

PAN4820

Instruction Manual

■ Before Using

Be sure to take note of precautions and warnings indicated in this manual when using this products. Improper usage may lead to electric shock or fire. Be sure to read this instruction manual and related Power Module instruction manual thoroughly before using this product.

■ Caution

- This product is designed for exclusive use of DC input. Do not use this product with AC input.
- Avoid touching the case of this product because they get hot.
- There are high voltage and high temperature components within this product. Refrain from disassembling this product or touching its internal components as this may lead to electric shock or burned.
- To avoid unexpected accident, refrain from placing hand or face near the unit during operations.
- Confirm connections to input/output terminals as indicated in the instruction manual.
- Attach a fast blow type external fuse to each module to ensure safety operation and compliance to each safety standard approval.
- This product is designed for professional installation within the end user equipment.
- This product has no effect on attenuating high energy pulse voltage like lightning surge and equivalent. If protection on such pulse is required, please connect a surge limiting component (varistor and equivalent) to input side of this products.
- Use isolated voltage by reinforced or double insulation as input power source.
- Output voltage of this product is considered to have hazardous energy level (voltage of 2V and above with power of 240W and above) and must not have physical contact with operator. Protection must be provided on this module when installed on equipment to prevent physical contact with service technician himself or accidentally dropped tools during repair. Before repair, be sure to turn off the input source and confirm that input and output voltages have dropped down to a safe level.
- The application circuits and their parameter are for reference only. Be sure to verify effectiveness of application circuits and their parameters before finalizing circuit design.
- The information in this document is subject to change without prior notice., For actual design-in, please refer to the latest publications of data sheet, etc., for the most up-to date specifications of the unit.
- No part of this document may be copied or reproduced in any for, or by any mean without prior written consent of Densei-Lambda




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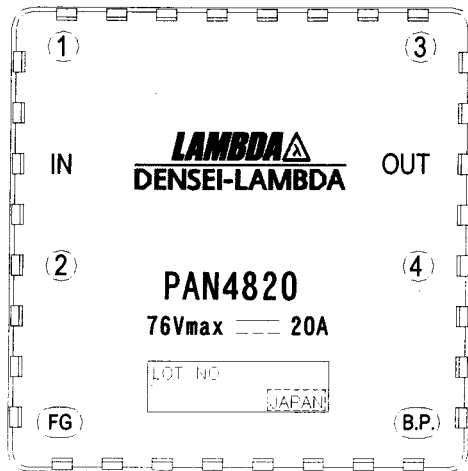
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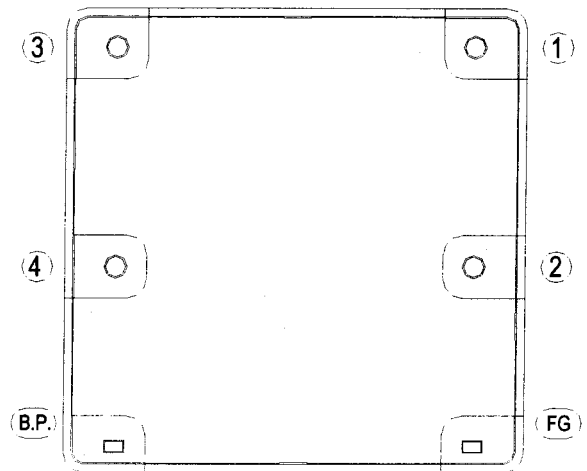
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Terminal Explanation

TOP VIEW



BOTTOM VIEW



[Input side terminal]

1 : Input Terminal

2 : Input Terminal

FG : Ground Terminal*1

[Output side terminal]

