

**COMPLEMENTARY OUTPUT HALL EFFECT LATCH****AH277A****General Description**

The AH277A is an integrated Hall sensor with output driver designed for electronic commutation of brushless DC motor applications. The device includes an on-chip Hall sensor for magnetic sensing, an amplifier that amplifies the Hall voltage, a Schmitt trigger to provide switching hysteresis for noise rejection, a temperature compensation circuit and two complementary open-collector drivers for sinking large load current. It also includes an internal band-gap regulator which is used to provide bias voltage for internal circuits.

Place the device in a variable magnetic field, while the magnetic flux density is larger than threshold B_{OP} , DO will be turned on (low) and DOB will be turned off (high). This output state is held till the magnetic flux density reversal falls below B_{RP} causing DO to be turned off (high) and DOB turned on (low).

AH277A is available in TO-94 (SIP-4L) package.

Features

- On-chip Hall Sensor
- 3.5V to 16V Supply Voltage
- 400mA (avg) Output Sink Current
- Reversed Supply Voltage Protection
- -20°C to 85°C Operating Temperature
- Low Profile TO-94 (SIP-4L) Package
- ESD Rating: 300V (Machine Model)

Applications

- Dual-coil Brushless DC Motor
- Dual-coil Brushless DC Fan
- Revolution Counting
- Speed Measurement

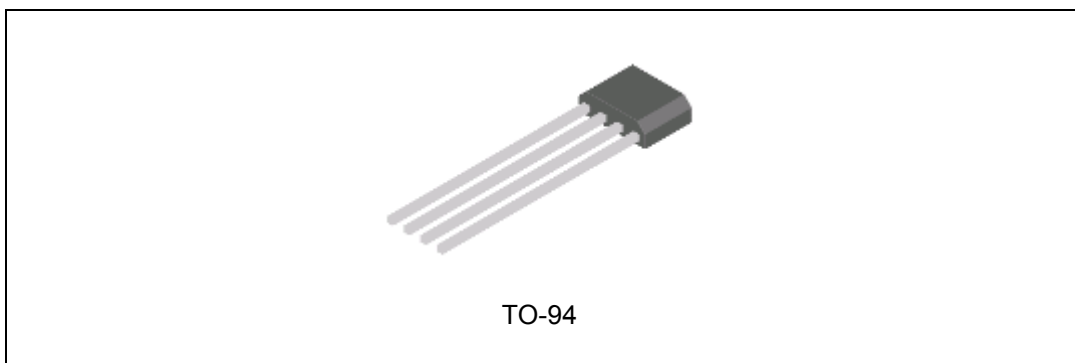


Figure 1. Package Type of AH277A

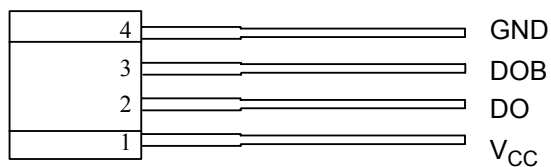
**COMPLEMENTARY OUTPUT HALL EFFECT LATCH****AH277A****Pin Configuration**Z4 Package
(TO-94)

Figure 2. Pin Configuration of AH277A (Top View)

Pin Description

Pin Number	Pin Name	Function
1	V _{CC}	Supply voltage
2	DO	Output 1
3	DOB	Output 2
4	GND	Ground



