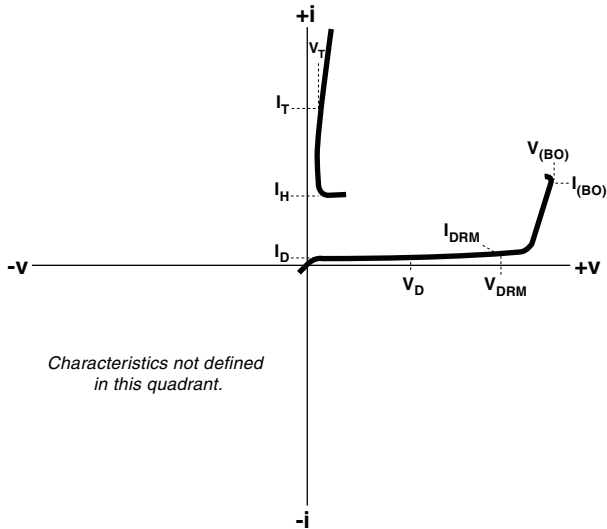
Specifications are subject to change without notice.

Customers should verify actual device performance in their specific applications.

# LSP Series LED Shunt Protector



V-I Characteristic



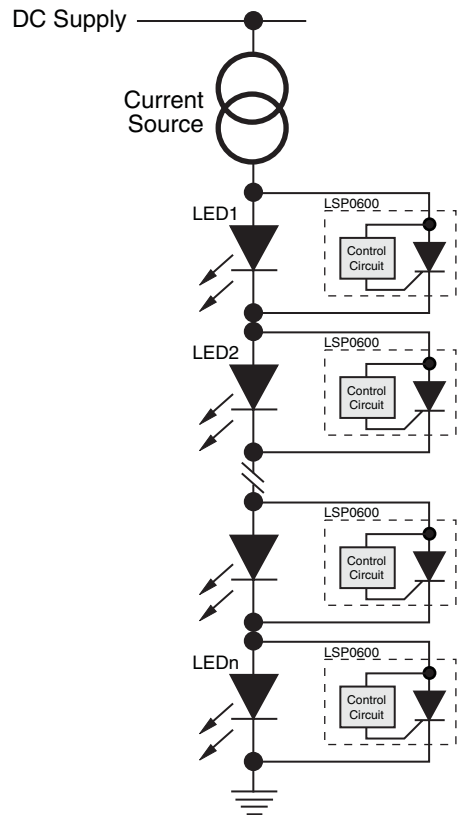
On-state Voltage vs. Junction Temperature



Normalized Breakover Voltage vs. Junction Temperature



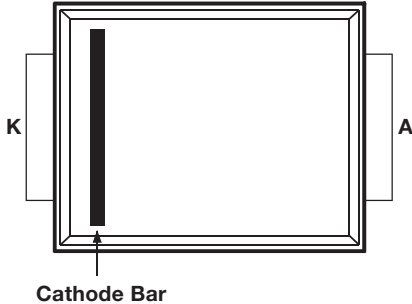
Typical Application



# LSP Series LED Shunt Protector

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## Product Specifications



Unit ..... Epoxy molded SMB D0-214AA package  
 Mold Material ..... UL94V-0  
 Terminations ..... 100 % matte tin-plated over copper alloy  
 Unit Weight ..... 102 mg.

## Packaging Specifications

Standard ..... EIA-481-1  
 Tape Width ..... 12 mm (.472 in.)  
 Reel Diameter ..... 330 mm (12.99 in.)  
 Part Alignment ..... Cathode bar adjacent to sprocket hole  
 Quantity per Reel ..... 3,000 pieces

## Typical Part Marking

	Top Side Marking
LSP0600BJR-S .....	LSP060
LSP0900BJR-S .....	LSP090
LSP1300BJR-S .....	LSP130
LSP1800BJR-S .....	LSP180

## How to Order

	<b>LSP 0600 BJ R - S</b>
Model Series _____	LED Shunt Protector
Off-State Voltage _____	0600 = 6 V 0900 = 9 V 1300 = 13 V 1800 = 18 V
Package _____	BJ = SMB DO-214AA Package
Standard Packaging _____	R = Tape and Reel Packaging (3,000 pcs./reel)
Termination _____	S = Pb Free Termination (RoHS Compliant)

