AC/DC converter BP5716

AC100V input, 12V/1000mA output

● Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit	Conditions
8-pin input voltage	V_D	500	V	
6-pin input voltage	V_{DD}	25	V	
8-pin input current	I_D	500	mA	
6-pin input current	I_{DD}	10	mA	
Maximum Power	Po	13	W	
Withstanding voltage	Vi	2.5	kV	1s (primary-secondary)
Allowable maximum surface temperature	Tcmax	105	°C	Ambient temperature + The module self-heating ≤ Tcmax
Operating temperature range	Topr	–25 to +80	°C	
Storage temperature range	Tstg	–40 to +105	°C	

● Electrical Characteristics

<Input conditions> (Unless otherwise noted, Vi=141V, Ta=25°C)

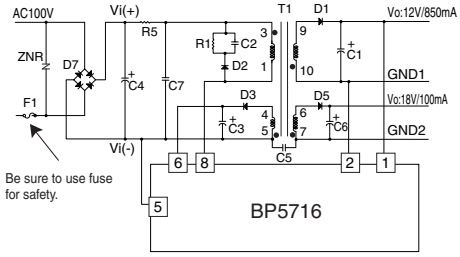
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
8-pin input voltage	V_D	–	–	350	V	Io=1000mA
Operating power voltage	V_{DD}	8.8	12	20	V	DC, Io=1000mA ∗1

<12V output>

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Output voltage	Vo	11.4	12.0	12.6	V	
Output current	Io	0	–	1000	mA	Refer to derating curve
Line regulation	Vr	–	10	200	mV	Vi=113V to 170VDC, Io=1000mA
Load regulation	Vl	–	58	200	mV	Io=50mA to 1000mA
Output ripple voltage	Vp	–	300	500	mVpp	∗2
Power conversion efficiency	η	75	84	–	%	

∗1 Operating start voltage is15.5V to 17.5V.
∗2 Pulse noise not included.

● Application circuit



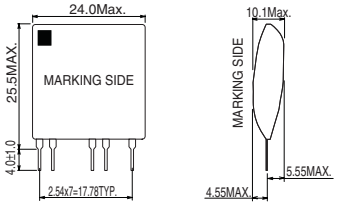
Pin No.	Name	Function
1	Vo	This is the secondary side 12V output voltage control terminal. Insert the output smoothing capacitor 1000μF between GND.
2	GND	This is the GND terminal for the secondary side 12V output.
5	Vin(-)	This is the primary side input minus terminal.
6	V_{DD}	This is the internal circuit power supply terminal.
8	V_D	This is the built-in FET of drain terminal. The primary coil minus side of the external transformer, and the snubber circuit for noise reduction are connected to this.

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.

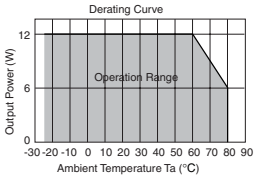
External components setting

C1: Capacitor for output voltage smoothing	1000μF / 35V Low impedance for power supply
C2: For noise terminal voltage reduction	2200pF / 400V or higher
C3: Capacitor for output voltage smoothing	10μF / 50V Low impedance for power supply
C4: Capacitor for input voltage smoothing	33μF / 250V
C5: For noise terminal voltage reduction	Please set it, if necessary
C6: Capacitor for output voltage smoothing	100μF / 35V Low impedance for power supply
C7: Noise terminal voltage countermeasure capacitor	Please set it, if necessary Limiting element voltage 250V or higher 0.1 to 0.22μF
D1: Rectifier diode	60V / 6A
D2: Rectifier diode	1kV / 1A
D3: Rectifier diode	80V / 0.1A
D5: Rectifier diode	100V or higher / 1A
D7: Diode bridge	800V / 1A
R1: Resistor	100kΩ ± 5% 3W Limiting element voltage 300V or higher
R5: Noise terminal voltage countermeasure resistor	Please set it, if necessary 1W or higher 10 to 22Ω
T1: Switching transformer	
F1: Fuse	Be sure to use this for safety
ZNR: Varistor	Must be use. It protects this part from lightning surge and static electricity.

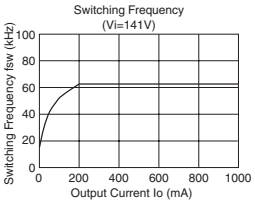
● Dimensions (Unit : mm)



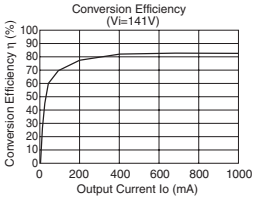
● Derating Curve



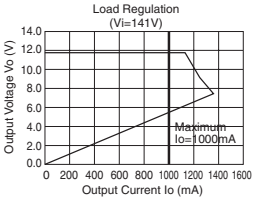
● Switching Frequency



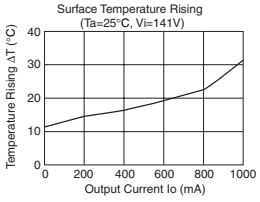
● Conversion Efficiency



● 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. Cl_2, H_2S, NH_3, SO_2, NO_2) 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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