

< Specifications (Precautions and Prohibitions) >

● **Precaution for safety**

- 1) The products are designed and produced for application in ordinary electronic equipment (AV equipment, OA equipment, telecommunication equipment, home appliances, amusement equipment, etc.).
If the products are to be used in devices requiring extremely high reliability (medical equipment, transport equipment, aircraft/spacecraft, nuclear power controllers, fuel controllers, car equipment including car accessories, safety devices, etc.) and whose malfunction or operational error may endanger human life and sufficient fail-safe measures, please consult with the ROHM sales staff in advance. If product malfunctions may result in serious damage, including that to human life, sufficient fail-safe measures must be taken, including the following:
 - [a] Installation of protection circuits or other protective devices to improve system safety
 - [b] Installation of redundant circuits in the case of single-circuit failure

- 2) The products are designed for use in a standard environment and not in any special environments. Application of the products in a special environment can deteriorate product performance. Accordingly, verification and confirmation of product performance, prior to use, is recommended if used under the following conditions:
 - [a] Use in various types of liquid, including water, oils, chemicals, and organic solvents
 - [b] Use outdoors where the products are exposed to direct sunlight, or in dusty places
 - [c] Use in places where the products are exposed to sea winds or corrosive gases, including Cl₂, H₂S, NH₃, SO₂, and NO₂
 - [d] Use in places where the products are exposed to static electricity or electromagnetic waves
 - [e] Use in proximity to heat-producing components, plastic cords, or other flammable items
 - [f] Use involving sealing or coating the products with resin or other coating materials
 - [g] Use involving unclean solder or use of water or water-soluble cleaning agents for cleaning after soldering
 - [h] Use of the products in places subject to dew condensation

- 3) The products are not radiation resistant.

- 4) De-rate Power Dissipation (Pd) depending on Ambient temperature (Ta).
When used in sealed area, confirm the actual ambient temperature.

- 5) Confirm that operation temperature is within the specified range described in product specification.

- 6) Failure induced under deviant condition from what defined in the product specification can not be guaranteed.

- 7) When product safety related problems arises, please immediately inform to ROHM, and consider technical counter measure.

- 8) The positioning of the peripheral components must confirm the safety regulations, any applicable laws, and the effectiveness of the module by electrical and heat influences, the electrical characteristics, and confirmation of the reliability.

DESIGN <i>S. Yamada</i>	CHECK <i>H. Nitega</i>	APPROVAL <i>H. Yamori</i>	DATE : 12/APR/2011	SPECIFICATION No. : BP5890-A-001-E (Lead Free)
			REV.A	ROHM Co.,Ltd.

< Specifications (Precautions and Prohibitions) >

Precaution for Storage

- 1) Product performance and soldered connections may deteriorate if the products are stored in the following places:
 - [a] Where the products are exposed to sea winds or corrosive gases, including Cl₂, H₂S, NH₃, SO₂, and NO₂
 - [b] Where the temperature or humidity exceeds those recommended by the Company
Temperature: 5 - 40 , Humidity 40% - 60%
 - [c] Storage in high Electrostatic
 - [d] Storage in the place where a thermal shock and a mechanical shock are added.
- 2) The guaranteed period of solder connections and product performance is within one year from shipment by the Company, provided that the above-mentioned storage conditions have been satisfied.
By using after long-term preservation, please confirm that whether there is any degradation of the soldering by module lead terminal oxidization or change of electrical characteristics.

Precaution for product label

QR code printed on ROHM product label is only for internal use, and please do not use at customer site. It might contain a internal part number that is inconsistent with an product part number.

Precaution for disposition

When disposing products please dispose them properly with a industry waste company.

Prohibitions Regarding Industrial Property

- 1) These Specifications contain information related to the ROHM industrial property.
Any use of them other than pertaining to the usage of appropriate products is not permitted.
Duplication of these specifications and its disclosure to a third party without the Company's permission is prohibited.
- 2) Information and data on products, including application examples, contained in these specifications are simply for reference; the Company does not guarantee any industrial property rights, intellectual property rights, or any other rights of a third party regarding this information or data. Accordingly, the Company does not bear any responsibility for:
 - [a] infringement of the intellectual property rights of a third party
 - [b] any problems incurred by the use of the products listed herein.
- 3) The Company prohibits the purchaser of its products to exercise or use the intellectual property rights, industrial property rights, or any other rights that either belong to or are controlled by the Company, other than the right to use, sell, or dispose of the products.

