Complementary Output Hall Effect Latch CL277A

■ General Description

The CL277A is an integrated Hall sensor with output driver designed for electronic commutation of brushless DC motor applications. The device includes an on-chip Hall voltage generator for magnetic sensing, an amplifier that amplifies the Hall voltage, and a Schmitt trigger to provide switching hysteresis for noise rejection, and complementary open-collector drivers for sinking large current loads. An internal band-gap regulator is used to provide bias voltage for internal circuits and allows a wide operating supply range.

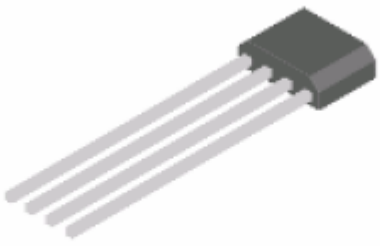
If a magnetic flux density larger than threshold Bop, DO is turned on (low) and DOB is turned off (high). The output state is held until a magnetic flux density reversal falls below Brp causing DO to be turned off (high) and DOB turned on.

■ 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 package.
- ESD rating: 300V (Machine mode).

■ Applications

- Dual-coil Brushless DC motor.
- Dual-coil Brushless DC fan.
- Revolution Counting.
- Speed Measurement.



Package Type of CL277A: TO-94

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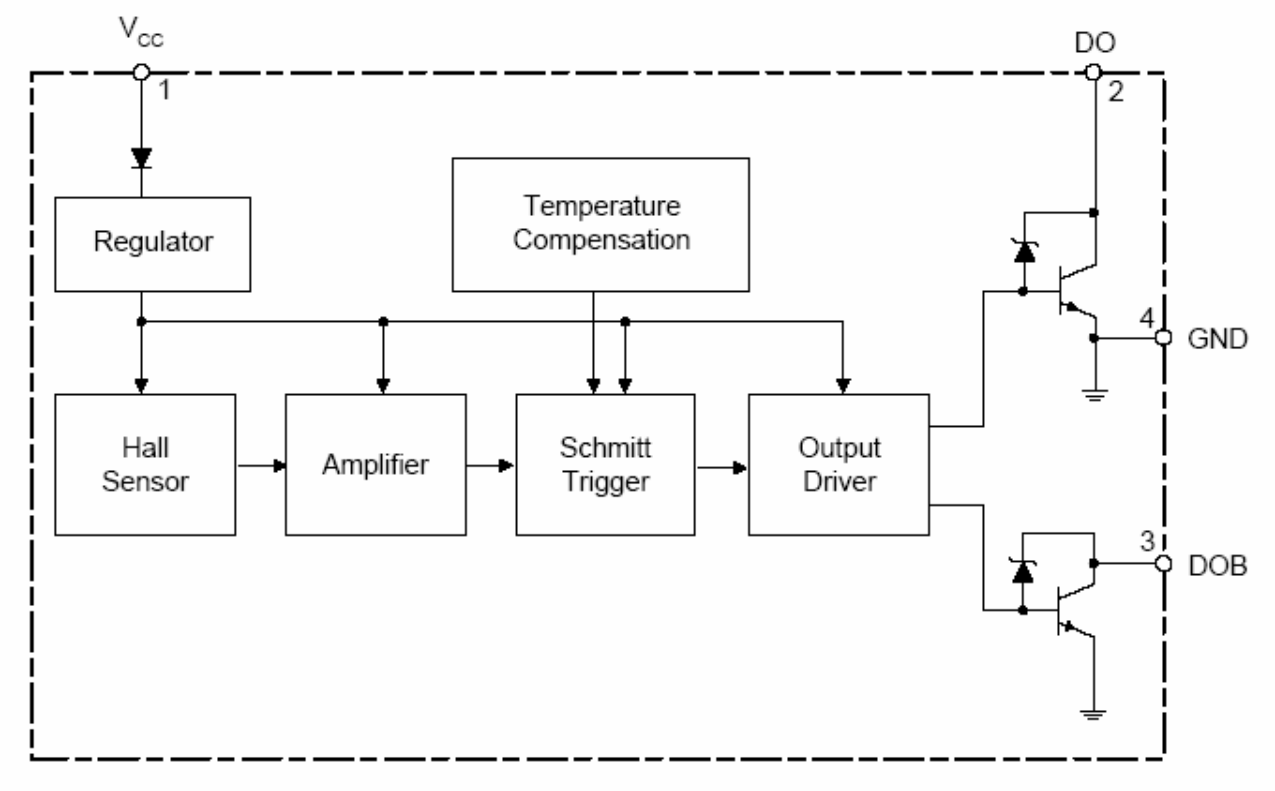
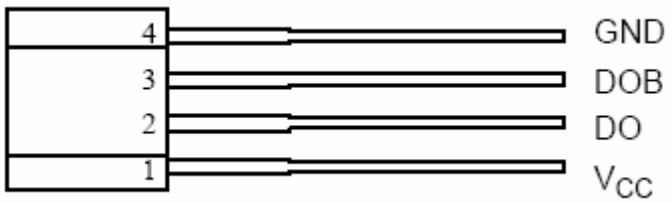
■ Function Block



