

100-230VAC Input/6W Output

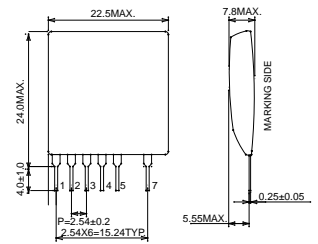
# Isolated AC/DC Converter

**BP5725**

## Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit	Conditions
7-pin input voltage	V <sub>D</sub>	800	V	
4-pin input voltage	V <sub>G</sub>	45	V <sub>peak</sub>	
7-pin input Current	I <sub>D</sub>	400	mA	
Maximum power	P <sub>o</sub>	6	W	
Allowable maximum surface temperature	T <sub>max</sub>	105	°C	Ambient temperature + module self-heating ≤ T <sub>max</sub>
Operating temperature range	T <sub>opr</sub>	-25 to +80	°C	
Storage temperature range	T <sub>stg</sub>	-25 to +105	°C	

## Dimensions (Unit : mm)



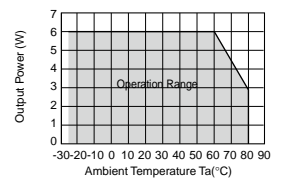
## Electrical Characteristics

<In case of 12V output> (Unless otherwise noted, V<sub>i</sub>=311V, rated load T<sub>a</sub>=25°C)

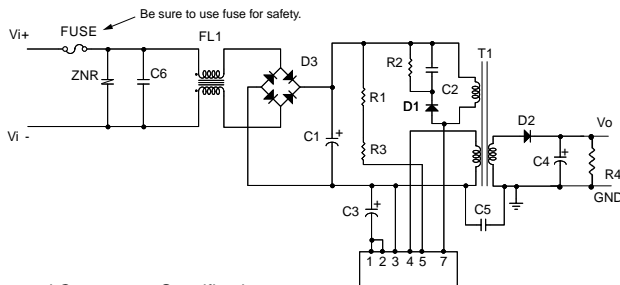
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Output detection voltage	V <sub>od</sub>	-7.1	-7.6	-8.1	V	I <sub>o</sub> =500mA
Output current	I <sub>o</sub>	10	-	500	mA	Refer to derating curve
Line regulation	V <sub>r</sub>	-	380	500	mV	V <sub>i</sub> =119V to 405VDC I <sub>o</sub> =500mA
Load regulation	V <sub>l</sub>	-	90	200	mV	I <sub>o</sub> =200mA to 500mA
Output ripple voltage	V <sub>p</sub>	-	300	500	mVp-p	*1
Power conversion efficiency	η	70	77	-	%	

\*1: Pulse noise is not included.

## Derating Curve



## Sample Application Circuit



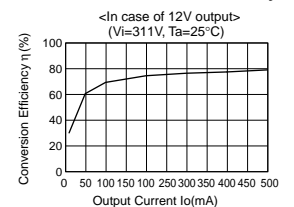
### External Component Specifications

- C1: Input smoothing capacitor 10μF/450V
- C2: Noise reduction capacitor 2200pF/1kV
- C3: V<sub>od</sub> smoothing capacitor 10μF/50V
- C4: Output smoothing capacitor 1000μF/25V
- C5: Noise reduction capacitor 2200pF/AC250V
- C6: Noise reduction capacitor Use if necessary
- D1: Rectifier diode Limiting element voltage DC630V or higher, 0.1 to 0.22μF
- D2: Rectifier diode FRD 800V/0.5A
- D3: Diode bridge FRD 200V/1A
- R1, R3: Resistor 800V/1A
- R2: Resistor 360kΩ±5% 0.25W
- R4: Bleeder resistor 200kΩ±5% 1W
- T1: Switching transformer In case I<sub>o</sub> is less than 10mA, connect a bleeder resistor in parallel to C4.
- FL1: Noise reduction filter Use if necessary
- FUSE: Fuse Be sure to use this for safety.
- ZNR: Varistor A varistor is required to protect against lightning surges and static electricity.

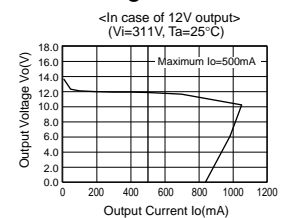
Pin No.	Name	Function
1	V <sub>od</sub>	This is the output detection terminal.
2	V <sub>od</sub>	This is the output detection terminal.
3	V <sub>i</sub> (-)	This is the primary side input minus terminal.
4	V <sub>G</sub>	MOSFET, GATE driving input terminal.
5	V <sub>s</sub>	This is the start terminal. Connect this via the external resistor (720kΩ) to V <sub>i</sub> (+).
6	NC	This is the NC pin.
7	V <sub>o</sub>	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.

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

## Conversion Efficiency



## Load Regulation



## Usage Precautions

- When the capacitance of the output smoothing electrolytic capacitor C4 is made large the output may not rise. 100 to 2200μF is recommended. Set the rise time within 10ms.
- Set the V<sub>od</sub> electrolytic capacitor C3 to 10μF.
- Be sure to use the V<sub>G</sub> terminal voltage within the operating voltage range.
- Set the external starting resistor (R1+R3) to 720kΩ. Reducing the resistance value may cause failure during startup.
- A built-in overcurrent protection circuit (reset type) prevents damage due to surge currents. Please discontinue operation if protection circuit is continuously active.

# 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<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, NO<sub>2</sub>) 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
- 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.

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