

Insulation Type AC-DC Converter

BP5049-15

AC 220V input, 15 V/800 mA output

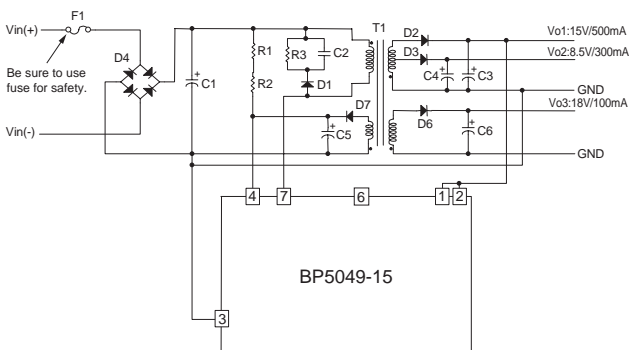
Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit	Conditions
Input Voltage 1	Vin	405	V	DC
Input Voltage 2	VD	900	V	DC
Input Voltage 3	VDD	25	V	DC
Input Current	ID	600	mA	
Output Current	IDD	10	mA	
Output Wattage	Po	13	W	
Operating Temperature Range	Topr	-25 to +80	°C	Refer to Derating Curve
Storage Temperature Range	Tstg	-30 to +105	°C	
Max Surface Temperature	Tsmax	100	°C	

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input Voltage	Vin	240	311	374	V	DC
Operating Power Voltage (4 pin)	VDD	8.8	12	22.7	V	
Output Voltage	Vo	14.2	15.2	16.3	V	Vi=311V, Io=800mA
Output Current	Io	0	-	800	mA	Vi=311V
Line Regulation	Vr	-	0.05	0.2	V	Vi=240V to 374V Io=800mA
Load Regulation	VI	-	0.1	0.2	V	Vi=311V, Io=0 to 800mA
Output Ripple Voltage	Vp	-	0.2	0.5	Vp-p	Vi=311V, Io=800mA
Conversion Efficiency	η	78	83	-	%	Vi=311V, Io=800mA

Sample Application Circuit



Pin No.	Terminal name	Terminal function
1	Vo1	15V output voltage control terminal
2	Vo1	15V output voltage control terminal
3	Vin(-)	Input minus terminal
4	VDD(+)	Internal circuit power supply terminal
5	-	Skip
6	NC	Non Connection
7	VD	Built-in FET of drain terminal

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

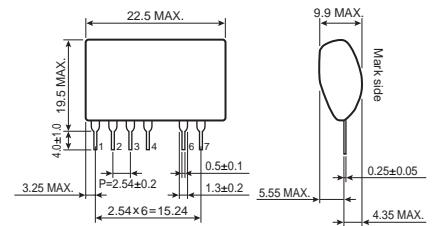
External Component Settings

C1: Input Capacitor	22μF/450V	D3: Rectifier Diode	60V/2A
C2: Noise Reduction Capacitor	2200pF/630V	D4: Diode Bridge	800V/1A
C3: Output Capacitor	470μF/50V low-impedance capacitor for power supply	D6: Rectifier Diode	100V/1A
C4: Output Capacitor	470μF/50V low-impedance capacitor for power supply	D7: Rectifier Diode	80V/0.1A
C5: VDD Capacitor	10μF/50V low-impedance capacitor for power supply	R1: Resistor	750kΩ±5%, 0.25W, 300V or higher rated voltage
C6: Output Capacitor	100μF/50V low-impedance capacitor for power supply	R2: Resistor	750kΩ±5%, 0.25W, 300V or higher rated voltage
D1: Rectifier Diode	900V/1A	R3: Resistor	100kΩ±5%, 2W, 300V or higher rated voltage
D2: Rectifier Diode	90V/3A	F1: Fuse	Use a fuse for safety

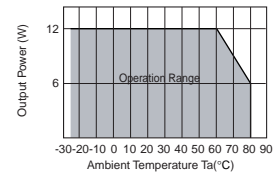
Operation Notes

- 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 C5 should be 10μF, since an excessively small value will result in malfunction. The activation time is defined as: $t(\text{sec}) = R2 \times C3 \times \ln[1 - 17 / (VI - 30\mu A \times R2)]$, where VI is the DC voltage after smoothing.
- The resistance of (R1+R2) should be 1.5MΩ, since an excessively small value will result in malfunction.
- Overcurrent (reset type) and overvoltage protection circuits are built in, preventing damage from occurring due to unexpected conditions.

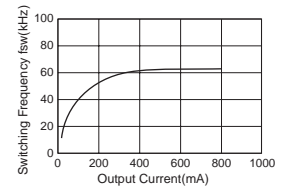
Dimensions (mm)



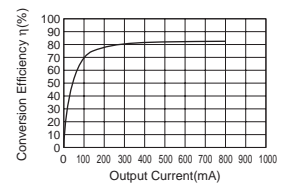
Derating Curve



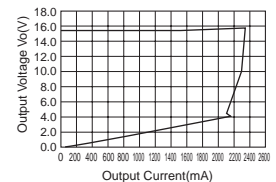
Switching Frequency



Conversion Efficiency



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. 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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