

# 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

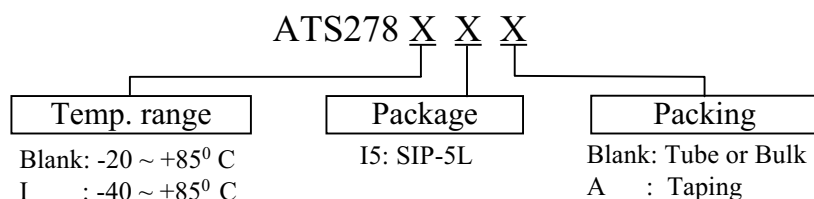
### ■ General Description

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.

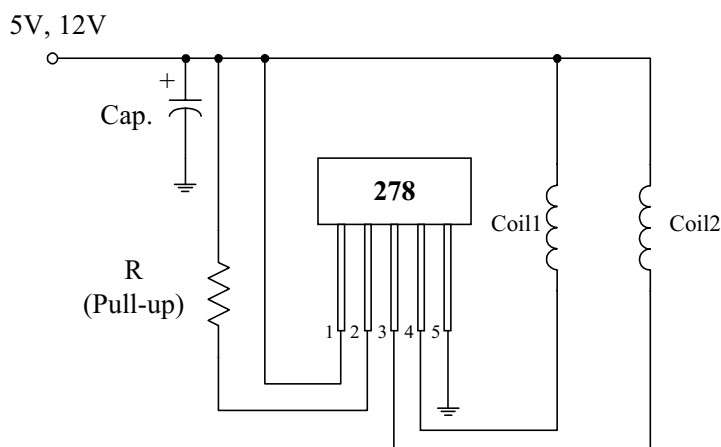
On-chip Hall sensor will generate Hall voltage due to magnetics sensing. The amplifier will amplify the Hall voltage. The Schmitt trigger determines switching hysteresis and then control internal driver's on/off to sink load current. Meanwhile, An internal bandgap regulator is used to provide stable 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

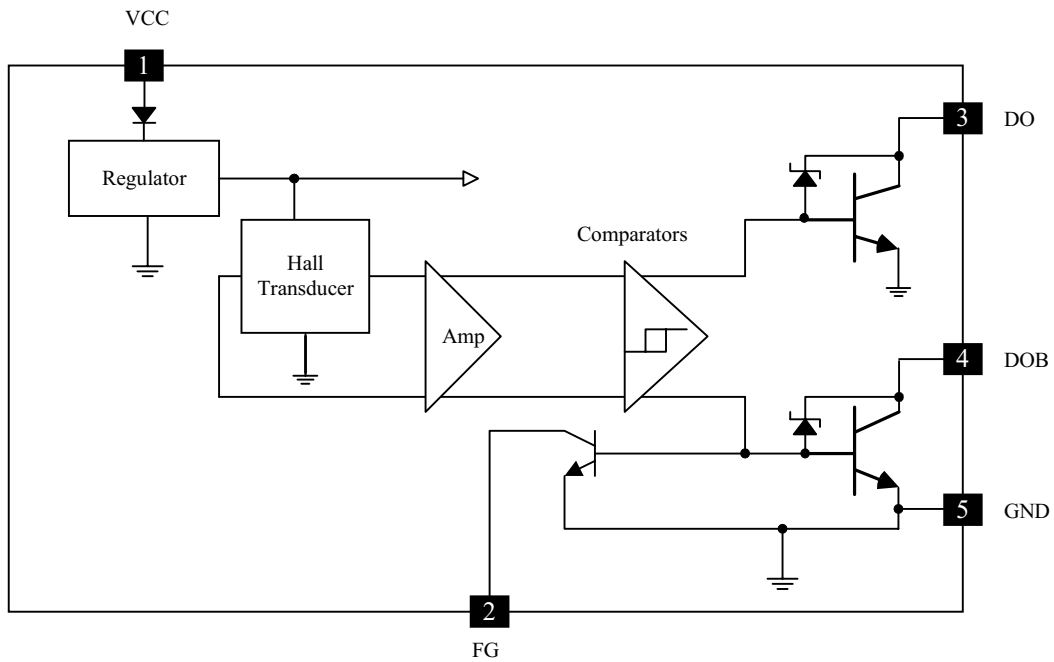
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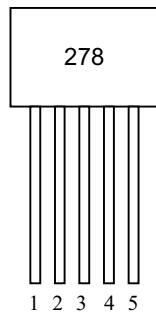


