

High-power LED Drivers for Illumination

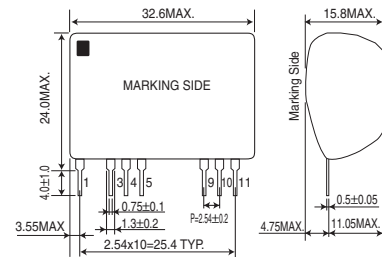
BP5841A1

AC100V input, constant current

Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit	
Input voltage	V_i	170	V	DC
Output voltage	V_o	36	V _{pk}	
Withstand voltage	BV	1.8	kV	1s (between primary and secondary)
Maximum surface temperature	T_{cmax}	105	°C	Ambient temperature + module self-heating $\leq T_{cmax}$
Operating temperature range	T_{opr}	-20 to +80	°C	Refer to derating curve
Storage temperature range	T_{stg}	-25 to +85	°C	

Dimensions (Unit : mm)



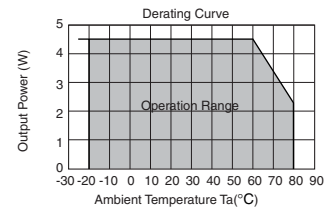
Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage range	V_i	113	141	170	V	
Output current	I_o	142	150	158	mA	$V_i=141V, R_1=1.2\Omega$ (1%)
Output voltage range1	V_o	12.5	—	36	V	$V_i=141V, I_o=100mA$
Output voltage range2		12.5	—	30	V	$V_i=141V, I_o=150mA$
Output ripple voltage	V_p	—	—	0.5	V _{p-p}	$V_i=141V, I_o=150mA$
Power conversion efficiency	η	80	84	—	%	$V_i=141V, V_o=30V, I_o=150mA$

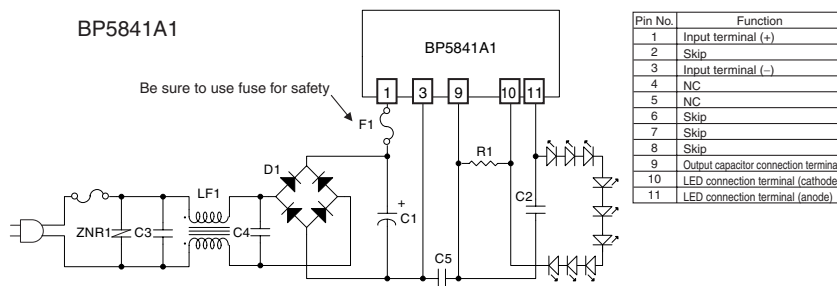
*1 Maximum output current varies depending on ambient temperature ; please refer to derating curve.

*2 Spike noise is not included in output ripple voltage.

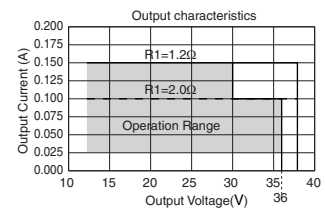
Derating Curve



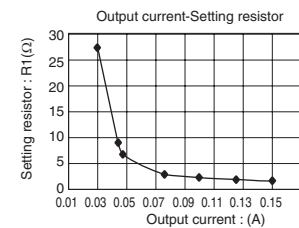
Application circuit



Output Characteristics



Setting current



How to calculate R1
 $R1 = 0.9362 / (6.2 \times I_o - 0.151)$
 I_o : Output current

External components setting

C1 : Input Capacitor	22μF/250V
C2 : Output Capacitor	4.4μF/25V Ceramics capacitor
R1 : Output current setting resistor	1.2Ω ± 1% 1/4W ($I_o=150mA$)
C3, C4: Noise Removal Capacitor	Please use the capacitor, if necessary. Capacitance : 0.1μF to 0.22μF Rated voltage : 250V or higher
C5 : Noise Removal Capacitor	2200pF (Basic insulation)
D1: Diode bridge	800V/1A
F1: Fuse	Fuse must be used for safety
LF1: Line Filter	10mH
ZNR1: Varistor	Varistor must be used. It protects this part from lighting surge and static electricity.

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. Cl₂, H₂S, NH₃, SO₂, NO₂) 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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 - [b] Problems arising from the use of the products listed herein
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