

Isolated AC/DC Converter

AC 100 to AC230V input, 24W output

BP5729

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	

Electrical Characteristics

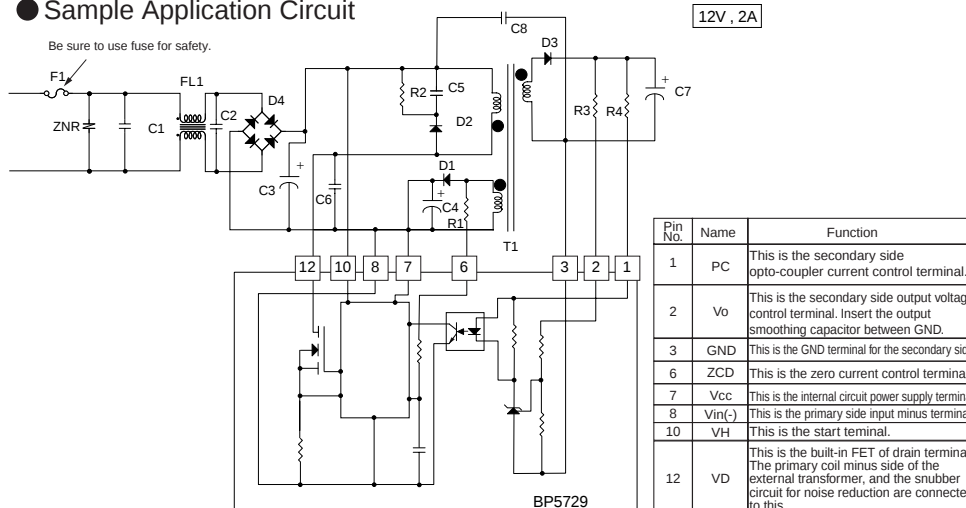
<In case of 12V output>

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

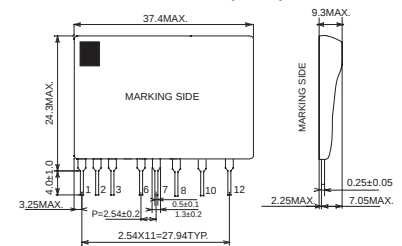
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Output voltage	V_O	11.4	12.0	12.6	V	$I_O=2000mA$
Output current	I_O	0	—	2000	mA	Refer to derating curve
Line regulation	V_r	—	13	200	mV	$V_i=120$ to $372VDC$ $I_O=1000mA$
Load regulation	V_L	—	20	200	mV	$I_O=50$ to $2000mA$
Output ripple voltage	V_p	—	0.16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

* Pulse noise is not included.

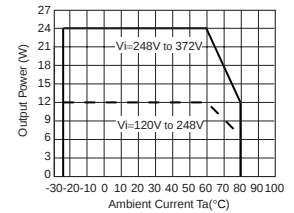
Sample Application Circuit



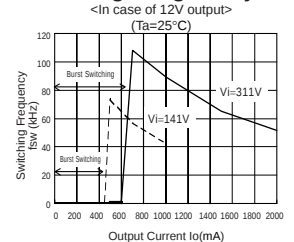
Dimensions (mm)



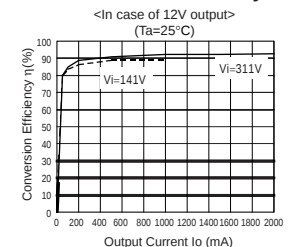
Derating Curve



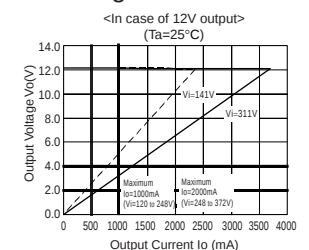
Switching Frequency



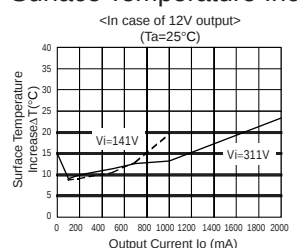
Conversion Efficiency



Load Regulation



Surface Temperature Increase



External Components Setting

C1, C2: Noise terminal voltage countermeasure capacitor	Limiting element voltage AC250V or higher 0.1 to 0.22μF
C3: Capacitor for input voltage smoothing	33μF / 450V General purpose one
C4: Capacitor for V_{CC} voltage smoothing	10μF / 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	1000μF / 35V x 2 Low impedance for power supply Rated ripple current 4.5Arms or higher ESR 18mΩ 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	47kΩ ±1% 0.1W
R2: Resistor	100kΩ ±5% 3W Limiting element voltage 300V or higher
R3: Resistor for output voltage setting	68kΩ ±1% 0.1W
R4: Resistor	910Ω ±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

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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