

Two Phase Hall Effect Latch With FG Output

■ Features

- On-chip Hall plate
- Operating voltage: 3.5V~20V
- Internal bandgap regulator allows temperature compensated operations and a wide operating voltage range
- High output sinking capability up to 400mA for driving large load
- Built-in protection diode only for chip reverse power connecting
- Frequency Generation (FG) output
- Package: SIP-5L

■ Applications

- Dual coils Brush-less DC Motor
- Dual coils Brush-less DC Fan
- Revolution Counting
- Speed Measurement

■ General Description

ATS278 is an integrated Hall sensor with two output drivers and rotor speed output, typically designed for electronic commutation of two-phase brush-less DC fan applications.

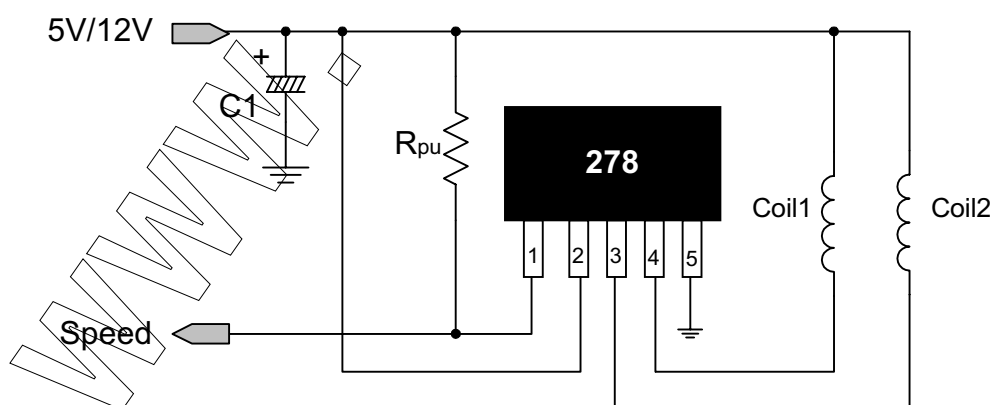
On-chip Hall sensor will generate Hall voltage due to magnetics sensing. The amplifier will amplify the Hall voltage. The Schmitt trigger determines switching hysteresis and then control internal driver's on/off to sink load current. Meanwhile, An internal bandgap regulator is used to provide stable bias due to temperature-compensation. FG pin will provide switching frequency of driver. Major feature is to minimize the external components by building-in FG output transistor.

If a magnetic flux density larger than threshold Bop, DO is turned on (low) and DOB is turned off (high). The output state is held until a magnetic flux density reversal falls below Brp causing DO to be turned off and DOB turned on.

