

AC/DC converter

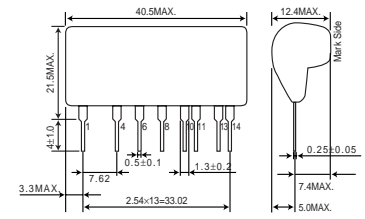
AC100V input, output-1 : 15V/80mA, output-2 : 5V/350mA

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 to +80	°C
Storage temperature range	T_{stg}	-25 to +105	°C

Dimensions(Unit : mm)

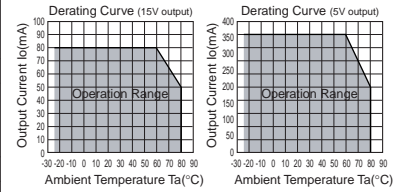


Electrical Characteristics

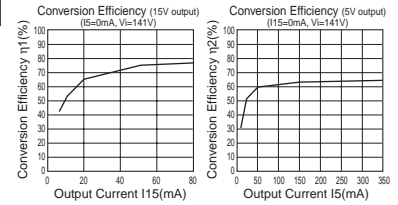
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	V_i	113	141	170	V	DC
Output voltage1	V_{15}	14.0	15.0	16.0	V	$V_i=141V, I_{15}=80mA$
Output current1	I_{15}	0	-	80	mA	$V_i=141V$ *1
Output voltage2	V_5	4.7	5.0	5.3	V	$V_i=141V, I_5=200mA$
Output current2	I_5	0	-	350	mA	$V_i=141V$ *1
Line regulation1	V_{r1}	-	0.1	0.2	V	$V_i=113$ 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	$V_i=141V, I_{15}=0mA, I_5=350mA$
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.

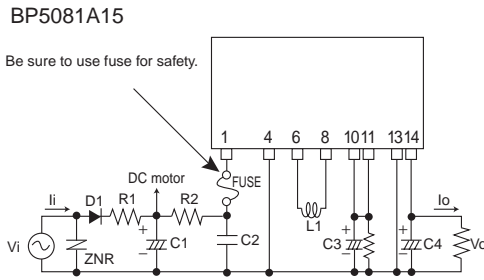
Derating Curve



Conversion Efficiency



Application circuit



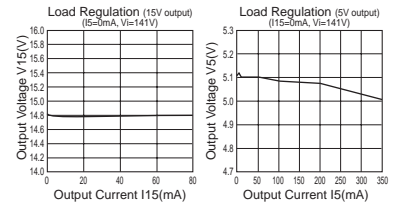
Pin No.	Function
1	Input terminal V_i (141VDC)
2	Not used
3	Not used
4	COMMON
5	Not used
6	Choke coil connect
7	Not used
8	Choke coil connect
9	Not used
10	15V output terminal
11	15V input terminal
12	Not used
13	COMMON
14	Output terminal V_o (5V)

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.

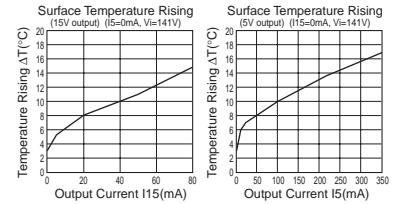
External components setting

FUSE: FUSE	Recommend the use of fast-acting type fuse 1.0A.
C1: Input capacitor	Rated voltage : More than 200V Capacity : 22 to 820 μ F Rated ripple current : More than 0.13Arms
C2: Noise removal capacitor	Rated voltage : More than 200V film capacitor, or Ceramics Capacitor Capacity : 0.1 to 0.22 μ F
C3: Output capacitor (For 15V output)	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.
C4: Output capacitor (For 5V output)	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.
L1: Power inductor	Inductance : 1.0mH Rated current : More than 0.49A
D1: Rectifier diode	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.
R1: Rush current limitation resistance	Rush current flows corresponding to the capacity of C1. Select electric power and resistance value corresponding to the start character of the module.
R2: Noise removal resistor	Resistance : 10 to 22 Ω , Power : More than 1/4W
ZNR: Varistor	Be sure to use it to protect this product from thunder surge and the static electricity.

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

- 1) A sufficient margin must be allowed if changes are made to the peripheral circuit due to variations in the inherent tolerances of the external components as well as transient and static characteristics. In addition, please be aware that the Company has not conducted investigations on whether or not particular changes in the example application circuits would result in patent infringement.
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Should you intend to use these products with equipment or devices which require an extremely high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

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