

AC/DC converter

BP5081A15

AC100V input, output-1 : 15V/80mA, output-2 : 5V/350mA

Absolute Maximum Ratings

| Parameter | Symbol | Limits | Unit |
|-----------------------------|-------------|-------------|------|
| Input voltage | V_i | 170 | V |
| Maximum Output current(15V) | I_{15MAX} | 80 | mApk |
| Maximum Output current(5V) | I_{5MAX} | 350 | mApk |
| ESD endurance | Vsurge | 2 | kV |
| Maximum surface temperature | T_{cmax} | 105 | °C |
| Operating temperature range | T_{opr} | -25 to +80 | °C |
| Storage temperature range | T_{stg} | -25 to +105 | °C |

Electrical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|------------------------------|----------|------|------|------|------|--------------------------------------|
| Input voltage | V_i | 113 | 141 | 170 | V | DC |
| Output voltage1 | V_{15} | 14.0 | 15.0 | 16.0 | V | $V_i=141V, I_{15}=80mA$ |
| Output current1 | I_{15} | 0 | - | 80 | mA | $V_i=141V$ *1 |
| Output voltage2 | V_5 | 4.7 | 5.0 | 5.3 | V | $V_i=141V, I_5=200mA$ |
| Output current2 | I_5 | 0 | - | 350 | mA | $V_i=141V$ *1 |
| Line regulation1 | V_{r1} | - | 0.1 | 0.2 | V | $V_i=113$ to $170V, I_{15}=80mA$ |
| Line regulation2 | V_{r2} | - | 0.1 | 0.2 | V | $V_i=113$ to $170V, I_5=350mA$ |
| Load regulation1 | V_{l1} | - | 0.05 | 0.2 | V | $V_i=141V, I_{15}=0$ to $80mA$ *2 |
| Load regulation2 | V_{l2} | - | 0.05 | 0.2 | V | $V_i=141V, I_5=0$ to $350mA$ *2 |
| Output ripple voltage1 | V_{p1} | - | 0.05 | 0.2 | Vp-p | $V_i=141V, I_{15}=80mA, I_5=0mA$ |
| Output ripple voltage2 | V_{p2} | - | 0.05 | 0.2 | Vp-p | $V_i=141V, I_5=0$ to $350mA$ |
| Power conversion efficiency1 | η_1 | 65 | 72 | - | % | $V_i=141V, I_{15}=80mA, I_5=0mA$ *2 |
| Power conversion efficiency2 | η_2 | 60 | 65 | - | % | $V_i=141V, I_{15}=0mA, I_5=350mA$ *2 |

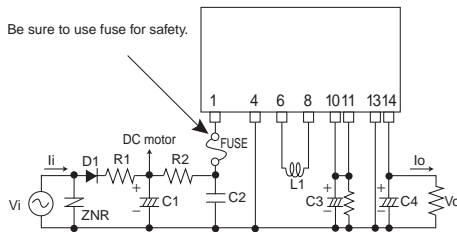
*1 Maximum output current varies depending on ambient temperature; please refer to derating curve.

*2 Please refer to Load regulation, Conversion efficiency.

Application circuit

BP5081A15

Be sure to use fuse for safety.



| Pin No. | Function |
|---------|-------------------------------|
| 1 | Input terminal V_i (141VDC) |
| 2 | Not used |
| 3 | Not used |
| 4 | COMMON |
| 5 | Not used |
| 6 | Choke coil connect |
| 7 | Not used |
| 8 | Choke coil connect |
| 9 | Not used |
| 10 | 15V output terminal |
| 11 | 15V input terminal |
| 12 | Not used |
| 13 | COMMON |
| 14 | Output terminal V_o (5V) |

For actual usage, Please kindly evaluate and confirm our part mounted in your product, Especially, Please make sure to confirm whether the load current exceed Max. rated current by using the current probe.

External components setting

FUSE: FUSE

C1: Input capacitor

C2: Noise removal capacitor

C3: Output capacitor
(For 15V output)

C4: Output capacitor
(For 5V output)

L1: Power inductor

D1: Rectifier diode

R1: Rush current limitation
resistance

R2: Noise removal resistor

ZNR: Varistor

Recommend the use of fast-acting type fuse 1.0A.

Rated voltage : More than 200V

Capacity : 22 to 820 μ F

Rated ripple current : More than 0.13Arms

Rated voltage : More than 200V

film capacitor, or Ceramics Capacitor

Capacity : 0.1 to 0.22 μ F

Rated voltage : More than 25V

Capacity : 100 to 1000 μ F, low impedance type

ESR : Less than 0.4 Ω

Rated ripple current : More than 0.25Arms

Evaluate it with the actual opportunity because it influences an output ripple voltage.

Rated voltage : More than 16V

Capacity : 100 to 1000 μ F, low impedance type

ESR : Less than 0.4 Ω

Rated ripple current : More than 0.41Arms

Evaluate it with the actual opportunity because it influences an output ripple voltage.

Inductance : 1.0mH

Rated current : More than 0.49A

Peak reverse voltage : More than 400V

Mean rectifying current : More than 1.0A

Peak forward surge current : More than 40A

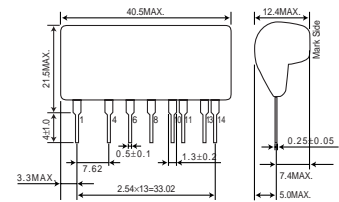
This product can use even all the wave rectification.

Rush current flows corresponding to the capacity of C1. Select electric power and resistance value corresponding to the start character of the module.

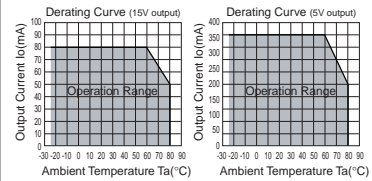
Resistance : 10 to 22 Ω , Power : More than 1/4W

Be sure to use it to protect this product from thunder surge and the static electricity.

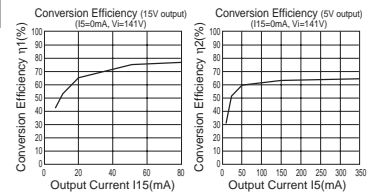
Dimensions(Unit : mm)



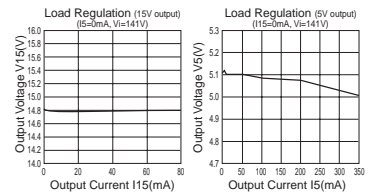
Derating Curve



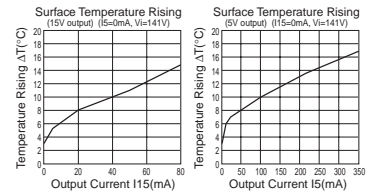
Conversion Efficiency



Load Regulation



Surface Temperature Rising



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. Cl₂, H₂S, NH₃, SO₂, NO₂) 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

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