■ Ordering Information

Order Number	Operate Temp.	Package	Packing
ATS278	-20°C to +85°C	SIP-5L	Bulk

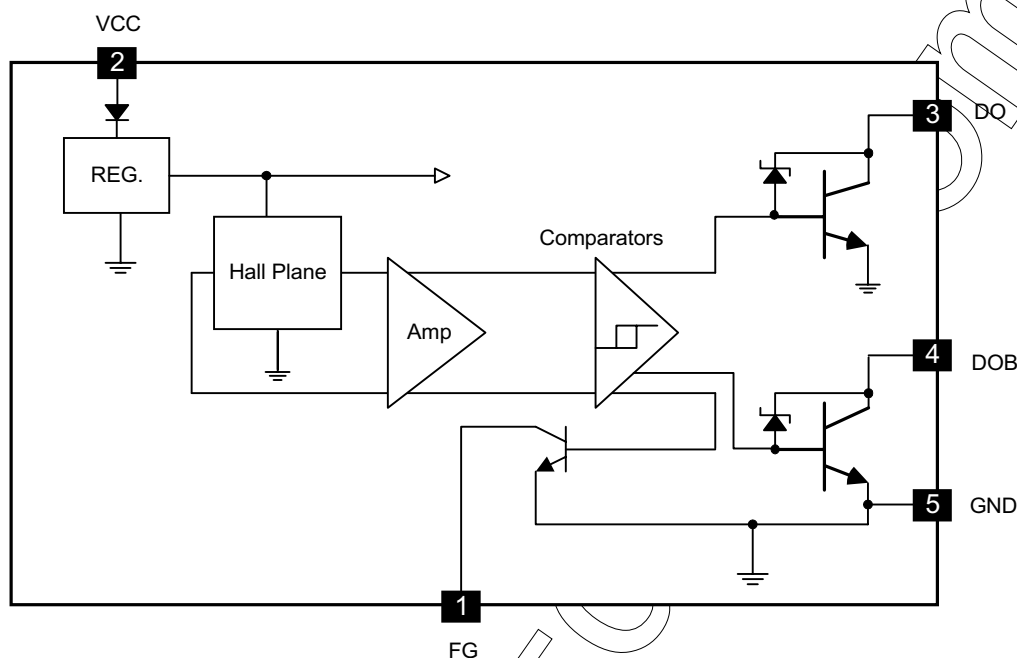
■ Typical Application Circuit



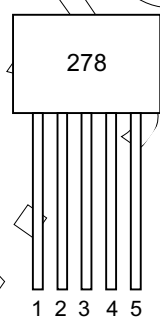
5V/12V DC Brush-less Fan with FG output function

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■ Block Diagram



■ Pin Configuration



(Front View)

- 1 : FG
- 2 : VCC
- 3 : DO
- 4 : DOB
- 5 : GND

Name	I/O	Pin #	Description
FG	O	1	Frequency detection output
VCC	I	2	Positive power input
DO	O	3	Driver Output
DOB	O	4	Driver Output (Inverting)
GND	I	5	Ground

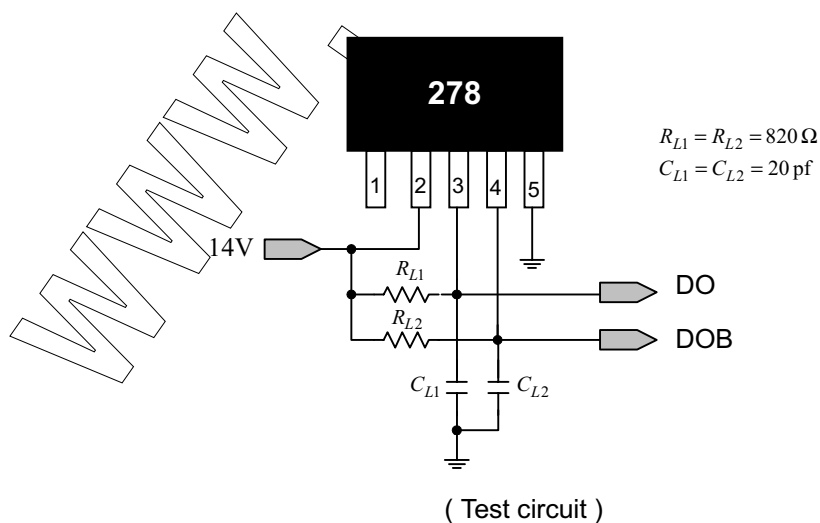
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■ Absolute Maximum Ratings

- Supply Voltage, V_{CC}	20V
- Reverse V_{CC} Polarity Voltage, V_{RCC}	-20V
- Magnetic flux density, B	Unlimited
- Output ON Current, I_C	
Continuous	0.4A
Hold	0.5A
Peak (Start Up)	0.7A
- Sink current of FG, I_{FG}	40mA
- Operating Temperature Range, T_a	-20°C to +85°C
- Storage Temperature Range, T_s	-65°C to +150°C
- Package Power Dissipation, P_d	500mW

■ Electrical Characteristics ($T=+25^{\circ}C$)