( Preliminary )

## ■ 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

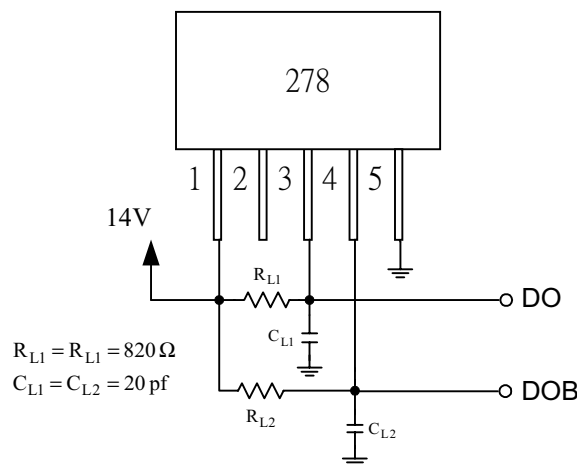
- Supply Voltage, $V_{CC}$	-----	20V
- Reverse $V_{CC}$ Polarity Voltage, $V_{RCC}$	-----	-20V
- Magnetic flux density, B	-----	Unlimited
- Output OFF Voltage, $V_{ce}$	-----	46V(Note 1)
- Output ON Current, $I_c$		
Continuous	-----	0.4A
Hold	-----	0.7A
Peak (Start Up)	-----	1A
- Sink current of FG, $I_{FG}$	-----	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 ( $T=+25^{\circ}C$ )

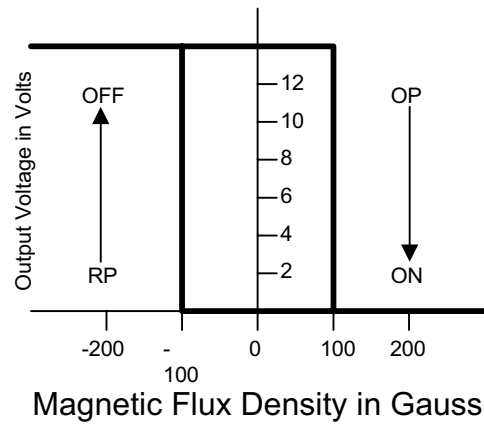
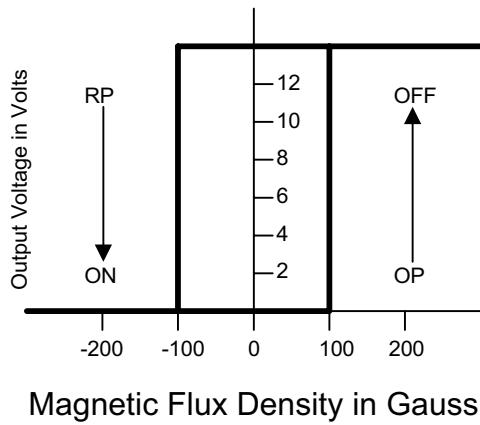
Characteristic	Symbol	Test Conditions	Min	Typ	Max	Units
Supply Voltage	$V_{CC}$		3.5	----	20	V
Output Saturation Voltage	$V_{ce(sat)}$	$V_{CC}=14V, I_L=300mA$	----	300	600	mV
Output Leakage Current	$I_{cex}$	$V_{ce}=14V, V_{CC}=14V$	----	<0.1	10	$\mu A$
Supply Current	$I_{CC}$	$V_{CC}=20V, \text{Output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

( Top view )