Other Matters

- 1) Please sign these Specifications and return one copy to the Company.
If a copy is not returned within three months after the issued date specified on the front page of these Specifications, the Company will consider the Specifications accepted.
- 2) If any matter related to these Specifications needs to be clarified, discussions shall be held promptly between the two parties concerned to determine the issue.

< Specifications (Precautions and Prohibitions) >

Precaution for using

- 1) Be sure to evaluate the module under the condition that it is mounted on your product.
- 2) It is necessary to reduce the output current along with the rise of the ambient temperature.
(Refer to the derating curve)
- 3) Please ensure that the current never exceeds the maximum value, including transients because applying a current greater than the maximum rating may damage the part.
- 4) This product is not insulated on the primary sides, and there is a danger of electrical shock if it is touched. (But, an insulation type isn't contained)
- 5) Strong shock should not be influenced.
- 6) For external parts, please use those mentioned in this specification or those equivalent parts. Efficient evaluation is necessary in case any other parts are used. Parts for different applications may not satisfy the Spec or even result in failure cause.
- 7) Take into account the transient conditions during startup.
- 8) There are some cases that the over voltage or current are flowed to input and output terminal of the module by back electromotive force during start-up when a motor and relay are attached.
Please be sure not to exceed absolute maximum ratings.
- 9) Moisture absorbed in the package can weaken the insulation can cause malfunction. Please be careful especially the area between the input terminals.
- 10) Never supply a voltage to the output terminal exceeding the rated value. It will become cause of destruction.
- 11) There are some cases that output voltage does not activate by supplying a reverse voltage to the output terminal. Please do not supply a reverse voltage to the output terminal during startup.
- 12) Please fix and use this product when the vibration occurs in the market.
- 13) Ensure that operating temperature never exceeds the derating value.
- 14) Please give an electrification preventive measure so that static electricity is not impressed to a product at the time of mounting at a process, and storage.
- 15) Because this module is composed of the precise electrical components, the use beyond the specification will lead to the loss of product reliability, and also to destruct it self.

1. **STRUCTURE** Assembled product using printed circuit board
2. **PRODUCTS** POWER MODULE
3. **TYPE** BP5890
4. **APPLICATION** LED DRIVER
5. **FUNCTION** Non-Isolated LED Driver

BP5890 is constant-current output and non-isolation type LED DRIVER which is applied for AC90~264V input.
 It builds in a circuit which can drive 4 to 8 pieces of power LED and its output current is 350mA.
 It has a thermal shutdown function.

6. ABSOLUTE MAXIMUM RATINGS

These are the values 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	Vi	264	V	AC
2	Output voltage (limits)	Vo	28.8	V	
3	Output current	Io	385	mA	
4	Allowable maximum surface temperature	Tcmax	105		Ambient temperature + the module self-heating Tcmax
5	Operating temperature range	Topr	-20 ~ 60		Refer to derating curve
6	Storage temperature range	Tstg	-25 ~ 85		

7. ELECTRICAL CHARACTERISTICS

< definition of items >

Output voltage range	This is an output voltage range allowed at a constant-current output. This value must not be exceeded even momentarily.
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(Unless otherwise noted, Vi=AC90 ~ 264V, Vo=10 ~ 28.8V, Ta=25)

No.	PARAMETER	SYMBOL	SPEC			UNIT	TEST CIRCUIT	REMARK
			MIN.	TYP.	MAX.			
1	Input voltage range	Vi	90	100	264	VAC	-	50/60Hz
2	Output voltage range	Vo	10.0	16.0	28.8	V	FIG.1	Io=350mA
3	Output current	Io	315	350	385	mA	FIG.1	
			315	340	365			Vi=AC100V
			325	350	375			Vi=AC200V