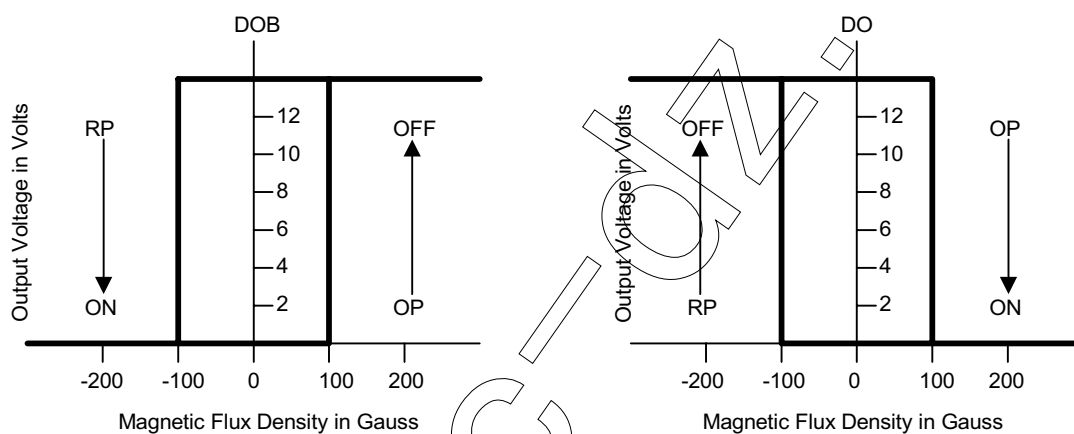
Characteristic	Symbol	Conditions	Min	Typ	Max	Units
Supply Voltage	V_{CC}		3.5	----	20	V
Output Saturation Voltage	$V_{ce(sat)}$	$V_{CC}=14V, I_L=300mA$	----	300	700	mV
Output Zener Breakdown	V_Z			35		V
Output Leakage Current	I_{ceX}	$V_{ce}=14V, V_{CC}=14V$	----	<0.1	10	μA
Supply Current	I_{CC}	$V_{CC}=20V$, Output Open	----	16	25	mA
Output Rise Time	t_r	$V_{CC}=14V, R_L=820\Omega$, $C_L=20pF$ (Test Circuit)	----	3.0	10	μs
Output Falling Time	t_f	$V_{CC}=14V, R_L=820\Omega$, $C_L=20pF$ (Test Circuit)	----	0.3	1.5	μs
Switch Time Differential	Δt	$V_{CC}=14V, R_L=820\Omega$, $C_L=20pF$ (Test Circuit)	----	3.0	10	μs
FG saturation voltage	V_{FG}	$V_{CC}=14V, I_L=20mA$	----	200	700	mV



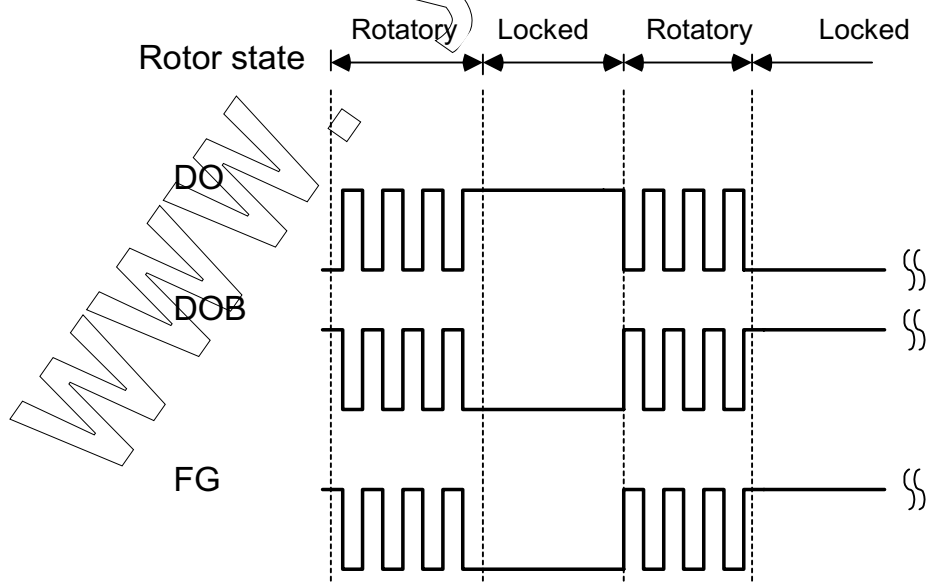
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■ Magnetic Characteristics

