1. **STRUCTURE** Single In-line Package With Coating

2. **PRODUCTS** POWER MODULE

3. **TYPE** BP5726-15

4. **APPLICATION** Power supply for electric household appliances and washing machine

5. **FUNCTION** BP5726-15 is a non-insulation type switching regulator module employing RCC (Ringing choke converter) control method.
Input voltage is equivalent to 85～276V (AC) with 120～390V (DC).
Output is 6.4W type with input voltage 120～239V (DC),
12W type with 240～390V (DC).
Built-in over current protection function

## 6. ABSOLUTE MAXIMUM RATINGS

These are the valves which must not be exceeded at any time under any application or any test conditions. Please make design keeping enough margins accordingly.

(Ta=25℃)

| No. | PARAMETER | SYMBOL | RATING | UNIT | REMARK |
|---|---|---|---|---|---|
| 1 | Input voltage (Pin.7) | VD | 800 | V | |
| 2 | Input voltage (Pin.4) | VFB | 24 | V | |
| 3 | Input current (Pin.7) | ID | 400 | mA | |
| 4 | Output power | Po | 12<br>6.4 | W<br>W | Input voltage 240～390V (DC)<br>Input voltage 120～239V (DC) |
| 5 | Allowable maximum surface temperature | Tcmax | 105 | ℃ | Ambient temperature + The module self-heating ≦ Tcmax |
| 6 | Operating temperature range | Topr | -25 ～ +80 | ℃ | Refer to derating curve |
| 7 | Storage temperature range | Tstg | -40 ～ +105 | ℃ | |

## 7. ELECTRICAL CHARACTERISTICS

<Definition of items >

| | |
|---|---|
| Line regulation | It is the change value of the output voltage by change of input voltage. |
| Load regulation | It is the change value of the output voltage by change of output current. |
| Power conversion efficiency | It computes by $\eta = \frac{Vo \times Io}{Vin \times Iin} \times 100[\%]$. |
| Output ripple voltage | It measures on PEAK-TO-PEAK of the ripple voltage, and spike noise is not inclided. |

(Unless otherwise noted, Vi=311V, rated load Ta=25℃)

| No. | PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CIRCUIT | CONDITIONS |
|---|---|---|---|---|---|---|---|---|
| 1 | Output voltage | Vo | 14.0 | 15.0 | 16.0 | V | FIG.1 | Io=800mA |
| 2 | Output current | Io | 0 | - | 800 | mA | | Note1) |
| 3 | Line regulation | Vr | - | 30 | 150 | mV | | Vin=240 ~ 390VDC Io=800mA |
| 4 | Load regulation | Vl | - | 80 | 500 | mV | | Io=50mA ~ 800mA |
| 5 | Output ripple voltage | Vp | - | 150 | 500 | mVpp | | Note 2) |
| 6 | Power conversion efficiency1 | η1 | 75 | 85 | - | % | | |
| 7 | Power conversion efficiency2 | η2 | 35 | 49 | - | % | ↓ | Io=20mA |

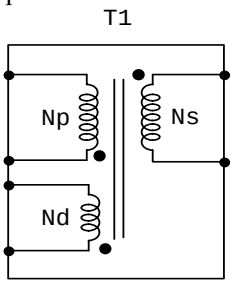
Note1) Max output current should be reduced according to the surrounding temperature.

Note2) The output ripple voltage may vary depending on the capacitance, environment, and location of peripheral components. Especially more attention has to be paid to aluminum electrolytic capacitor because ESR changes greatly and output ripple voltages increase at the time of the low temperature.

Reference specifications

* Transformer specifications

| | | Inductance (10KHz) | Number of turns |
|---|---|---|---|
| Primary side | Np coil | 4.5mH±15% | 134T |
| Ns shorted | Leakage-L | 138μHMAX | |
| Feedback side | Nd coil | — | 7T |
| Secondary side | Ns coil | — | 18T |

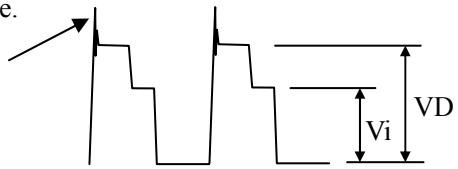



● :This mark shows the start of coil turn.