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Functional Block Diagram

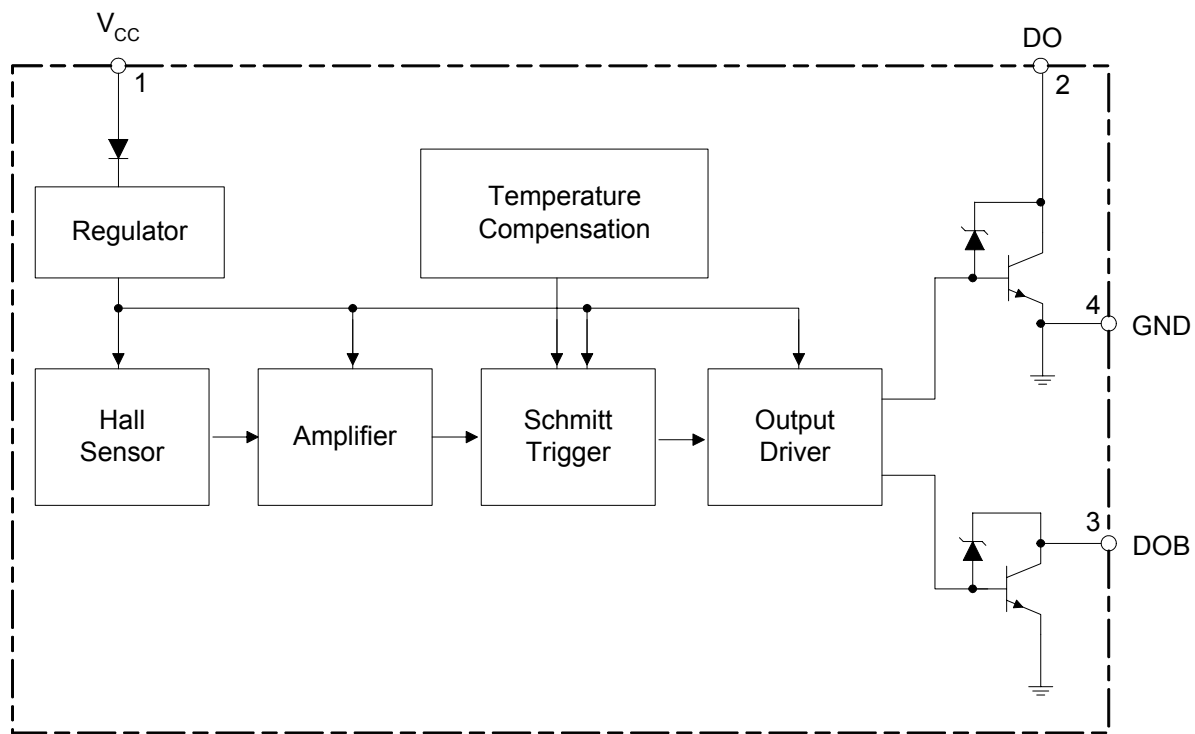
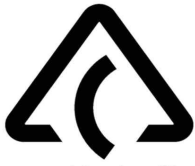


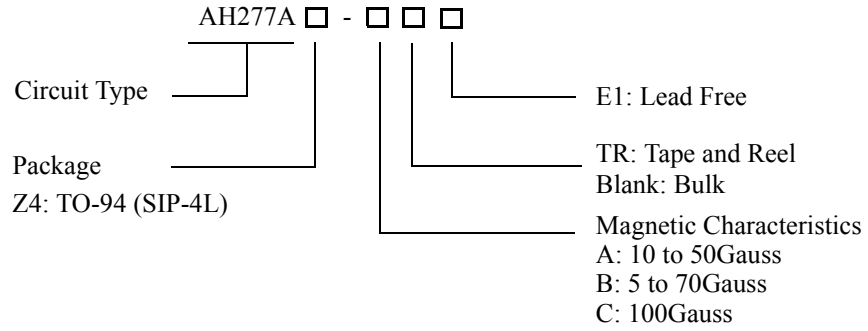
Figure 3. Functional Block Diagram of AH277A



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Ordering Information



Package	Temperature Range	Part Number	Marking ID	Packing Type
TO-94	-20 to 85 °C	AH277AZ4-AE1	AH277A	Bulk
		AH277AZ4-BE1	AH277A	Bulk
		AH277AZ4-CE1	AH277A	Bulk
		AH277AZ4-ATRE1	AH277A	Tape & Reel
		AH277AZ4-BTRE1	AH277A	Tape & Reel
		AH277AZ4-CTRE1	AH277A	Tape & Reel

BCD Semiconductor's Pb-free products, as designated with "E1" suffix in the part number, are RoHS compliant.

**COMPLEMENTARY OUTPUT HALL EFFECT LATCH****AH277A****Absolute Maximum Ratings (Note 1)** $(T_A=25^{\circ}\text{C})$

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC}	20	V
Reverse Protection Voltage	V_{RCC}	-20	V
Magnetic Flux Density	B	Unlimited	Gauss
Output Current	I_O	Continuous	400 mA
		Hold	600 mA
		Peak (start up)	800 mA
Power Dissipation	P_D	500	mW
Storage Temperature	T_{STG}	-50 to 150	$^{\circ}\text{C}$
ESD (Machine Model)	ESD	300	V

Note 1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. "Absolute Maximum Ratings" for extended period may affect device reliability.

