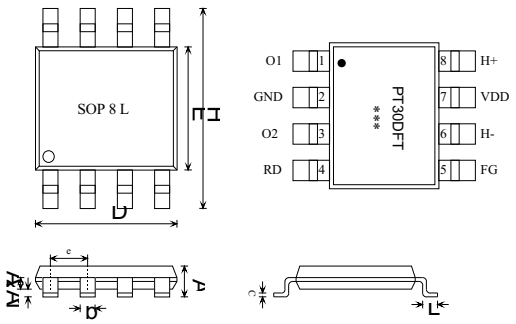
PT-30DFT
H - Bridge Driver

Applications
- Single coils DC brushless motor.
- DC 3.0V~18V.

Features
- Single-phase full-wave driver
- Motor lock protection and automatic restart
- Connectable direct to Hall element
- Built-in hysteresis comparator
- Frequency Generation output
- Rotate Detection (Alarm) output
- Low power consumption and high driving efficiency

Input devices
- Hall IC

Package: SOP8



SYMBOLS	DIMENSIONS IN MILLIMETERS(mm)		
	MIN	NOM	MAX
A	1.47	1.60	1.73
A1	0.10	-	0.30
A2	-	1.45	-
B	0.33	0.41	0.51
C	0.19	0.20	0.25
D	4.80	4.85	4.95
E	3.81	3.91	3.99
H	5.79	5.99	6.20
E	-	1.27	-
L	0.38	0.71	1.27

Pin Description

Name	Pin	Description	Type
O1	1	First output pin	O
GND	2	DC ground	P
O2	3	Second output pin	O
RD	4	Rotation Detector(Alarm)	O
FG	5	Frequency Generation	O
H-	6	Hall element input(-)	I
VDD	7	DC power supply	P
H+	8	Hall element input(+)	I

Specifications

Absolute Maximum Ratings (Ta = 25°C)

Parameter	Symbol	Conditions	Ratings	Units
Maximum supply voltage	V_{DD}^{max}		18	V
Allowable power dissipation	Pd		650*	mW
Operating temperature	Ta		-30 ~ +100	°C
Storage temperature	Ts		-55 ~ +150	°C
Output current	I_{Out}	Continoue	400	mA
		Peak	600	mA

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

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Electrical Characteristics

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Units
Supply Voltage	V_{DD}		3		18	V
Output low-level Voltage	V_{OL}	I_O=200mA		0.4	0.5	V
Output High-level Voltage	V_{OH}	I_O=200mA	Vcc-0.5	Vcc-0.4		V
Output Breakdown Voltage	V_{BV}		18	22	30	V
Input offset voltage	V_{OS}		-6	0	6	mV
Supply Current	I_{DD}	Output open		3	10	mA
FG/RD flow-in Current	I_{FG}/I_{RD}	Pull-high resistor is 470ohm@12V		25		mA
FG/RD Supply Voltage				12	30	V
FG Frequency		Same with Hall input signal				

Truth Table

H+	H-	State	O1	O2	FG	RD
H	L	Rotate	H	L	H	L
L	H	Rotate	L	H	L	L
H	L	Lock	L	L	H	H
L	H	Lock	L	L	H	H

Lock Protection

In order to protect the motor, the driver IC will be shutdown to drive the coil when the motor is locked over 0.3 seconds. Then, it restarts to drive the motor after 2.1 seconds. Figure 1 shows the timing diagram between the hall input signal and driver's output state.