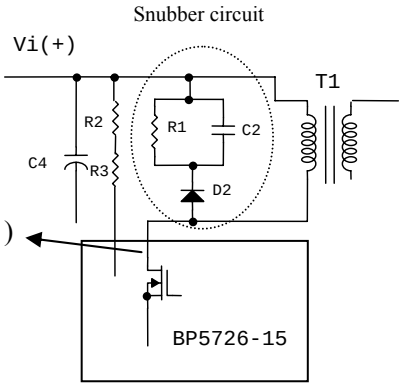
- Design the transformer so that the maximum surface temperature of the module should be 105℃ or less in the actual conditions.
- Inductances and number of turn should not change, because Electrical Characteristics is changed.

VD shows the following voltage.

Be sure to make it 750V peak or less with a snubber circuit or the like.




Module 7-pin voltage waveform (built-in FET of drain voltage )



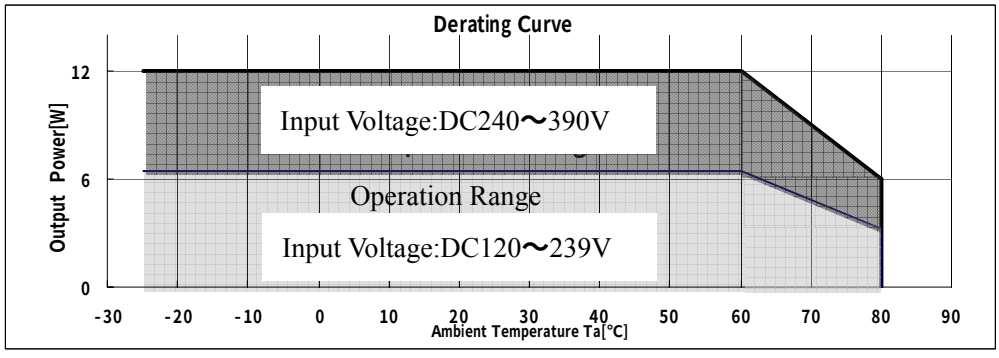

* Internal power MOS element specifications

RDS(ON) : 15Ω TYP 20Ω MAX

ID : 1A

VDSS : 900V

**8. DERATING CURVE**




GRAPH1. Derating Curve

## 9. TEST CIRCUIT

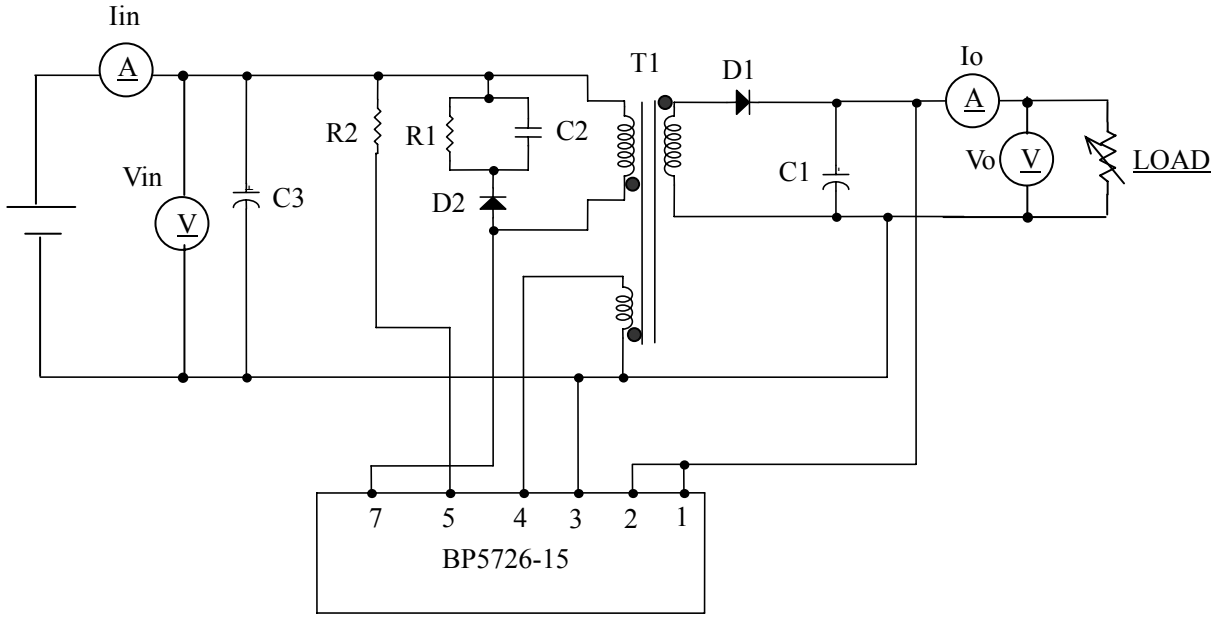
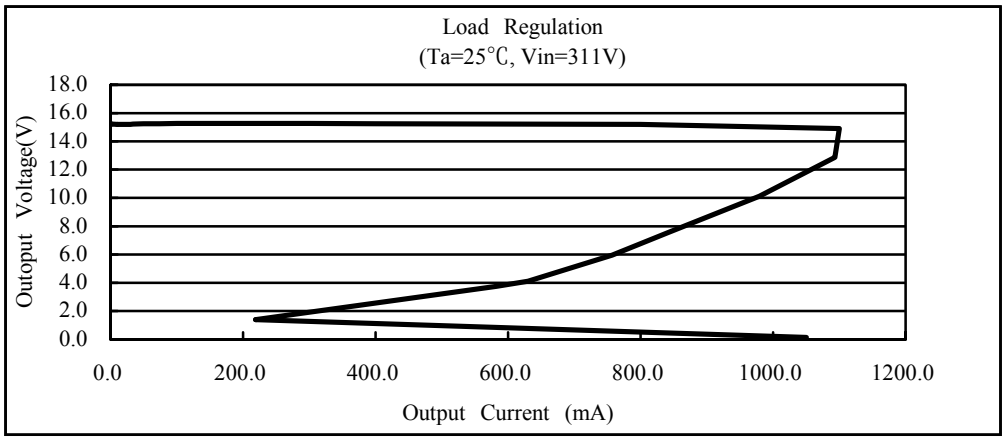



