Complementary Output Hall Effect Latch

ATS276/277

■ Features

- On-chip Hall sensor with two different sensitivity and hysteresis settings for ATS276/277
- 3.5V to 20V operating voltage
- 400mA (avg) output sink current
- Build-in protecting diode only for chip reverse power connecting
- -20°C to 85°C operating temperature
- Low profile 4 pin SIP package

■ Applications

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

■ General Description

ATS276/277 are integrated Hall sensors with output drivers, mainly designed for electronic commutation of brush-less DC Fan. This IC internally includes the regulator, protecting diode, Hall plate, amplifier, comparator, and a pair of complementary open-collector outputs **(DO, DOB)**.

While the magnetic flux density **(B)** is larger than operate point **(Bop)**, **DO** will turn on (low), and meanwhile **DOB** will turn off (high). Each output is latched until **B** is lower than release point **(Brp),** and then **DO**、**DOB** transfer each state.

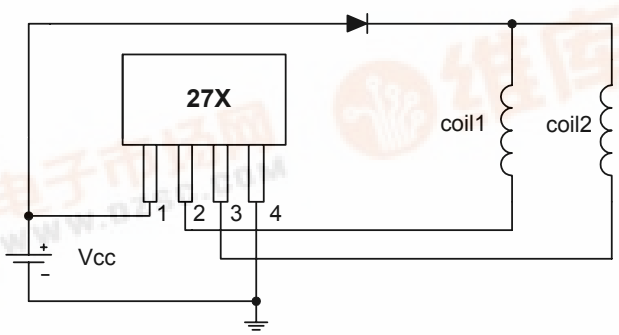
For DC fan application, sometimes need to test power reverse connection condition. Internal diode only protects chip-side but not for coil-side. If necessary, add one external diode to block the reverse current from coil-side.

■ Ordering Information

ATS27X X - X X X - X

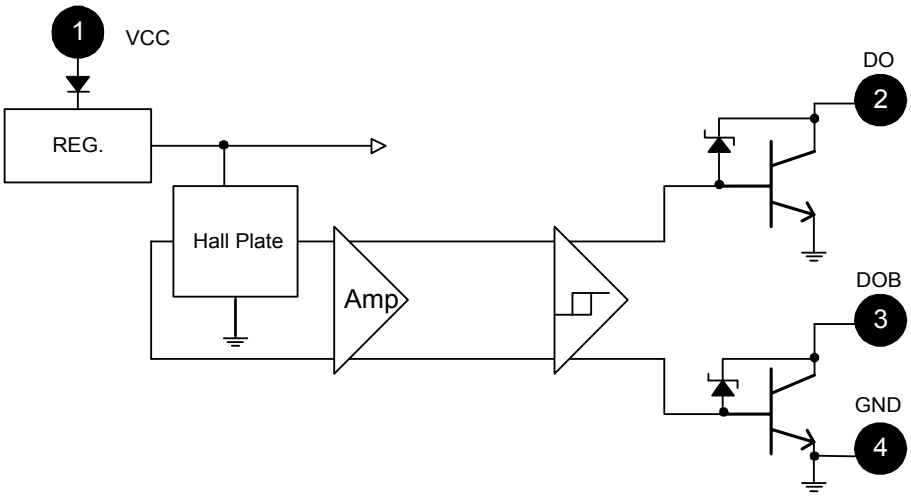
Part No.	Wafer Body	Package	Lead	Packing	Magnetic Characteristics
6 : ATS276 7 : ATS277	Blank or A~Z : if necessary to specify	P: SIP-4L	L : Lead Free Blank: Normal	Blank : Tube or Bulk A : Tape & Reel	276:A or B or C 277:A or B