Recommended Operating Conditions $(T_A=25^{\circ}\text{C})$

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V_{CC}	3.5	16	V
Ambient Temperature	T_A	-20	85	$^{\circ}\text{C}$



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Electrical Characteristics

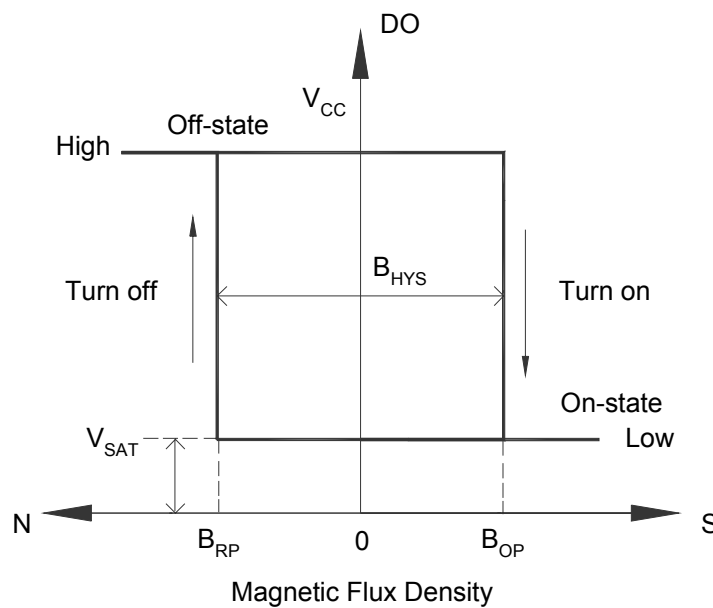
($T_A=25^\circ\text{C}$, $V_{CC}=14\text{V}$, unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Output Saturation Voltage	V_{SAT}	$V_{CC}=3.5\text{V}, I_O=100\text{mA}$		0.4		V
		$I_O=400\text{mA}$		0.35	0.6	V
Output Leakage Current	I_{OL}	$V_{CE}=16\text{V}$		0.1	10	μA
Supply Current	I_{CC}	$V_{CC}=16\text{V}$, Output Open		12	16	mA
Output Rise Time	t_r	$R_L=820\Omega, C_L=20\text{pF}$		3.0	10	μs
Output Falling Time	t_f	$R_L=820\Omega, C_L=20\text{pF}$		0.3	1.5	μs
Switch Time Differential	Δt	$R_L=820\Omega, C_L=20\text{pF}$		3.0	10	μs

Magnetic Characteristics

($T_A=25^\circ\text{C}$)

Parameter	Symbol	Grade	Min	Typ	Max	Unit
Operate Point	B_{OP}	A	10	30	50	Gauss
		B	5		70	Gauss
		C			100	Gauss
Release Point	B_{RP}	A	-50	-30	-10	Gauss
		B	-70		-5	Gauss
		C	-100			Gauss
Hysteresis	B_{HYS}			60	Gauss	





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Magnetic Characteristics (Continued)