8. TEST CIRCUIT

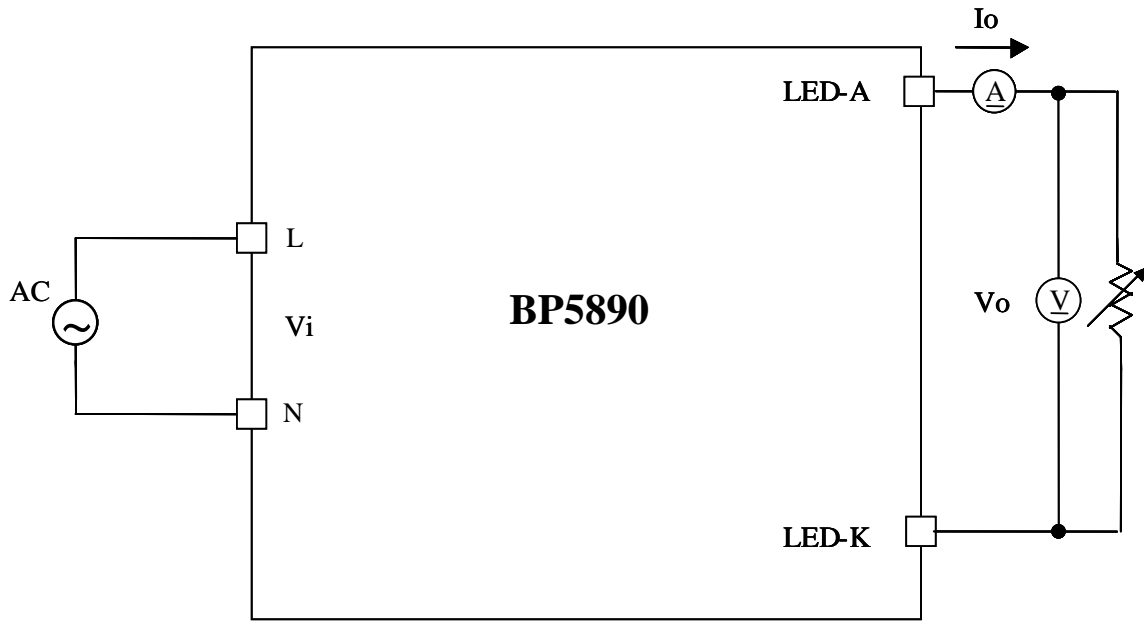


FIG.1 Test Circuit

9. DIMENSIONS (UNIT:mm)

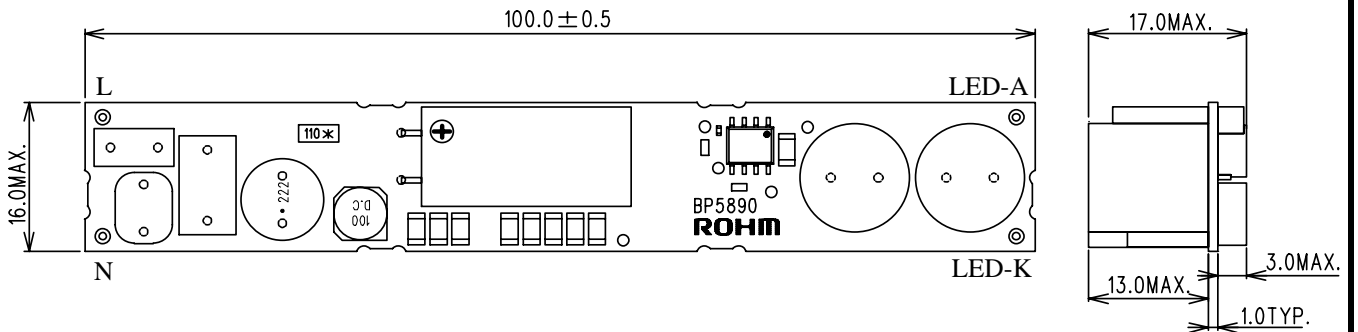


FIG.2 Dimensions

The external inspection standard is assumed to be a ROHM standard.

Terminal hole layout

Terminal No.	Terminal name
L	AC100V input terminal (Line)
N	AC100V input terminal (Neutral)
LED-A	LED anode terminal
LED-K	LED cathode terminal

10. DERATING CURVE

- Maximum output current is set to 11.08W. Operations beyond this limit are prohibited.
- Output Power = Output voltage × Output current

