AC/DC converter

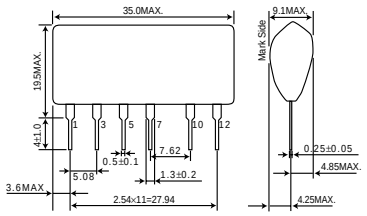
AC100V input, 12V/300mA output

BP5039B12

● Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit
Input voltage	Vi	170	V
Maximum Output current	I_{OMAX}	300	mApk
ESD endurance	Vsurge	2	kV
Maximum surface temperature	T_{CMAX}	105	°C
Operating temperature range	Topr	−20 ~ +80	°C
Storage temperature range	Tstg	−25 ~ +105	°C

● Dimension(Unit : mm)

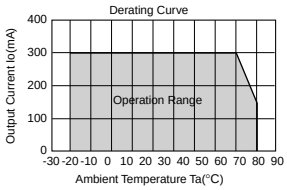


● Electrical Characteristics

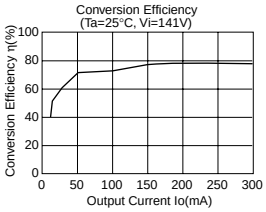
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage range	Vi	113	141	170	V	DC
Output voltage	Vo	11	12	13	V	Vi=141V, Io=100mA
Output current	Io	0	–	300	mA	Vi=141V ∗1
Line regulation	Vr	−0.10	0.04	0.10	V	Vi=113~170V, Io=100mA
Load regulation	Vl	−0.20	0.05	0.20	V	Vi=141V, Io=0~100mA ∗2
Output ripple voltage	Vp	–	0.07	0.15	Vp-p	Vi=141V, Io=100mA
Power conversion effciency	η	65	74	–	%	Vi=141V, Io=300mA ∗2

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

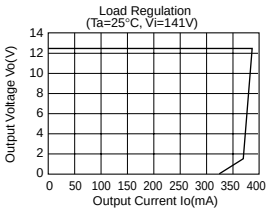
● Derating Curve



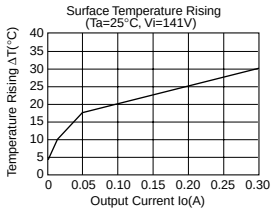
● Conversion Efficiency



● Load Regulation

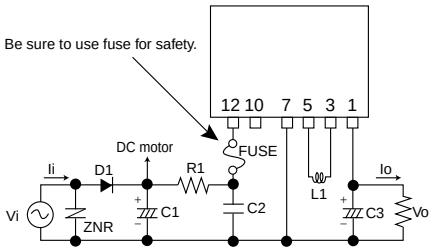


● Surface Temperature Rising



● Application circuit

BP5039B12



Pin No.	Function
1	Output terminal Vo(12V)
2	Not used
3	Choke coil connect
4	Not used
5	Choke coil connect
6	Not used
7	COMMON
8	Not used
9	Not used
10	N.C.
11	Not used
12	Input terminal Vi(141VDC)

For acutual 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 quick acting fuse 1A
C1: Capacitor for input voltage smoothing	Capacitance : 22µF~820µF Rated voltage : 250V or higher Ripple current is 0.13Arms above.
C2: For noise terminal voltage reduction	Capacitance : 0.1µF~0.22µF Rated voltage : 25V or higher Film capacitor or ceramic capacitor. Reduce the noise terminal voltage. The constant value should be evaluated in the set.
C3: Capacitor for Output voltage smooting	Capacitance : 100µF~470µF Rated voltage : 250V or higher, ESR is 0.4W max. Ripple current is 0.25Arms above. Output noise voltage is influenced. Please evaluate it in the actual set.
L1: Choke coil	L : 1mH Allowable current : 600mA or higher Please use the one that is hard to be magnetic saturated even in the high temperature.
D1: Rectifier diode	In the absolute maximum ratings, the reverse peak voltage should be 400V or higher, the average rectifying current should be 0.5A or higher, and the peak surge current should be 20A or higher. (Full-wave rectifier can be used in our part.)
R1: For noise terminal voltage reduction	10Ω~22Ω 1/4W Reduce the noise terminal voltage.The constant value should be evaluated in set.
ZNR: Varistor	Varistor must be used. It protects this part from lightning surge and static electricity.

Precautions on Use of ROHM Power Module

Safety Precautions

1) The products are designed and produced for application in ordinary electronic equipment (AV equipment, OA equipment, telecommunication equipment, home appliances, amusement equipment etc.).
   If the products are to be used in devices requiring extremely high reliability (medical equipment, transport equipment, aircraft/spacecraft, nuclear power controllers, fuel controllers, car equipment including car accessories, safety devices, etc.) and whose malfunction or operational error may endanger human life and sufficient fail-safe measures, please consult with the Company's sales staff in advance. If product malfunctions may result in serious damage, including that to human life, sufficient fail-safe measures must be taken, including the following:
   [a] Installation of protection circuits or other protective devices to improve system safety
   [b] Installation of redundant circuits in the case of single-circuit failure
2) The products are designed for use in a standard environment and not in any special environments. Application of the products in a special environment can deteriorate product performance. Accordingly, verification and confirmation of product performance, prior to use, is recommended if used under the following conditions:
   [a] Use in various types of liquid, including water, oils, chemicals, and organic solvents
   [b] Use outdoors where the products are exposed to direct sunlight, or in dusty places
   [c] Use in places where the products are exposed to sea winds or corrosive gases, including Cl2, H2S, NH3, SO2, and NO2
   [d] Use in places where the products are exposed to static electricity or electromagnetic waves
   [e] Use in proximity to heat-producing components, plastic cords, or othe flammable items
   [f] Use involving sealing or coating the products with resin or other coating materials
   [g] Use involving unclean solder or use of water or water-soluble cleaning agents for cleaning after soldering
   [h] Use of the products in places subject to dew condensation
3) The products are not 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.

Precautions Regarding Application Example and External Circuits

1) If change is made to the constant of an external circuit, allow a sufficient margin due to variations of the characteristics of the products and external components, including transient characteristics, as well as static characteristics. Please be informed that the Company has not conducted investigations on whether or not particular changes in the application examples or external circuits would result in the infringement of patent rights of a third party.
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] any problems incurred by the use of the products listed herein.
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  Products listed in this document are no antiradiation design.

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