■ Pin Descriptions

TO-94 Package



Pin No.	Symbol	Function
1	VCC	Supply voltage
2	DO	Output1
3	DOB	Output2
4	GND	Ground

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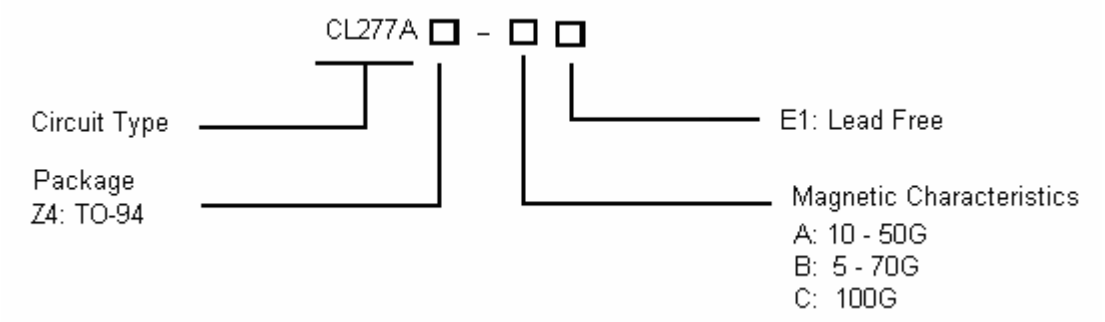
■ Ordering Information



Package	Temperature Range	Part number (Lead Free)	Marking ID	Packing Type
TO-94	-20 to 85℃	CL277AZ4-AE1	CL277A	Bulk
		CL277AZ4-BE1		
		CL277AZ4-CE1		

■ Absolute Maximum Ratings (Ta= 25˚C)

Symbol	Parameter		Range	Unit
Vcc	Supply voltage		20	V
VRCC	Reverse VCC polarity voltage		-20	V
B	Magnetic flux density		Unlimited	G
IO	Output sink current	Continuous	400	mA
		Hold	500	mA
		Peak (start up)	700	mA
PD	Power dissipation		550	mW
Tstg	Storage temperature		-50 ~ 150	˚C
θ JA	Thermal resistance (die to atmosphere)		227	˚C /W

Note: Stresses greater than those listed under Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operation is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

■ Recommended Operating Conditions (Ta= 25˚C)

Parameter	Symbol	Range	Unit
Supply voltage	Vcc	3.5 ~ 16	V
Operating temperature	Ta	-20 ~ 85	˚C

■ Electrical Characteristics

(Vcc = 14V, Ta = 25˚C, unless otherwise specified)

Symbol	Parameter	Test Condition	Min	Typ.	Max	Unit
VSAT	Output saturation voltage	Vcc=3.5V, Io=100mA	--	0.4	--	V
		Io=400mA	--	0.35	0.6	V
IOL	Output leakage current	VCE=16V	--	0.1	10	μA
Icc	Supply current	Vcc=16V, Output open	--	12	16	mA
tr	Output rise time	RL=820Ω, CL=20pF	--	3.0	10	μs
tf	Output falling time	RL=820Ω, CL=20pF	--	0.3	1.5	μs
Δt	Switch time differential	RL=820Ω, CL=20pF	--	3.0	10	μs
VZ	Output Zener Breakdown			55		V

■ Magnetic Characteristics

(Vcc = 14V, Ta = 25˚C, unless otherwise specified)

Symbol	Parameter	Grade	Min.	Type	Max.	Unit
Bop	Operate point	A	10	30	50	G
		B	5		70	G
		C			100	G
Brp	Release point	A	-50	-30	-10	G
		B	-70		-5	G
		C	-100			G
Bhys	Hysteresis			60		G

