500mA LED PROTECTOR

SMD602

FEATURES

- 5V Protection activating Voltage
- 500mA Bypass Current Capability
- 1V Bypass Dropout Voltage
- 500mA Reverse Current Capability
- 8KV ESD Protection
- 2-Lead 2mm x 2mm FBP Package

DESCRIPTION

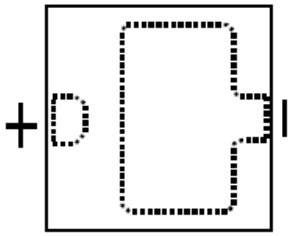
The SMD602 is a two terminal LED protector with low dropout voltage rated for 500mA bypass current. Low operation current at protection mode and high bypass current capability at activating mode. Build-in reverse diode for bypass reversed supply voltage.
The SMD602 is designed for parallel connection with power LED. It bypasses LED driving current when LED at open circuit condition. It also bypasses LED driving current at reverse connected driving current to LED.

APPLICATIONS

- LED Lighting
- LED backlight for LCD TV/ Monitor
- High Power LED Protection

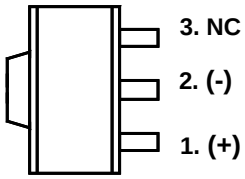
PACKAGE/ORDER INFORMATION

Order Part Number



2-Pin 2×2 FBP
(Top View)

SMD602FBP2



3-Pin Plastic SOT-89 Surface Mount
(Top View)

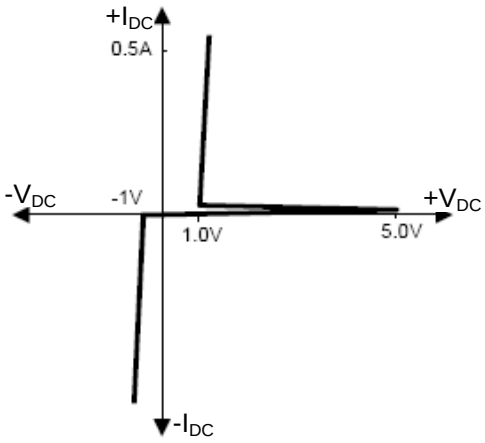
SMD602PKT

ABSOLUTE MAXIMUM RATINGS (Note 1)

Input Voltage, V_{DC}	40V
Maximum Operating Junction Temperature, TJ	150°C
Storage Temperature Range	-65°C to 150°C

Note 1: Exceeding these ratings could cause damage to the device. All voltages are with respect to ground. Currents are positive into, negative out of the specified terminal.

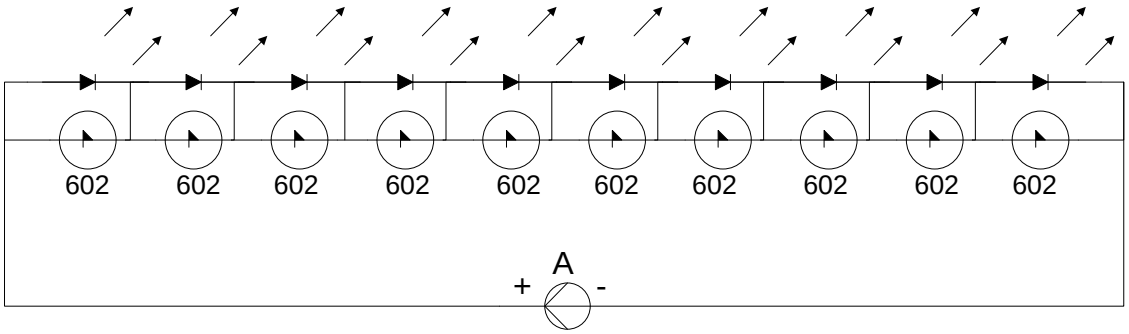
I-V Curve



RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Units
Input voltage	V_{DC}			38	V
By pass current (with adequate heat sinking)	I_{BP}			500	mA
Reverse current	I_R			500	mA
Operating ambient temperature range	T_A	-40		85	°C
Operating junction temperature	T_J			125	°C

TYPICAL APPLICATIONS



Constant current
Driver for LEDs

ELECTRICAL CHARACTERISTICS

Unless otherwise specified, T_J = 25°C; and are for DC characteristics only. (Low duty cycle pulse testing techniques are used which maintains junction and case temperatures equal to the ambient temperature.)