**BOURNS®**

**Asia-Pacific:** Tel: +886-2 2562-4117 • Fax: +886-2 2562-4116

**Europe:** Tel: +41-41 768 5555 • Fax: +41-41 768 5510

**The Americas:** Tel: +1-951 781-5500 • Fax: +1-951 781-5700

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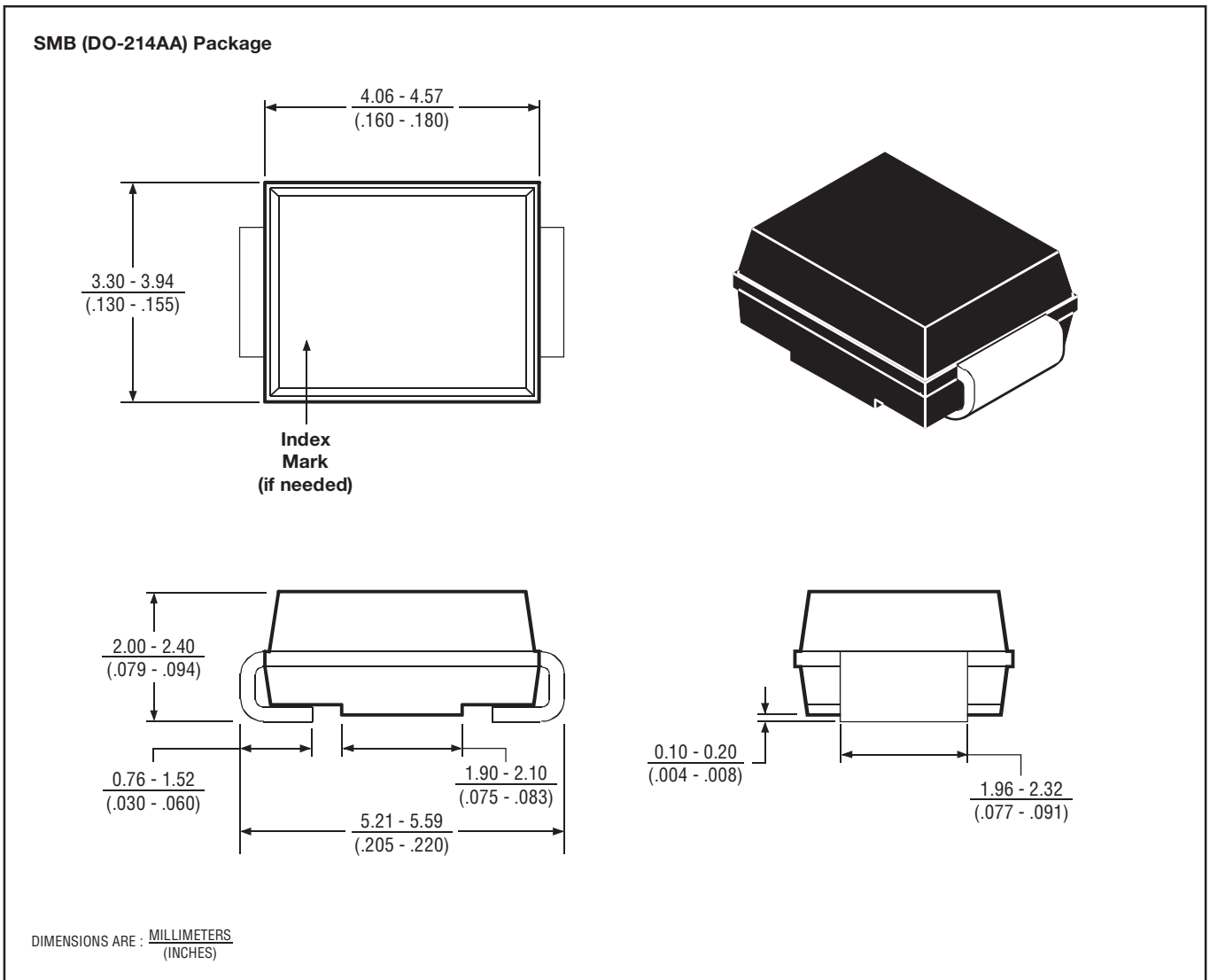


