

AC/DC converter

AC220V input, -5V/200mA output

BP5045A5

Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit
Input voltage	V_i	-390	V
Output voltage	V_o	200	mApk
ESD endurance	V_{surge}	2	kV
Operating temperature range	T_{opr}	-20 to +80	°C
Storage temperature range	T_{stg}	-25 to +105	°C

Electrical Characteristics

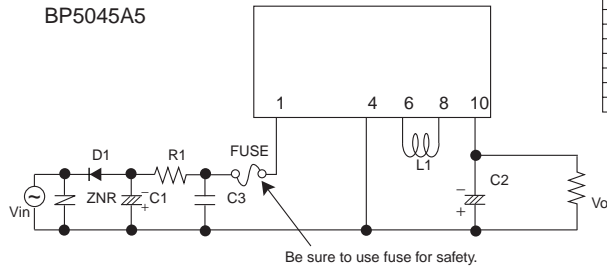
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage range	V_i	-113	-311	-390	V	DC
Output voltage	V_o	-4.7	-5.0	-5.3	V	$V_i = -311V, I_o = 200mA$
Output current	I_o	-	-	200	mA	$V_i = -311V$ *1
Line regulation	V_r	-	0.10	0.15	V	$V_i = -113$ to $-390V, I_o = 200mA$
Load regulation	V_l	-	0.10	0.15	V	$V_i = -311V, I_o = 0$ to $200mA$
Output ripple voltage	V_p	-	0.10	0.20	Vp-p	$V_i = -311V, I_o = 200mA$ *2
Power conversion efficiency	η	60	65	-	%	$V_i = -311V, I_o = 200mA$

*1 Maximum output current must be reduced by ambient temperature.

*2 An output ripple voltage sometimes changes in capacitor to use, the measurement environment.

Application circuit

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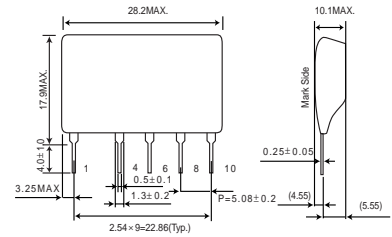


Be sure to use fuse for safety.

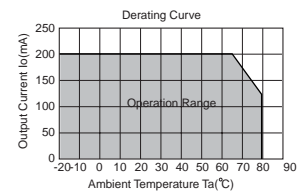
Be sure to evaluate it under the condition that it is mounted by your product.
Especially, Confirm whether output current never exceeds a maximum standard with current probe.

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

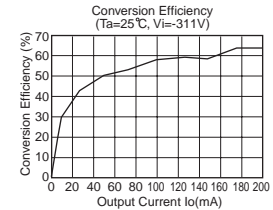
Dimension(Unit : mm)



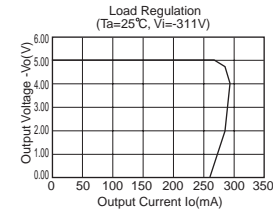
Derating Curve



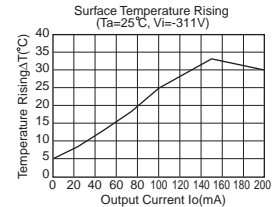
Conversion Efficiency



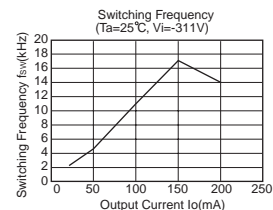
Load Regulation



Surface Temperature Rising



Switching Frequency



External components setting

- FUSE:** FUSE Recommended the use of fast-acting type fuse 1.0A.
- C1:** Input Capacitor Rated voltage : More than 450V
Capacitance : 22 μ F to 100 μ F
- C2:** Output Capacitor Rated voltage : More than 25V
Capacitance : 100 μ F to 1000 μ F, low impedance type
ESR : Less than 0.18 Ω
Rated ripple current : More than 0.62Arms
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 Ceramics capacitor
Capacitance : 0.1 to 0.22 μ F ;
- L1:** Power Inductor Inductance : 1mH Rated Current : More than 0.41A
It is changed electrical characteristics by winding direction of Power Inductor
- R1:** Noise Removal Resistor Resistance : 10 Ω to 22 Ω
Power : More than 1/2W
- 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.
If capacitance for input voltage smoothing is large, please use rectifier diode that peak forward surge current is larger
- ZNR:** Varistor Be sure to use it to protect this product from thunder surge and the static electricity.

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. Cl₂, H₂S, NH₃, SO₂, NO₂) 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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In case of export from Japan, please confirm if it applies to "objective" criteria or an "informed" (by MITI clause) on the basis of "catch all controls for Non-Proliferation of Weapons of Mass Destruction.