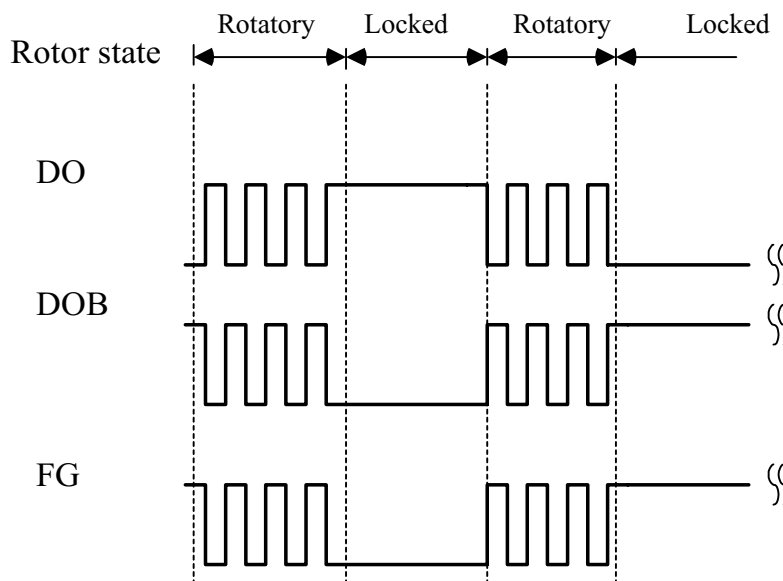


### ■ Magnetic Characteristics

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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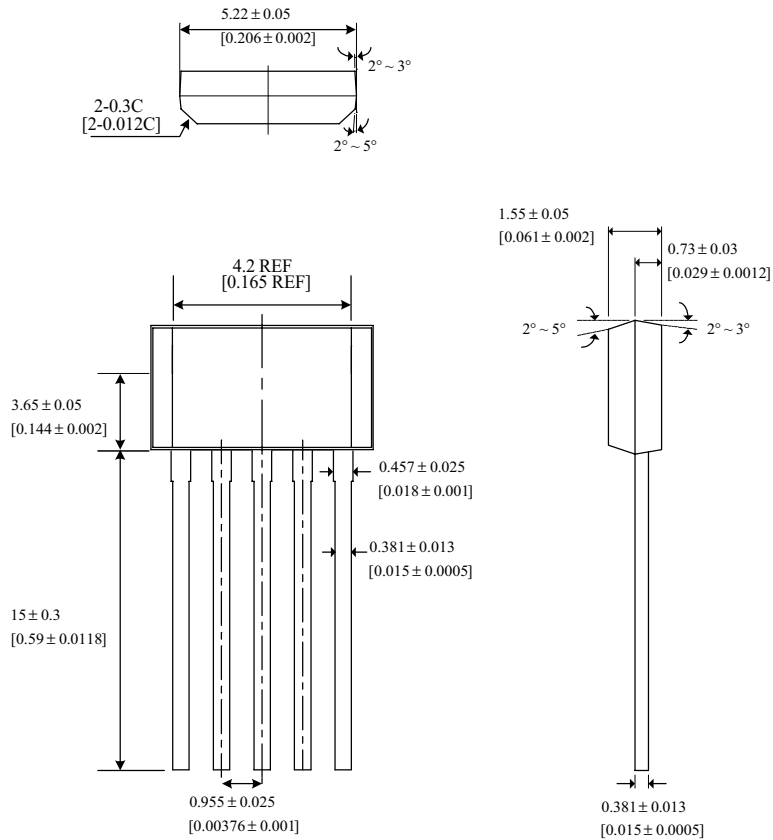


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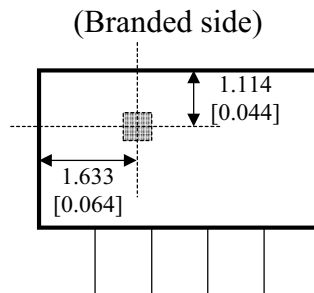
## Package Information

SIP-5L

unit: mm / [inch]



## Location of Sensing Point



## Marking Information

