



# DC Brushless Motor Driver IC

## PT-3086-C

### Frequency Generation Output

#### Applications

- Double coils DC brushless motor.
- DC 3V ~ 18V.

#### Features

- Motor lock protection and automatic restart
- Frequency Generation output
- Low power consumption and high driving efficiency

#### Input Devices

- Hall IC

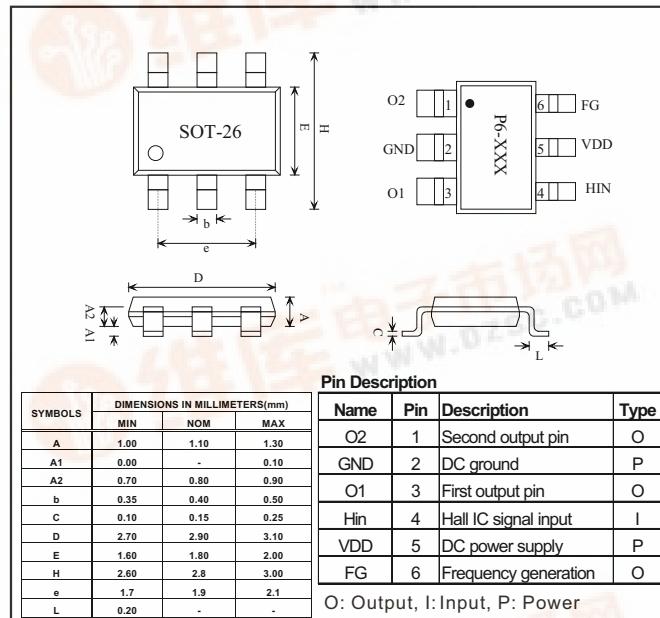
#### Specifications

##### Absolute Maximum Ratings (Ta = 25 C)

Parameter	Symbol	Conditions	Ratings	Units
Maximum supply voltage	V <sub>DD</sub> <sup>max</sup>		18	V
Allowable power dissipation	P <sub>d</sub>		350 <sup>*</sup>	mW
Operating temperature	T <sub>a</sub>		-30 ~ +100	°C
Storage temperature	T <sub>s</sub>		-55 ~ +150	°C
Output current	I <sub>out</sub>	Continoue	400	mA
		Peak	650	mA

\* On 50mm x 50mm x 1.6mm glass epoxy board

#### Package: SOT-26



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**Electrical Characteristics**

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Units
Supply Voltage	$V_{DD}$		3		18	V
Output Sink Voltage	$V_{DS(ON)}$	$R_L=30@12V$	0.6	0.66	0.88	V
Output Breakdown Voltage	$V_{BV(ON)}$		18	22	30	V
Supply Current	$I_{DD}$	Output open@12V			10	mA
Driving Current	$I_O$	$R_L=25@12V (V_{DS(ON)}=0.8V)$	435	440	450	mA
		$R_L=30@12V$	370	378	380	mA
		$R_L=40@12V$	283	287	288	mA
		$R_L=50@12V$	230	231	232	mA
		$R_L=100@12V$	117	118	118	mA
		$R_L=200@12V$	59.4	59.5	59.6	mA
FG flow-in Current	$I_{FG}$	Pull-high resistor is 470ohm@12V		25		mA
FG Supply Voltage				12	30	V
Hin Input Voltage	High		$V_{DD}-1.2$		$V_{DD}$	V
	Low		GND		0.3	V
Hin Input Current	$I_{IN}$	$Hin=12V$		85		uA

 $R_L$ : DC impedance of inductor

**Truth Table**

Hin	O1	O2
H	GND	VDD
L	VDD	GND

## Frequency Generation

This driver IC outputs the FG signals for some special applications. For FG application, the driver IC will generate square wave to indicate the motor rotation frequency. According to the motor internal structure, the pole number is different for different motors. The FG will output the real motor's rotation frequency by dividing the pole number (must be adjusted under IC process).

## Lock Protection

In order to protect the motor, the driver IC will stop to drive the coil when the motor is locked over 0.4 seconds. Then, it restarts to drive the motor after 2.8 seconds. Figure 1 shows the timing diagram between the hall input signal and driver's output state.