FIG1. Test Circuit

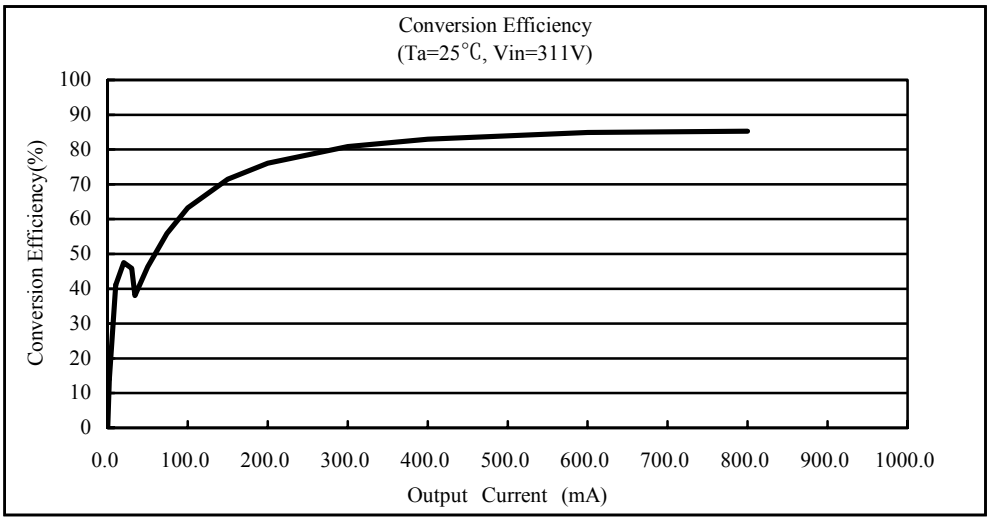
<External components setting>

| SYMBOL | APPLICATION | CHARACTERISTICS | RECOMMENDED PARTS |
|---|---|---|---|
| C1 | output capacitor | 1000 μF / 35V Low impedance product | UPM1V102M (Nichicon) |
| C2 | Noise removal capacitor | 2200pF / 1KV | ECKA3A222KBP (Panasonic) |
| C3 | Input capacitor | 33 μF / 450V | 450YXA33M (Rubicon) |
| D1 | Rectifier diode | 90V/6A | RB095B-90 (ROHM) |
| D2 | Rectifier diode | 1KV/1A | U05NU44 (Toshiba) |
| R1 | Resistor | 100KΩ ±5% 3W<br>Rated voltage: 300V or higher | |
| R2 | Resistor | 750kΩ ±5% 0.25W<br>Rated voltage: 600V or higher | |
| T1 | Switching transformer | Custom one | |

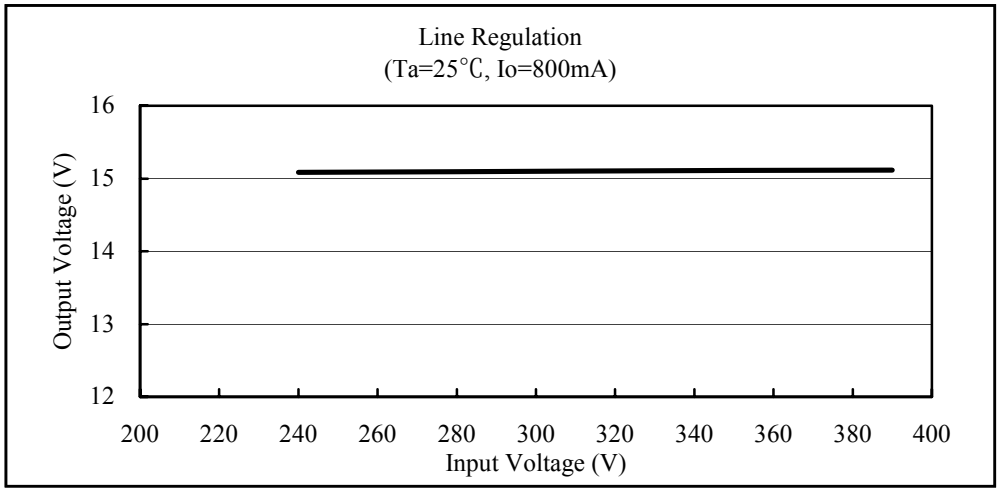
## 10. ELECTRICAL CHARACTERISTICS CURVES




