

ATS278

Two Phase Hall Effect Latch with FG output

(Preliminary)

■ 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
- Build in protection diode for chip reverse power connecting
- Frequency Generation (FG) output
- Package: SIP-5L

■ Application

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

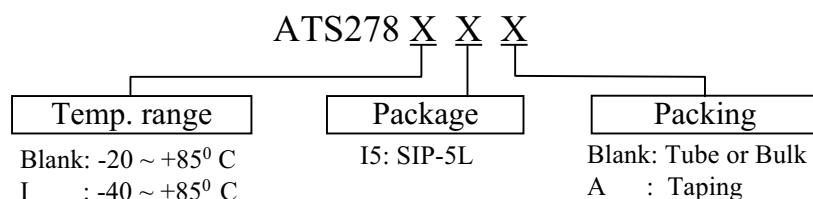
■ General Description

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.

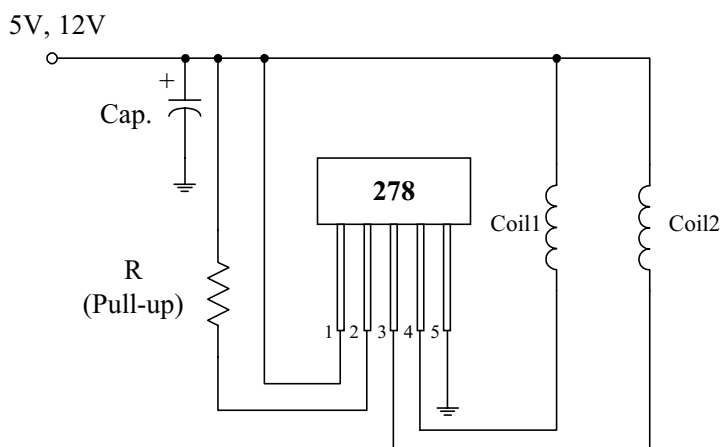
On-chip Hall sensor will generate Hall voltage due to magnetics sensing. The amplifier will amplify the Hall voltage. The Schmitt trigger determines switching hysteresis and then control internal driver's on/off to sink load current. Meanwhile, An internal bandgap regulator is used to provide stable 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 B_{op} , DO is turned on (low) and DOB is turned off (high). The output state is held until a magnetic flux density reversal falls below B_{rp} causing DO to be turned off and DOB turned on.

■ Ordering Information



■ Typical Application Circuit



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

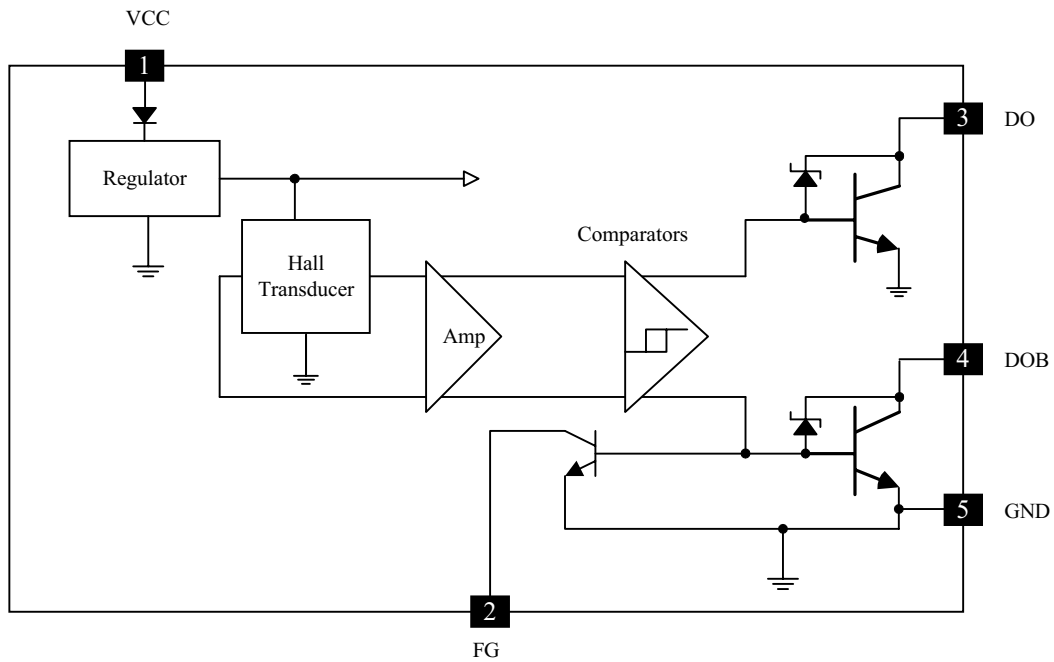
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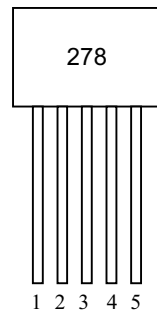


