

Two Phase Hall Effect Latch With FG Output

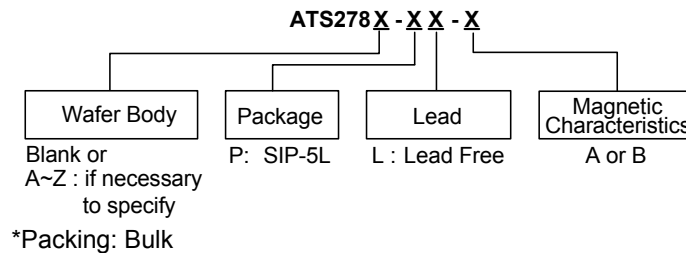
■ Features

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

■ Ordering Information



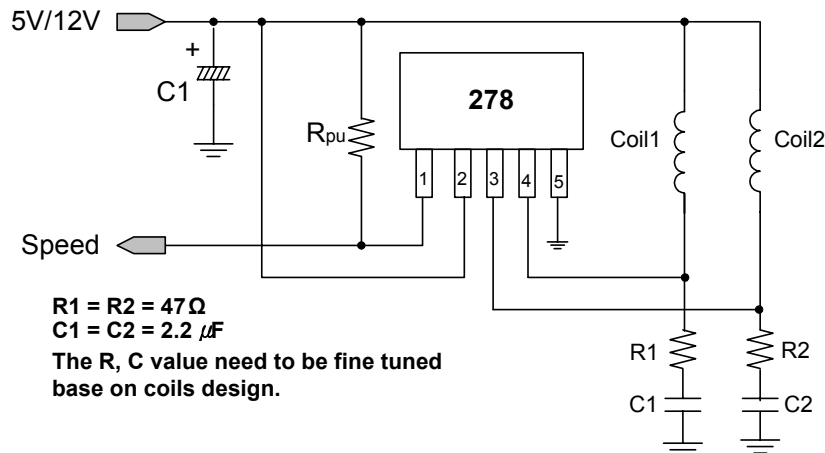
■ General Description

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.

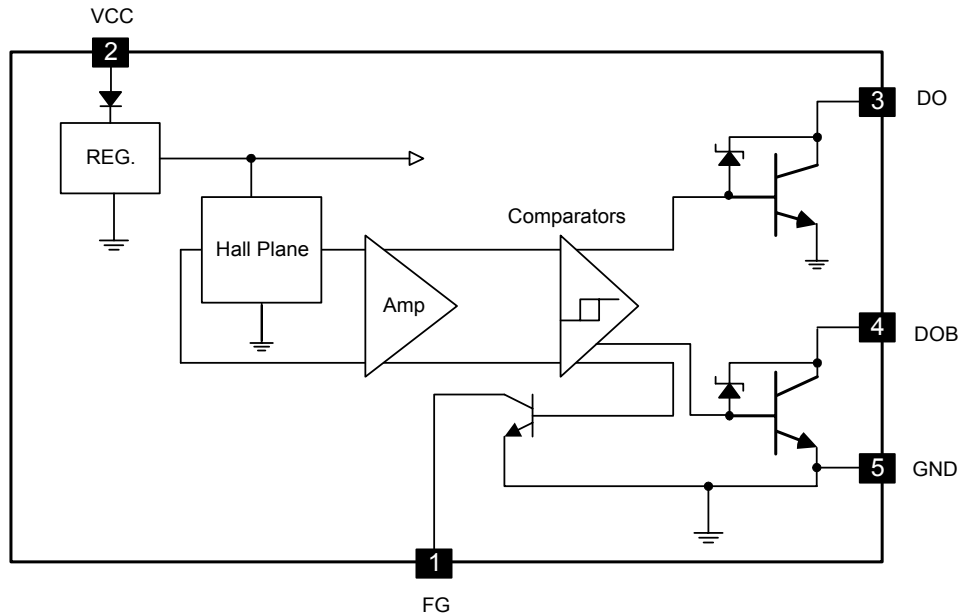
■ Typical Application Circuit



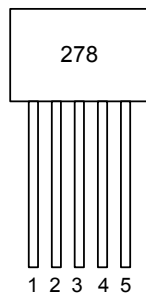
5V/12V DC Brush-less Fan with FG output function

Two Phase Hall Effect Latch With FG Output

■ Block Diagram



■ Pin Configuration



(Front View)

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

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

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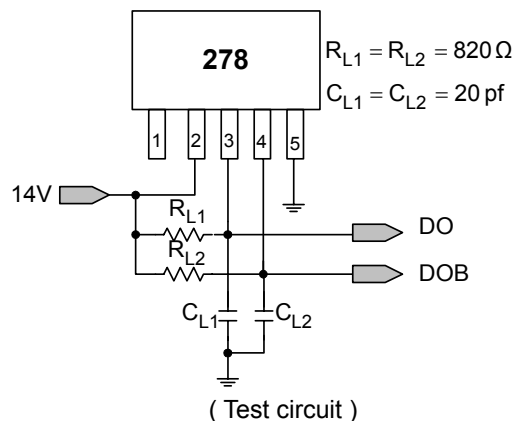
■ Absolute Maximum Ratings