GRAPH.2 Load Regulation




GRAPH.3 Conversion Efficiency




GRAPH.4 Line Regulation

**11. DIMENSIONS (UNIT:mm)**

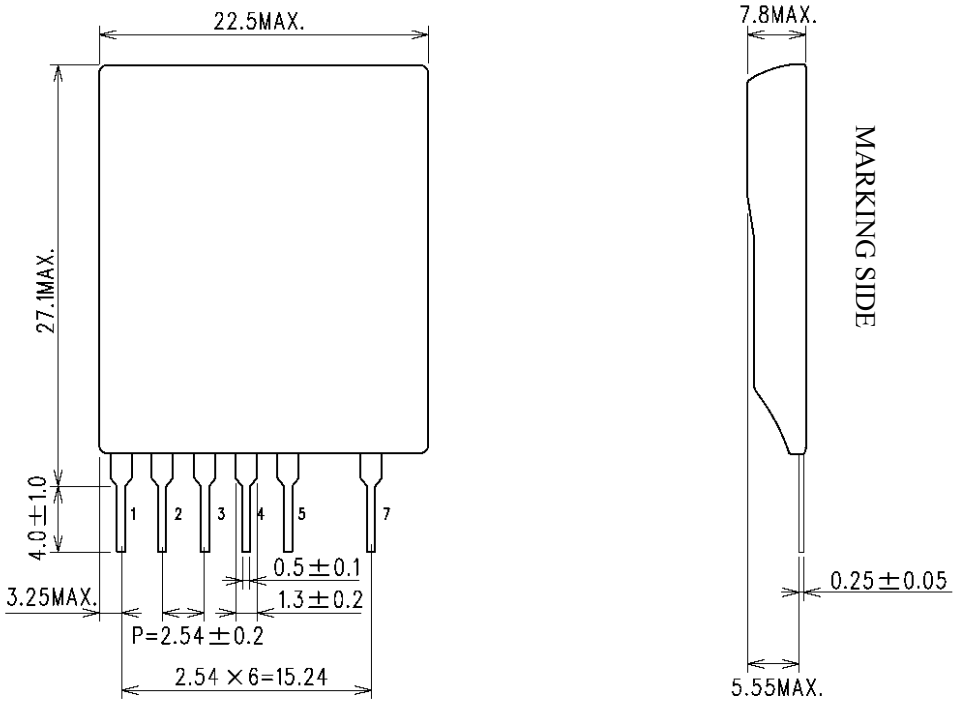



Fig.2. Dimensions

*As for painting, parts may be exposed partially, but there is no problem in electrical characteristics and reliability.

● Marking contents

■ : 1 pin side mark

BP5726-15 : Type name

1106S : Production lot number

(Manufactured in the 6th week of 2011)

S : ROHM ELECTRONIC DALIAN CORPORATION

* The externals inspection standard is assumed to be a ROHM standard.

< TERMINAL FUNCTIONS >

| PIN No. | NAME | FUNCTIONS |
|---|---|---|
| 1 | Vo | Output detection terminal (15V) |
| 2 | Vo | Output detection terminal (15V) |
| 3 | Vin(-) | Primary side input minus terminal. |
| 4 | VFB | Feedback terminal |
| 5 | VS | Starting terminal.<br>Please connect this via the external resister (750kΩ) to Vin. |
| 6 | NC | NC pin |
| 7 | VD | Built-in FET of drain terminal.<br>The primary coil minus side of the external transformer, and the snubber circuit for noise reduction are connected to this. |

## 12. APPLICATION CIRCUIT

For actual usage, Please kindly evaluate and confirm our part mounted in your product,
Especially, Please make sure to confirm whether the load current exceeds maximum output current by current probe.