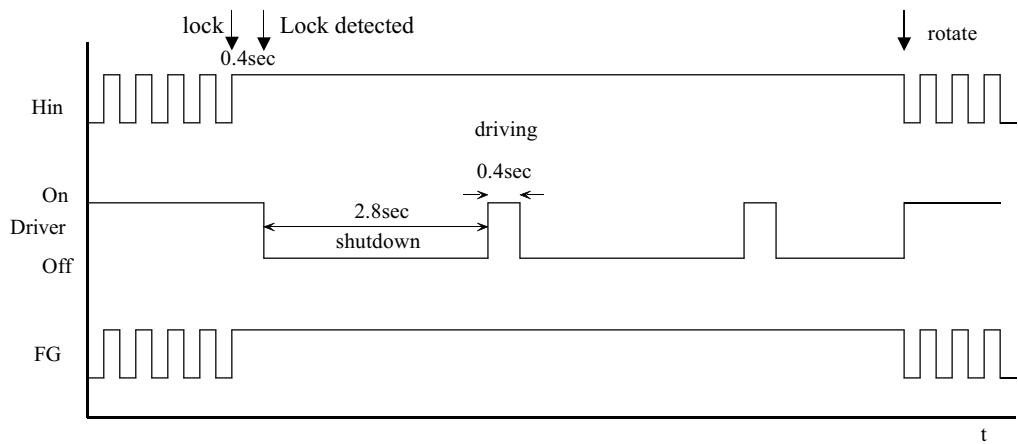


Fig 2. Lock Protection

The driver IC architecture block diagram is shown in Fig. 2

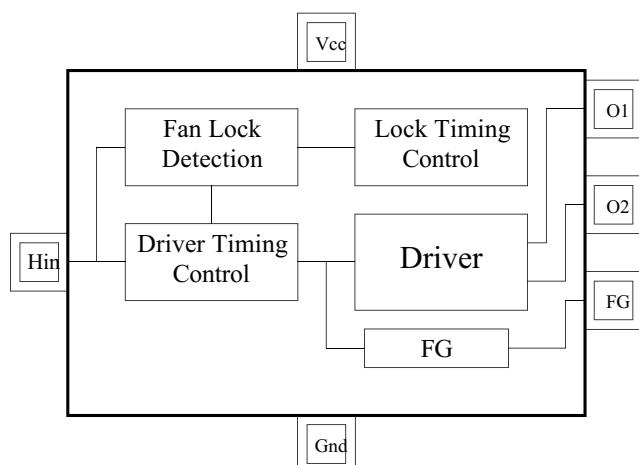
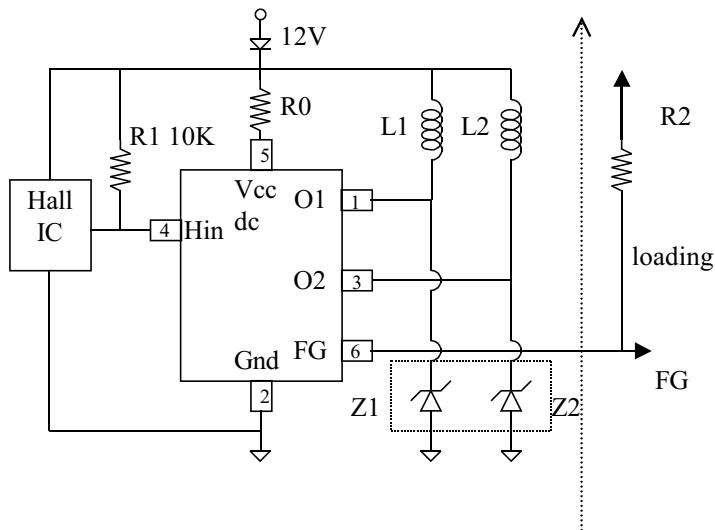


Fig. 2. Driver IC Architecture

## Application circuits

### Double coil



R1 : depend on Hall IC Spec.

R2 : > 470ohm

Z1,Z2 :18V Zener diode

**Note1 :** Z1,Z2 is optional. If the applied coil generate too large count emf(> 30V), the Z1 and Z2 must be added. Vz=18V will be recommended.

**Note2 :** Z1,Z2 can be replaced by C1 and C2 capacitor 1uF~2.2uF/50V

**Note3 :** R0=1K is recommended@12V.

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