■ Typical Application Circuit

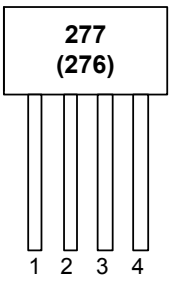


Brush-less DC Fan

■ Block Diagram



■ Pin Assignment



Front View

1 : VCC

2 : DO

3 : DOB

4 :GND

Name	P/I/O	Pin #	Description
Vcc	P	1	Power Supply Input
DO	O	2	Output Pin
DOB	O	3	Output Pin
GND	P	4	Ground

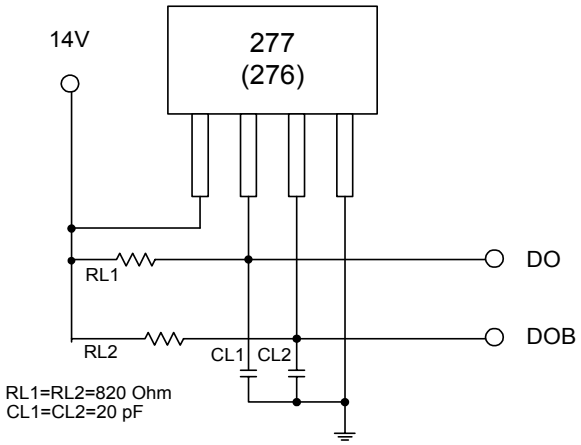
■ Absolute Maximum Ratings (at Ta=25°C)

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	Ic	0.4	A
	Hold		0.5	
	Peak (Start Up)		0.7	
Operating temperature range		T_a	-20~+85	°C
Storage temperature range		T_s	-65~+150	°C
Package Power Dissipation		PD	550	mW
Maximum Junction Temp		Tj	150	°C

■ Electrical Characteristics (T=+25°C Vcc = 4.0V to 20V)

Characteristic	Symbol	Conditions	Min	Typ	Max	Units
Low Supply Voltage	Vce	Vcc=3.5V, I_L=100mA		0.4		V
Supply Voltage	Vcc		3.5		20	V
Output Zener Breakdown	Vz			46		V
Output Saturation Voltage	Vce(sat)	Vcc=14V, I_L=300mA		0.3	0.6	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, R_L=820Ω, C_L=20pF		3.0	10	μs
Output Falling Time	tf	Vcc=14V, R_L=820Ω, C_L=20pF		0.3	1.5	μs
Switch Time Differential	Δt	Vcc=14V, R_L=820Ω, C_L=20pF		3.0	10	μs

■ Test Circuit



■ Magnetic Characteristics(Ta=+25°C)

(1mT=10 Gauss)

A grade

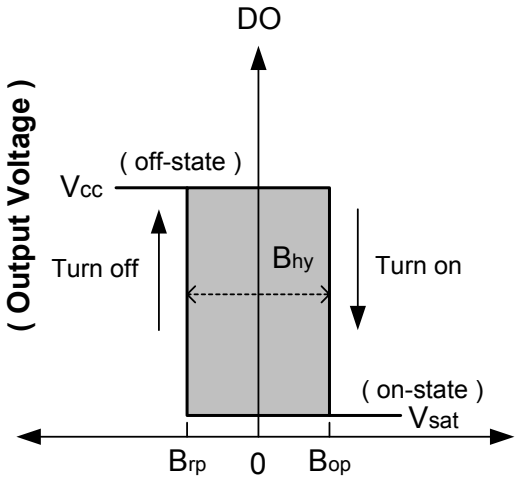
Characteristic		Symbol	Min.	Typ.	Max.	Unit
Operate Point	ATS276	Bop	10	-	50	Gauss
	ATS277		10	-	50	
Release Point	ATS276	Brp	-50	-	-10	Gauss
	ATS277		-50	-	-10	
Hysteresis	ATS276	Bhy	-	75	-	Gauss
	ATS277		-	75	-	