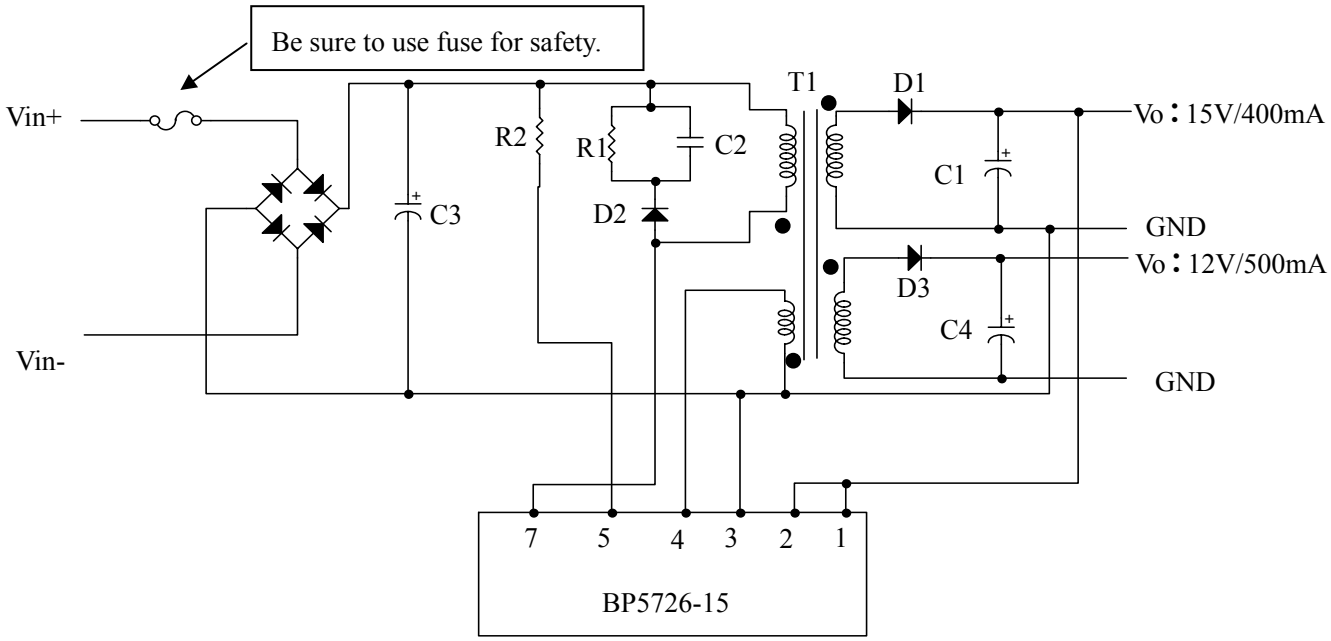



Fig.3 Application Circuit

<External components setting>

| SYMBOL | PRODUCTS | CHARACTERISTICS | RECOMMENDED PARTS |
|---|---|---|---|
| C1,C4 | Output capacitor | 470 μF / 35V Low impedance product | UPM1V471M (Nichicon) |
| C2 | Noise removal capacitor | 2200pF / 1kV | ECKA3A222KBP (Panasonic) |
| C3 | Input capacitor | 33 μF / 450V | 450YXA33M (Rubycon) |
| D1,D3 | Rectifier diode | 90V/6A | RB095B-90 (ROHM) |
| D2 | Rectifier diode | 1kV/1A | U05NU44 (Toshiba) |
| R1 | Resistor | 100kΩ ±5% 3W<br>Rated voltage: 300V or higher | |
| R2 | Resistor | 750kΩ ±5% 0.25W<br>Rated voltage: 600V or higher | |
| T1 | Switching transformer | Custom one | |

## 13. PACKING SPEC

30 pieces of modules might be packaged in the packaging tray, and it might be piled up 5 steps to make 150 pieces, and with an empty pack on the top, in principle.
The number of piling might change according to the quantity of delivery without previous notice.

## 14. MANUFACTURING FACTORY

Rohm Electronic Dalian Corporation (China)

## 15. STRUCTURE

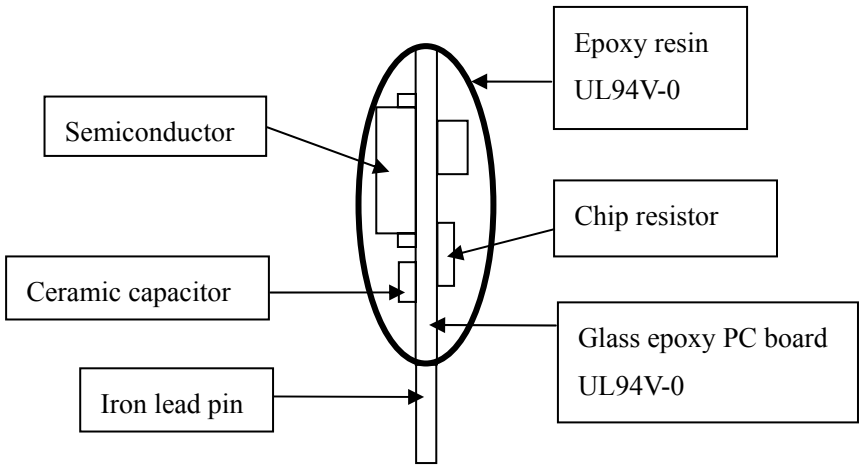



Fig.4 Structure

| | | |
|---|---|---|
| Soldering condition | Flow soldering<br>Manual soldering | 260℃, within 10 sec<br>380℃, within 3 sec |
| Recommended land dimensions | Hole diameter<br>Land diameter | 0.9mm<br>2.0mm |