AC/DC converter

AC220V input, -12V/200mA output

BP5045A

● Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit
Input voltage	Vi	−390	V
Output current	Io	200	mApk
ESD endurance	Vsurge	2	kV
Operating temperature range	Topr	−20 to +80	℃
Storage temperature range	Tstg	−25 to +105	℃

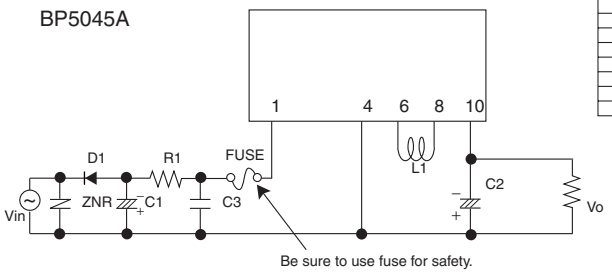
● Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage range	Vi	−113	−311	−390	V	DC
Output voltage	Vo	−11.5	−12.2	−12.9	V	Vi= −311V, Io=200mA
Output current	Io	−	−	200	mApk	Vi= −311V ∗1
Line regulation	Vr	−	0.07	0.15	V	Vi= −113 to −390V, Io=200mA
Load regulation	Vl	−	0.10	0.15	V	Vi= −311V, Io=0 to 200mA
Output ripple voltage	Vp	−	0.15	0.20	Vp-p	Vi= −311V, Io=200mA ∗2
Power conversion efficiency	η	72	75	−	%	Vi= −311V, Io=200mA

∗1 Maximum output current varies depending on ambient temperature ; please refer to derating curve.
∗2 Spike noise is not included in output ripple voltage.

● Application circuit

BP5045A



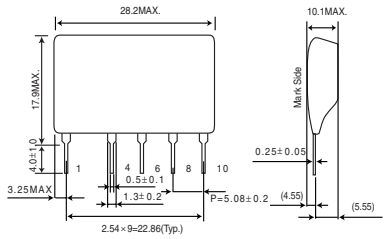
Pin No.	Function
1	Input
2	Skip
3	Skip
4	Common
5	Skip
6	Power inductor
7	Skip
8	Power inductor
9	Skip
10	Output

For actual usage, Please kindly evaluate and confirm our part mounted in your product, Especially, Please make sure to confirm the load current does not exceed Max. rated current by using the current probe.

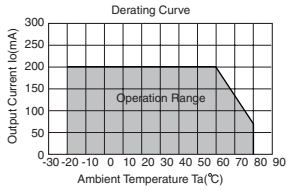
External components setting

FUSE: FUSE	Recommend the use of fast-acting type fuse 1.0A.
C1: Input capacitor	Rated voltage : More than 450V Capacity : 22 to 100μF
C2: Output capacitor	Rated voltage : More than 35V Capacity : 220 to 470μF, low impedance type ESR : Less than 0.16Ω Rated ripple current : More than 0.58Arms Evaluate it with the actual opportunity because it influences an output ripple voltage.
C3: Noise removal capacitor	Rated voltage : More than 450V film capacitor, or ceramic capacitor Capacity : 0.1 to 0.22μF
L1: Choke coil	Inductance : 820μH Rated current : More than 0.42A
R1: Noise removal resistor	Resistance : 10 to 22Ω Power : More than 1/4W
D1: Rectifier diode	Peak reverse voltage : More than 800V Mean rectifying current : More than 1.0A Peak forward surge current : More than 20A This product can use even all the wave rectification.
ZNR: Varistor	Be sure to use it to protect this product from thunder surge and the static electricity.

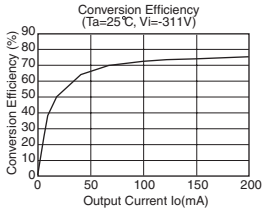
● Dimensions(Unit : mm)



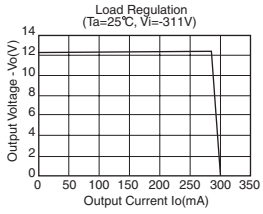
● Derating Curve



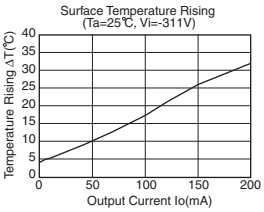
● Conversion Efficiency



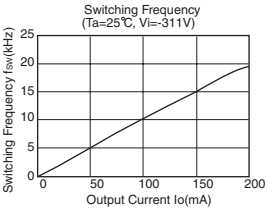
● Load Regulation



● Surface Temperature Rising



● Switching Frequency



Rev.F

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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