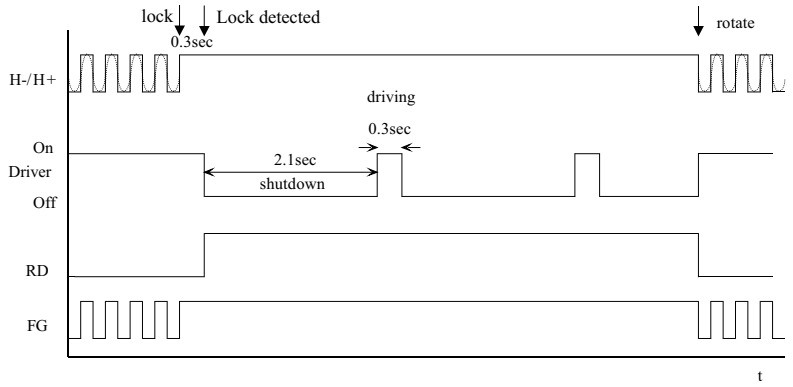


Fig 1. Lock Protection

Rotation Frequency and Detector

This driver IC outputs the FG and RD signal for some special application. For FG application, the driver IC will generate square wave to indicate the motor rotation frequency. For RD application, the driver IC will output a high signal to indicate the stop of the motor and a low signal to indicate the normal operation of the motor. (See Fig. 1)

Pre-Amplifier

This driver IC integrates signal amplifier and the hysteresis comparator in this chip. The hysteresis comparator uses the hysteresis characteristic to eliminate noisy oscillations at output of the comparator.

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

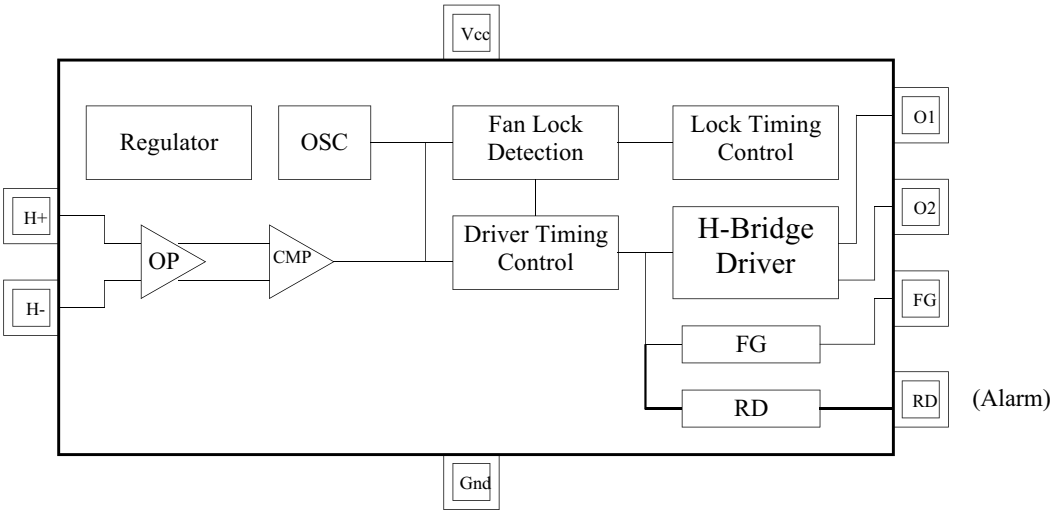
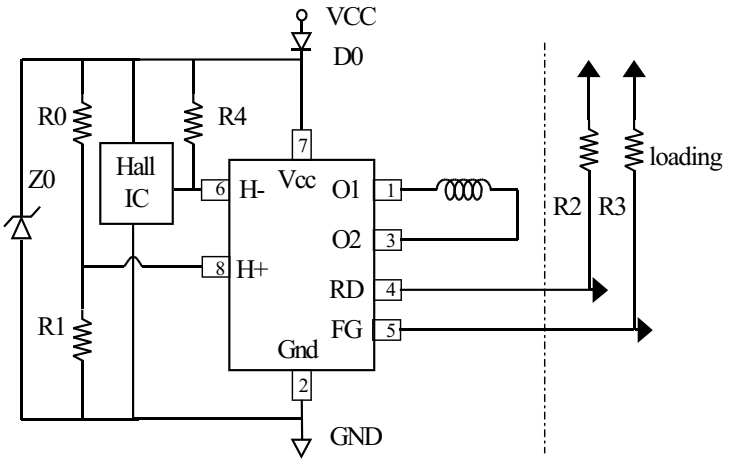