B grade

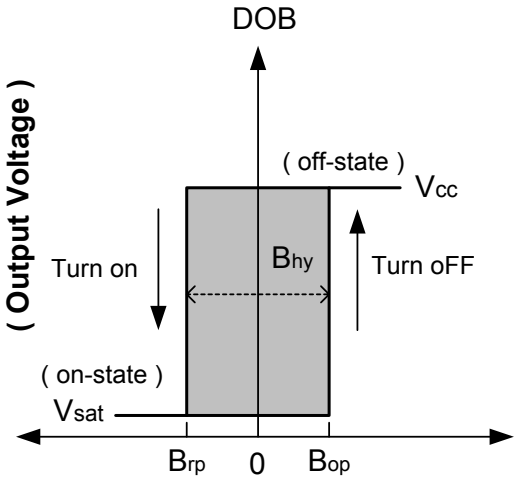
Characteristic		Symbol	Min.	Typ.	Max.	Unit
Operate Point	ATS276	Bop	5	-	70	Gauss
	ATS277		5	-	70	
Release Point	ATS276	Brp	-70	-	-5	Gauss
	ATS277		-70	-	-5	
Hysteresis	ATS276	Bhy	-	75	-	Gauss
	ATS277		-	75	-	

C grade

Characteristic		Symbol	Min.	Typ.	Max.	Unit
Operate Point	ATS276	Bop	-	-	100	Gauss
Release Point	ATS276	Brp	-100	-	-	Gauss
Hysteresis	ATS276	Bhy	-	75	-	Gauss



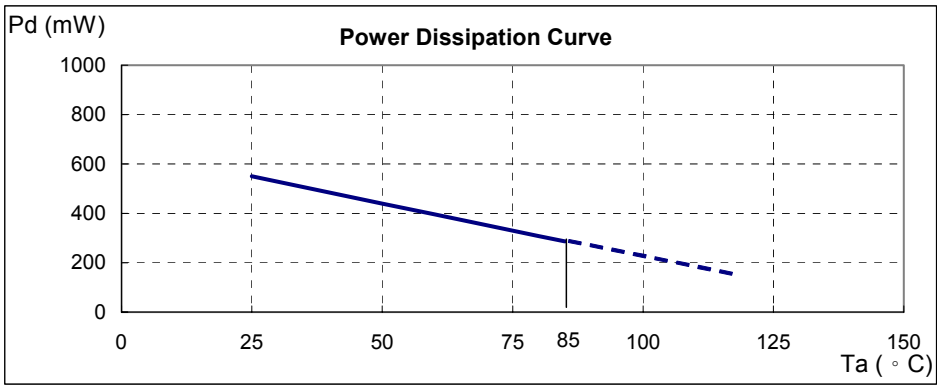
(Magnetic flux density B)

