

220VAC Input/12VDC (1A) Output

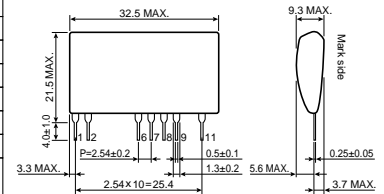
# Isolated AC/DC Converter

## BP5722A12

### ● Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit	Conditions
Pin 11 input voltage	V <sub>D</sub>	800	V	
Pin 7,8 input voltage	V <sub>DD</sub>	25	V	
Pin 11 input Current	I <sub>D</sub>	350	mA	
Pin 8 input Current	I <sub>DD</sub>	10	mA	
Output power	P <sub>o</sub>	13	W	
Withstand voltage	V <sub>I</sub>	2.5	kV	1 sec (between primary and secondary)
Maximum allowable surface temperature	T <sub>cmx</sub>	105	°C	Ambient temperature + module self-heating ≤ T <sub>cmx</sub>
Operating temperature range	T <sub>opr</sub>	-25 to +80	°C	
Storage temperature range	T <sub>stg</sub>	-40 to +105	°C	

### ● Dimensions (Unit : mm)

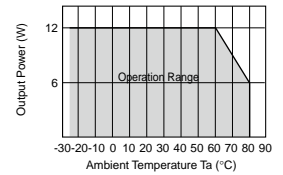


### ● Electrical Characteristics

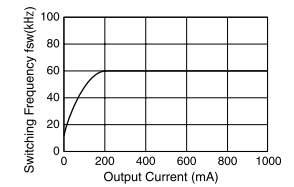
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Pin 11 input voltage	V <sub>D</sub>	-	-	700	V	I <sub>o</sub> =1000mA
Operating power voltage(Pin 7)	V <sub>DD</sub>	8.8	12	20	V	DC, I <sub>o</sub> =1000mA *1
Rated output voltage	V <sub>o</sub>	11.4	12.0	12.6	V	
Rated output current	I <sub>o</sub>	0	-	1000	mA	Refer to derating curve
Line regulation	ΔV <sub>r</sub>	-	8	200	mV	V <sub>i</sub> =217 to 405V DC I <sub>o</sub> =1000mA
Load regulation	ΔV <sub>l</sub>	-	30	200	mV	I <sub>o</sub> =50 to 1000mA
Output ripple voltage	ΔV	-	200	500	mVpp	*2
Power conversion efficiency	η	75	83	-	%	

\*1: The operation starting voltage is between 15.5 and 17.5 V.  
\*2: Pulse noise is not included.

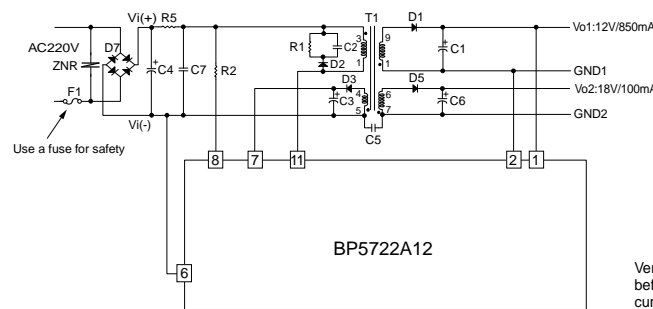
### ● Derating Curve



### ● Switching Frequency



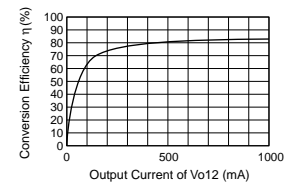
### ● Sample Application Circuit



Pin No.	Terminal name	Terminal function
1	Vo	Secondary 12V output voltage control terminal. Insert a 1000µF output smoothing capacitor before the GND for use.
2	GND	Secondary 12V output GND terminal.
6	Vi(-)	Primary input negative terminal.
7	VDD	Internal circuit power terminal.
8	Vs	Start-up terminal. Connect to Vi(+) through an external resistor (1.5MΩ).
9	NC	NC pin.
11	Vd	Drain terminal for the built-in FET.

Verify proper operation under actual conditions before use. In particular, confirm that the load current does not exceed the maximum rating.

### ● Conversion Efficiency



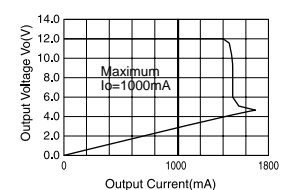
### External Component Settings

- \* C1: Output smoothing capacitor 1000µF/35V Low-impedance type
- C2: Noise reduction capacitor 4700pF/400V or higher
- \* C3: Output smoothing capacitor 10µF/50V Low-impedance type
- C4: Input smoothing capacitor 33µF/450V
- C5: Noise reduction capacitor Use if necessary
- C6: Output smoothing capacitor 100µF/35V Low-impedance type
- C7: Noise reduction capacitor Use if necessary
- D1: Rectifier Diode 90V/6A
- D2: Rectifier Diode 1kV/1A
- \* C1, C3, R2: Refer to directions
- D3: Rectifier Diode 90V/0.13A
- D5: Rectifier Diode 100V or higher /1A
- D7: Diode Bridge 800V/1A
- R1: Resistor 100kΩ±5%, 3W
- Limiting element voltage 300V or higher
- \* R2: Resistor 1.53MΩ±5%, 0.25W
- Limiting element voltage 600V or higher
- R5: Noise reduction resistor Use if necessary
- 1W or higher 10 to 22Ω
- T1: Switching Transformer
- F1: Fuse Be sure to use this for safety.
- ZNR: Varistor A varistor is required to protect against lightning surges and static electricity.

### Operation Notes

- An excessively large capacitance at C1 may cause the output to become inactive. Therefore, a capacitance between 1000 and 2200µF is recommended, with a rise time of 10ms or less.
- The capacitance of C3 should be 10µF, since an excessively small value will result in malfunction. The activation time is defined as: t(sec)=R2 C3 ln[1-17/(Vi-30µA R2)], where Vi is the DC voltage after smoothing.
- The resistance of R2 should be 1.5MΩ, since an excessively small value will result in malfunction.
- Overcurrent (reset type) and overvoltage (latch type) protection circuits are built in, preventing damage from occurring due to unexpected conditions. The overvoltage protection circuit shuts down operation once V<sub>DD</sub> exceeds 20V. In order to reset the input capacitor C4 must be discharged and the power turned back on.

### ● Load Regulation



# 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
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