Characteristics		Symbol	Values	Unit
Supply voltage		V_{CC}	20	V
Reverse V_{CC} Polarity Voltage		V_{RCC}	-20	V
Magnetic flux density		B	Unlimited	
Output "on" current	Continuous	I_c	0.4	A
	Hold		0.5	
	Peak (Start Up)		0.7	
Sink current of FG		I_{FG}	40	mA
Operating temperature range		T_a	-20~+85	°C
Storage temperature range		T_s	-65~+150	°C
Package Power Dissipation		PD	550	mW

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

Characteristic	Symbol	Conditions	Min	Typ	Max	Unit
Supply Voltage	VCC		3.5	----	20	V
Output Saturation Voltage	Vce(sat)	Vcc=14V, IL=300mA	----	300	800	mV
Output Zener Breakdown	Vz*			46		V
Output Leakage Current	Icex	Vce=14V, Vcc=14V	----	<0.1	10	μA
Supply Current	Icc	Vcc=20V, Output Open	----	16	25	mA
Output Rise Time	tr	Vcc=14V, RL=820 Ω , CL=20pF (Test Circuit)	----	3.0	10	μs
Output Falling Time	tf	Vcc=14V, RL=820 Ω , CL=20pF (Test Circuit)	----	0.3	1.5	μs
Switch Time Differential	Δt	Vcc=14V, RL=820 Ω , CL=20pF (Test Circuit)	----	3.0	10	μs
FG saturation voltage	V_{FG}	Vcc=14V, IL=20 mA	----	200	700	mV

*Note: The Vz may vary with the inductance/resistance of DC Fan. In order to reduce the risk of dynamic operation, the capacitor/resistor is recommended to add below the DO/DOB as Application Circuit (on page 1).



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■ Magnetic Characteristics(Ta=+25°C)

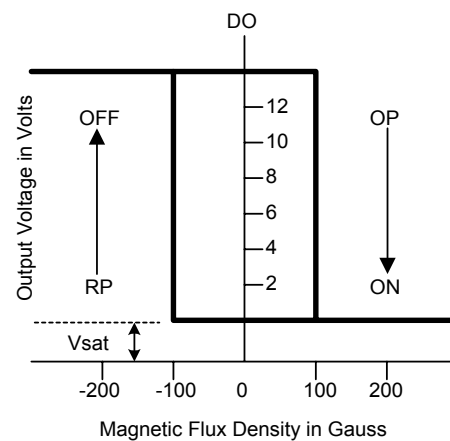
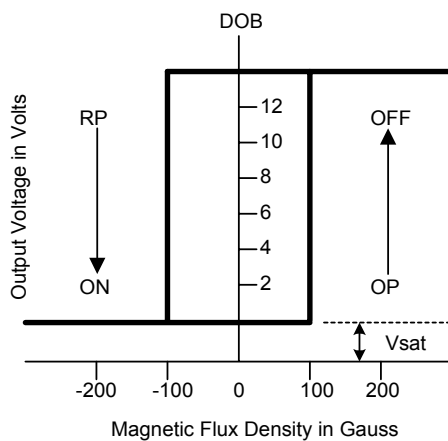
(1mT=10 Gauss)

A grade

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Operate Point	B _{OP}	10	-	60	Gauss
Release Point	B _{RP}	-60	-	-10	Gauss
Hysteresis	B _{HYS}	-	75	-	Gauss

B grade

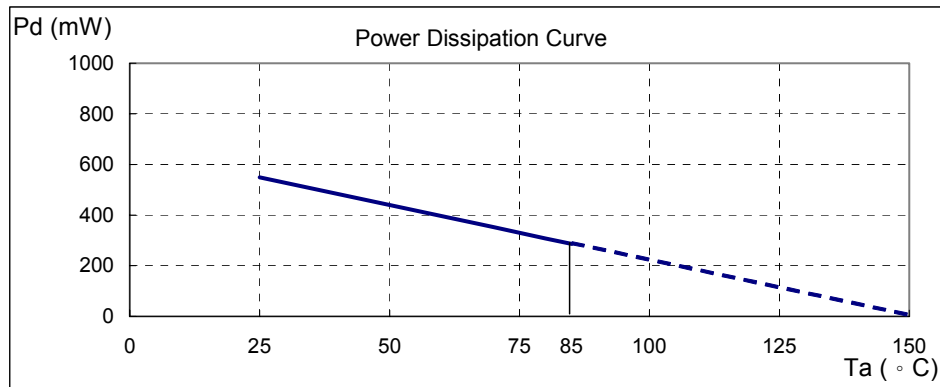
Characteristic	Symbol	Min.	Typ.	Max.	Unit
Operate Point	B _{OP}	5	-	80	Gauss
Release Point	B _{RP}	-80	-	-5	Gauss
Hysteresis	B _{HYS}	-	75	-	Gauss