3 : Output Terminal

4 : Output Terminal

B.P. : Ground Terminal*2

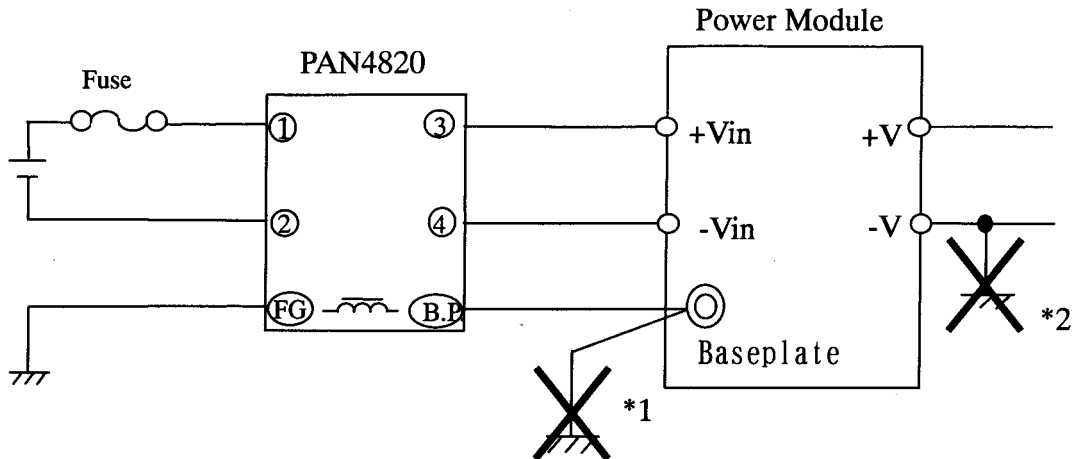
*1 Connect to Ground

*2 Connect to baseplate of power modules

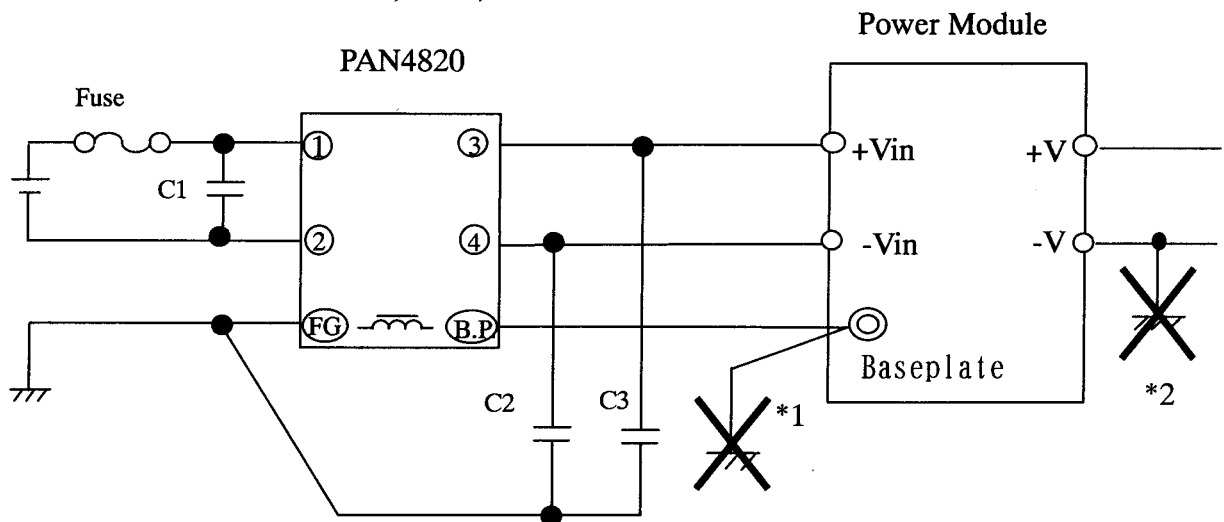
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Standard Connecting Method

Built to meet EN55011/55022, VCCI, FCC CLASS A



Built to meet EN55011/55022, VCCI, FCC CLASS B



Recommended value C1:22 μ F (Ceramic capacitor) C2,3:0.47 μ F (Film or Ceramic Capacitor)

For both connecting methods, connect the recommended resistor and capacitor according to the instruction manual of power module to input and output side of power module. Also this product has no built-in fuse. Attach a prescribed fuse according to the instruction manual of power module to input side of this product.

Note) Above connecting method apply to each standards with our measurement condition when one unit of our power module (PAF500F48 Series or PAH200S48 series) is combined. There may be not up to the standards in following conditions, so please make sure to confirm EMI (Conducted Emission, Radiated Emission) with actual measurement..

- quantity of connected power module/ unit construction/ load condition
- wiring condition of input and output
- customer's circuit

In order to make full use of this product capability, please take note for following matters. If these are not satisfied, attenuation characteristics under 1MHz may decrease around 10-20dB.

*1 Baseplate of power module should not be earthed. Please connect to B.P terminal of this product only.

*2 If one side of the output voltage (+V or -V) need to be earthed, please connect to B.P terminal of this product.

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Instruction for your using

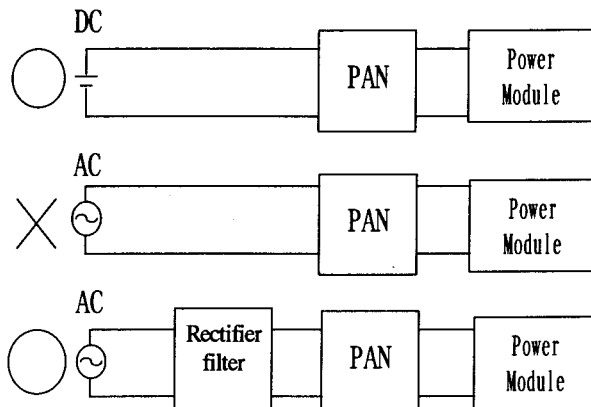
1. Mounting Position

To make full use of this product capability, connect to a power module as near as possible(within 50mm).

