

# 11-FD216

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*Brushless Vibrator Driver*  
*Built-in Hall Sensor*



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## Brushless Vibrator Driver Built-in Hall Sensor

### General Specifications

The device is designed specifically for brushless DC motor applications without any external components, such as vibrator, ultra-small brushless 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, $T_A = 25\text{ }^\circ\text{C}$ )

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 Ambient	$\theta_{JA}$	70	$^\circ\text{C}/\text{W}$
Operating Temperature Range	$T_{OPR}$	-40 ~ 125	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-65 ~ 150	$^\circ\text{C}$

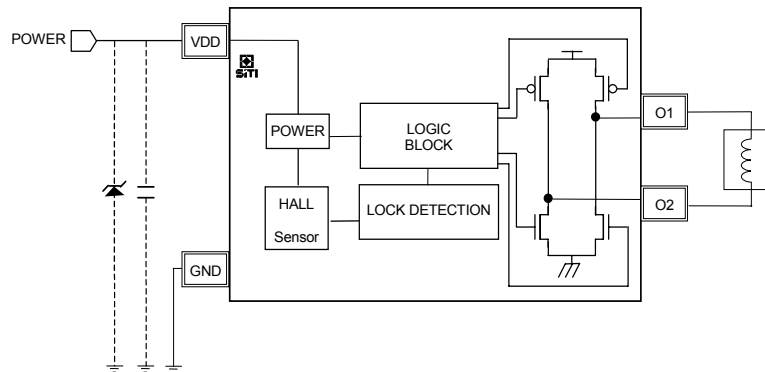
### Electrical Characteristics ( Unless otherwise noted, $T_A = 25\text{ }^\circ\text{C}$ , $V_{DD} = 3\text{V}$ )

Characteristic	Sym.	Condition	Limit			Unit
			Min.	Typ.	Max.	
Supply Voltage	$V_{DD}$	Operating	1.8	3	4.5	V
Magnetic Specifications ( $T_J = 25\text{ }^\circ\text{C}$ )						
Operating Point	$B_{OP}$		-	1.0	10	mT
Release Point	$B_{RP}$		-	-1.0	-10	mT
Hysteresis	$B_{HYS}$		-	2.0	20	mT
O1/O2 Output Terminal ( $T_J = 25\text{ }^\circ\text{C}$ )						
Output Voltage High	$V_{OH}$	$I_{OUT} = 100\text{ mA}$	2.6	2.85	-	V
Output Voltage Low	$V_{OL}$	$I_{OUT} = 100\text{ mA}$	-	0.3	0.5	V
Output Current	$I_{OUT}$	$R_L = 30\ \Omega$	-	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

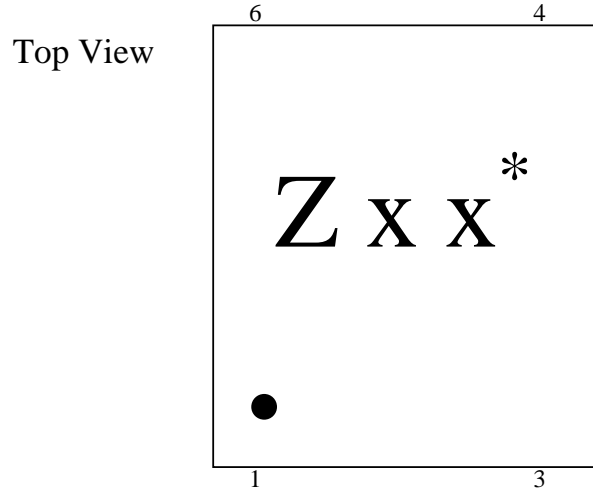
## Block Diagram & Application Circuit



### Application Notes

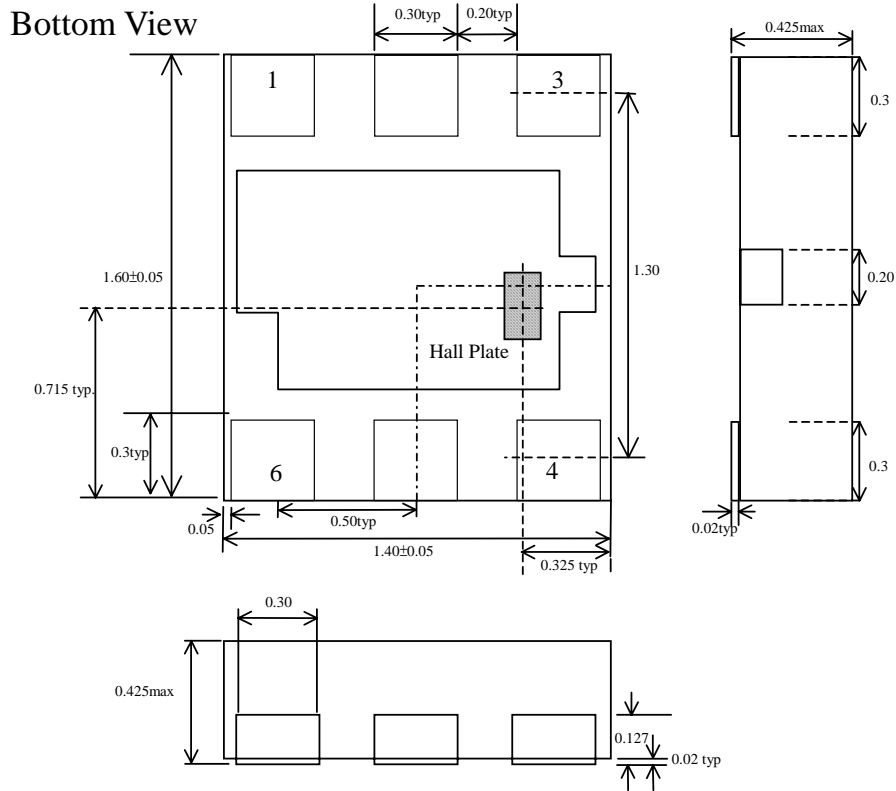
- The connection of the capacitor or Zener Diode between VDD and GND will increase stability of operation, if required.

## Package Specifications ( CSP6 )



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

Unit : mm



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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