

Isolated AC/DC Converter

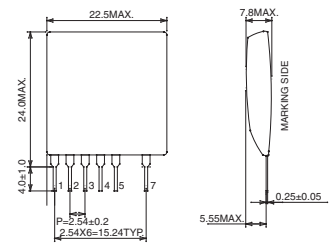
AC 100 to AC230V input, 6W output

BP5725

Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit	Conditions
7-pin input voltage	VD	800	V	
4-pin input voltage	VG	45	Vpeak	
7-pin input Current	ID	400	mA	
Maximum power	Po	6	W	
Allowable maximum surface temperature	Tcmax	105	°C	Ambient temperature + module self-heating ≤ Tcmax
Operating temperature range	Topr	-25 to +80	°C	
Storage temperature range	Tstg	-25 to +105	°C	

Dimensions (mm)



Electrical Characteristics

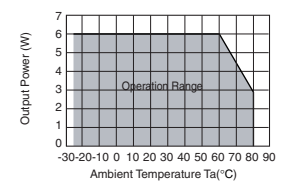
<In case of 12V output>

(Unless otherwise noted, Vi=311V, rated load Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Output detection voltage	Vod	-7.1	-7.6	-8.1	V	Io=500mA
Output current	Io	10	-	500	mA	Refer to derating curve
Line regulation	Vr	-	380	500	mV	Vi=119V to 405VDC Io=500mA
Load regulation	VI	-	90	200	mV	Io=200mA to 500mA
Output ripple voltage	Vp	-	300	500	mVp-p	*1
Power conversion efficiency	η	70	77	-	%	

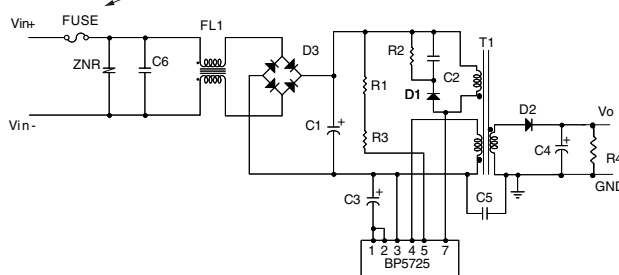
*1: Pulse noise is not included.

Derating Curve



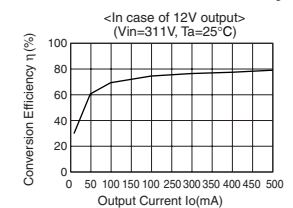
Sample Application Circuit

Be sure to use fuse for safety.

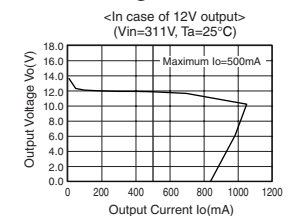


Pin No.	Name	Function
1	Vod	This is the output detection terminal.
2	Vod	This is the output detection terminal.
3	Vin(-)	This is the primary side input minus terminal.
4	VG	MOSFET, GATE driving input terminal.
5	Vs	This is the start terminal. Connect this via the external resistor (720kΩ) to Vi (+).
6	NC	This is the NC pin.
7	VD	This is the built-in FET of drain terminal. The primary coil minus side of the external transformer, and the snubber circuit for noise reduction are connected to this.

Conversion Efficiency



Load Regulation



External Component Settings

C1: Capacitor for input voltage smoothing	10μF/450V
C2: For noise terminal voltage reduction	2200pF/1kV
C3: Capacitor for Vod voltage smoothing	10μF/50V
C4: Capacitor for output voltage smoothing	1000μF/25V
C5: For noise terminal voltage reduction	2200pF/AC250V
C6: Noise terminal voltage countermeasure capacitor	Please set it, if necessary Limiting element voltage DC630V or higher 0.1 to 0.22μF
D1: Rectifier diode	FRD 800V/0.5A
D2: Rectifier diode	FRD 200V/1A
D3: Diode bridge	800V/1A
R1, R3: Resistor	360kΩ±5% 0.25W
R2: Resistor	200kΩ±5% 1W
R4: Bleeder resistor	In case Io is less than 10mA, connect a bleeder resistance in parallel to C4.
T1: Switching transformer	
FL1: For noise terminal voltage reduction	Please set it, if necessary
FUSE: Fuse	Be sure to use this for safety.
ZNR: Varistor	Must be use. It protects this part from lightning surge and static electricity.

Be sure to evaluate it under the condition that it is mounted by your product. Especially, confirm whether output power never exceeds a maximum standard with current probe.

Precautions on use of products

- When the capacity of the output smoothing electrolytic capacitor C1 is made large, output may not rise. 100μF to 2200μF is recommended. Set the rise time within 10ms.
- Set the Vod electrolytic capacitor C3 to 10μF.
- Be sure to use the VG terminal voltage within the operating voltage range.
- Set the external starting resistor (R1+R3) to 720KΩ. When reducing the resistance value, start-up may fail. Take note of the loss of the resistor when it is reduced.
- This product has built-in over current (reset type) protection function to prevent destruction at abrupt error. These protection functions are effective for prevention against destruction owing to abrupt accident, therefore, avoid using them for continuous protection circuit operating, or at transition

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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