AC/DC converter

AC100V input, 15V/200mA output

BP5039-15

● Absolute Maximum Ratings

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

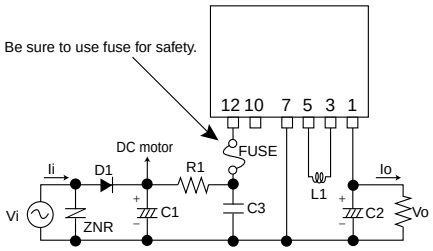
● Electrical Characteristics

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	–	–	200	mA	Vi=141V ∗1
Line regulation	Vr	–0.20	0.05	0.20	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 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 effciency.

● Application circuit

BP5039-15



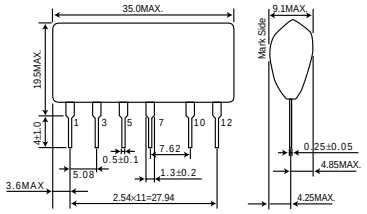
Pin No.	Function
1	Output terminal Vo(15V)
2	Not used
3	Choke coil connect
4	Not used
5	Choke coil connect
6	Not used
7	COMMON
8	Not used
9	Not used
10	N.C.
11	Not used
12	Input terminal Vi(141VDC)

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.

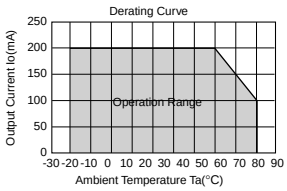
External components setting

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: Capacitor for Output voltage smooting	Capacitance : 100µF~470µF Rated voltage : 50V or higher, ESR is 0.4Ω max. Ripple current is 0.25Arms above. Output noise voltage is influenced.Please evaluate it in the actual set.
C3: For noise terminal voltage reduction	Capacitance : 0.1µF~0.22µF Rated voltage : 250V or higher Film capacitor or ceramic capacitor. Reduce the noise terminal voltage. The constant value should be evaluated in the 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 forward peak 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. Please set it,if necessary. The constant value should be evaluated in set.
ZNR: Varistor	Varistor must be used. It protects this part from lightning surge and static electricity.

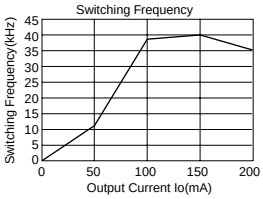
● Dimension(Unit : mm)



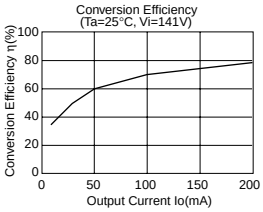
● Derating Curve



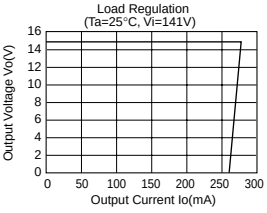
● Switching Frequency



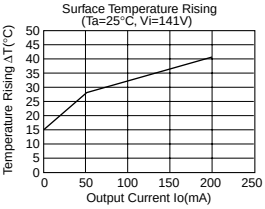
● Conversion Efficiency



● Load Regulation



● Surface Temperature Rising



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.

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