STRUCTURE Silicon Monolithic Integrated Circuit

PRODUCT SERIES 1ch Motor Driver

Under Developing

TYPE BD6875GSW

FEATURES ・Built in 1 Full-ON Driver

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limit	Unit
Power supply voltage	VCC	-0.5 to +7.0	V
Motor power supply voltage	VM	-0.5 to +7.0	V
Control input voltage	VIN	-0.5 to VCC+0.5	V
Power dissipation	Pd	425※1	mW
Operating temperature range	Topr	-25 to +85	°C
Junction temperature	Tjmax	125	°C
Storage temperature range	Tstg	-55 to +125	°C
H-bridge output current	Iout	-200 to +200※2	mA/ch

※1 Reduced by 4.25mW/°C over 25°C, when mounted on a glass epoxy board (114.3mm × 76.2mm × 1.6mm)

※2 Must not exceed Pd, ASO, or Tjmax of 125°C.

●Operating Conditions (Ta=-25°C to +85°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	VCC	2.5	3.0	5.5	V
Motor power supply voltage	VM	2.5	5.0	5.5	V
Control input voltage	VIN	0	-	VCC	V
H-bridge output current	Iout	-	-	±100※3	mA/ch

※3 Must not exceed Pd or ASO.

The product described in this specification is a strategic product (and/or service) subject to COCOM regulations.
It should not be exported without authorization from the appropriate government authorities.
This product isn't designed for protection against radioactive rays.

●Package Outline

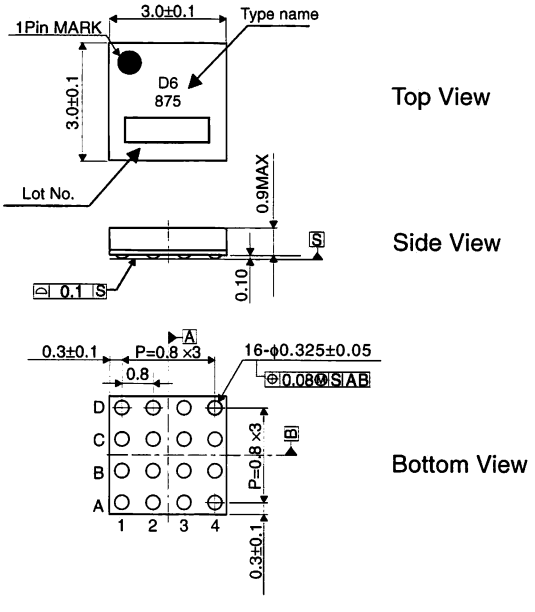


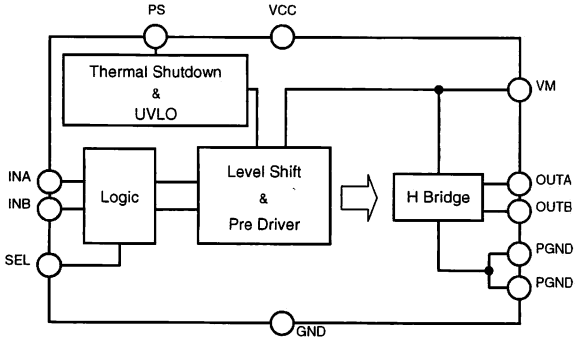
Fig.1 BGA016W030 Package (Unit: mm)

●Pin Arrangement (Top View)

	1	2	3	4
A	N.C.	OUTA	SEL	N.C.
B	PGND	VM	PS	INA
C	PGND	N.C.	VCC	INB
D	N.C.	OUTB	GND	N.C.

Fig.2 BD6875GSW Pin Arrangement (Top View)

●Block Diagram



●Pin No. and Pin Name

No.	Pin name
1A	N.C.
2A	OUTA
3A	SEL
4A	N.C.
1B	PGND
2B	VM
3B	PS
4B	INA
1C	PGND
2C	N.C.
3C	VCC
4C	INB
1D	N.C.
2D	OUTB
3D	GND
4D	N.C.

