

## Excellent Integrated System Limited

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[Rohm Semiconductor](#)  
[BP5081A15](#)

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## AC/DC converter

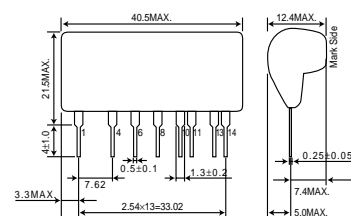
AC100V input, output-1 : 15V/80mA, output-2 : 5V/350mA

## BP5081A15

### ● 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	$V_{surge}$	2	kV
Maximum surface temperature	$T_{cmax}$	105	°C
Operating temperature range	$T_{opr}$	-25 ~ +80	°C
Storage temperature range	$T_{stg}$	-25 ~ +105	°C

### ● Dimension(Unit : mm)



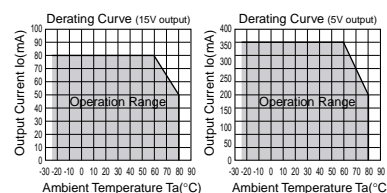
### ● Electrical Characteristics

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	$V_i=113\sim170V, I_{15}=80mA$
Line regulation2	$V_{r2}$	—	0.1	0.2	V	$V_i=113\sim170V, I_5=350mA$
Load regulation1	$V_{l1}$	—	0.05	0.2	V	$V_i=141V, I_{15}=0\sim80mA$ *2
Load regulation2	$V_{l2}$	—	0.05	0.2	V	$V_i=141V, I_5=0\sim350mA$ *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	$V_i=141V, I_{15}=0mA, I_5=350mA$
Power conversion efficiency1	$\eta_1$	65	72	—	%	$V_i=141V, I_{15}=80mA, I_5=0mA$ *2
Power conversion efficiency2	$\eta_2$	60	65	—	%	$V_i=141V, I_{15}=0mA, I_5=350mA$ *2

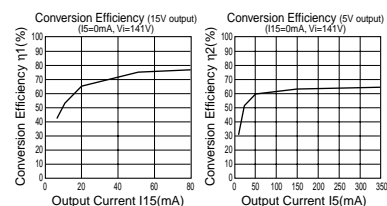
\*1 Maximum output current varies depending on ambient temperature ; please refer to derating curve.

\*2 Please refer to Load regulation, Conversion efficiency.

### ● Derating Curve



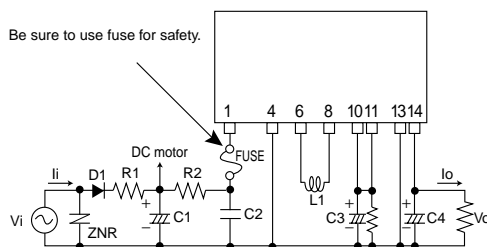
### ● Conversion Efficiency



### ● Application circuit

#### BP5081A15

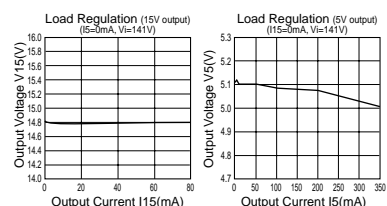
Be sure to use fuse for safety.



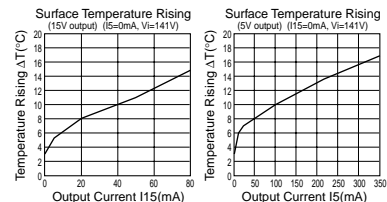
Pin No.	Function
1	Input terminal $V_i$ (141VDC)
2	Not used
3	Not used
4	COMMON
5	Not used
6	Choke coil connect
7	Not used
8	Choke coil connect
9	Not used
10	15V output terminal
11	15V input terminal
12	Not used
13	COMMON
14	Output terminal $V_o$ (5V)

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.

### ● Load Regulation



### ● surface Temperature Rising



#### External components setting

FUSE: Fuse

C1: Capacitor for input voltage smoothing

C2: For noise terminal voltage reduction

C3: Capacitor for Output (15V output)

C4: Capacitor for Output (5V output)

L1: Choke coil

D1: For noise terminal voltage reduction

R1: Rush current limiting resistance

R2: For noise terminal

ZNR: Varistor

Please make sure to use quick acting fuse 1A

Capacitance : 22μF~390μF Rated voltage : 200V or higher  
Ripple current is 0.13Arms above.

Capacitance : 0.1μF~0.22μF Rated voltage : 200V or higher  
Film capacitor or ceramic capacitor. Reduce the noise terminal voltage.  
The constant value should be evaluated in the set.

Capacitance : 100μF~1000μF Rated voltage : 25V or higher,  
ESR is 0.4Ω max. Ripple current is 0.25Arms above.  
Output ripple voltage is influenced. Please evaluate it in the actual set.

Capacitance : 100μF~1000μF Rated voltage : 16V or higher,  
ESR is 0.4Ω max. Ripple current is 0.25Arms above.  
Output ripple voltage is influenced. Please evaluate it in the actual set.  
L : 1mH Allowable current : 490mA or higher.

Please use the one that is hard to be magnetic saturated even in the high temperature.

In the absolute maximum ratings, the reverse peak voltage should be 400V or higher, the average rectifying current should be 1A or higher, and the peak surge current should be 40A or higher.  
Rush current can be reduced by setting R1, but, to use the large capacity one for surge current is recommended.(Full-wave rectifier can be used in our part.)

Limiting resistance must be used because rush current at powering up is applied in proportion to the C1 capacitance.Please determine the resistance value after confirming the rising characteristics of the module at powering up.

10Ω~22Ω 1/4W Reduce the noise terminal voltage.Please set it,if necessary.  
The constant value should be evaluated in set.

Varistor must be used. It protects this part from lightning surge and static electricity.

## Precautions on Use of ROHM Power Module

### Safety Precautions

- 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 Company's 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 Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, and NO<sub>2</sub>
  - [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) 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.

### Precautions Regarding Application Example and External Circuits

- 1) If change is made to the constant of an external circuit, allow a sufficient margin due to variations of the characteristics of the products and external components, including transient characteristics, as well as static characteristics. Please be informed that the Company has not conducted investigations on whether or not particular changes in the application examples or external circuits would result in the infringement of patent rights of a third party.
- 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] any problems incurred by the use of the products listed herein.
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Products listed in this document are no antiradiation design.

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