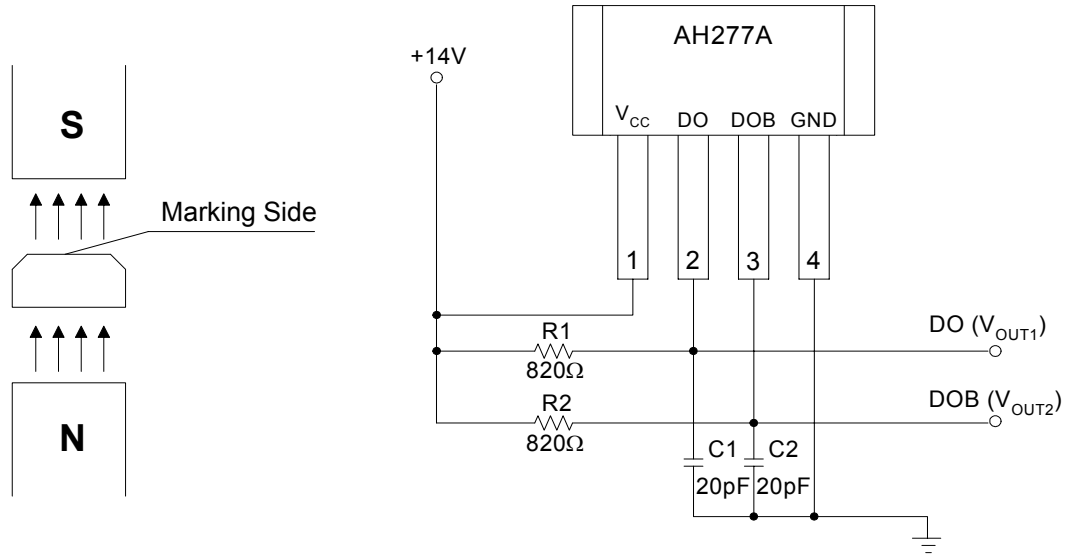


Figure 4. Basic Test Circuit

Typical Performance Characteristics

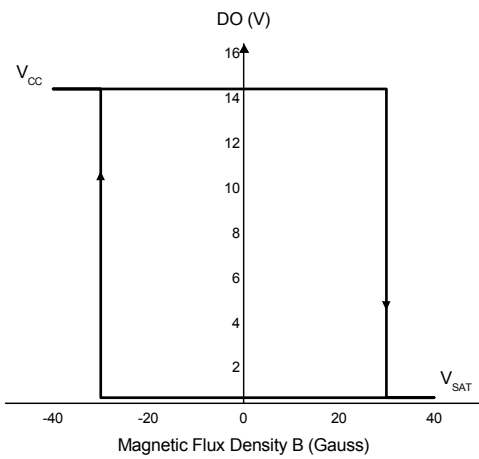


Figure 5. V_{OUT1} vs. Magnetic Flux Density

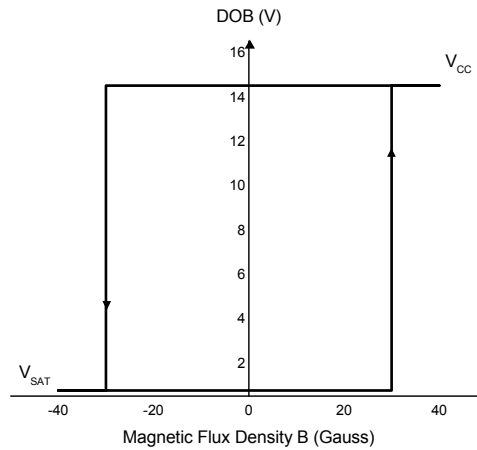


Figure 6. V_{OUT2} vs. Magnetic Flux Density



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Typical Performance Characteristics (Continued)

