

100-230VAC Input/24W Output

# Isolated AC/DC Converter

**BP5729**

## Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit	Conditions
12-Pin input voltage	V <sub>D</sub>	720	V	
12-Pin input current	I <sub>D</sub>	1	Apk	
10-Pin input voltage	V <sub>H</sub>	400	V	
7-Pin input voltage	V <sub>CC</sub>	30	V	
6-Pin input voltage	V <sub>ZCD</sub>	9.2	V	
6-Pin input current	I <sub>SOZCD</sub>	-2.0	mA	
	I <sub>SZCD</sub>	+3.0	mA	
1-Pin input current	I <sub>PC</sub>	10	mA	
	P <sub>O</sub>	24	W	DC248 to DC372V
Maximum power	P <sub>O</sub>	12	W	DC120 to DC372V
Withstanding voltage	V <sub>I</sub>	2.5	kV	1s (primary - secondary)
Allowable maximum surface temperature	T <sub>Cmax</sub>	105	°C	Ambient temperature + The module self-heating ≤ T <sub>Cmax</sub>
Operating temperature range	T <sub>opr</sub>	-25 to +80	°C	
Storage temperature range	T <sub>stg</sub>	-30 to +105	°C	

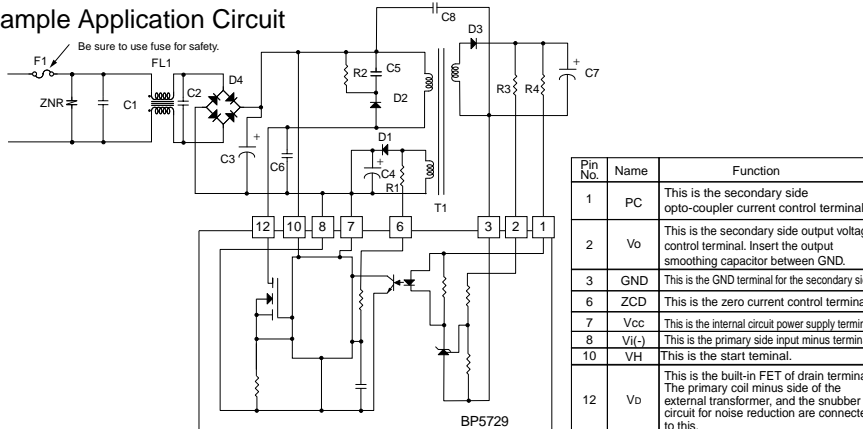
## Electrical Characteristics

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Output voltage	V <sub>O</sub>	11.4	12.0	12.6	V	I <sub>O</sub> =2000mA
Output current	I <sub>O</sub>	0	-	2000	mA	Refer to derating curve
Line regulation	V <sub>r</sub>	-	13	200	mV	V <sub>i</sub> =120 to 372V DC I <sub>O</sub> =1000mA
Load regulation	V <sub>l</sub>	-	20	200	mV	I <sub>O</sub> =50 to 2000mA
Output ripple voltage	V <sub>p</sub>	-	0.16	0.5	Vp-p	*
Power conversion efficiency	η	82	90	-	%	I <sub>O</sub> =2000mA

\* Pulse noise is not included.

## Sample Application Circuit



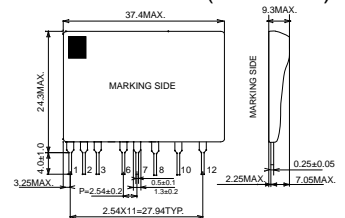
### External Components Specifications

- C1,C2: Noise reduction capacitors
  - C3: Input smoothing capacitor
  - C4: V<sub>CC</sub> smoothing capacitor
  - C5: Noise reduction capacitor
  - C6: Quasi-resonance capacitor
  - C7: Output smoothing capacitor
  - C8: Noise reduction capacitor
  - D1: Rectifier diode
  - D2: Rectifier diode
  - D3: Rectifier diode
  - D4: Diode bridge
  - R1: Resistor
  - R2: Resistor
  - R3: Output voltage setting resistor
  - R4: Resistor
  - T1: Switching transformer
  - F1: Fuse
  - FL1: AC line filter
  - ZNR: Varistor
- Limiting element voltage AC250V or higher, 0.1 to 0.22μF  
 33μF / 450V General purpose type  
 10μF / 50V Low impedance type  
 2200pF / 630V  
 Use if necessary  
 1000μF / 35V x 2 Low impedance type  
 Rated ripple current 4.5Arms or higher ESR 18mΩ or below  
 2200pF / AC250V  
 FRD 200V / 0.5A  
 800V / 0.5A  
 60V / 20A  
 800V / 1A  
 47kΩ ±1% 0.1W  
 100kΩ ±5% 3W Limiting element voltage 300V or higher  
 68kΩ ±1% 0.1W  
 910Ω ±1% 0.1W
- Be sure to use this for safety
- A varistor is required to protect against lightning surges and static electricity.

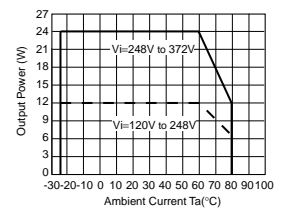
## Usage Precautions

- This product has built-in over current (reset type) and over voltage (latch type) protection functions to prevent destruction due to surges. Discontinue operation if protection circuits are continuously active.

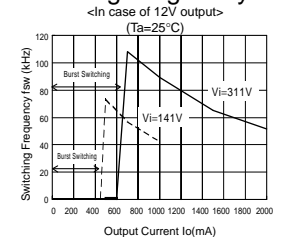
## Dimensions (Unit : mm)



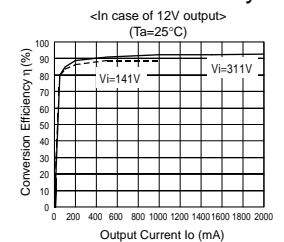
## Derating Curve



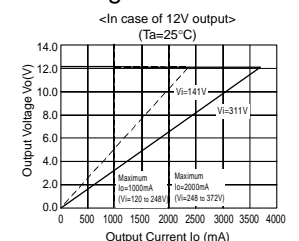
## Switching Frequency



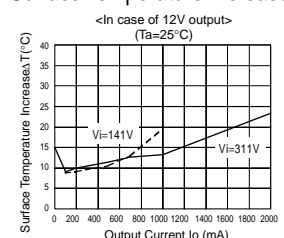
## Conversion Efficiency



## Load Regulation



## Surface Temperature Increase



# 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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