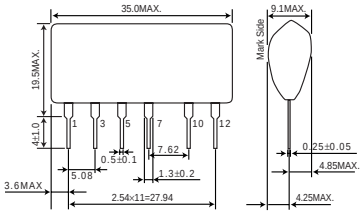
AC/DC converter BP5039-15

AC100V input, 15V/200mA output

● Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit
Input voltage	Vi	170	V
Maximum output current	I_{OMAX}	200	mApk
ESD endurance	Vsurge	2	kV
Operating temperature range	Topr	–25 to +80	°C
Storage temperature range	Tstg	–25 to +105	°C

● Dimensions (Unit : mm)

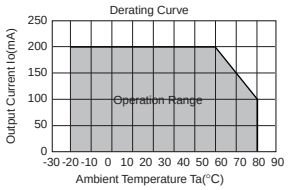


● Electrical Characteristics

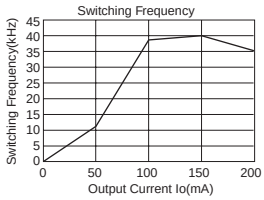
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage range	Vi	113	141	170	V	DC
Output voltage	Vo	14.25	15.00	15.75	V	Vi=141V, Io=100mA
Output current	Io	0	–	200	mA	Vi=141V ∗1
Line regulation	Vr	–0.20	0.05	0.20	V	Vi=113 to 170V, Io=100mA
Load regulation	Vl	–0.20	0.05	0.20	V	Vi=141V, Io=0 to 100mA ∗2
Output ripple voltage	Vp	–	0.07	0.15	Vp-p	Vi=141V, Io=100mA
Power conversion efficiency	η	60	74	–	%	Vi=141V, Io=200mA ∗2
Surface temperature rising	Tc	–	38	–	K	Vi=170V, Io=200mA
Output current overcurrent1	Im	240	270	–	mA	Vi=141V
Output current overcurrent2	Is	–	260	290	mA	Vi=141V

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

● Derating Curve

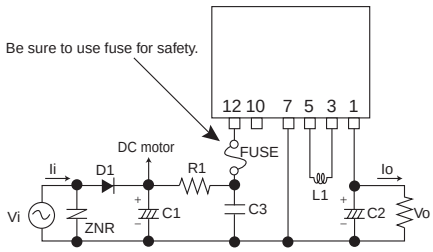


● Switching Frequency



● Application circuit

BP5039-15



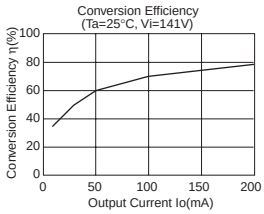
Pin No.	Function
1	Output terminal Vo(15V)
2	Skip
3	Choke coil connect
4	Skip
5	Choke coil connect
6	Skip
7	COMMON
8	Skip
9	Skip
10	N.C.
11	Skip
12	Input terminal Vi(141VDC)

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 absolute maximum rating by using current probe.

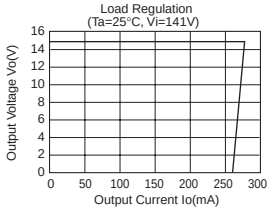
External components setting

FUSE: Fuse	Please make sure to use quick acting fuse (1A)
C1: Input capacitor	Above 250V, 22 to 820μF Ripple current 0.13Arms above
C2: Output capacitor	Above 25V, 100 to 470μF, Low impedance ESR : 0.4Ω Max. Ripple current 0.25Arms above Impedance of capacitor effects the output ripple voltage.
C3: For noise terminal voltage reduction capacitor	Above 250V, 0.1 to 0.22μF Film capacitor or Ceramic capacitor Reduce the noise terminal voltage. The constant value should be evaluated in the product.
L1: Power inductor	Inductance : 1mH, Rating current : above 600mA Choose components that do not easily get magnetically saturated in high temperature.
D1: Rectifier diode	Use a rectifying diode with the peak reverse voltage of 400V or higher, the average rectification current of 0.5A or larger and the peak surge current of 20A or larger. When using an input capacitor of a large capacity, choose a component that endures the inrush current on power-up. This product is compatible with full-wave rectification.
R1: For noise terminal voltage reduction resistor	10Ω~22Ω, 1/4W Reduce the noise terminal voltage. The constant value should be evaluated in the product.
ZNR: Varistor	Varistor must be used. It protects this part from lightning surge and static electricity.

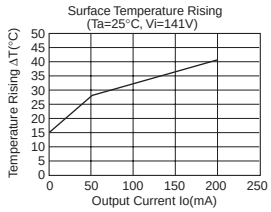
● Conversion Efficiency



● Load Regulation



● Surface Temperature Rising



Rev.A

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_2, H_2S, NH_3, SO_2, NO_2) 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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