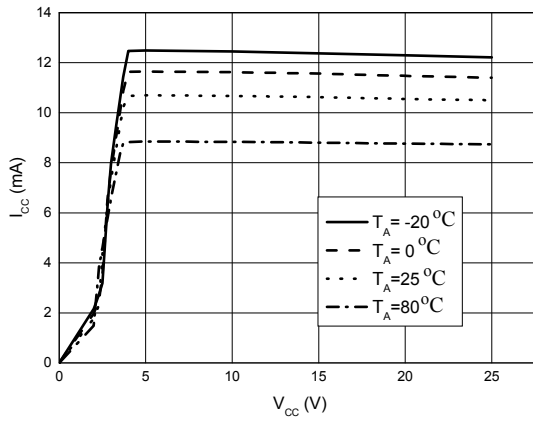


Figure 7. I_{CC} vs. V_{CC}

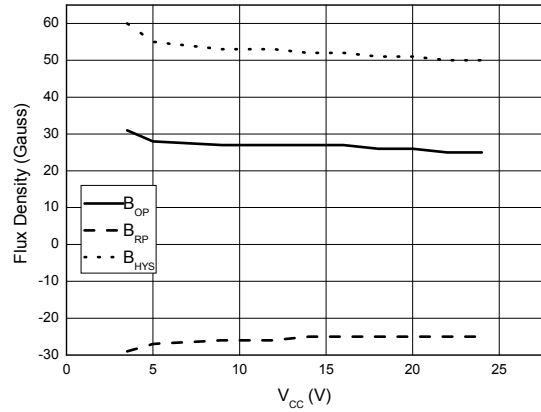


Figure 8. $B_{OP}/B_{RP}/B_{HYS}$ vs. V_{CC}

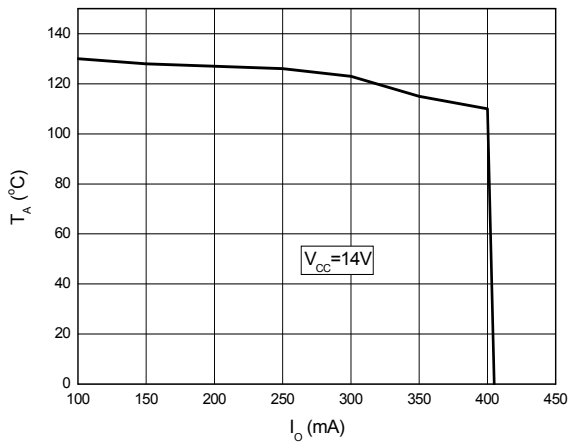


Figure 9. Output Current Curves



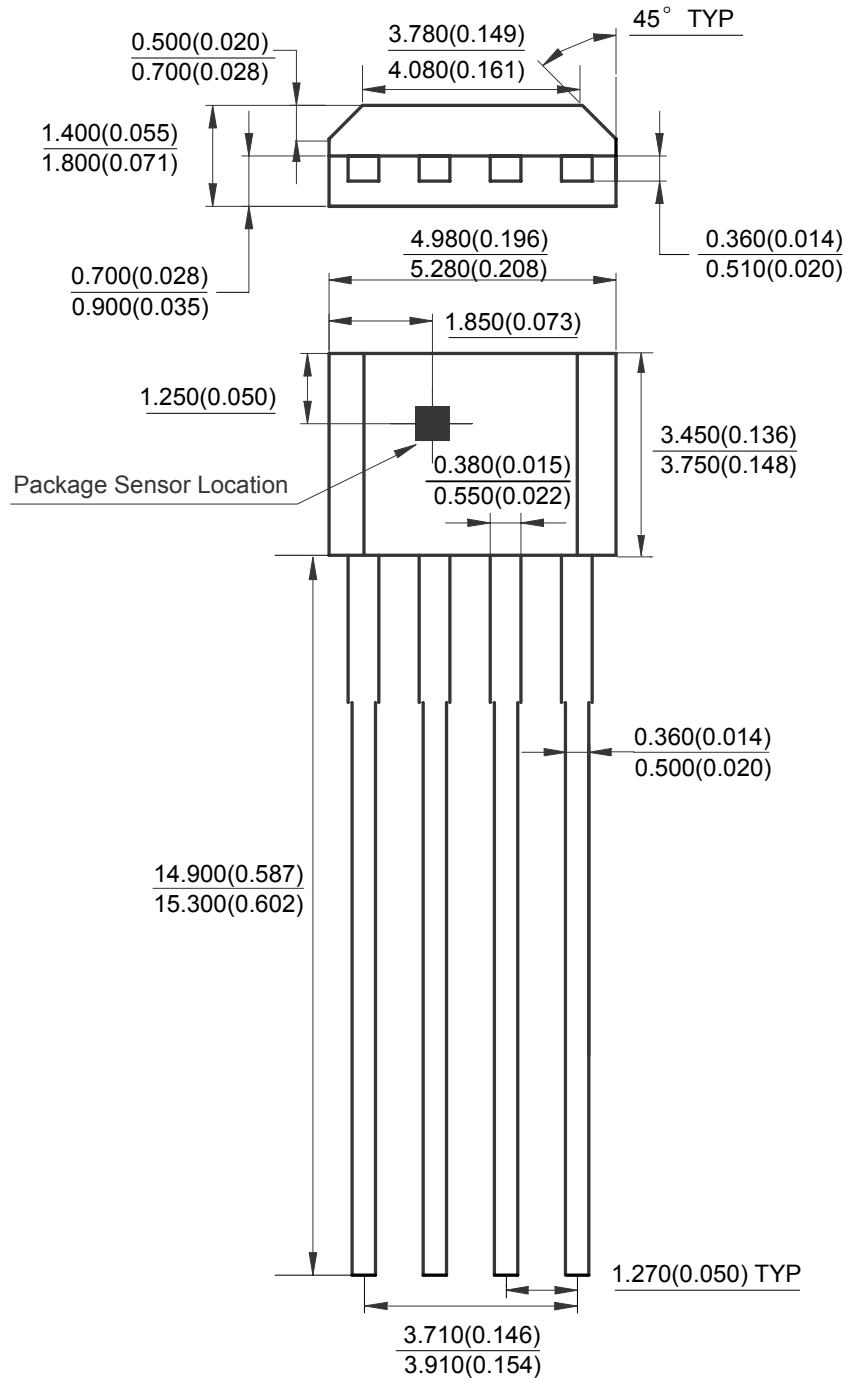
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Mechanical Dimensions

TO-94

Unit: mm(inch)





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