100VAC Input/2.5V-12V (250-360mA) Output

Isolated High-power LED Driver for Illumination

BP5844

● Absolute Maximum Ratings

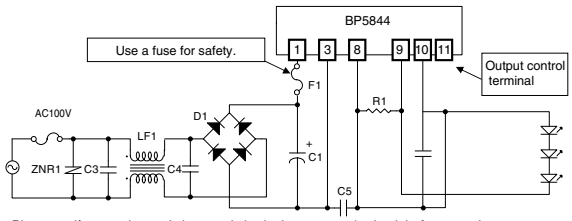
Parameter	Symbol	Limits	Units
Input voltage	Vi	170	V
Output voltage (limits)	Vo	12	V
Output voltage (no load)	Vo	12.5	V
Output current	Io	378	mA
Output control terminal voltage	VCTL	12.5	V
Withstand voltage	BV	1.8	kV
Maximum surface temperature	Tcmax	105	°C
Operating temperature range	Topr	-20 to +80	°C
Storage temperature range	Tstg	-25 to +85	°C

● Electrical Characteristics

Parameter	Symbol	Spec			Units	Conditions
		Min.	Typ.	Max.		
Input voltage range	Vi	113	141	170	V	-
Output current	Io	342	360	378	mA	Vi=141V,R1=0.78Ω ∗1
Output voltage range	Vo	2.5	-	12	V	Vi=141V,Io=360mA
Output ripple voltage	Vp	-	-	0.5	Vp-p	Vi=141V,Io=360mA ∗2
Conversion efficiency	η	80	85	-	%	Vi=141V,Vo=12V,Io=360mA

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

● Application Circuit Example



Pin No.	Terminal name
1	Input terminal (+)
2	Skip
3	Input terminal (-)
4,5	N.C
6-7	Skip
8	Output capacitor connection terminal (-)
9	LED connection terminal (cathode)
10	LED connection terminal (anode)
11	VCTL terminal

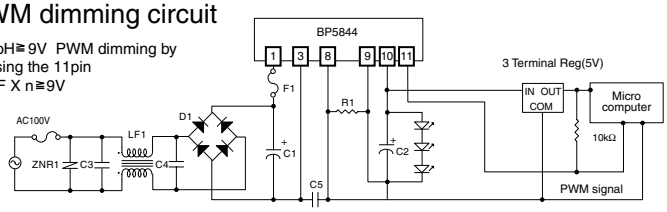
Please verify operation and characteristics in the customer's circuit before actual usage.
Ensure that the load current does not exceed the maximum rating.

External Component Specifications

C1 : Input capacitor	10μF / 250V (general purpose)
C2 : Output capacitor	47μF / 25V low impedance type
R1 : Output current setting resistor	0.78Ω(0.22Ω+0.56Ω)±1% 1/4 (Io=360mA) By changing R1 it is possible to adjust output voltage. Refer the Output Voltage Setting graph at right
C3,C4: Noise reduction capacitor	Use if required adove 125V 0.1 to 0.22μF
C5: Noise reduction capacitor	2200pF(Products with basic isolation certification)
D1: Diode bridge	400V / 1A
F1: FUSE	Use a fuse for safety.
LF1: Line filter	10mH
ZNR1: Varistor	A varistor is required to protect against lightning surges and static electricity.

● PWM dimming circuit

VoH≅9V PWM dimming by using the 11pin
VF X n≅9V



● Phase control dimming circuit

PWM dimming is possible by configuring a phase control circuit at the input side.

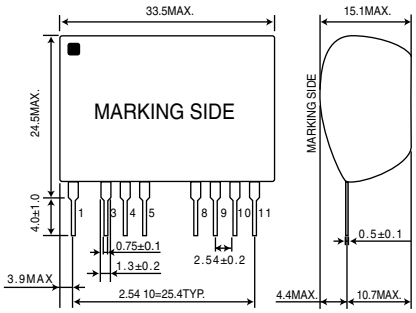
● PWM dimming signal

In case of using PWM or phase control dimming, please input the PWM signals at the VCTL pin.

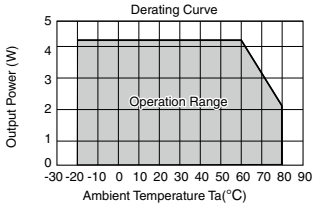
Parameter	Symbol	Spec			Units	Conditions
		Min.	Typ.	Max.		
LED OFF Voltage	VoL	6.5	6.9	7.3	V	VoH≅9V
PWM Signal H level	VCTL(H)	3	5	10	V	
PWM Signal L level	VCTL(L)	0	-	0.5	V	
PWM Signal freqency	fosc	90	100	132	kHz	∗3

∗3 Flickering may occur due to LED load. Please evaluate with the actual application to determine the frequency.