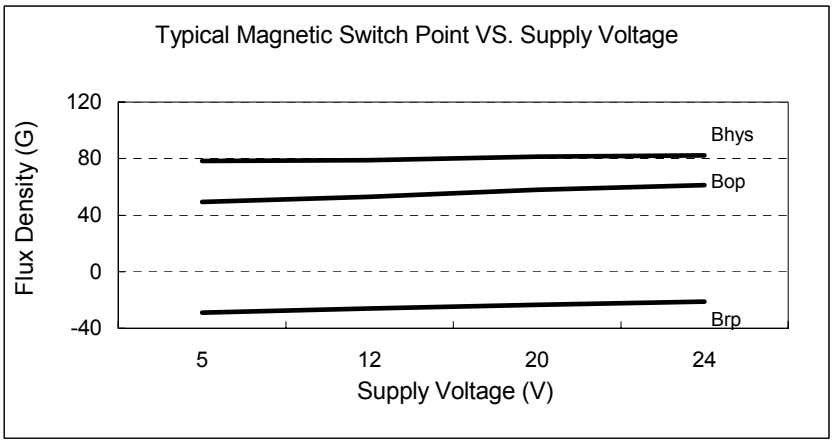


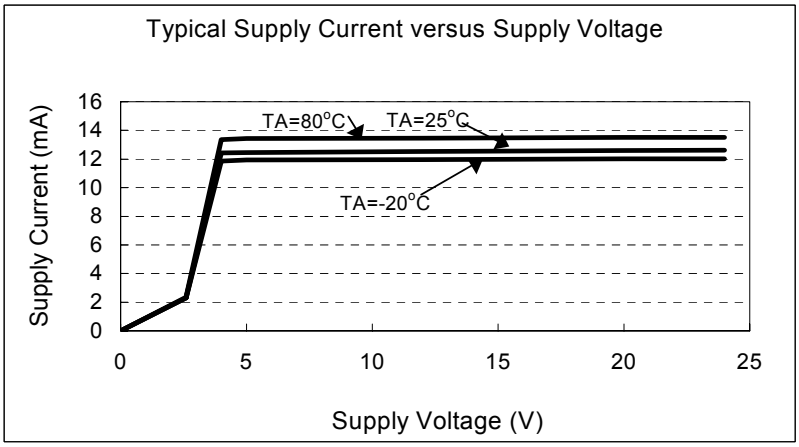
(Magnetic flux density B)

■ Performance Characteristics (SIP4)

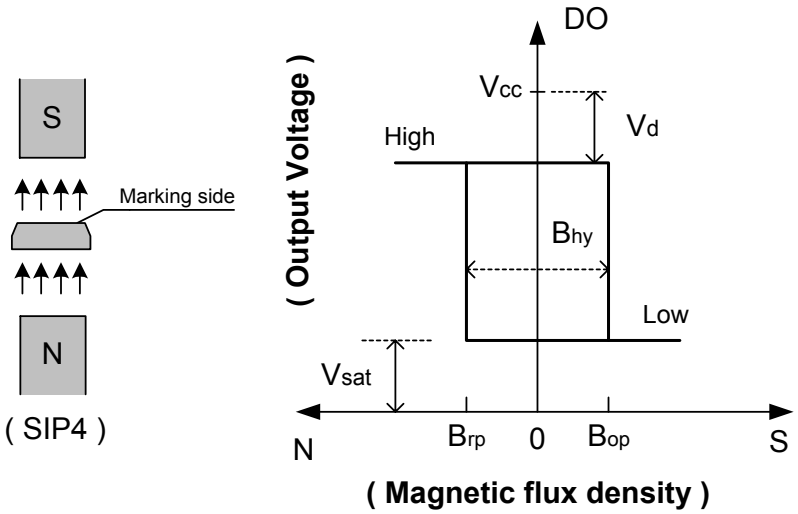
Ta (°C)	25	50	60	70	80	85	90	95	100	105	110	115	120
Pd (mW)	550	440	396	352	308	286	264	242	220	198	176	154	132



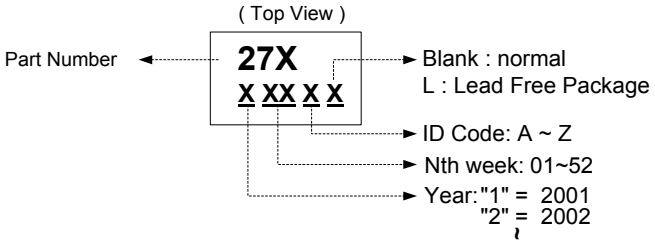




■ Operating Characteristics

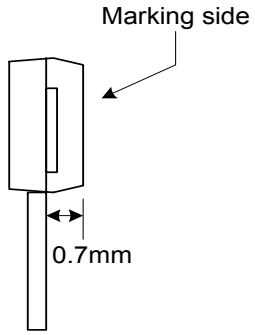


■ Marking Information

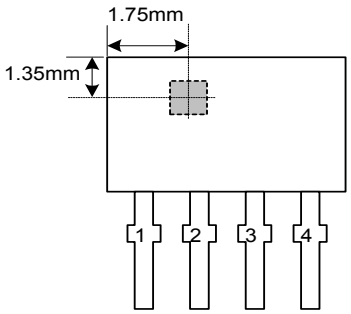


■ Package Information

Active Area Depth



Package Sensor Location



Package Dimension