

Variable output DC/DC converter

BP5811

0 to 19V/300mA output type

Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit
Motor driving supply voltage	V_{MIN}	25	V
CTL input voltage	V_{CTL}	0.3 to 5.5	V
Maximum output current	I_{OPEAK}	300	mA
Operating temperature range	T_{OPR}	-20 to +80	°C
Storage temperature range	T_{STG}	-30 to +85	°C
Maximum surface temperature	T_{CMAX}	100	°C

Recommended Action Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Motor driving supply voltage	V_{MIN}	19.0	20.0	21.0	V	$I_O=300mA$
CTL input voltage	V_{CTL}	0	-	5.0	V	
CTL input frequency	f_{CTL}	1	50	100	kHz	

Electrical Characteristics

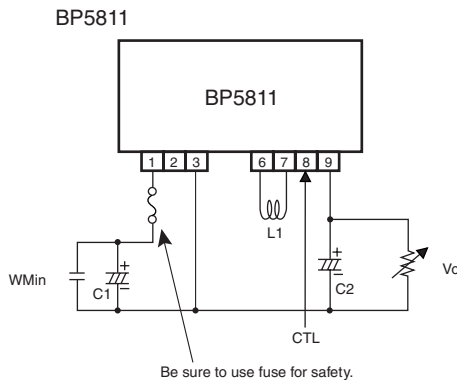
Unless otherwise specified, $V_{MIN}=20V$, $I_O=300mA$, $V_{CTL}=5.0V$, $T_a=25^\circ C$

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Output voltage	V_O	18.0	19.0	20.0	V	
		14.3	15.1	15.9	V	$V_{CTL}=4.0V$ $I_O=240mA$
		6.76	7.35	7.94	V	$V_{CTL}=2.0V$ $I_O=120mA$
Output current	I_O	-	-	300	mA	*1
Output ripple	V_P	-	0.05	0.15	Vp-p	*2
Power conversion efficiency	η	88	93	-	%	

*1 Maximum output current is charged due to the output voltage or the ambient temperature.

*2 An output ripple voltage is charged due to smooth capacitor, measurement environment, pattern layout.

Application circuit



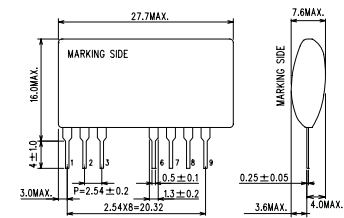
External components setting

FUSE: Fuse	Please make sure to use quick acting (2.3A)
C1: Capacitor for input voltage smoothing	470 μ F/50V Low impedance Recommended part : PM series (Nichicon)
C2: Capacitor for Output voltage smoothing	470 μ F/50V Low impedance Recommended part : PM series (Nichicon)
L1: Power inductor	47 μ H, Rated current 1.2A or higher Recommended part : TSL0808-470K1R2 (TDK)

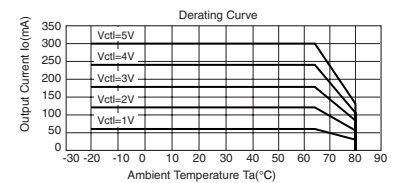
Description terminal

Pin No.	Function
1	Input terminal
2	N.C.
3	GND
4	Skip
5	Skip
6	Coil connection terminal
7	Coil connection terminal
8	Control terminal
9	Output voltage

Dimensions (Unit : mm)

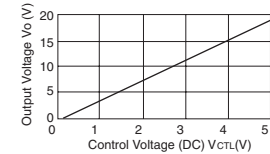


Derating Curve

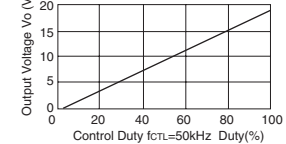


Output voltage control characteristic (Ta=25°C)

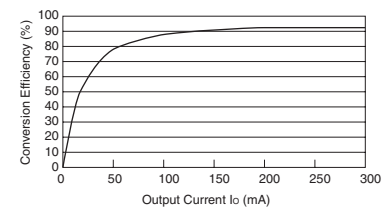
V_O - V_{CTL} Characteristics ($V_{MIN}=20V$)



V_O -Duty Characteristics ($V_{MIN}=20V$)



Conversion efficiency ($V_{MIN}=20V$, $V_{CTL}=5V$)



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.
- 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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