

LED bypass protection

Datasheet - production data

Features

Bidirectional device: LBP01-0810BUnidirectional device: LBP01-0803SC5

■ RoHS compliant

Benefits

 Keep LED strings on in case of LED open mode failure

Reduced maintenance cost

■ Increase lifetime of the lighting system

Complies with the following standards:

■ IEC61000-4-2 level 4

- ±15 kV (air discharge)
- ±8 kV (contact discharge)
- IEC 61000-4-5
 - ±1kV / 24 A

Applications

This device shunts failed LEDs in applications where LED strings can not be turned-off for safety reason due to a LED failure. Main applications are:

- Automotive headlights
- Traffic lights
- Aircraft runaway lights
- Emergency lighting systems
- Display panel backlighting
- Street lighting

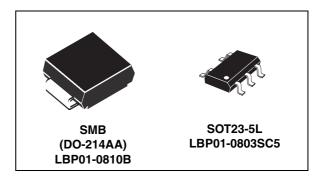
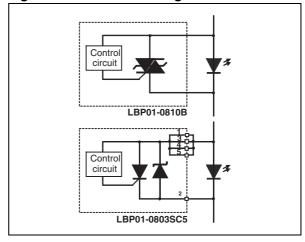


Figure 1. Functional diagrams



Description

The LBP01 series are bypass switches to be connected in parallel with 1 or 2 LEDs. In case of LED failure, this allows the current to flow through the other LEDs.

It also provides an overvoltage protection against surges defined in IEC 61000-4-2 and IEC 61000-4-5

Their robust dice also protect LEDs against surge.

These devices are compatible with LEDs up to 1 A.

LBP01 are packaged either in SMB or SOT23-5L

Characteristics LBP01

1 Characteristics

Table 1. Absolute maximum ratings ($T_{amb} = 25$ °C)

Symbol		Value	Unit	
V_{PP}	Peak pulse voltage	IEC 61000-4-2 contact discharge	30	kV
I _{PP}	Repetitive peak pulse cu	24	Α	
I _F On-sta	On-state DC current	SOT23-5L	0.35	Α
	On-state DC current	SMB	1	Α
Tj	Operating junction temperature range		-55 to 150	°C
T _{stg}	Storage temperature range		-65 to 150	°C
T _L	Maximum lead temperat	260	°C	

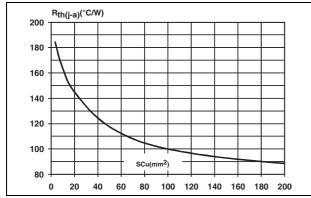
Table 2. Electrical characteristics ($T_{amb} = 25$ °C)

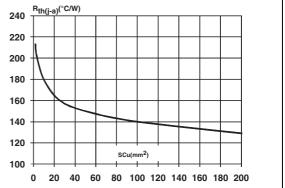
Symbol	Test conditions			Тур.	Max.	Unit
I _{RM}	V _{RM} = 3 V				100	nA
V _{BO}			8		15	V
I _H		SOT23-5L			200	mA
		SMB			200	IIIA
	I _{on} = 0.35 A ⁽¹⁾	SOT23-5L			2	V
V _{on}	I _{on} = 0.35 A	SMB			1.3	V
	I _{on} = 1 A	SMB			1.5	V
dV/dt			300			V/µs
R _{th(j-a)}	On recommended pad layout with copper area of 1 cm ²	SOT23-5L		140		°C/W
		SMB		100		°C/W

^{1.} Measured between pin 1, 3, 4, or 5 and pin 2

Figure 2. Thermal resistance, junction to ambient, versus copper area under each lead (SMB)

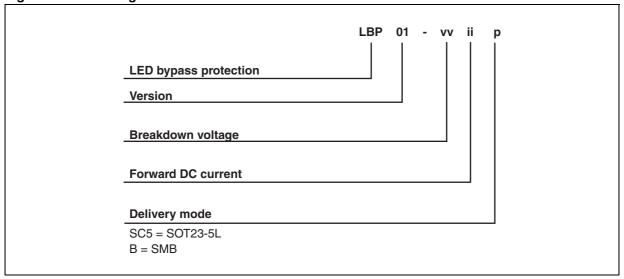
Figure 3. Thermal resistance, junction to ambient, versus copper area under each lead (SOT23-5L)





2 Ordering information scheme

Figure 4. Ordering information scheme



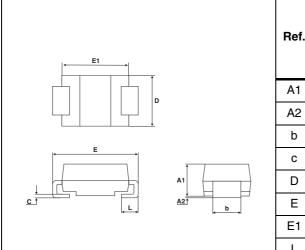
Package information LBP01

3 Package information

- Epoxy meets UL94, V0
- Lead-free package

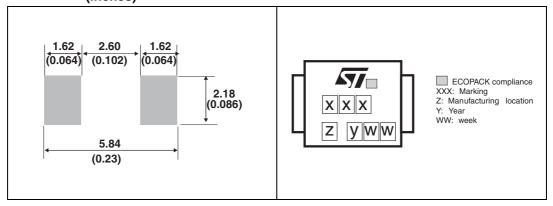
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK[®] packages, depending on their level of environmental compliance. ECOPACK[®] specifications, grade definitions and product status are available at: www.st.com. ECOPACK[®] is an ST trademark.