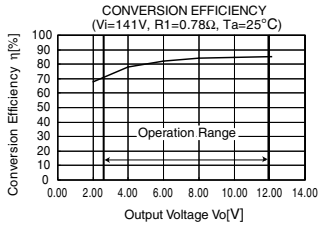
● Dimensions (Unit : mm)



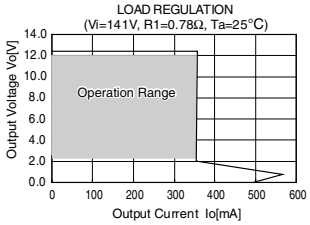
● Derating Curve



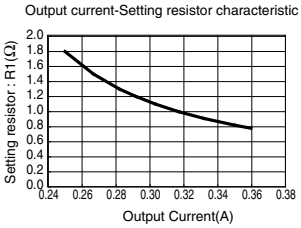
● Output Characteristics



● Load Regulation



● Output voltage setting



How to calculate setting resistor R1
R1=0.13741/(0.91 x Io-0.151)
Io : Output current
Note) A maximum output current is set to 360mA.
Operation beyond this limit are prohibited.

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.

Notes Regarding Industrial Property

1) The specifications included herein contain information related to the Company's industrial property. Their use other than pertaining to the relevant products is forbidden. Duplication and/or disclosure to a third party without express written permission is strictly prohibited.
2) Product information and data, including application examples, contained in the specifications are for reference purposes only; the Company does not guarantee the industrial/intellectual property rights or any other rights of a third party. Accordingly, the Company shall not bear responsibility for:
   [a] Infringement of the intellectual property rights of a third party
   [b] Problems arising from the use of the products listed herein
3) The Company prohibits the purchaser from exercising or using the intellectual/industrial property rights or any rights belonging to or are controlled by the Company, other than the right to use, sell, or dispose of the products.

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.

Notes Regarding Industrial Property

1) The specifications included herein contain information related to the Company's industrial property. Their use other than pertaining to the relevant products is forbidden. Duplication and/or disclosure to a third party without express written permission is strictly prohibited.
2) Product information and data, including application examples, contained in the specifications are for reference purposes only; the Company does not guarantee the industrial/intellectual property rights or any other rights of a third party. Accordingly, the Company shall not bear responsibility for:
   [a] Infringement of the intellectual property rights of a third party
   [b] Problems arising from the use of the products listed herein
3) The Company prohibits the purchaser from exercising or using the intellectual/industrial property rights or any rights belonging to or are controlled by the Company, other than the right to use, sell, or dispose of the products.

Notes

No copying or reproduction of this document, in part or in whole, is permitted without the consent of ROHM Co.,Ltd.

The content specified herein is subject to change for improvement without notice.

The content specified herein is for the purpose of introducing ROHM's products (hereinafter "Products"). If you wish to use any such Product, please be sure to refer to the specifications, which can be obtained from ROHM upon request.

Examples of application circuits, circuit constants and any other information contained herein illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

Great care was taken in ensuring the accuracy of the information specified in this document. However, should you incur any damage arising from any inaccuracy or misprint of such information, ROHM shall bear no responsibility for such damage.

The technical information specified herein is intended only to show the typical functions of and examples of application circuits for the Products. ROHM does not grant you, explicitly or implicitly, any license to use or exercise intellectual property or other rights held by ROHM and other parties. ROHM shall bear no responsibility whatsoever for any dispute arising from the use of such technical information.

The Products specified in this document are intended to be used with general-use electronic equipment or devices (such as audio visual equipment, office-automation equipment, communication devices, electronic appliances and amusement devices).

The Products specified in this document are not designed to be radiation tolerant.

While ROHM always makes efforts to enhance the quality and reliability of its Products, a Product may fail or malfunction for a variety of reasons.

Please be sure to implement in your equipment using the Products safety measures to guard against the possibility of physical injury, fire or any other damage caused in the event of the failure of any Product, such as derating, redundancy, fire control and fail-safe designs. ROHM shall bear no responsibility whatsoever for your use of any Product outside of the prescribed scope or not in accordance with the instruction manual.

The Products are not designed or manufactured to be used with any equipment, device or system which requires an extremely high level of reliability the failure or malfunction of which may result in a direct threat to human life or create a risk of human injury (such as a medical instrument, transportation equipment, aerospace machinery, nuclear-reactor controller, fuel-controller or other safety device). ROHM shall bear no responsibility in any way for use of any of the Products for the above special purposes. If a Product is intended to be used for any such special purpose, please contact a ROHM sales representative before purchasing.

If you intend to export or ship overseas any Product or technology specified herein that may be controlled under the Foreign Exchange and the Foreign Trade Law, you will be required to obtain a license or permit under the Law.

ROHM SEMICONDUCTOR

Thank you for your accessing to ROHM product informations.
More detail product informations and catalogs are available, please contact us.

ROHM Customer Support System

http://www.rohm.com/contact/