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**SMB (DO-214AA)**

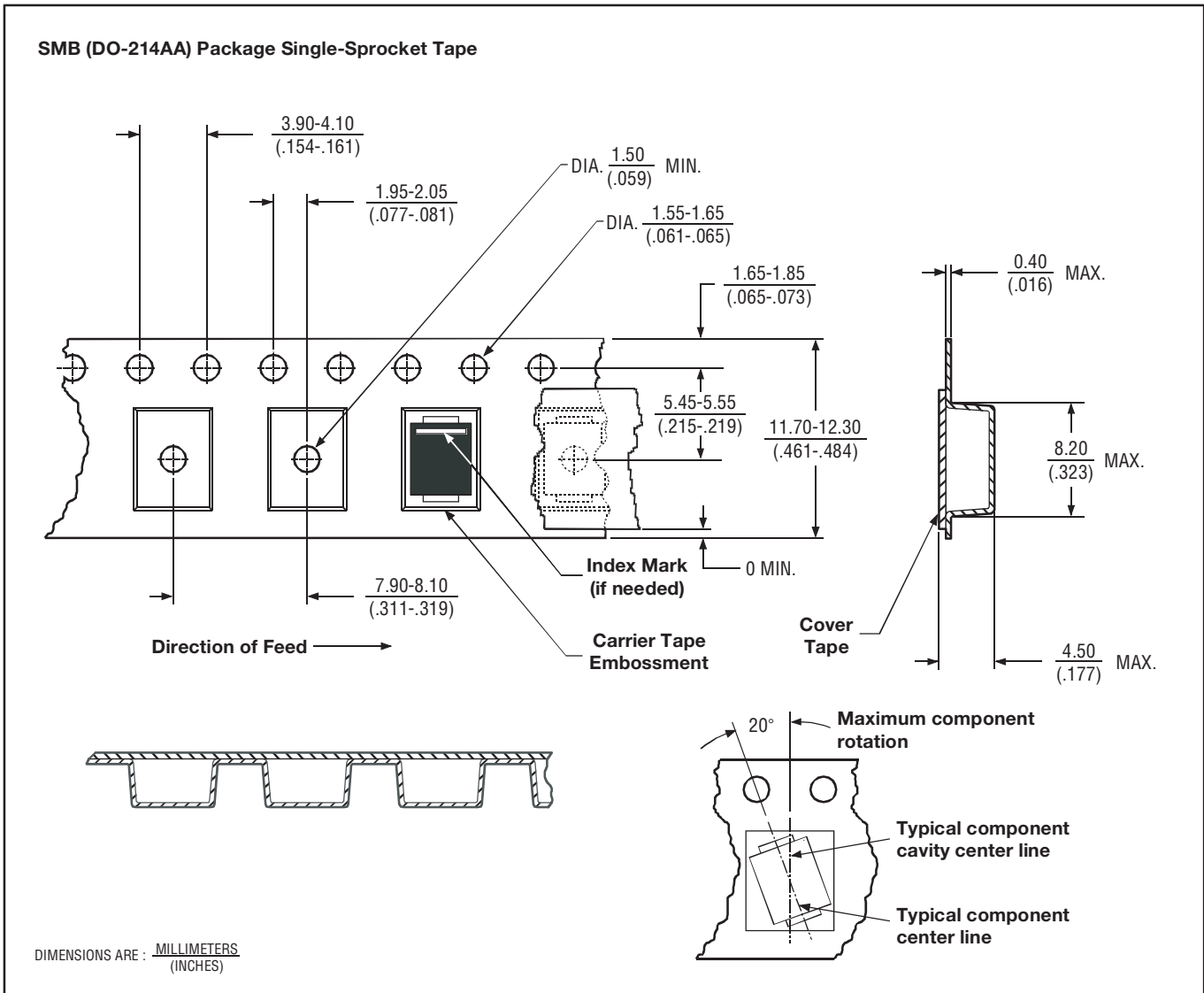
**Package Outline Dimensions**

This surface mount two terminal package consists of a circuit mounted on a lead frame and encapsulated within a plastic compound. The compound is designed to withstand normal soldering temperatures with no deformation and circuit performance characteristics will remain stable when operated in most high humidity conditions. Terminals require no additional cleaning or processing when used in soldered assembly.



MD-SMB-001-a

## Tape Dimensions



NOTES: A. The clearance between the component and the cavity must be within 0.05 mm (.002 in) MIN. to 0.65 mm (.026 in) MAX. so that the component cannot rotate more than  $20^\circ$  within the determined cavity.

B. Taped devices are supplied on a reel of the following dimensions:-

Reel diameter: 330 mm  $\pm 3.0$  mm (12.99 in  $\pm .118$  in)  
 Reel hub diameter: 75 mm (2.95 in) MIN.  
 Reel axial hole: 13.0 mm  $\pm 0.5$  mm (.512 in  $\pm .020$  in)

C. 3000 devices are on a reel.

MD-SMB-002-a

## Recommended Printed Wiring Land Pattern Dimensions

SMB (DO-214AA) Land Pattern



DIMENSIONS ARE:  $\frac{\text{MILLIMETERS}}{\text{(INCHES)}}$

MD-SMB-003-a