Table 3. SMB dimensions



	Dimensions					
Ref.	Millimeters		Inches			
	Min.	Max.	Min.	Max.		
A1	1.90	2.45	0.075	0.096		
A2	0.05	0.20	0.002	0.008		
b	1.95	2.20	0.077	0.087		
С	0.15	0.40	0.006	0.016		
D	3.30	3.95	0.130	0.156		
Е	5.10	5.60	0.201	0.220		
E1	4.05	4.60	0.159	0.181		
L	0.75	1.50	0.030	0.059		

Figure 5. Footprint, dimensions in mm Figure 6. Marking⁽¹⁾ (inches)



Product marking may be rotated by 90° for assembly plant differentiation. In no case should this product marking be used to orient the component for its placement on a PCB. Only pin 1 mark is to be used for this purpose.

LBP01 Package information

Table 4. SOT23-5L dimensions

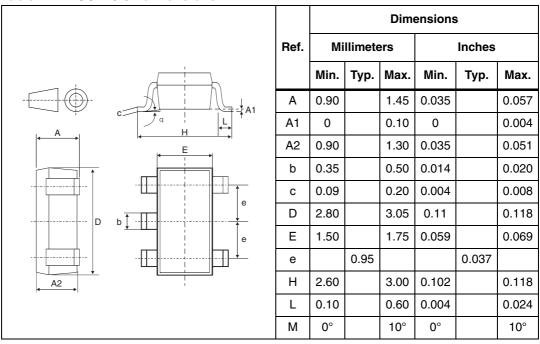
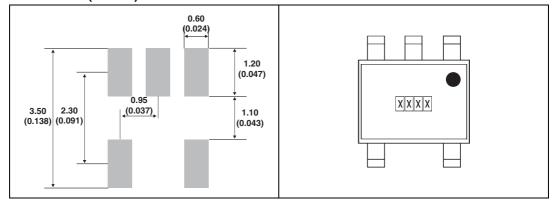


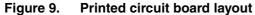
Figure 7. Footprint, dimensions in mm Figure 8. Marking (inches)

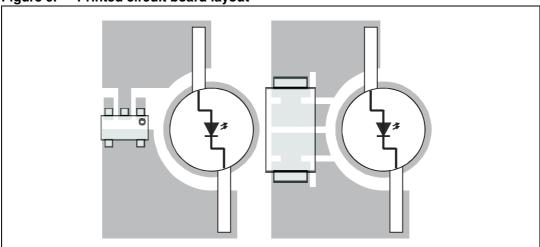


Recommendations on PCB assembly 4

4.1 **PCB** design

- To control the solder paste amount, the closed via is recommended instead of open
- 2. The position of tracks and open vias in the solder area should be well balanced. The symmetrical layout is recommended, in case any tilt phenomena caused by asymmetrical solder paste amount due to the solder flow away.

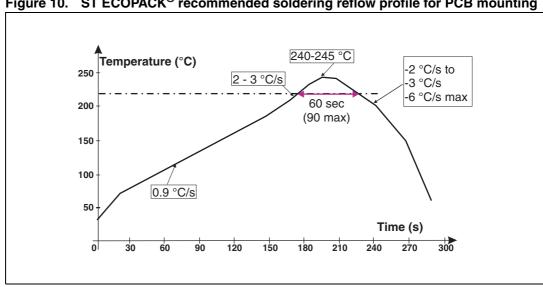




Reflow profile 4.2

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Figure 10. ST ECOPACK® recommended soldering reflow profile for PCB mounting



Note: Minimize air convection currents in the reflow oven to avoid component movement.

Doc ID 022950 Rev 1

5 Ordering information

Table 5. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
LBP01-0803SC5	XT08	SOT23-5L	16 mg	3000	Tape and reel
LBP01-0810B	L08 ⁽¹⁾	SMB	0.11 g	2500	Tape and reel

^{1.} The marking can be rotated by 90° to differentiate assembly location.

6 Revision history

Table 6. Document revision history

Date	Revision	Changes
20-Mar-2012	1	Initial release.

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