ROHM
SEMICONDUCTOR

STRUCTURE   Silicon Monolithic Integrated Circuit

PRODUCT SERIES   Three-Phase Full-Wave Motor Driver for Fan Motor

TYPE   BH6717NUV

FEATURES   Speed controllable by PWM input signal
                            Sensorless drive
                            Soft switched drive
                            Power save function

○ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Limit	Unit
Supply voltage	VCC	-0.3～6.5	V
Power dissipation	Pd	560∗	mW
Operating temperature	Topr	-25～+95	℃
Storage temperature	Tstg	-55～+125	℃
Output current	Iomax	700∗∗	mA
FG signal output voltage	VFG	6.5	V
FG signal output current	IFG	6	mA
Junction temperature	Tjmax	125	℃

∗ Reduce by 5.6mW/℃ over 25℃.
 (On 70.0mm×70.0mm×1.6mm glass epoxy board)
∗∗This value is not to exceed Pd.

○OPERATING CONDITIONS

Parameter	Symbol	Limit	Unit
Operating supply voltage range	VCC	1.8～5.5	V

∗This product is not designed for production against radioactive rays.
∗This document may be strategic data subject to COCOM regulations.

○ELECTRICAL CHARACTERISTICS (Unless otherwise specified Ta=25℃,VCC=5V)

Parameter	Symbol	Limit			Unit	Conditions
		Min.	Typ.	Max.		
Circuit current STB	ICST	-	20	50	μA	
Circuit current	ICC	1.5	4	6.5	mA	
PWM input H level	VPH	2.5	-	VCC	V	
PWM input L level	VPL	0	-	0.7	V	
PWM input current H	IPH	-	0	1	μA	PWM=VCC
PWM input current L	IPL	-50	-20	-	μA	PWM=GND
Input frequency	FP	20	-	50	kHz	
FR input H level	VFRH	4.5	-	VCC	V	FR=H : Reverse drive
FR input L level	VFRL	0	-	0.5	V	FR=L : Forward drive
PWM off time	TPO	500	1000	2000	μs	
Limit voltage	VLM	0.2	0.25	0.3	V	
Output voltage	VO	-	0.25	0.325	V	Io＝250mA (H.L. total)
FG low voltage	VFGL	-	-	0.4	V	IFG＝5mA
Lock protection det.time	LDT	-	0.5	-	s	
Lock protection rel.time	LRT	2.5	5	10	s	
Lock protection ratio	RLT	9	10	-	-	rel.time/det.time ratio

○PACKAGE OUTLINES

VSON010V3030　(UNIT:mm)
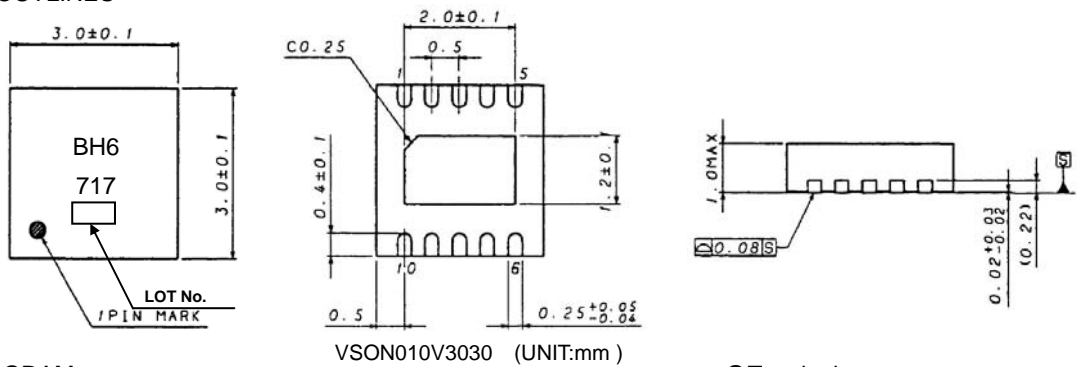
○BLOCK DIAGRAM
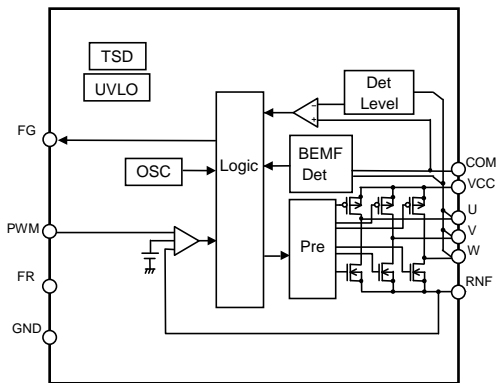
○Terminal name

