11-FD216

Brushless Vibrator Driver

Built-in Hall Sensor

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General Specifications

The device is designed specifically for brushless DC motor applications without any external components, such as vibrator, ultra-small blushless motor. Each device includes a HALL sensor, a lock detection circuit to shut down the driver output for the lock prevention, and complementary bi-directional drivers for driving and sinking coil load.

If the motor rotation is stall by external forces or obstacles, the drivers will shut down roughly 0.5 to 2 seconds after the motor is locked. When the drivers shut down, the automatic self-restart circuit will try to power up the drivers every 0.5 to 2 seconds till the motor locking is released.

Pin Description

NO.	NAME	Description
1	O2	Output Driver2
2	NC	No Connection
3	VSS	Ground
4	O1	Output Driver1
5	NC	No Connection
6	VDD	Power

Features and Benefits

- Optimized for small Brushless DC Motor applications
- Low voltage operation
- Built-in Hall effect sensor
- Built-in Reverse Protection
- Lock detection and automatic self-restart without external capacitor
- High sinking and driving output capability
- Thin, highly reliable package (CSP6)

Absolute Maximum Ratings (Unless otherwise noted, T_A = 25 °C)

Characteristic	Symbol	Rating	Unit
Supply Voltage	V_{DD}	5.5	V
Output Current	I_{OUT}	200	mA
Power Dissipation	P_D	400	mW
Thermal Resistance, Junction to Ambien	θ_{JA}	70	°C/ W
Operating Temperature Range	T_{OPR}	–40 ~ 125	°C
Storage Temperature Range	T_{STG}	-65 ~ 150	°C

Electrical Characteristics (Unless otherwise noted, T_A= 25°C , V_{DD}= 3V)

Characteristic	Sym.	Condition	Limit			Unit
			Min.	Typ.	Max.	
Supply Voltage	V_{DD}	Operating	1.8	3	4.5	V
Magnetic Specifications (T_J = 25°C)						
Operating Point	B_{OP}		-	1.0	10	mT
Release Point	B_{RP}		-	-1.0	-10	mT
Hystersis	B_{HYS}		-	2.0	20	mT
O1/O2 Output Terminal (T_J = 25°C)						
Output Voltage High	V_{OH}	I_{OUT} = 100 mA	2.6	2.85	-	V
Output Voltage Low	V_{OL}	I_{OUT} = 100 mA	-	0.3	0.5	V
Output Current	I_{OUT}	R_L = 30 Ω	-	85	-	mA
Automatic Self-Restart Circuit						
On Time	T_{ON}	-	-	156	-	ms
Duty Ratio	R_{DR}	T_{OFF} / T_{ON}		3		

