220VAC Input/15VDC (80mA) Output

Non-Isolated AC/DC Converter

BP5041B15

● Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit
Input voltage	Vi	390	V
Output current	Io	80	mApk
ESD endurance	Vsurge	2	kV
Operating temperature range	Topr	−25 to +80	°C
Storage temperature range	Tstg	−25 to +105	°C

● Electrical Characteristics

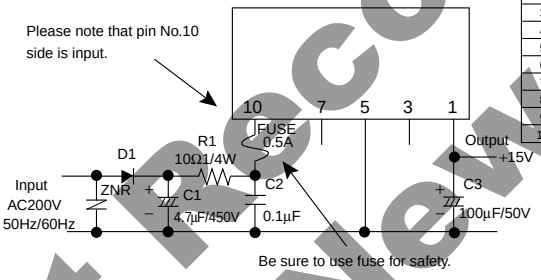
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage range	Vi	226	282	390	V	DC(160 to 276VAC)
Output voltage	Vo	14.0	15.0	16.0	V	Vi=282V, Io=50mA
Output current	Io	0	–	80	mA	Vi=282V ∗1
Line regulation	Vr	–	0.05	0.15	V	Vi=226 to 390V, Io=50mA
Load regulation	Vl	–	0.05	0.15	V	Vi=282V, Io=0 to 50mA ∗2
Output ripple voltage	Vp	–	0.05	0.15	Vp-p	Vi=282V, Io=50mA
Power conversion efficiency	η	50	64	–	%	Vi=282V, Io=80mA ∗2

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

● Application Circuit

BP5041B15

Please note that pin No.10 side is input.



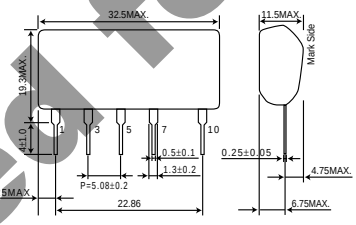
Pin No.	Function
1	Output terminal Vo(15V)
2	Not used
3	N.C.
4	Not used
5	COMMON
6	Not used
7	N.C.
8	Not used
9	Not used
10	Input terminal Vi(282VDC)

Please verify operation and characteristics in the customer's circuit before actual usage.
Ensure that the load current does not exceed the maximum rating.

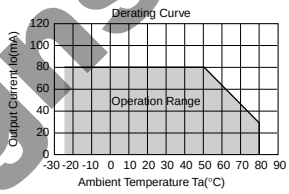
External Component Specifications

FUSE: FUSE	Use a fuse of 0.5A
C1: Input smoothing capacitor	Capacitance : 3.3 to 22μF Rated voltage : 450V or higher Ripple current 0.13Arms or greater
C2: Noise reduction capacitor	Capacitance : 0.1 to 0.22μF Rated voltage : 450V or higher Use a film or ceramic capacitor. Evaluate under actual operating conditions.
C3: Output smoothing capacitor	Capacitance : 100 to 470μF Rated voltage : 25V or higher, low impedance part Impedance is 0.39Ω max. at high frequencies Ripple current 0.1Arms above. Capacitor impedance affects the output ripple voltage.
D1: Rectifier diode	In the absolute maximum ratings, the reverse surge voltage should be 800V or higher, the average rectifying current should be 0.5A or higher, and the forward surge current should be 20A or higher.
R1: Noise reduction resistor	10 to 22Ω 1/4W Determine the ideal value through actual testing.
ZNR: Varistor	A varistor is required to protect against lightning surges and static electricity.

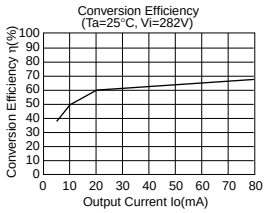
● Dimensions (Unit : mm)



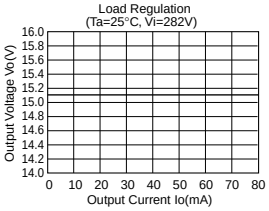
● Derating Curve



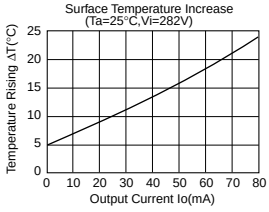
● Conversion Efficiency



● Load Regulation



● Surface Temperature Increase



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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