

100VAC Input/12VDC (350mA) Output

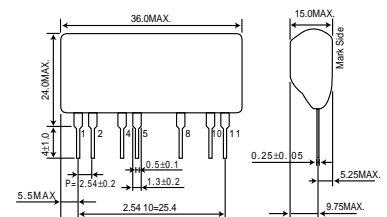
# Isolated AC/DC Converter

**BP5710-1**

## ● Absolute Maximum Ratings

| Parameter                   | Symbol      | Limits      | Unit | Conditions                   |
|-----------------------------|-------------|-------------|------|------------------------------|
| Input voltage               | $V_i$       | 170         | V    | DC                           |
| Output current              | $I_o$       | 350         | mApk |                              |
| ESD endurance               | $V_{surge}$ | 2           | kV   | IEC61000-4-2 Highest level 1 |
| Operating temperature range | $T_{opr}$   | -20 to +80  | °C   |                              |
| Storage temperature range   | $T_{stg}$   | -25 to +105 | °C   |                              |
| Voltage between 1&2 order   | BV          | 1800        | Vrms | 2s                           |

## ● Dimensions (Unit : mm)



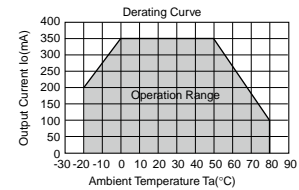
## ● Electrical Characteristics

| Parameter                   | Symbol | Min. | Typ. | Max. | Unit | Conditions                      |
|-----------------------------|--------|------|------|------|------|---------------------------------|
| Input voltage range         | $V_i$  | 120  | 141  | 162  | V    | DC(85 to 115VAC)                |
| Output voltage              | $V_o$  | 11.0 | 12.0 | 13.0 | V    | $V_i=141V, I_o=350mA$           |
| Output current              | $I_o$  | 0    | -    | 350  | mA   | $V_i=141V$ *1                   |
| Line regulation             | $V_r$  | -    | 0.15 | 0.3  | V    | $V_i=120$ to $162V, I_o=350mA$  |
| Load regulation             | $V_l$  | -    | 0.15 | 0.3  | V    | $V_i=141V, I_o=0$ to $350mA$ *2 |
| Output ripple voltage       | $V_p$  | -    | 0.25 | -    | Vp-p | $V_i=141V, I_o=350mA$           |
| Power conversion efficiency | $\eta$ | 70   | 77   | -    | %    | $V_i=141V, I_o=350mA$ *2        |
| Isolation resistance        | BR     | 100  | -    | -    | MΩ   | DC100V between 1&2 order        |

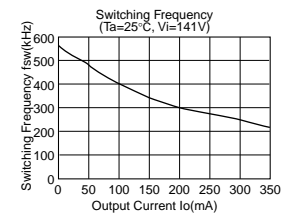
\*1 The max Output current is changed due to the ambient temperature. Please refer to the note regarding derating curve.

\*2 Please refer to regarding the definitions of the Load regulation, Conversion efficiency.

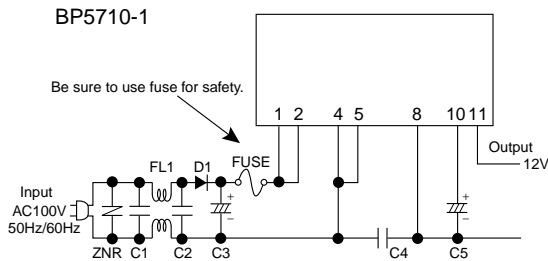
## ● Derating Curve



## ● Switching Frequency



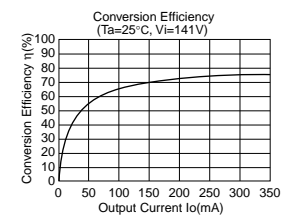
## ● Application Circuit



| Pin No. | Function                      |
|---------|-------------------------------|
| 1       | Input terminal $V_i$ (141VDC) |
| 2       | Input terminal $V_i$ (141VDC) |
| 3       | Not used                      |
| 4       | COMMON (Primary)              |
| 5       | COMMON (Primary)              |
| 6       | Not used                      |
| 7       | Not used                      |
| 8       | COMMON (Secondary)            |
| 9       | Not used                      |
| 10      | Capacitor connect             |
| 11      | Output terminal $V_o$ (12V)   |

Please verify operation and characteristics in the customer's circuit before actual usage. Ensure that the load current does not exceed the maximum rating.

## ● Conversion Efficiency

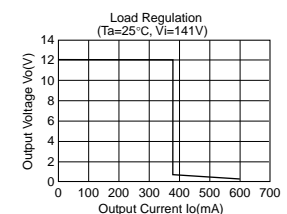


## External Component Specifications

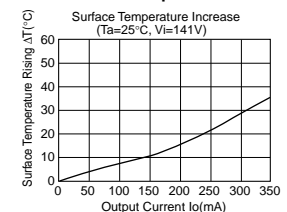
FUSE : Use a quick-acting fuse of 0.5A.

- ZNR : Varistor  
A varistor is required to protect against lightning surges and static electricity.
- D1: Rectifier diode  
In the absolute maximum ratings, the reverse peak voltage should be 400V or higher, the average rectifying current should be 0.5A or higher, and the peak surge current should be 20A or higher. (Full-wave rectification can be used.)
- C3: Input smoothing capacitor  
Rated voltage : 200V or higher. Capacitance : 33 to 330μF
- FL1: Noise reduction filter  
Use a line filter if necessary.
- C1,2,4 : Noise reduction capacitors  
Capacitance (C1,C2) : 0.1 to 0.22μF, (C4) : 4700pF  
Rated voltage : 200V or higher. Film or ceramic capacitor. Evaluate under actual operating conditions.
- C5: Output smoothing capacitor  
Capacitance : 470 to 1000μF Rated voltage : 25V or higher, ESR is 0.16Ω max. Ripple current is 0.58Arms or greater Low impedance type. Evaluate under actual operating conditions.

## ● 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<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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  - [b] Problems arising from the use of the products listed herein
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