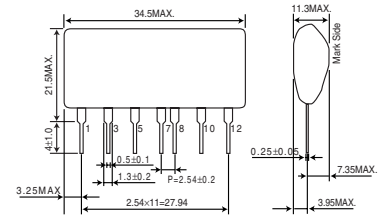


Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit
Input voltage	V_i	-190	V
Output current	I_o	850	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

Dimensions (Unit : mm)

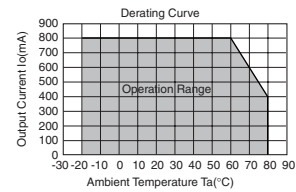


Electrical Characteristics

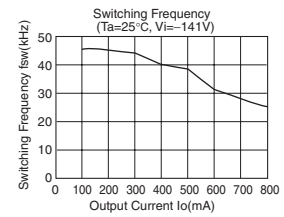
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage range	V_i	-120	-141	-162	V	DC(80 to 120VAC)
Output voltage	V_o	-11	-12	-13	V	$V_i=-141V, I_o=800mA$
Output current	I_o	0	-	800	mA	$V_i=-141V$ *1
Line regulation	V_r	-	0.20	0.45	V	$V_i=-120$ to $-162V, I_o=800mA$ *2
Load regulation	V_l	-	0.50	0.75	V	$V_i=-141V, I_o=0$ to $800mA$ *2
Output ripple voltage	V_p	-	0.15	0.30	Vp-p	$V_i=-141V, I_o=800mA$ *2
Power conversion efficiency	η	65	78	-	%	$V_i=-141V, I_o=800mA$ *2

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

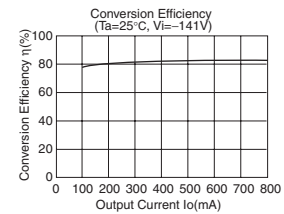
Derating Curve



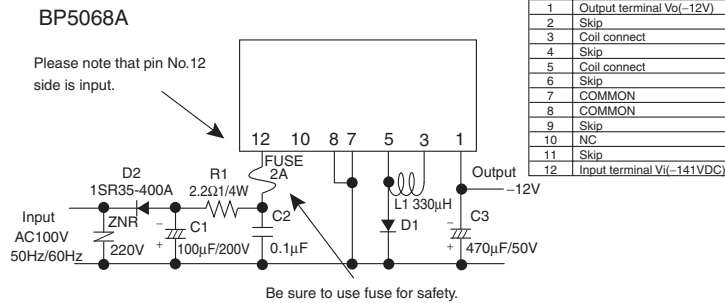
Switching Frequency



Conversion Efficiency



Application circuit



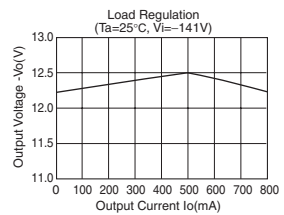
Pin No.	Function
1	Output terminal $V_o(-12V)$
2	Skip
3	Coil connect
4	Skip
5	Coil connect
6	Skip
7	COMMON
8	COMMON
9	Skip
10	NC
11	Skip
12	Input terminal $V_i(-141VDC)$

Be sure to use fuse for safety.
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.

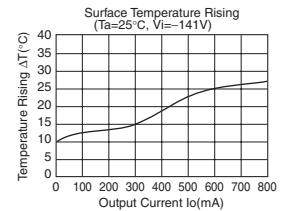
External components setting

- FUSE:** Fuse
Please make sure to use quick acting fuse 2A
- C1:** Input capacitor
Above 200V, 47 to 220μF
Ripple current 0.22Arms above
- C2:** For noise terminal voltage reduction capacitor
Above 200V, 0.1 to 0.22μF
Film capacitor or Ceramic capacitor
Reduce the noise terminal voltage.
The constant value should be evaluated in the product.
- C3:** Output capacitor
Above 25V, 330 to 1000μF, Low impedance
ESR : 0.08Ω Max.
Ripple current 1Arms above
Impedance of capacitor effects the output ripple voltage
- L1:** Power inductor
Inductance : 330μH, Rating current : above 1.6A
Choose components that do not easily get magnetically saturated in high temperature.
- D1:** Flywheel diode
Above 400V, current : above 3A
Fast recovery diode
Please note that both the switching and efficiency characteristics of the module are affected by this diode.
Recommended products : 31DF4 (Nihon Inter) or RU30 (Sanken)
- D2:** Rectifier diode
Use a rectifying diode with the peak reverse voltage of 400V or higher, the average rectification current of 1A or larger and the peak surge current of 20A or larger. When using an input capacitor of a large capacity, choose a component that endures the inrush current on power-up.
This product is compatible with full-wave rectification.
- R1:** For noise terminal voltage resistor
1Ω to 2.2Ω, 1/4W
Reduce the noise terminal voltage.
The constant value should be evaluated in the product.
- ZNR:** Varistor
Varistor must be used. It protects this part from lightning surge and static electricity.

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. 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.

Notes Regarding Industrial Property

- 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.
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 - [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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- Products listed in this document are no antiradiation design.

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).

Should you intend to use these products with equipment or devices which require an extremely high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

It is our top priority to supply products with the utmost quality and reliability. However, there is always a chance of failure due to unexpected factors. Therefore, please take into account the derating characteristics and allow for sufficient safety features, such as extra margin, anti-flammability, and fail-safe measures when designing in order to prevent possible accidents that may result in bodily harm or fire caused by component failure. ROHM cannot be held responsible for any damages arising from the use of the products under conditions out of the range of the specifications or due to non-compliance with the NOTES specified in this catalog.

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