Pin No.	Terminal name
1	FG
2	COM
3	VCC
4	U
5	RNF
6	W
7	V
8	GND
9	FR
10	PWM

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○CAUTIONS
  1) Absolute maximum ratings
    There is possibility of destruction in using beyond the absolute maximum rating. In case of destruction, a failure mode can not be defined (short mode or open mode). Therefore when special mode is envisaged where absolute maximum rating may be exceeded, please take a physical safety measure such as fuse.
  2) Reverse connection of power supply connector
    Reverse connection of power supply connector may break IC. Take a measure against reverse connection destruction such as inserting a diode between power supply and Vcc terminal.
  3) Power supply line
    Back electromotive force causes regenerated current to power supply line, therefore take a measure such as placing a capacitor between power supply and GND for routing regenerated current, and fully ensure that the capacitor characteristics have no problem before determine a capacitor value
  4) GND potential
    Ensure that the potential of GND terminal is the minimum potential in any operating condition. Also ensure that all terminals except GND terminal do not fall below GND voltage including transient characteristics. However, it is possible that the motor output terminal may deflect below GND because of influence by back electromotive force of motor. Malfunction may possibly occur depending on use condition, environment, and property of individual motor. Please make fully confirmation that no problem is found on operation of IC.
  5) Thermal design
    Consider the power dissipation under actual use condition and apply thermal design with sufficient margin.
  6) Mounting failures
    In attaching IC to printed board, pay enough attention to the direction and dislocation of IC. Mounting failures may break IC. In addition, destruction is also possible when circuit is shorted by foreign substance brought between outputs or between output and power supply - GND.
  7) Operation in strong electromagnetic field
    Use in strong electromagnetic field may cause malfunction, please be careful.
  8) ASO
    Consider that the output Tr does not exceed the absolute maximum rating and ASO.
  9) Thermal shut down circuit
    This IC has thermal shut down (TSD) circuit. Operation temperature is 150℃(typ.) and has a hysteresis width of 15℃(typ.). When IC chip temperature rises and TSD circuit works, the output terminal becomes an open state. TSD circuit is simply for the purpose of intercepting IC from overheating, and not for protecting and assuring IC. Therefore do not continue to use IC thereafter with this circuit operating and do not use IC assuming the operation of this circuit.
  10) Inspection with a set board
    When connecting a capacitor to a pin with low impedance in inspection on a set board, stress may possibly be applied to IC, therefore be sure to apply discharging in each process. In attaching to and detaching from jigs in inspection process, be sure to turn off power before connecting, and turn off power before removing IC. In addition, apply grounding to assembling process as a measure of anti-static electricity, and use full caution in transporting and storing.
  11) GND wiring pattern
    When there are small signal GND and large current GND, separate the large current GND pattern from small signal GND pattern. It is recommended to apply one-point grounding at the reference point of the set in order that resistance of wiring pattern and large current do not cause change of voltage of small signal GND. Please be cautious not to fluctuate the wiring pattern of GND of external mounted parts.
  12) IC terminal input
    When Vcc voltage is not applied to IC, do not apply voltage to each input terminal. When voltage above Vcc or below GND is applied to the input terminal, parasitic element is actuated due to the structure of IC. Operation of parasitic element causes mutual interference between circuits, resulting in malfunction as well as destruction in the last. Do not use in a manner where parasitic element is actuated.
  13) FR function
    Swiching H/L of FR terminal should not be done during the motor rotation. it should be done from once the motor stop. FR terminal should be connected to VCC or GND for reducing PWM noise.

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Notes

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