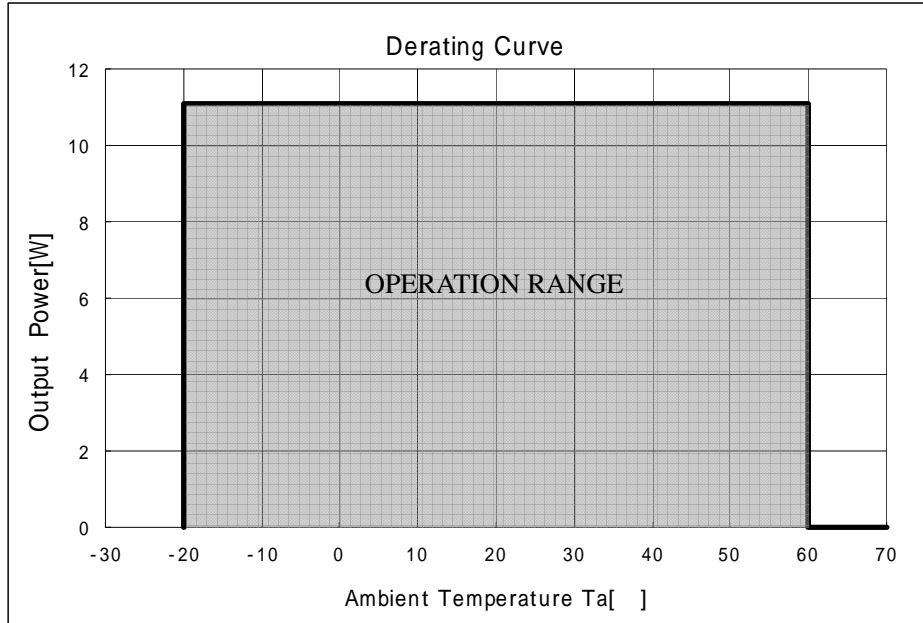


FIG.3 Derating Curve

For evaluation, please make design keeping enough margins that the most heated part of the module must not exceed 105 °C which is the total of self-heating and ambient temperature.

When the ambient temperature is constant at 25 °C, the shaded areas (4 areas) shown below is the part reaching the highest temperature. If the module is used in a condition that the surface temperature is higher than 105 °C, the reliability of the module may be declined.

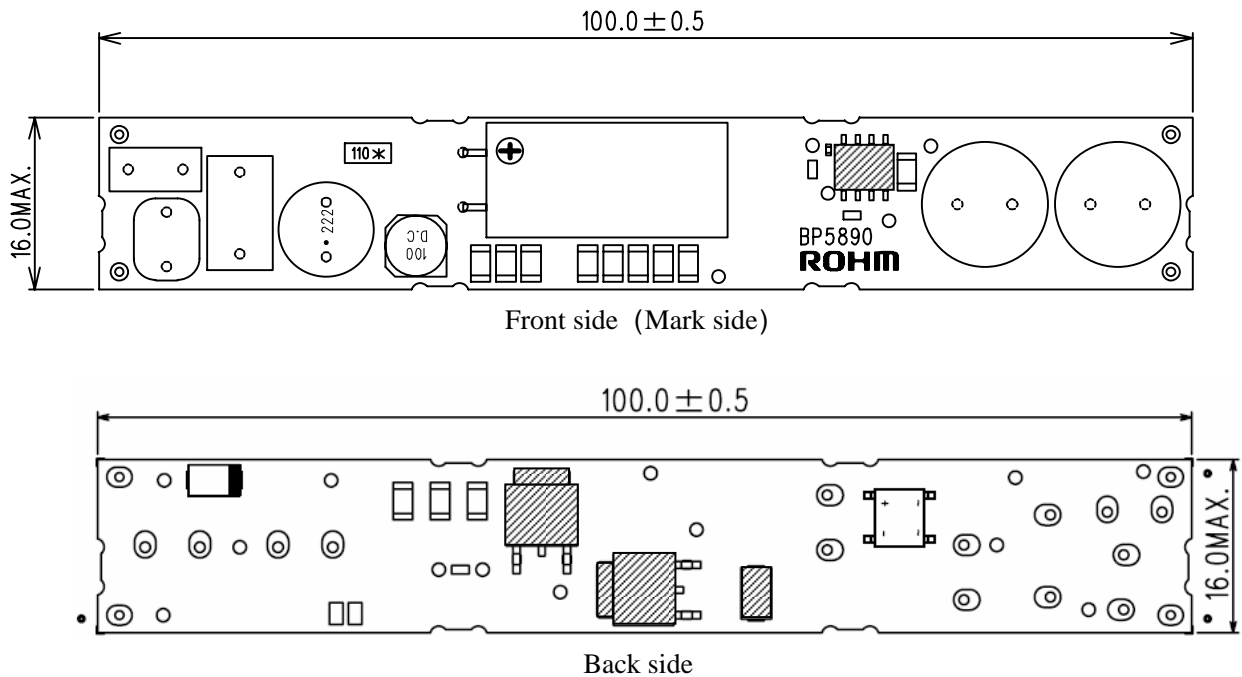


FIG.4 The Highest Heating Part

11. PACKING SPEC

14 pieces of modules might be packaged in the packaging tray, and it might be piled up 4 steps to make 56 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.

