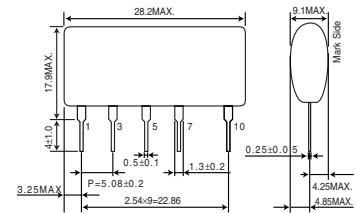


### Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit
Input voltage	$V_i$	-170	V
Output current	$I_o$	200	mApk
ESD endurance	$V_{surge}$	2	kV
Operating temperature range	$T_{opr}$	-25 to +80	°C
Storage temperature range	$T_{stg}$	-25 to +105	°C

### Dimensions(Unit : mm)



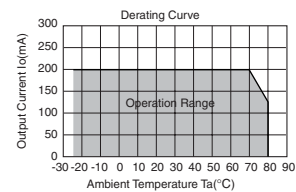
### Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage range	$V_i$	-113	-141	-170	V	DC
Output voltage	$V_o$	-11	-12	-13	V	$V_i=-141V, I_o=200mA$
Output current	$I_o$	-	-	200	mA	$V_i=-141V$ *1
Line regulation	$V_r$	-	0.04	0.15	V	$V_i=-113$ to $-170V, I_o=200mA$
Load regulation	$V_l$	-	0.05	0.15	V	$V_i=-141V, I_o=0$ to $200mA$
Output ripple voltage	$V_p$	-	0.05	0.15	Vp-p	$V_i=-141V, I_o=200mA$ *2
Conversion efficiency	$\eta$	60	74	-	%	$V_i=-141V, I_o=200mA$

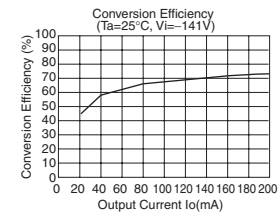
\*1 Maximum output current varies depending on ambient temperature ; please refer to derating curve.

\*2 Spike noise is not included in output ripple voltage.

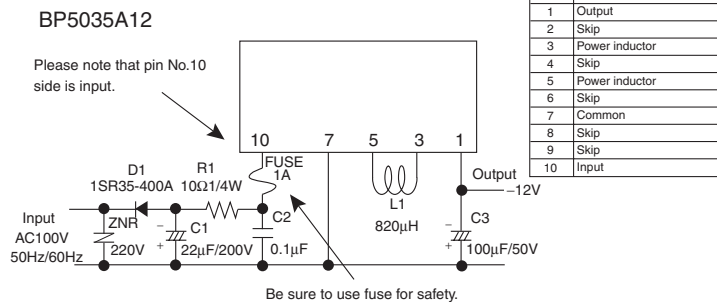
### Derating Curve



### Conversion Efficiency



### Application circuit



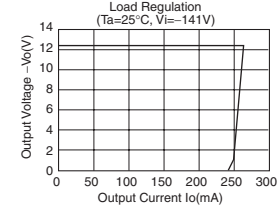
Pin No.	Function
1	Output
2	Skip
3	Power inductor
4	Skip
5	Power inductor
6	Skip
7	Common
8	Skip
9	Skip
10	Input

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 Max. rated current by using the current probe.

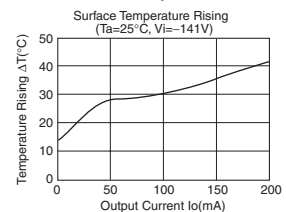
### External components setting

FUSE: FUSE	Recommend the use of fast-acting type fuse 1.0A.
C1: Input capacitor	Rated voltage : More than 200V Capacity : 22 to 100μF
C2: Noise removal capacitor	Rated voltage : More than 200V film capacitor, or Ceramic capacitor Capacity : 0.1 to 0.22μF
C3: Output capacitor	Rated voltage : More than 25V Capacity : 100 to 470μF, low impedance type ESR : Less than 0.4Ω Rated ripple current : More than 0.25Arms Evaluate it with the actual opportunity because it influences an output ripple voltage.
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 400V Mean rectifying current : More than 0.5A Peak forward surge current : More than 20A This product can use even all the wave rectification. Be sure to use it to protect this product from thunder surge and the static electricity.
ZNR: Varistor	

### Load Regulation



### Surface Temperature Rising



# 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<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, NO<sub>2</sub>) 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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- 1) The specifications included herein contain information related to the Company's industrial property. Their use other than pertaining to the relevant products is forbidden. Duplication and/or disclosure to a third party without express written permission is strictly prohibited.
- 2) Product information and data, including application examples, contained in the specifications are for reference purposes only; the Company does not guarantee the industrial/intellectual property rights or any other rights of a third party. Accordingly, the Company shall not bear responsibility for:
  - [a] Infringement of the intellectual property rights of a third party
  - [b] Problems arising from the use of the products listed herein
- 3) The Company prohibits the purchaser from exercising or using the intellectual/industrial property rights or any rights belonging to or are controlled by the Company, other than the right to use, sell, or dispose of the products.

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The products listed in this document are designed to be used with ordinary electronic equipment or devices (such as audio visual equipment, office-automation equipment, communications devices, electrical appliances and electronic toys).

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