(Preliminary)

■ Block Diagram



■ Pin Configuration



(Front View)

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

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

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Absolute Maximum Ratings

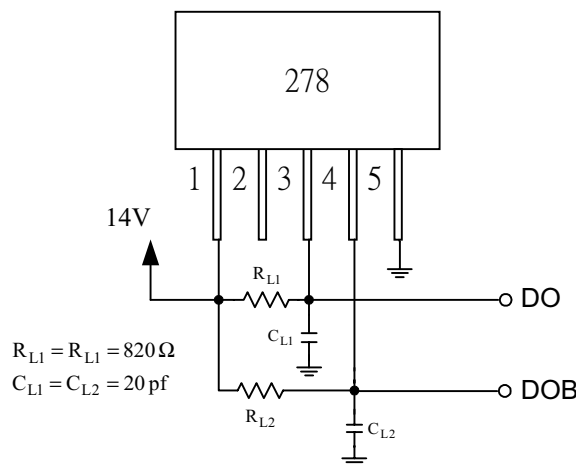
- Supply Voltage, V_{CC} ----- 20V
- Reverse V_{CC} Polarity Voltage, V_{RCC} ----- -20V
- Magnetic flux density, B ----- Unlimited
- Output OFF Voltage, V_{ce} ----- 46V(Note 1)
- Output ON Current, I_c
 - Continuous ----- 0.4A
 - Hold ----- 0.7A
 - Peak (Start Up) ----- 1A
- Sink current of FG, I_{FG} ----- 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 ----- 600mW

(Note 1) Output Zener protection voltage.

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

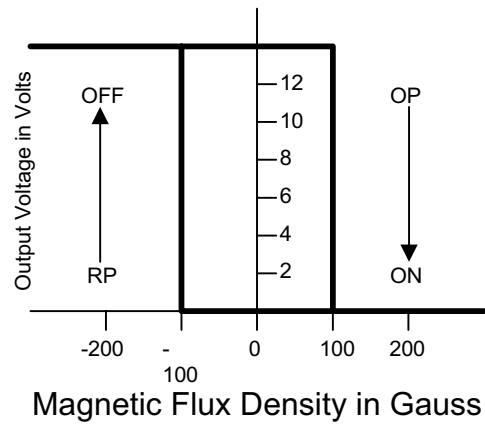
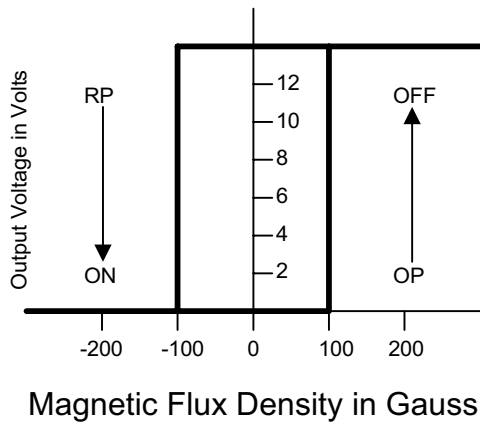
Characteristic	Symbol	Test Conditions	Min	Typ	Max	Units
Supply Voltage	V_{CC}		3.5	----	20	V
Output Saturation Voltage	$V_{ce(sat)}$	$V_{cc}=14V, I_L=300mA$	----	300	600	mV
Output Leakage Current	I_{cex}	$V_{ce}=14V, V_{cc}=14V$	----	<0.1	10	μA
Supply Current	I_{cc}	$V_{cc}=20V, \text{Output Open}$	----	16	25	mA
Output Rise Time	t_r	$V_{cc}=14V, R_L=820\Omega, C_L=20pF$	----	3.0	10	μs
Output Falling Time	t_f	$V_{cc}=14V, R_L=820\Omega, C_L=20pF$	----	0.3	1.5	μs
Switch Time Differential	Δt	$V_{cc}=14V, R_L=820\Omega, C_L=20pF$	----	3.0	10	μs
FG saturation voltage	V_{FG}	$V_{cc}=14V, I_L=20\text{ mA}$		340	700	mV

