

AC220V input, 24V/150mA output

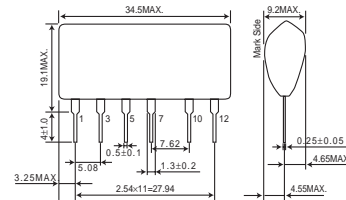
# Non-isolated AC/DC converter

## BP5047A24

● Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit
Input voltage	$V_i$	358	V
Maximum output voltage	$I_{OMAX}$	150	mApk
ESD endurance	$V_{surge}$	2	kV
Operating temperature range	$T_{opr}$	-20 to +80	°C
Storage temperature range	$T_{stg}$	-25 to +105	°C

● Dimensions (Unit : mm)

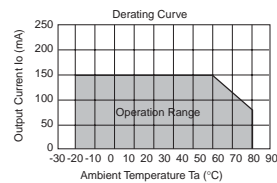


● Electrical Characteristics

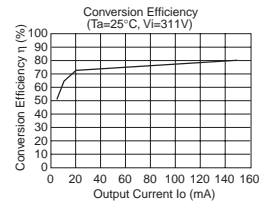
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage range	$V_i$	249	311	358	V	
Output voltage	$V_o$	23.0	24.0	25.8	V	$V_i=311V, I_o=100mA$
Output current	$I_o$	0	-	150	mA	$V_i=311V$ *1
Line regulation	$V_r$	-0.20	0.05	0.20	V	$V_i=249$ to $358V, I_o=100mA$
Load regulation	$V_l$	-0.20	0.05	0.20	V	$V_i=311V, I_o=0$ to $100mA$ *2
Output ripple voltage	$V_p$	-	0.07	0.15	Vp-p	$V_i=311V, I_o=100mA$
Power conversion efficiency	$\eta$	65	78	-	%	$V_i=311V, I_o=150mA$ *2

\*1 Maximum output current varies depending on ambient temperature ; please refer to derating curve.  
\*2 Please refer to Load regulation, Conversion efficiency.

● Derating Curve

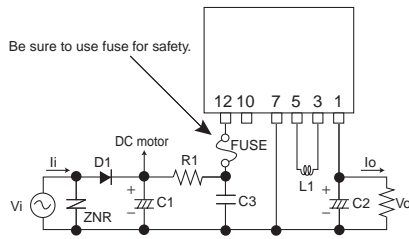


● Conversion Efficiency



● Application circuit

BP5047A24



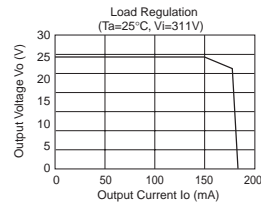
Pin No.	Function
1	Output terminal Vo(24V)
2	Skip
3	Choke coil connect
4	Skip
5	Choke coil connect
6	Skip
7	COMMON
8	Skip
9	Skip
10	N.C.
11	Skip
12	Input terminal Vi(311VDC)

For actual usage, Please kindly evaluate and confirm our part mounted in your product, Especially, Please make sure to confirm whether the load current exceed Max. rated current by using the current probe.

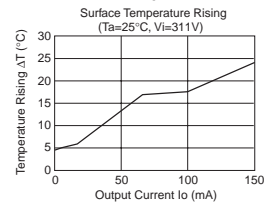
External components setting

- FUSE: Fuse Please make sure to use fuse 1A.
- C1: Input capacitor Rated voltage 400V or higher 22 to 820μF Permissible ripple current is 0.13Arms of higher
- C2: Output capacitor Rated voltage 35V or higher 100 to 470μF Low impedance type Impedance is 0.4Ω max at high frequency range. The constant value should be evaluated in the set.
- C3: Noise removal capacitor Rated voltage 400V or higher 0.1 to 0.22μF Film or ceramic capacitor Reduce the noise terminal voltage. The constant value should be evaluated in the set. Ripple current 0.25Arms above. Impedance of capacitor effects the output ripple voltage.
- L1: Power inductor Inductance : 1.5mH Permissible current value 300mA or higher
- D1: Rectifier diode The reverse surge voltage 800V or higher The average rectifying current 0.5A or higher The forward surge current should be 20A or higher.
- R1: Noise removal resistor 10Ω to 22Ω 1/4W Reduce the noise terminal voltage. The constant value should be evaluated in set.
- ZNR: Varistor Varistor must be used. It projects this part from lightning surge and static electricity.

● Load Regulation



● Surface Temperature Rising



# 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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  - [a] Infringement of the intellectual property rights of a third party
  - [b] Problems arising from the use of the products listed herein
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