Characteristic	Symbol	Ta=+25°C		Ta=-20°C to 85°C		Units
		Min	Max	Min	Max	
Operate Point	Bop	10	100	5	100	G
Release Point	Brp	-100	-10	-100	-5	G
Hysteresis	Bhys	60	100	50	140	G



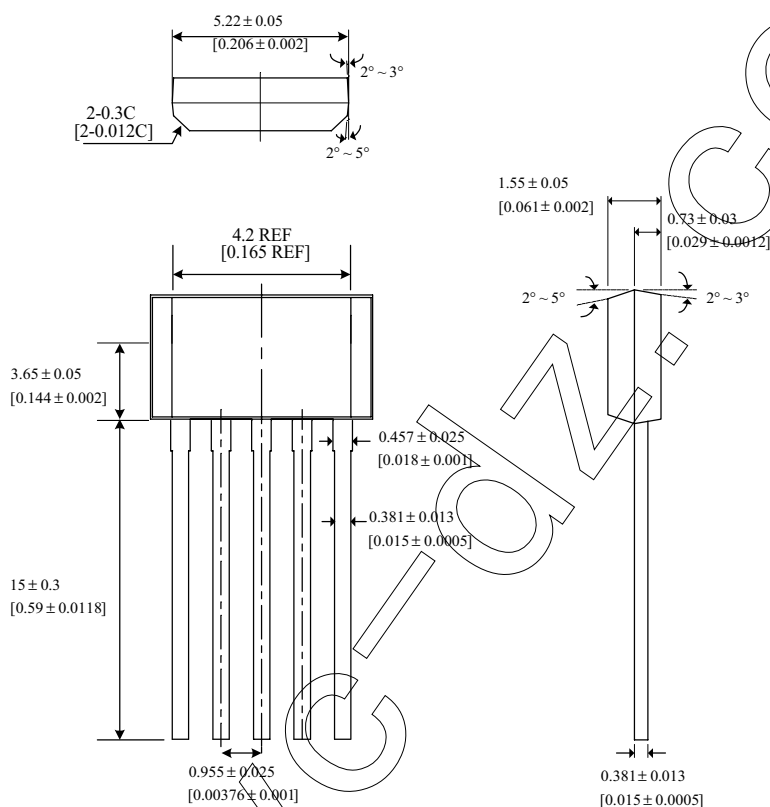
■ Timing Diagram



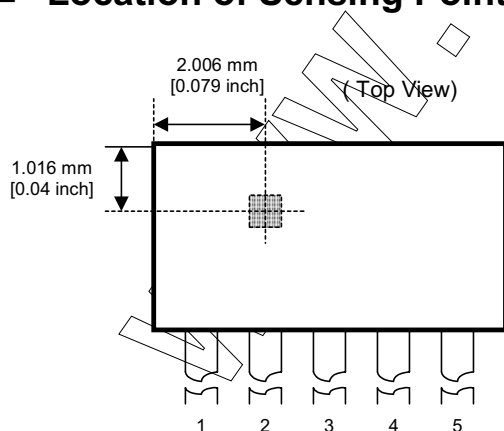
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■ Package Information

Package type: SIP-5L (unit: mm / [inch])



■ Location of Sensing Point



■ Marking Information

