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

Isolated High-power LED Driver for Illumination

BP5844

● Absolute Maximum Ratings

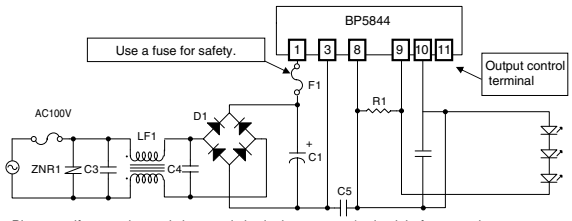
Parameter	Symbol	Limits	Units
Input voltage	Vi	170	V
Output voltage (limits)	Vo	12	V
Output voltage (no load)	Vo	12.5	V
Output current	Io	378	mA
Output control terminal voltage	VCTL	12.5	V
Withstand voltage	BV	1.8	kV
Maximum surface temperature	Tcmax	105	°C
Operating temperature range	Topr	-20 to +80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

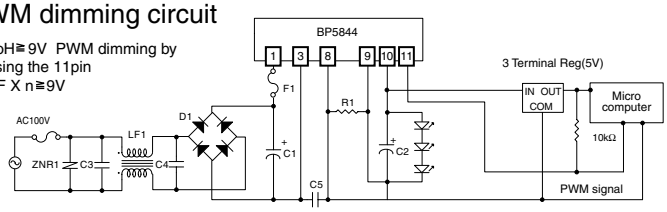
Please verify operation and characteristics in the customer's circuit before actual usage.
Ensure that the load current does not exceed the maximum rating.

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.

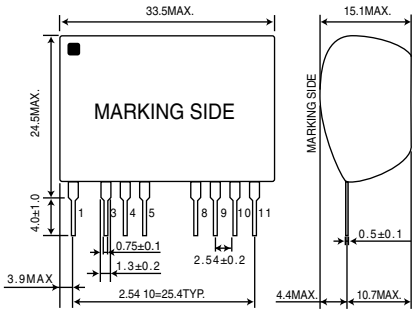
● PWM dimming signal

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

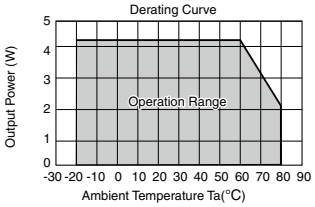
Parameter	Symbol	Spec			Units	Conditions
		Min.	Typ.	Max.		
LED OFF Voltage	VoL	6.5	6.9	7.3	V	VoH≅9V
PWM Signal H level	VCTL(H)	3	5	10	V	
PWM Signal L level	VCTL(L)	0	-	0.5	V	
PWM Signal freqency	fosc	90	100	132	kHz	∗3

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

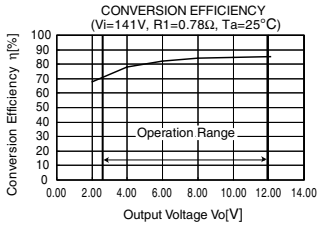
● Dimensions (Unit : mm)



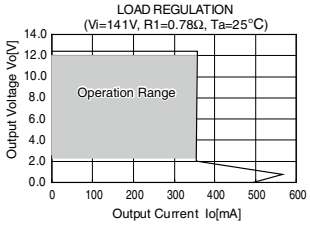
● Derating Curve



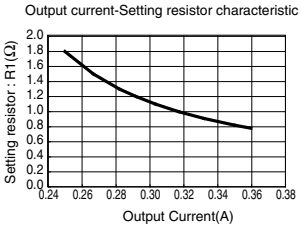
● Output Characteristics



● 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.

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