

AC / DC converter

BP5034D12

The BP5034D12 is an AC / DC converter which can be used to supply +12V, 100mA DC output from a commercial power supply (100V AC). Using this module enables simple, easy drive of microcomputers, LEDs, and other electronic components without using a transformer. It also allows set PCBs to be kept compact and lightweight, with extremely few attachments.

●Applications

Power supply circuits for vacuum cleaners, washing machines, refrigerators, electric carpets, electric rice cookers and crock pots, irons, cordless telephones, air purifiers, humidifiers, dehumidifiers, illumination devices and other small household appliances, as well as power supply circuits for gas, fire and smoke alarms, DC motors, sensors, and other similar devices

●Features

- 1) Elimination of a transformer enables compact, lightweight power supply boards.
- 2) Wide input voltage range. (80 to 138V for AC voltage conversion)
- 3) DC power supply can be easily configured, with few attachments.
- 4) Because no transformer is used, the power supply board is less vulnerable to splitting or cracking from impact or shock.
- 5) Allow easy assemblage of components.

●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	V _{IN}	195	V
Output current	I _o	100	mA
Operating temperature range	T _{opr}	-25~+80	°C
Storage temperature range	T _{stg}	-25~+105	°C

●Recommended operating conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	V _{IN}	113	141	195	V _(DC)

Power Module

●Electrical characteristics (unless otherwise noted, Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	V _{IN}	113	141	195	V	DC
Output voltage	V _O	11	12	13	V	V _{IN} =141V, I _O =50mA
Output current	I _O	0	—	100	mA	V _{IN} =141V *1
Line regulation	V _r	—	0.02	0.1	V	V _{IN} =113~195V, I _O =50mA
Load regulation	V _l	—	0.05	0.15	V	V _{IN} =141V, I _O =0~50mA
Output ripple voltage	V _p	—	0.05	0.15	V _{PP}	V _{IN} =141V, I _O =50mA *2
Conversion efficiency	η	50	60	—	%	V _{IN} =141V, I _O =100mA

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

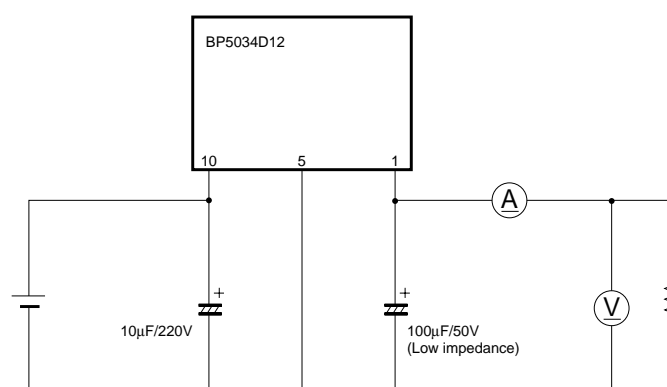
*2 Spike noise is not included in output ripple voltage.

●Pin descriptions

Pin No.	Pin name
1	V _{OUT}
2	N.C.
3	N.C.
4	N.C.
5	COMMON
6	COMMON
7	N.C.
8	N.C.
10	V _{IN}

Pin 9 is removed.

●Measurement circuit



*1 Pins 5 and 6 are internally connected.
Use the module with these pins OPEN, as well as NC pins.

Fig.1

Power Module

●Application example

Basic power supply circuit

Half wave rectifier type

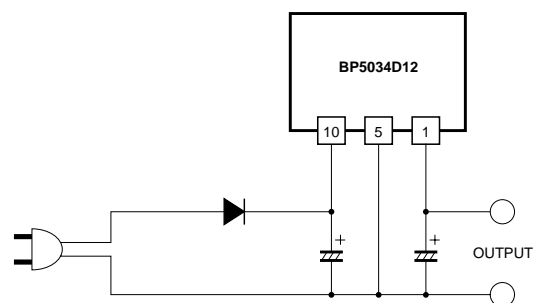


Fig.2

Full wave rectifier type

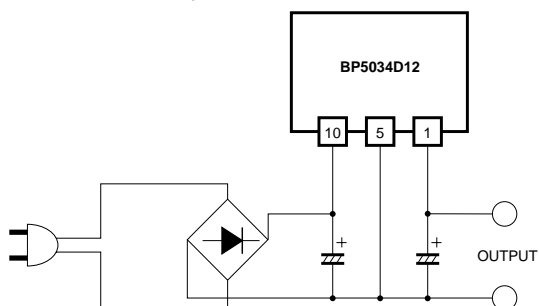


Fig.3

Example showing charger of cordless telephone (hand-held set)