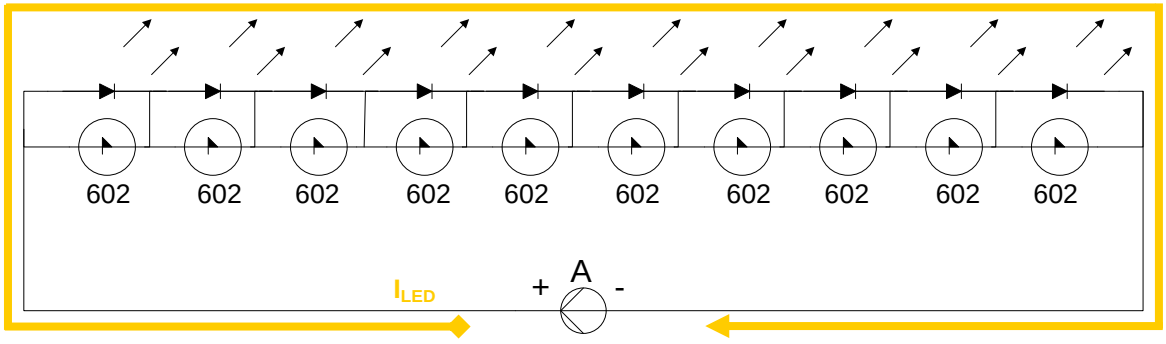
Parameter	Test Conditions	Min.	Typ.	Max.	Units
Activating voltage		4.65	5.0	5.25	V
Drop out voltage	I_{DC}=350mA		1.00	1.20	V
Reverse drop out voltage	I_R=350mA		1.10	1.50	V
Protection current	V_{DC}=3.5V		100	150	µA
Break over current				20	mA

Application information

Protection Mode:

The forward voltage drop (V_F) of all LEDs should be less than 4.5V, which is lower than SMD602 activating voltage 5.0V.

All SMD602 at protection mode would only sink 100μA current from the system.



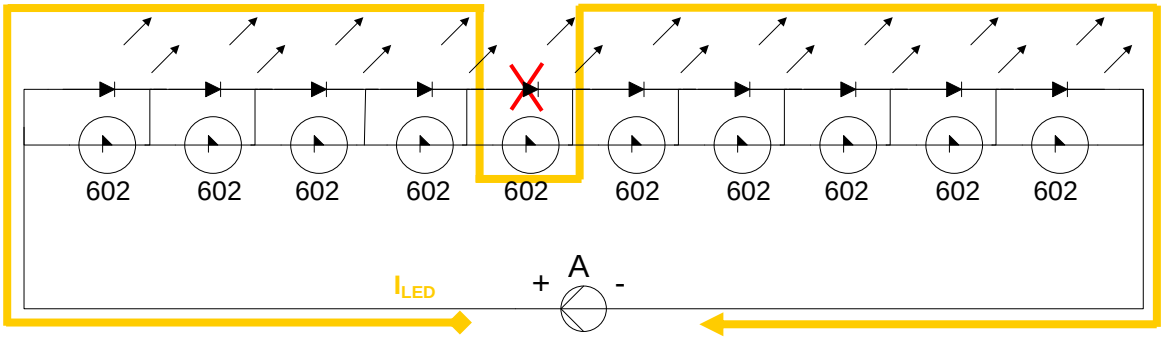
Constant current
Driver for LEDs

Activating Mode:

Any LED may become open circuit because of LED damage or wiring problem. When it happens, the voltage drop across adjacent SMD602 starts to increase, and then SMD602 will be activating when the voltage drop reaches 5V.

The dropout voltage on SMD602 will be around 1V and the LED current I_{LED} will be bypassed to next LED.

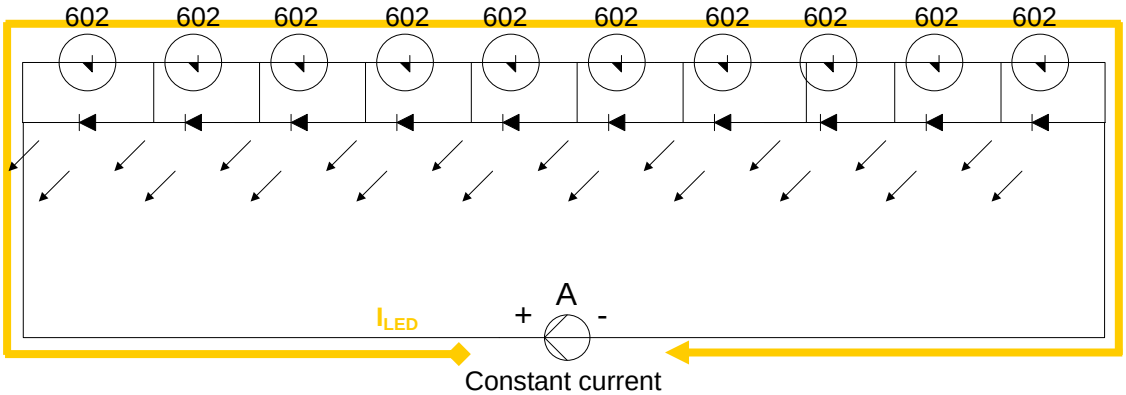
All LEDs will work well except the abnormal LED bypassed.