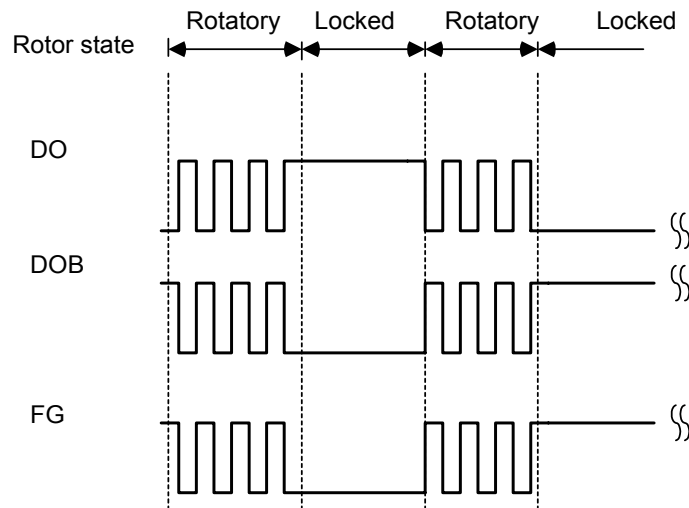
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■ Performance Characteristics (SIP5)

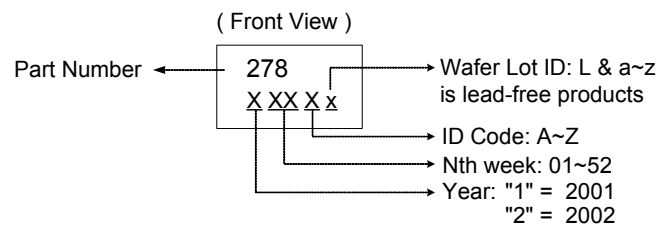
Ta (°C)	25	50	60	70	80	85	90	95	100
Pd (mW)	550	440	396	352	308	286	264	242	220
Ta (°C)	105	110	115	120	125	130	135	140	150
Pd (mW)	198	176	154	132	110	88	66	44	0



■ Timing Diagram



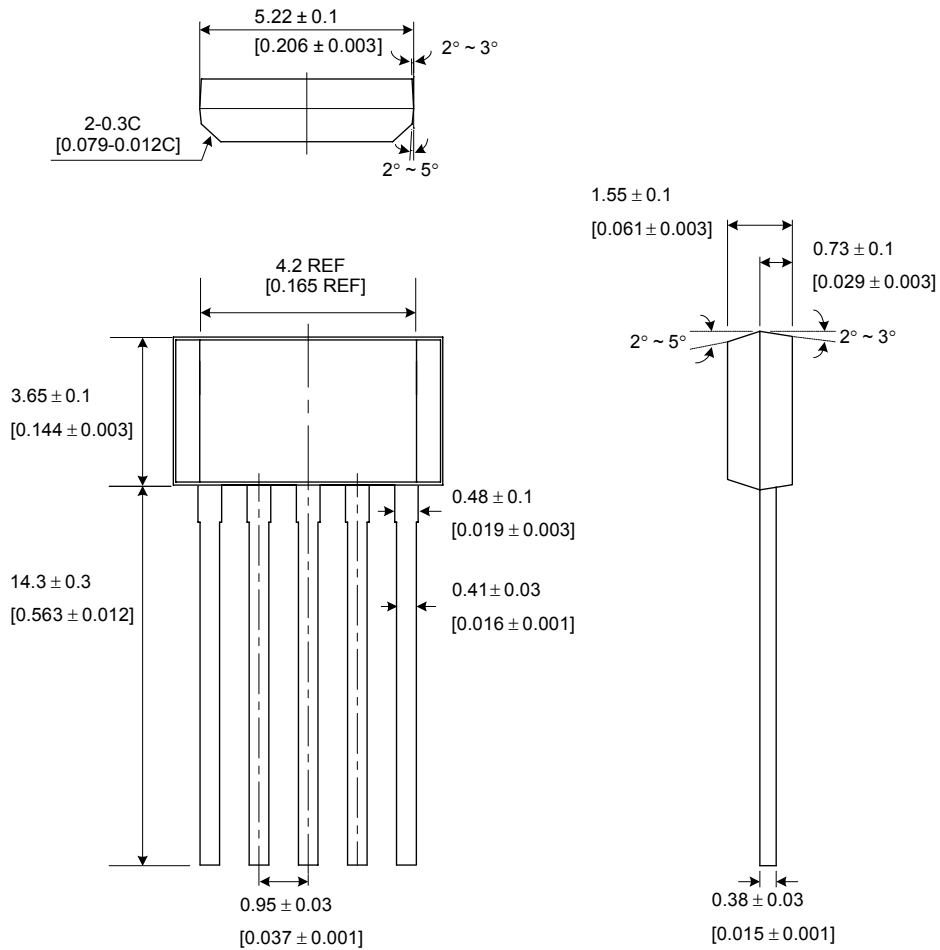
■ Marking Information



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■ Package Information

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



■ Location of Sensing Point