Fig. 2. Driver IC Architecture

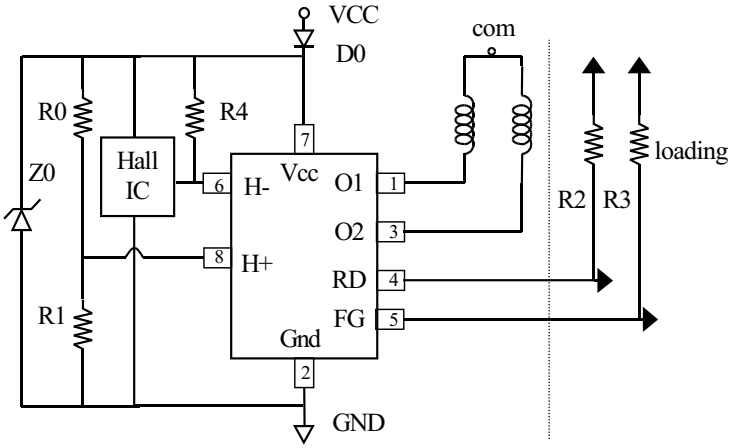
Application circuits/Single coil

* Hall IC input Single coil



R0, R1, R4: 10K
R2, R3: open drain loading
Z0: depend on VCC, if VCC=12V,
Vz=12V~18V.The zener diode is optional.

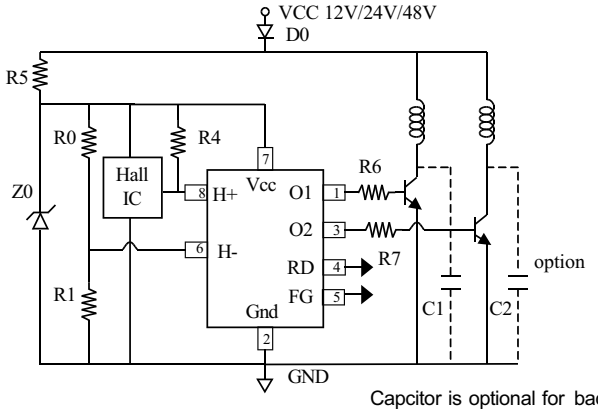
* Hall IC input Double coil



R0, R1, R4: 10K
R2, R3: open drain loading
Z0: Zener diode, if VCC=12V,
Vz=12V~18V.The zener diode is optional.

Note:
R0, R1, R4 is 10K ohm
D0 is general diode, 1/2W
Z0 is 12V~18V zener diode, 1/2W
Com point is floating for double coil

12V(high driving capability)/24V/48V Application circuits



R0, R1, R4: 10K
R2, R3: open drain loading
R5: 560,1/2W(for24V); 1.8K,1W(for48V); none(for 12V)
Z0: Zener diode, Vz=12V~18V.

Note:

D0: general diode 1/2W, (optional)
Z0: Vz=12V zener diode 1/2W
R5: 560,1/2W(for 24V) ; 1.8K,1W(for 48V); none(for 12V)
R0,R1,R4 : 10K
R6,R7 : 2K, 1/8W(for 0.4A output); 1K, 1/8W(for 0.8A output), 560, 1/4W (for 1.5A output)
Q1, Q2: depend on driving capability requirement
Ex. 2222A(40V, 0.6A, 0.3W), 2SD1782/SSTA06(80V, 0.5A, 0.3W), 2SD1768S(80V, 1A, 0.5W), 2SC4132(120V, 2A 0.5W), 2SD1760(50V, 3A 1W) ..
C1,C2 : 2.2uF, 50V(optional), or suitable Vz Zener diode