(Top view)

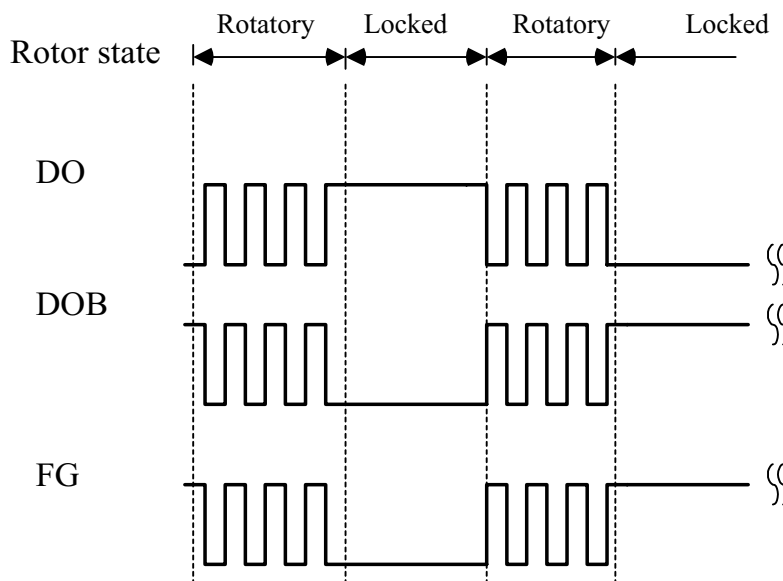


■ Magnetic Characteristics

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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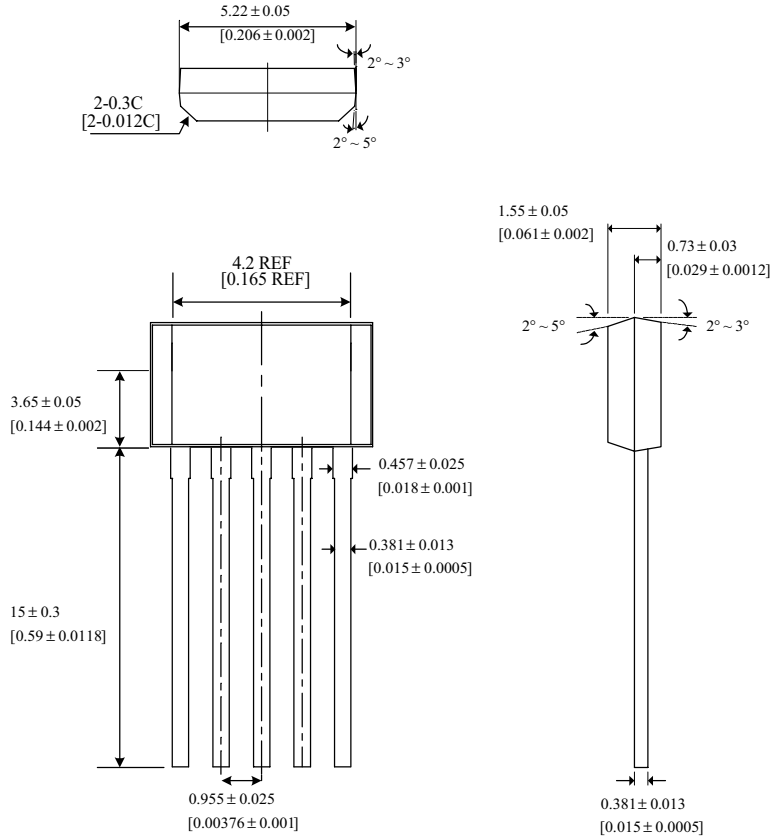


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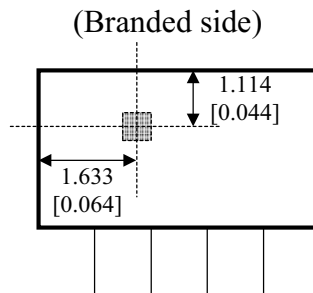
■ Package Information

SIP-5L

unit: mm / [inch]



■ Location of Sensing Point



■ Marking Information

