DC/DC converter

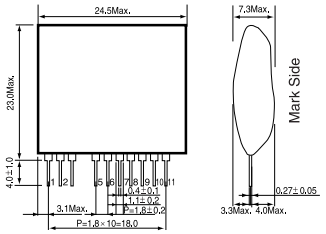
0 to 13V/300mA output type

BP5812

● Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit
Motor driving supply voltage	V_{MIN}	20	V
CTL input voltage	V_{CTL}	–0.3 to V_{MIN}	V
Maximum output current	Io	500	mA
Operating temperature range	Topr	–20 to +70	℃
Storage temperature range	Tstg	–30 to +80	℃
Maximum surface temperature	Tcmax	100	℃

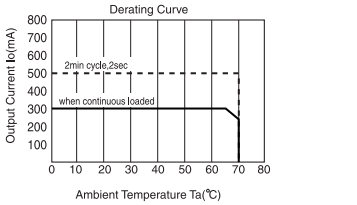
● Dimension (Unit : mm)



● Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Motor driving supply voltage	VMin	13.0	14.0	15.0	V	
CTL input voltage	V_{CTL}	0	–	5	V	
CTL input frequency	f_{CTL}	50	–	–	Hz	
Output voltage channel1,2	Vo1,2	12.5	13	13.5	V	VMin=14V, V_{CTL}=5V
		12	12.6	13.5	V	VMin=13V, V_{CTL}=5V
		5.5	6.5	7.5	V	VMin=14V, V_{CTL}=2.5V
Output current channel1,2	Io1,2	–	–	300	mA	VMin=14V, V_{CTL}=5V
Output ripple voltage1,2	V_P	–	0.10	0.15	Vp-p	VMin=14V, V_{CTL}=5V
Power conversion effciency	η	84	92	–	%	VMin=14V, V_{CTL}=5V

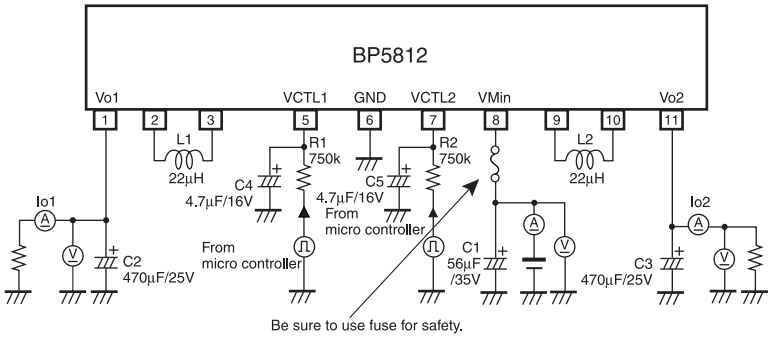
● Derating Curve



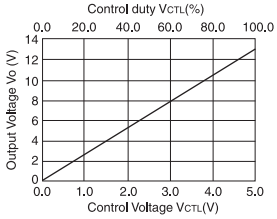
● Derating curve shown above is V_{CTL}=5V(duty100%).
When V_{CTL} voltage is reduced, output voltage should be reduced at a rate of Io × (V_{CTL}÷5=duty).
● ex)Continuous oprtation at Ta=40℃ : Io2=150mA when V_{CTL}_duty=50%.

● Application ciircuit

● Pulse signal is converted with DC and can be operated from micro-controller by connecting smoothing capacitor to pin4 and pin8. Changing pulse duty enables to change output voltage and control rotation of the motor.



● Output voltage control characteristic



Vo-V_{CTL} characteristics		
Output voltage Vo	Control voltage V_{CTL}[V]	Control duty V_{CTL}[%]
0	0	0
6.5	2.6	52.0
7	2.78	55.6
8	3.15	63.0
9	3.52	70.4
10	3.89	77.8
11	4.26	85.2
12	4.63	92.6
13	5.00	100.0

● External components setting

C1: Capacitor for input voltage smoothing	56μF/35V Low impedance for power supply Recommendable : ZL series/Rubycon
C2,C3: Capacitor for output voltage smoothing	470μF/25V Low impedance for power supply Recommendable : ZL series/Rubycon
C4,C5: Vctl smoothing capacitor	4.7μF/16V Normal products Recommendable : YXA series/Rubycon
L1,L2: Coil for switching regulator	22μH Rated current 1.2A or higher Recommendable : RCH-114 series/Sumida
R1,R2: Vctl divider resistor	750kHz±1% 63mW or higher Recommendable : MCR03 series/ROHM

● Terminal function

Pin No.	Terminal	Terminal function
1	Vo1	Power supply output pin for driving motor (CH1 side). Please connect a capacitor. (470μF/25V ZL series/Rubycon recommended)
2,3	L1	Choke coil connection pin (CH1 side).
4	Vctl1	Output pin variable pin (CH1 side) DC voltage of 0 to 5V is inputted by external resistor. Output voltage value can be changed by changing DC voltage to linear. It also can be controlled with pulse Duty of 0V/5V by connecting external capacitor.
5	VMin	Power supply input pin for driving motor(CH1 side). Please connect a capacitor to each pin. (56μF/35V ZL series/Rubycon recommended)
6	GND	GND pin.
8	Vctl2	Output pin variable pin (CH2 side) DC voltage of 0 to 5V is inputted by external resistior. Output voltage value can be changed by changing DC voltage to linear. It also can be controlled with pulse Duty of 0V/5V by connecting external capacitor.
9,10	L2	Choke coil connection pin (CH2 side).
11	Vo2	Power supply output pin for driving motor (CH2 side). Please connect a capacitor. (470μF/25V ZL series/Rubycon recommended)

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   [c] Use in places where the products are exposed to sea winds or corrosive gases, including Cl2, H2S, NH3, SO2, and NO2
   [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 othe 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.
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