100VAC Input/–24VDC (600mA) Output

Non-Isolated AC/DC Converter

BP5068A24

● Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit
Input voltage	Vi	–190	V
Output current	Io	0.8	Apk
ESD endurance	Vsurge	2	kV
Operating temperature range	Topr	–20 to +80	°C
Storage temperature range	Tstg	–25 to +105	°C

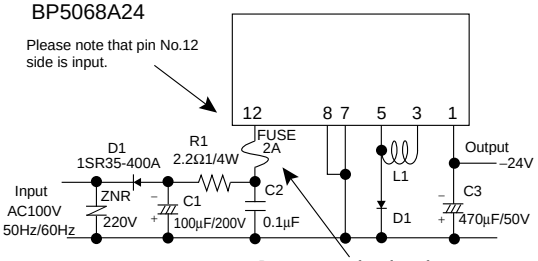
● Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage range	Vi	–162	–141	–120	V	DC(85 to 115VAC)
Output voltage	Vo	–26.0	–24.0	–22.0	V	Vi=–141V, Io=600mA
Output current	Io	0	–	0.6	A	Vi=–141V ∗1
Line regulation	Vr	–	0.23	0.48	V	Vi=–120 to –162V, Io=600mA
Load regulation	Vl	–	0.55	0.75	V	Vi=–141V, Io=0 to 600mA ∗2
Output ripple voltage	Vp	–	0.11	0.20	Vp-p	Vi=–141V, Io=600mA
Power conversion efficiency	η	82	88	–	%	Vi=–141V, Io=600mA ∗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

BP5068A24



Be sure to use fuse for safety.

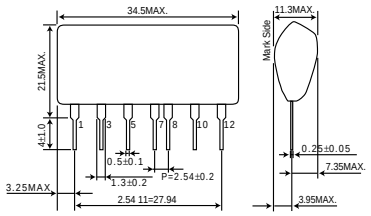
Pin No.	Function
1	Output terminal Vo(–24V)
2	Skip
3	Coil connect
4	Skip
5	Coil Connect
6	Skip
7	COMMON
8	COMMON
9	Skip
10	N.C.
11	Skip
12	Input terminal Vi(–141VDC)

Please verify operation and characteristics in the customer's circuit before actual usage and ensure that the load current does not exceed 0.6A.

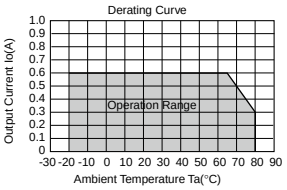
External Component Specifications

FUSE: Fuse	Use a quick-acting fuse (2A)
C1: Input capacitor	Above 200V, 47 to 220µF Ripple current 0.22Arms or greater
C2: Noise reduction capacitor	Above 200V, 0.1 to 0.22µF Use a film or ceramic capacitor. Evaluate under actual operating conditions.
C3: Output capacitor	Above 50V, 330 to 1000µF, low impedance ESR : 0.08Ω Max. Ripple current 1Arms or greater Capacitor impedance affects the output ripple voltage.
L1: Power inductor	Inductance : 1.0mH, Rating current : above 1.2A Select components that do not easily get magnetically saturated at 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 a peak reverse voltage of 400V or higher, an average rectification current of 1A or larger and a peak surge current of 20A or larger. When using a large capacitance input capacitor, select a component that is strong against inrush current during power up. Full-wave rectification can be used.
R1: Noise reduction resistor	1.0 to 2.2Ω, 1/4W Determine the ideal value through actual testing.
ZNR: Varistor	A varistor is required to protect against lightning surges and static electricity.

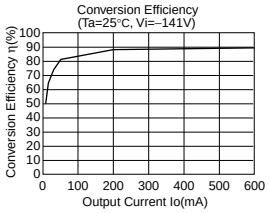
● Dimensions (Unit : mm)



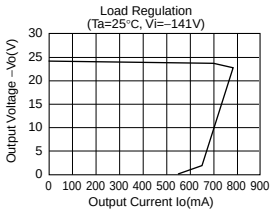
● Derating Curve



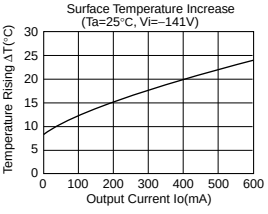
● Conversion Efficiency



● 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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