●BD6875GSW Electrical Characteristics (Unless otherwise specified, Ta=25°C, VCC=3.0V, VM=5.0V)

Parameter	Symbol	Target Limit			Unit	Conditions
		Min.	Typ.	Max.		
Overall						
Circuit current during standby operation	ICCST		0		μA	PS=L
Circuit current	ICC		0.9		mA	PS=H with no signal
Control input						
High level input voltage	VINH		-		V	INA, INB, SEL, PS
Low level input voltage	VINL		-		V	INA, INB, SEL, PS
High level input current	IINH		30		μA	INA, INB, SEL, PS; VIN=3V
Low level input current	IINL		0		μA	INA, INB, SEL, PS; VIN=0V
Pull-down resistor	RIN		100		kΩ	INA, INB, SEL, PS
UVLO						
UVLO voltage	VUVLO		-		V	
Full-ON Drive block (ch1)						
Output ON-Resistance 1	RON1		1.2		Ω	Io=±200mA on high and low sides in total
Turn-on time 1	ton1		0.6		μs	With 20Ω load
Turn-off time 1	toff1		0.08		μs	With 20Ω load
Rise time 1	tr1		0.15		μs	With 20Ω load
Fall time 1	tf1		0.03		μs	With 20Ω load
Output ON-Resistance 2	RON2		1.7		Ω	Io=±100mA on high and low sides in total, VCC=VM=2.5V※4
Turn-on time 2	ton2		0.6		μs	VCC=VM=2.5V※4
Turn-off time 2	toff2		0.08		μs	VCC=VM=2.5V※4
Rise time 2	tr2		0.15		μs	VCC=VM=2.5V※4
Fall time 2	tf2		0.03		μs	VCC=VM=2.5V※4

※4 Design target value (No total shipment inspection is made.)

●Operation Notes

1) Absolute maximum ratings

Use of the IC in excess of absolute maximum ratings such as the applied voltage or operating temperature range (Topr) may result in IC damage. Assumptions should not be made regarding the state of the IC (short mode or open mode) when such damage is suffered. The implementation of a physical safety measure such as a fuse should be considered when use of the IC in a special mode where the absolute maximum ratings may be exceeded is anticipated.

2) Power supply lines

Regenerated current may flow as a result of the motor's back electromotive force. Insert capacitors between the power supply and ground pins to serve as a route for regenerated current. Determine the capacitance in full consideration of all the characteristics of the electrolytic capacitor, because the electrolytic capacitor may loose some capacitance at low temperatures. If the connected power supply does not have sufficient current absorption capacity, regenerative current will cause the voltage on the power supply line to rise, which combined with the product and its peripheral circuitry may exceed the absolute maximum ratings. It is recommended to implement a physical safety measure such as the insertion of a voltage clamp diode between the power supply and GND pins.

3) Ground potential

Ensure a minimum GND pin potential in all operating conditions.

4) Setting of heat

Use a thermal design that allows for a sufficient margin in light of the power dissipation (Pd) in actual operating conditions.

5) Actions in strong magnetic field

Use caution when using the IC in the presence of a strong magnetic field as doing so may cause the IC to malfunction.

6) ASO

When using the IC, set the output transistor for the motor so that it does not exceed absolute maximum ratings or ASO.

7) Thermal shutdown circuit

This IC incorporates a TSD (thermal shutdown) circuit (TSD circuit). If the temperature of the chip reaches the following temperature, the motor coil output will be opened. The thermal shutdown circuit (TSD circuit) is designed only to shut the IC off to prevent runaway thermal operation. It is not designed to protect the IC or guarantee its operation. Do not continue to use the IC after operating this circuit or use the IC in an environment where the operation of this circuit is assumed.

TSD ON temperature [°C] (Typ.)	Hysteresis temperature [°C] (Typ.)
150	25

8) Ground Wiring Pattern

When using both small signal and large current GND patterns, it is recommended to isolate the two ground patterns, placing a single ground point at the application's reference point so that the pattern wiring resistance and voltage variations caused by large currents do not cause variations in the small signal ground voltage. Be careful not to change the GND wiring pattern of any external components, either.

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