100VAC Input/Constant Current

# Isolated High-power LED Driver for Illumination

**BP5843A**

## ● Absolute Maximum Ratings

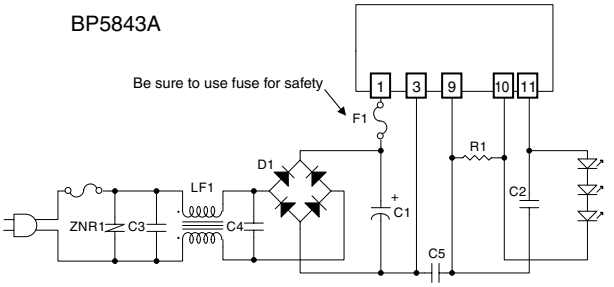
| Parameter | Symbol | Limits | Unit | Conditions |
|---|---|---|---|---|
| Input voltage | Vi | 170 | V | DC |
| Output voltage | Vo | 12 | Vpk | |
| Withstand voltage | BV | 1.8 | kV | 1s (between primary and secondary) |
| Maximum surface temperature | Tcmax | 105 | °C | Ambient temperature + module self-heating ≤ Tcmax |
| Operating temperature range | Topr | −20 to +80 | °C | Refer to derating curve |
| Storage temperature range | Tstg | −25 to +85 | °C | |

## ● Electrical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Input voltage range | Vi | 113 | 141 | 170 | V | |
| Output current | Io | 332 | 350 | 369 | mA | Vi=141V, R1=0.82Ω (1%) ∗1 |
| Output voltage range | Vo | 2.5 | – | 12 | V | Vi=141V, Io=350mA |
| Output ripple voltage | Vp | – | – | 0.5 | Vp-p | Vi=141V, Io=350mA ∗2 |
| Power conversion efficiency | η | 80 | 85 | – | % | Vi=141V, Vo=12V, Io=350mA |

∗1 Maximum output current varies depending on ambient temperature ; please refer to derating curve.
∗2 Spike noise is not included in output ripple voltage.

## ● Application Circuit

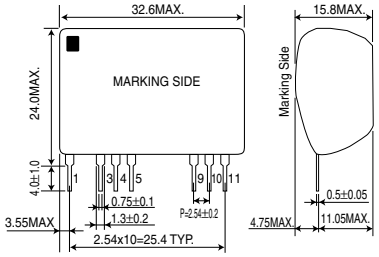



| Pin No. | Function |
|---|---|
| 1 | Input terminal (+) |
| 2 | Skip |
| 3 | Input terminal (–) |
| 4 | NC |
| 5 | NC |
| 6 | Skip |
| 7 | Skip |
| 8 | Skip |
| 9 | Output capacitor connection terminal |
| 10 | LED connection terminal (cathode) |
| 11 | LED connection terminal (anode) |

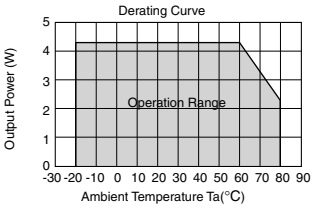
External Component Specifications

| | |
|---|---|
| C1 : Input Capacitor | 10μF/250V |
| C2 : Output Capacitor | 40μF/25V ceramic capacitor |
| R1 : Output current setting resistor | 0.82Ω ±1% 1/4W (Io=350mA) |
| C3, C4: Noise Removal Capacitor | Use if necessary<br>Capacitance : 0.1 to 0.22μF<br>Rated voltage : 250V or higher |
| C5 : Noise Removal Capacitor | 2200pF (Basic insulation) |
| D1: Diode bridge | 800V/1A |
| F1: Fuse | A fuse must be used for safety |
| LF1: Line Filter | 10mH |
| ZNR1: Varistor | A varistor is required to protect against lightning surges and static electricity. |

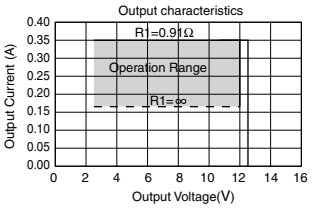
## ● Dimensions (Unit : mm)



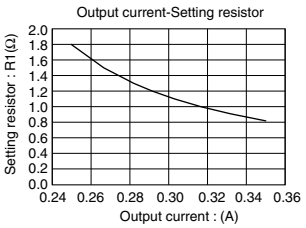

## ● Derating Curve




## ● Output Characteristics




## ● Current Setting




How to calculate R1
R1=0.13741/(0.91 x Io-0.151)
Io : Output current

# Power Module Usage Precautions

## Safety Precautions

1) The products are designed and manufactured for use in ordinary electronic equipment (i.e. AV/OA/ telecommunication/amusement equipment, home appliances). Please consult with the Company's (ROHM) sales staff if intended for use in devices requiring high reliability (e.g. medical/transport/ aircraft/spacecraft equipment, nuclear power/fuel controllers, automotive/safety devices) and whose malfunction may result in injury or death. In this case, failsafe measures must be taken, including the following:
   [a] Installation of protection circuits in order to improve system safety
   [b] Incorporation of redundant circuits in the case of single-circuit failure
2) The products are designed for use under normal conditions. Application in special environments can cause a deterioration in product performance. Therefore, verification and confirmation of product performance, prior to use, is recommended. The following environments are considered to be 'special':
   [a] Outdoors, exposed to direct sunlight or dust
   [b] In contact with liquids, such as water, oils, chemicals, or organic solvents
   [c] In areas where exposure to the sea air or corrosive gases (i.e. $Cl_2$, $H_2S$, $NH_3$, $SO_2$, $NO_2$) can occur
   [d] In places where the products may be in contact with static electricity or electromagnetic waves
   [e] In proximity to heat-producing items, plastic cords, or flammable materials
   [f] In contact with sealing or coating products, such as resin
   [g] In contact with unclean solder or exposed to water or water-soluble cleaning agents used after soldering
   [h] In areas where dew condensation occurs
3) The products are not designed to be radiation resistant
4) The Company is not responsible for any problems resulting from use of the products under conditions not recommended herein.
5) The Company should be notified of any product safety issues. Moreover, product safety issues should be periodically monitored by the customer.

## Application Notes

1) A sufficient margin must be allowed if changes are made to the peripheral circuit due to variations in the inherent tolerances of the external components as well as transient and static characteristics. In addition, please be aware that the Company has not conducted investigations on whether or not particular changes in the example application circuits would result in patent infringement.
2) The application examples, their constants, and other types of information contained herein are applicable only when the products are used in accordance with standard methods.
   Therefore, if mass production is intended, sufficient consideration to external conditions must be made.

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