As shown below, it might be fixed 4 places with cellophane tape and packed with packing case after packing the products in the tray.

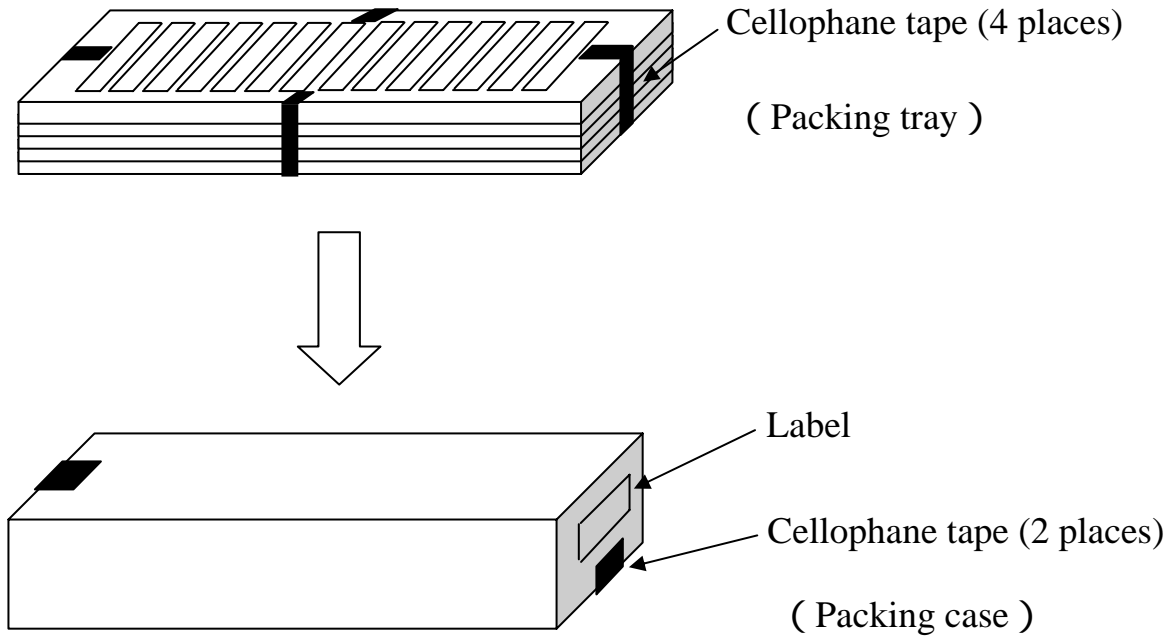


FIG.5 Packing Spec

The label with following things is stuck at the packing case.

Type name Quantity Lot Number Shipment inspection stamp
Country of origin Manufacturing company name (Trade mark)

Please refer to the following example of the label indication.



FIG.6 Label

12. OPERATING PRECAUTIONS

- 12-1. This module is only for LED load. Please do not connect resistor load etc.
- 12-2. Please do not use with the condition that output voltage is over 28.8V (limits) because there is a possibility of breaking by its abnormal fever.
- 12-3. When the LED is connected after power-on, an inrush current passes through the LED.
Please connect the LED before turning on the input power supply.
- 12-4. Please be careful to make the output open because the maximum voltage is 373.3V.
- 12-5. Please be careful enough for handling not to suffer stresses like bending, curving, or twisting because the shape of the product is extreme slender. Stresses for the products cause crack of parts, cracks of solder, or pattern disconnection, and reliability is ruined.
- 12-6. There is fear of the electric shock when working with the power supply turned on. Please do operations with the power supply pulled out without fail.

13. MANUFACTURING FACTORY

ROHM ELECTRICS DALIAN CO.,LTD. (CHINA)

14. OTHERS

The Company is not responsible for any problems resulting from use of the products under conditions not recommended herein.

Reproduction of this document in whole or in part without the permission of ROHM is prohibited.

This product is designed to be used for general electronics devices and offer a standard level of quality.

If you intend to use this product for applications requiring higher quality and reliability, such as automotive electric equipment, medical devices, aircrafts, controllers involving human lives and various safety devices, please contact our sales staff.