2. In using with AC input

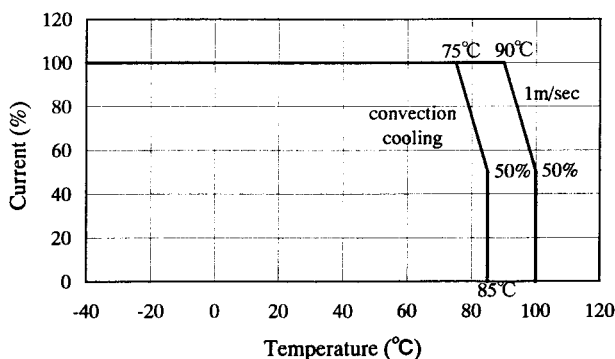
This product and power modules are designed for exclusive use with DC input. When using with AC input, please connect to a rectifier, filter circuit.

For details of a rectifier, filter circuit, please contact us.



3. Operating Ambient Temperature

There is no restriction on mounting direction but there should be enough consideration for airflow so that heat does not accumulate around this product vicinity. Determine external components configuration and mounting direction on PCB such that air could flow through the ventilator at forced cooling and convection cooling. Also please take note that allowable maximum current are difference with forced cooling and convection cooling.



4. Operating Ambient Humidity

Take note that moisture could lead to products abnormal operation or damage.

5. Storage Ambient Temperature

Abrupt temperature change would cause condensation built-up that leads to poor solderability of terminals of the products.

6. Storage Ambient Humidity

High temperature and humidity can cause the terminals on the module to oxidize. The quality of the solder will become worse.

7. Withstand Voltage

This product is designed to have a withstand voltage of 1.5kVDC between FG terminal pin and ①,② terminal pin (also B.P. terminal and ③,④ terminal pin) for 1minute. When conducting withstand voltage test during incoming inspection, be sure to set the current limit value of the withstand voltage testing equipment to 10mA.

Don't test with AC voltage because this would cause this product damage.

Circuit Board Mounting

1. Circuit Board Mounting

(1) Mounting hole on Printed Circuit Board

Determine diameter of hole and land of Printed Circuit Board with referring follows.

①-④ Terminal pin ($\phi 2.0$ mm)

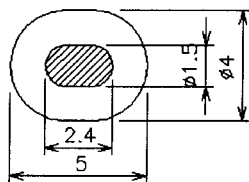
hole : $\phi 2.5$ mm

land : $\phi 5.0$ mm

FG, BP Terminal pin (1.0×1.8 mm)

hole : $\phi 1.5 \times 2.4$ mm

land : $\phi 4.0 \times 5.0$ mm



(2) Recommended Material of Printed Circuit Board

Recommended materials of the printed circuit board is multi-layer or double-sided glass epoxy with through holes. (thickness : $t=1.6$ mm, thickness of copper $35\mu\text{m}$)

(3) Terminal pin.

Each terminal pins are soldered to the internal electronic components. Do not bend nor give strong pull at lead.

(4) Pattern Width

According to the connected module, when 0 to 20 amperes of current flows to pattern connected to the terminal pin, voltage would drop and heat generation would be higher for narrow pattern. Relationship between current and pattern width change depending on materials of printed circuit board, thickness of conductor and temperature rise allowance. $35\mu\text{m}$ copper glass epoxy printed circuit board is shown in Figure 1 as an example. For example, when 5A of current flows and temperature rise below 10°C are expected, pattern width shall be more than 4.2mm with $35\mu\text{m}$ copper plate (generally 1mm/A is standard).

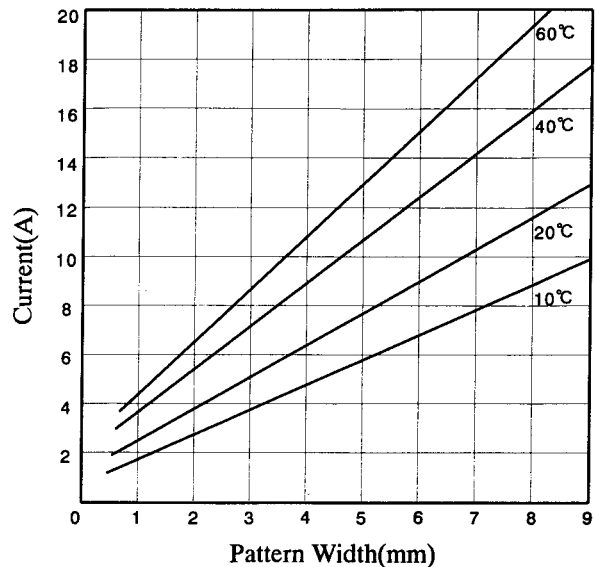


Fig.1 thickness of copper $35\mu\text{m}$
Characteristic of current allowance

(5) Pattern layout

Please design the pattern far away from this product as it may cause interference between the pattern and internal components and hence affect the performance of the product.

2. Recommended Soldering Method

Recommended soldering temperature is as follows.

(1) Soldering dip

260°C within 10seconds

Pre-heat condition

110°C , 30~40seconds

(2) Soldering iron.

450°C within 5seconds

3. Recommended Cleaning Condition

Recommended cleaning condition after soldering is as follows.

(1) Cleaning solvent

IPA(isopropyl alcohol)

(2) Cleaning Procedure

Use brush and dry the solvent completely.