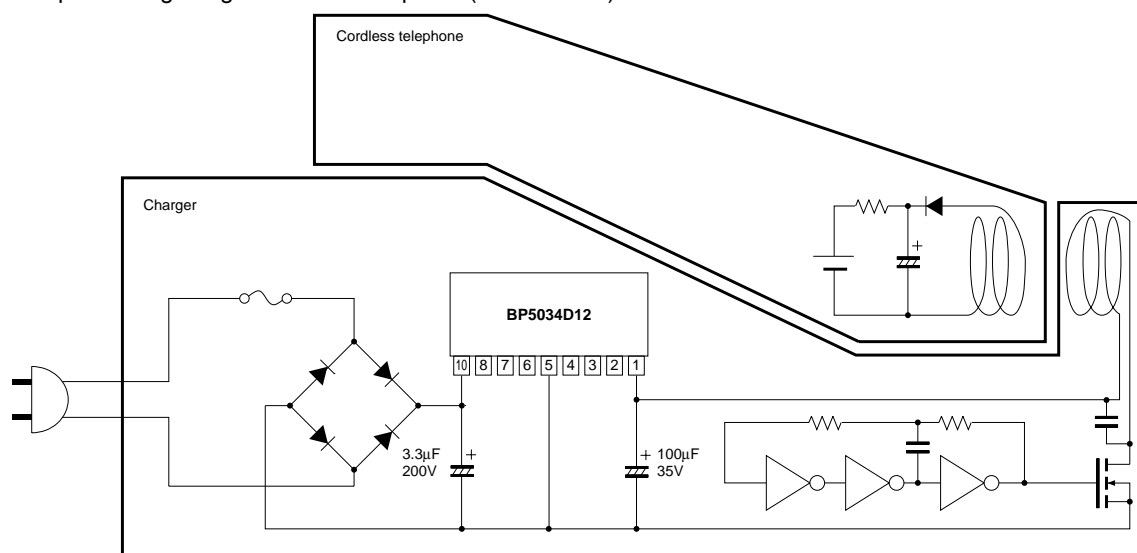


Fig.4

Power Module

●Selecting attachment

(1) Diodes

The rectifying diodes used should fulfill the following conditions.

In the absolute maximum ratings, the reverse peak voltage should be 400V or higher, the average rectifying current should be 0.5A or higher, and the forward peak surge current should be 20A or higher. For example, 1SR35-400A is recommended.

(2) Smoothing capacitor for input pin

A capacitor with a larger capacitance produces a more stable output voltage, but increases the rush current when the power supply is turned on. The capacitor should have a withstand voltage of at least 200V. Please refer to Fig.5 for examples of recommended capacitance values.

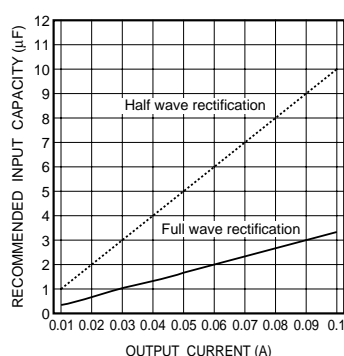


Fig.5 Recommended values for input capacitor

(3) Smoothing capacitor for output pin

This capacitor should have a low ESR. The low-impedance capacitors designed for switching power supplies are especially suitable. The ESR of the capacitor affects the output ripple voltage.

●Operation notes

(1) The output current needs to be reduced as the ambient temperature rises. (Refer to derating curve.)

(2) Lead pins should be securely soldered. If common pins are not securely connected, or pins which are connected internally but which are not used are connected to other pins, irregular voltages could be produced, causing breakdowns and damage.

(3) Over current and shorted circuit

The over current limit is a drooping model. If there is any danger of the load being shorted or over current being produced, always use a protective device such as a fuse.

(4) Avoid subjecting this product to strong impact.

(5) Regulations on Electrical Appliances

As a stand-alone product, this product is not subject to regulations governing electrical appliances. Please be aware, therefore, that applications must be submitted for sets and not for individual products.

(6) Insulation

This product is not insulated on the primary and secondary sides, and there is a danger of electrical shock if it is touched.

(7) Connections with other devices

Devices using this product should not be connected to other devices. If connected, insulation should be provided.

Power Module

●Electrical characteristic curves

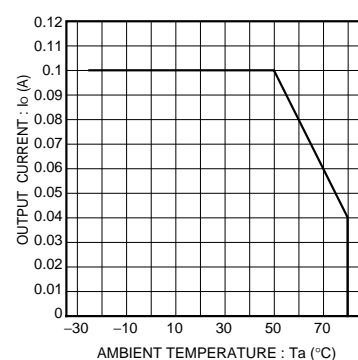


Fig.6 Derating curve

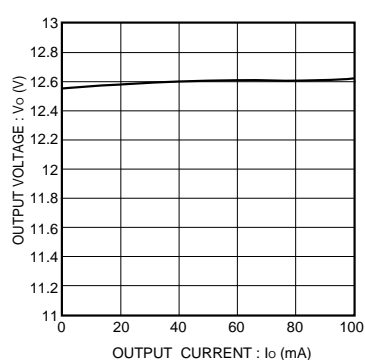


Fig.7 Output characteristic

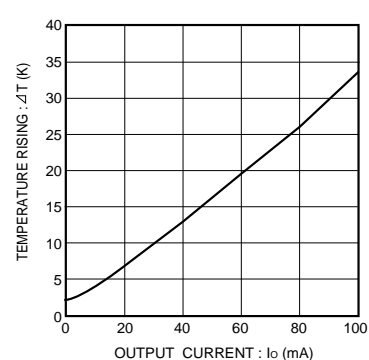


Fig.8 Surface temperature rise

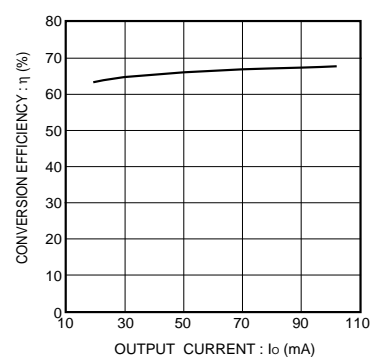


Fig.9 Conversion efficiency

●External dimensions (Units : mm)

