

Isolated AC/DC Converter

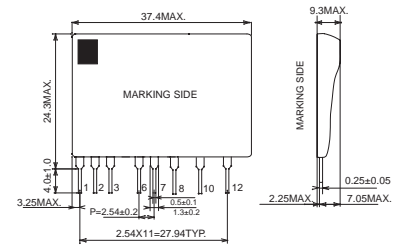
BP5729

AC 100 to AC230V input, 24W output

Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit	Conditions
12-Pin input voltage	V_D	720	V	
12-Pin input current	I_D	1	Apk	
10-Pin input voltage	V_H	400	V	
7-Pin input voltage	V_{CC}	30	V	
6-Pin input voltage	V_{ZCD}	9.2	V	
6-Pin input current	I_{SOZCD}	-2.0	mA	
	I_{SZCD}	+3.0	mA	
1-Pin input current	I_{PC}	10	mA	
Maximum power	P_o	24	W	DC248V to DC372V
		12	W	DC120V to DC372V
Withstanding voltage	V_I	2.5	kV	1s (primary - secondary)
Allowable maximum surface temperature	T_{cmax}	105	°C	Ambient temperature + The module self-heating $\leq T_{cmax}$
Operating temperature range	T_{opr}	-25 to +80	°C	
Storage temperature range	T_{stg}	-30 to +105	°C	

Dimensions (mm)



Electrical Characteristics

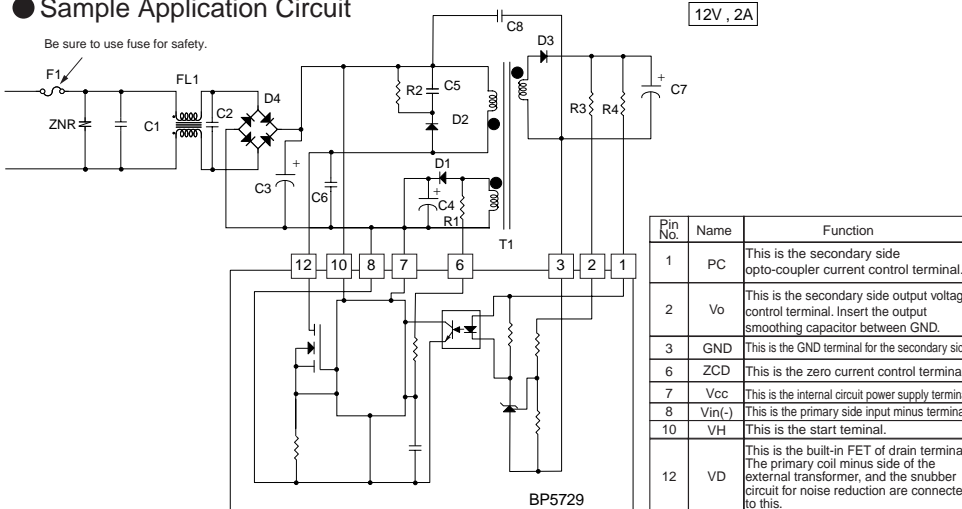
<In case of 12V output>

(Unless otherwise noted, $V_i=311V$, rated load $T_a=25^\circ C$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Output voltage	V_o	11.4	12.0	12.6	V	$I_o=2000mA$
Output current	I_o	0	-	2000	mA	Refer to derating curve
Line regulation	V_r	-	13	200	mV	$V_i=120$ to $372VDC$ $I_o=1000mA$
Load regulation	V_l	-	20	200	mV	$I_o=50$ to $2000mA$
Output ripple voltage	V_p	-	0.16	0.5	Vp-p	*
Power conversion efficiency	η	82	90	-	%	$I_o=2000mA$

* Pulse noise is not included.

Sample Application Circuit



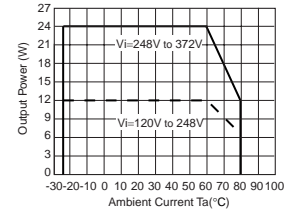
External Components Setting

- C1,C2: Noise terminal voltage countermeasure capacitor Limiting element voltage AC250V or higher 0.1 to 0.22 μF
- C3: Capacitor for input voltage smoothing 33 μF / 450V General purpose one
- C4: Capacitor for V_{CC} voltage smoothing 10 μF / 50V Low impedance for power supply
- C5: For noise terminal voltage reduction 2200pF / 630V
- C6: Capacitor for quasi-resonant Please set it, if necessary
- C7: Capacitor for output voltage smoothing 1000 μF / 35V x 2 Low impedance for power supply
Rated ripple current 4.5Arms or higher ESR 18m Ω or below
- C8: For noise terminal voltage reduction 2200pF / AC250V
- D1: Rectifier diode FRD 200V / 0.5A
- D2: Rectifier diode 800V / 0.5A
- D3: Rectifier diode 60V / 20A
- D4: Diode bridge 800V / 1A
- R1: Resistor 47k Ω $\pm 1\%$ 0.1W
- R2: Resistor 100k Ω $\pm 5\%$ 3W Limiting element voltage 300V or higher
- R3: Resistor for output voltage setting 68k Ω $\pm 1\%$ 0.1W
- R4: Resistor 910 Ω $\pm 1\%$ 0.1W
- T1: Switching transformer
- F1: Fuse Be sure to use this for safety
- FL1: AC line filter
- ZNR: Varistor Must be use. It protects this part from lightning surge and static electricity.

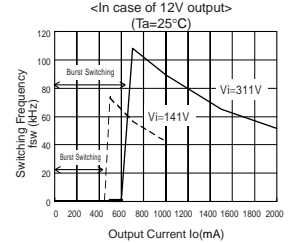
Precautions on use of products

- This product has built-in over current (reset type) and over voltage (latch 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

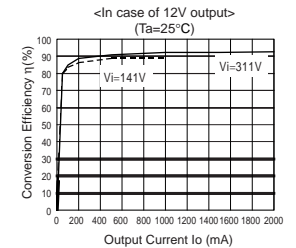
Derating Curve



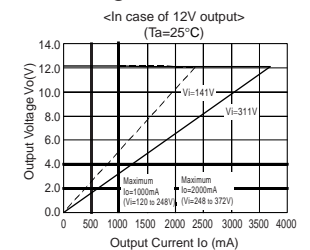
Switching Frequency



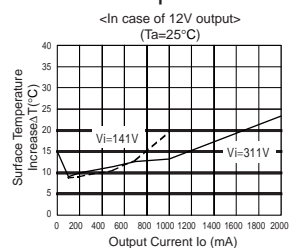
Conversion Efficiency



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. 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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