STRUCTURE Silicon Monolithic Integrated Circuit

PRODUCT SERIES 2ch Stepping Motor Driver

Under Developing

TYPE **BD6874GSW**

FEATURES • Built in 2 Full-ON Drivers

●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	610※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	-300 to +300※2	mA/ch

※1 Reduced by 6.1mW/°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	-	-	±200※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

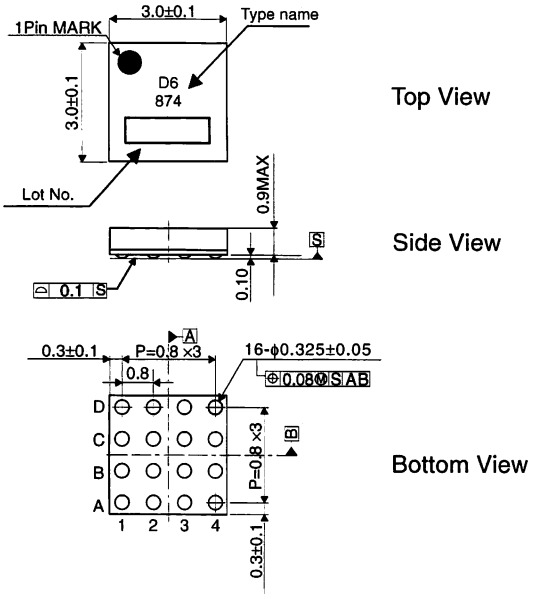

Fig.1 BGA016W030 Package (Unit: mm)

●Pin Arrangement (Top View)

	1	2	3	4
A	OUT1A	OUT1B	IN1A	PS
B	VM1	PGND	IN1B	VCC
C	VM2	PGND	IN2B	SEL
D	OUT2A	OUT2B	IN2A	GND

Fig.2 BD6874GSW Pin Arrangement (Top View)

●Block Diagram

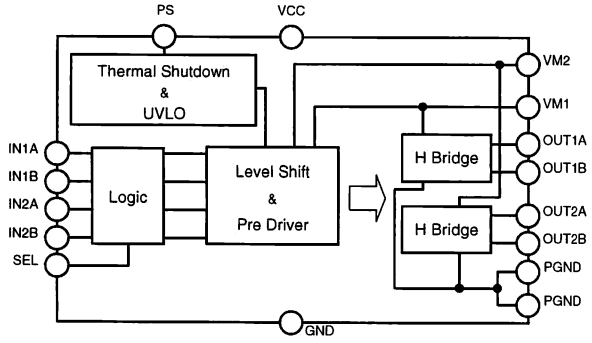

Fig.3 BD6874GSW Block Diagram

●Pin No. and Pin Name

No.	Pin name
1A	OUT1A
2A	OUT1B
3A	IN1A
4A	PS
1B	VM1
2B	PGND
3B	IN1B
4B	VCC
1C	VM2
2C	PGND
3C	IN2B
4C	SEL
1D	OUT2A
2D	OUT2B
3D	IN2A
4D	GND

●BD6874GSW 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	IN1A~IN2B, SEL, PS
Low level input voltage	VINL		-		V	IN1A~IN2B, SEL, PS
High level input current	IINH		30		μA	IN1A~IN2B, SEL, PS; VIN=3V
Low level input current	IINL		0		μA	IN1A~IN2B, SEL, PS; VIN=0V
Pull-down resistor	RIN		100		kΩ	IN1A~IN2B, SEL, PS
UVLO						
UVLO voltage	VUVLO		-		V	
Full-ON Drive block (ch1 and ch2)						
Output ON-Resistance	RON		1.0		Ω	Io=±100mA on high and low sides in total
Turn-on time	ton		0.6		μs	With 20Ω load
Turn-off time	toff		0.08		μs	With 20Ω load
Rise time	tr		0.15		μs	With 20Ω load
Fall time	tf		0.03		μs	With 20Ω load

●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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Taiwan / Taipei	TEL : +866(2)2500-6956	FAX : +866(2)2503-2869
Korea / Seoul	TEL : +82(2)8182-700	FAX : +82(2)8182-715
Singapore	TEL : +65-6332-2322	FAX : +65-6332-5662
Malaysia / Kuala Lumpur	TEL : +60(3)7958-8355	FAX : +60(3)7958-8377
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Thailand / Bangkok	TEL : +66(2)254-4890	FAX : +66(2)256-6334

Japan /
(Internal Sales)

Tokyo 2-1-1, Yaesu, Chuo-ku, Tokyo 104-0082
TEL : +81(3)5203-0321 FAX : +81(3)5203-0300

Yokohama 2-4-8, Shin Yokohama, Kohoku-ku, Yokohama, Kanagawa 222-8575
TEL : +81(45)476-2131 FAX : +81(45)476-2128

Nagoya Dainagayo Building 9F 3-28-12, Meieki, Nakamura-ku, Nagoya,Aichi 450-0002
TEL : +81(52)581-8521 FAX : +81(52)561-2173

Kyoto 579-32 Higashi Shiokouji-cho, Karasuma Nishi-iru, Shiokoujidori, Shimogyo-ku, Kyoto 600-8216
TEL : +81(75)311-2121 FAX : +81(75)314-6559

(Contact address for overseas customers in Japan)

Yokohama TEL : +81(45)476-9270 FAX : +81(045)476-9271

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