Constant current
Driver for LEDs

Reverse Mode:

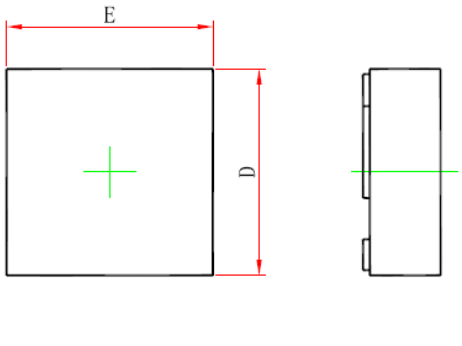
When the LED string was reversed connected to the driver, the SMD602 build-in reverse protection diode was turned-on to bypass the current. Such that the reverse voltage on LEDs was reduced to prevent LED damage.



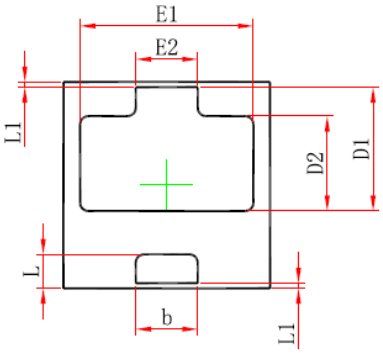
Constant current
Driver for LEDs

PACKAGE DESCRIPTION Dimensions in inches and millimeters unless otherwise specified

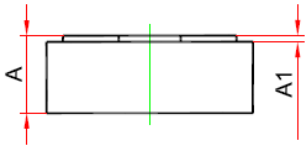
FBP Package



Top View

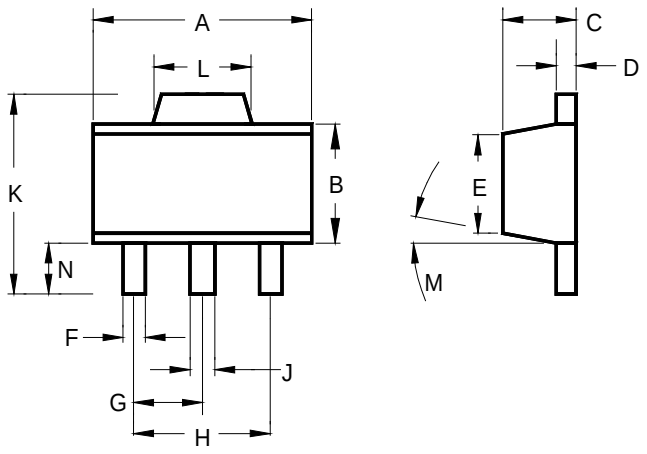


Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.800	0.900	0.031	0.035
A1	0.010	0.090	0.000	0.004
D	1.900	2.100	0.075	0.083
E	1.900	2.100	0.075	0.083
D1	1.150	1.250	0.045	0.049
D2	0.820	1.020	0.032	0.040
E1	1.580	1.780	0.062	0.070
E2	0.550	0.650	0.022	0.026
b	0.550	0.650	0.022	0.026
L	0.280	0.380	0.011	0.015
L1	0.000	0.050	0.000	0.002



	INCHES			MILLIMETERS		
	MIN	TYP	MAX	MIN	TYP	MAX
A	0.173	-	0.181	4.39	-	4.59
B	0.090	-	0.102	2.28	-	2.59
C	0.055	-	0.063	1.39	-	1.60
D	0.015	-	0.017	0.38	-	0.43
E	0.084	-	0.090	2.13	-	2.28
F	0.016	-	0.019	0.33	-	0.48
G	0.059 BSC			1.49 BSC		
H	0.118 BSC			2.99 BSC		
J	0.018	-	0.022	0.45	-	0.55
K	0.155	-	0.167	3.94	-	4.24
L	0.067	-	0.072	1.70	-	1.82
M	0°	-	8°	0°	-	8°
N	0.035	-	0.047	0.89	-	1.19

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