Driver Output v.s. Magnetic Pole

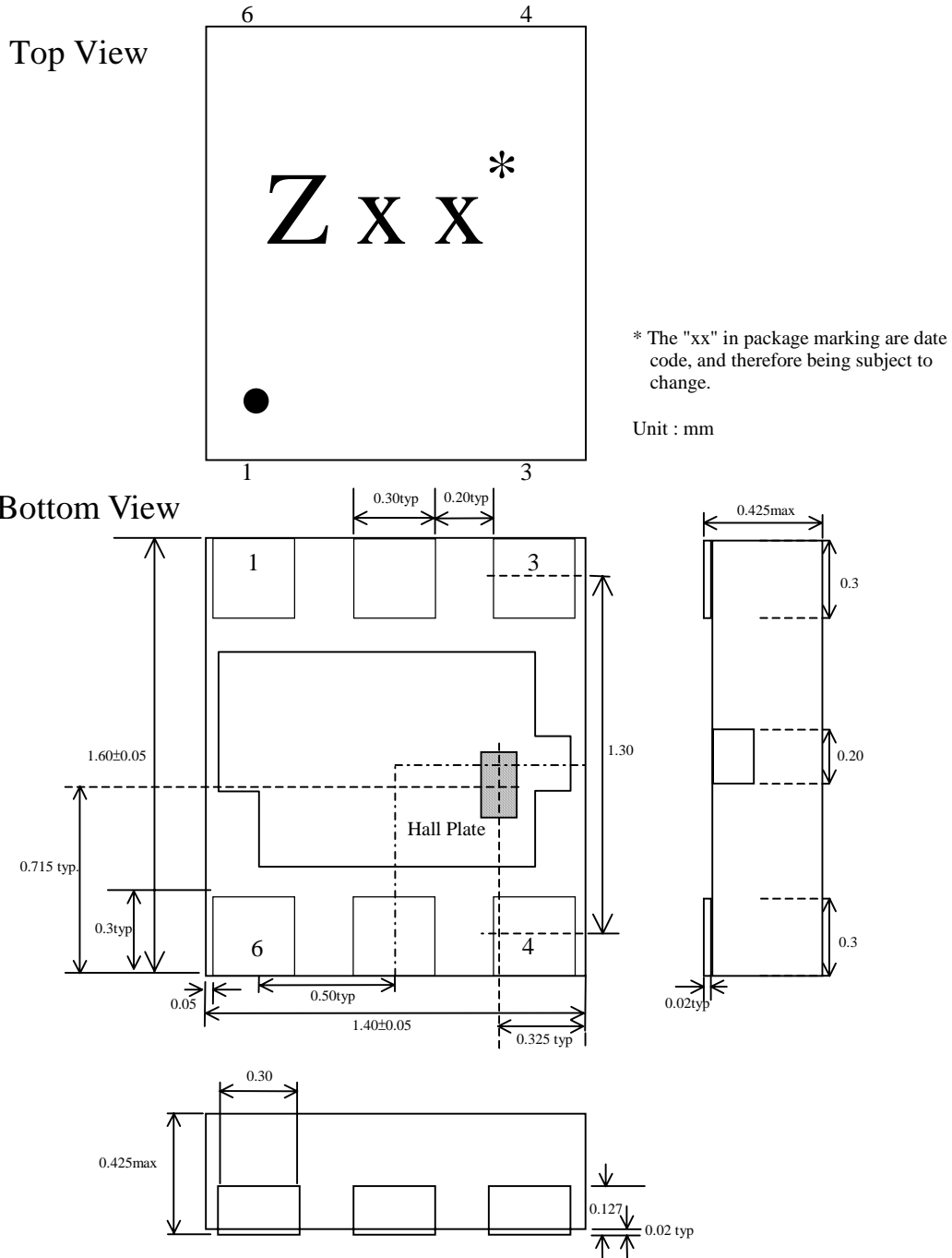| Magnetic Field	O1	O2
North magnetic pole	H	L
South magnetic pole	L	H

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Block Diagram & Application Circuit
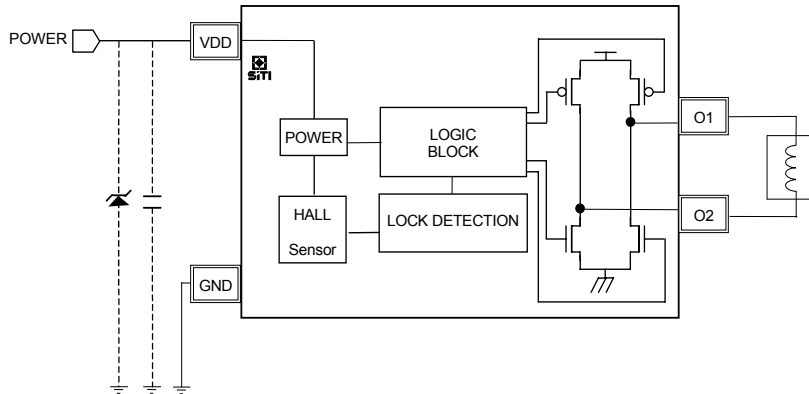
Application Notes

□ The connection of the capacitor or Zener Diode between VDD and GND will increase stability of operation, if required.

Package Specifications (CSP6)

Top View

6   4

Z x x *

1   3

* The "xx" in package marking are date code, and therefore being subject to change.

Unit : mm

Bottom View

0.30typ   0.20typ

1   3

1.60±0.05

1.30

Hall Plate

0.715 typ.

0.3typ

6   4

0.05

0.50typ

1.40±0.05

0.325 typ

0.425max

0.3

0.20

0.3

0.02typ

0.30

0.425max

0.127

0.02 typ

The products listed herein are designed for ordinary electronic applications, such as electrical appliances, audio-visual equipment, communications devices and so on. Hence, it is advisable that the devices should not be used in medical instruments, surgical implants, aerospace machinery, nuclear power control systems, disaster/crime-prevention equipment and the like. Misusing those products may directly or indirectly endanger human life, or cause injury and property loss.

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