■ Test Circuit

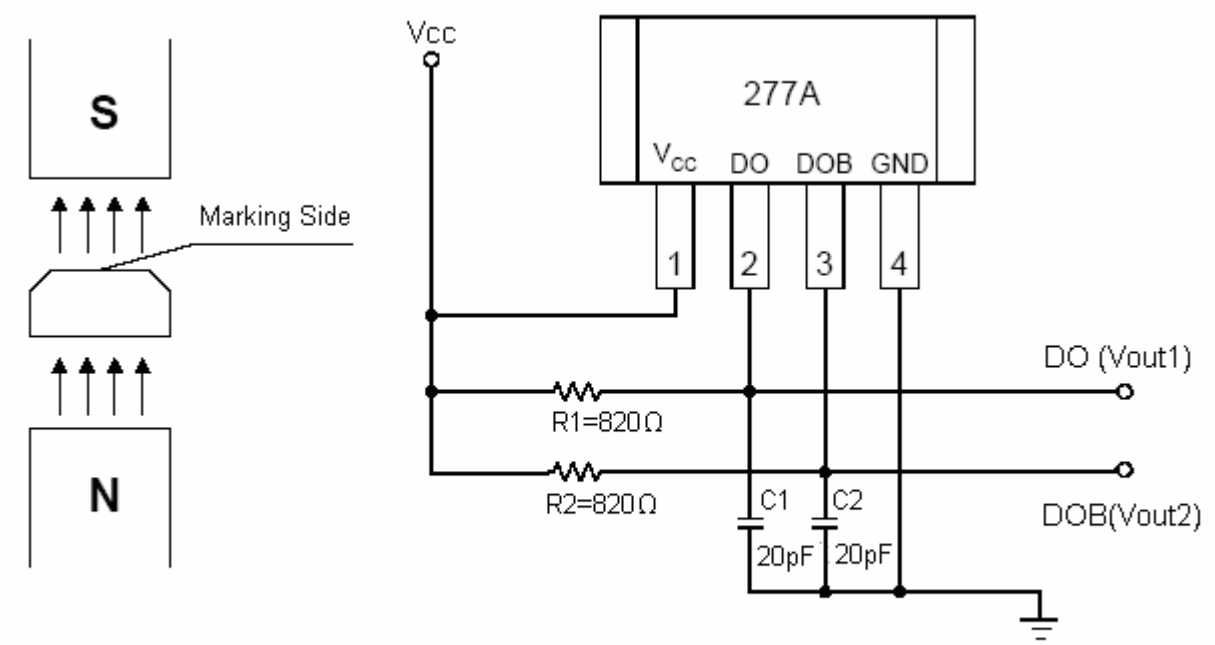


Figure 1. Basic test circuit

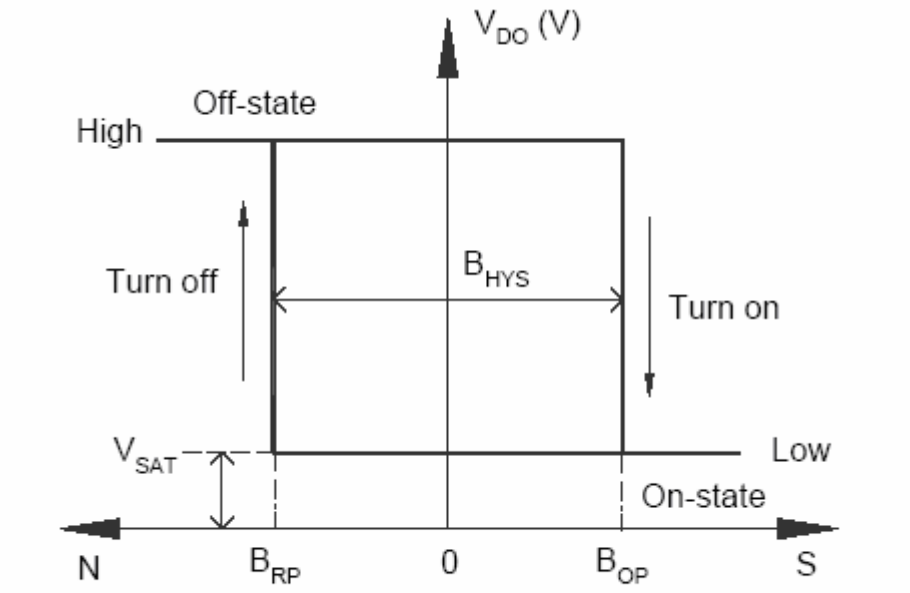


Figure 2. Magnetic flux density (Gauss)

■Typical Performance Characteristics

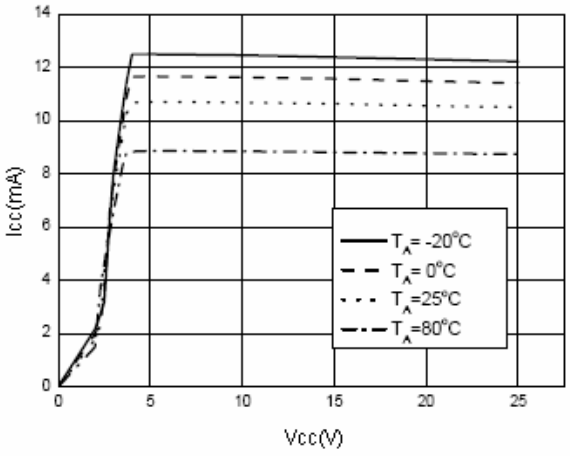


Figure 3. Icc vs. Vcc

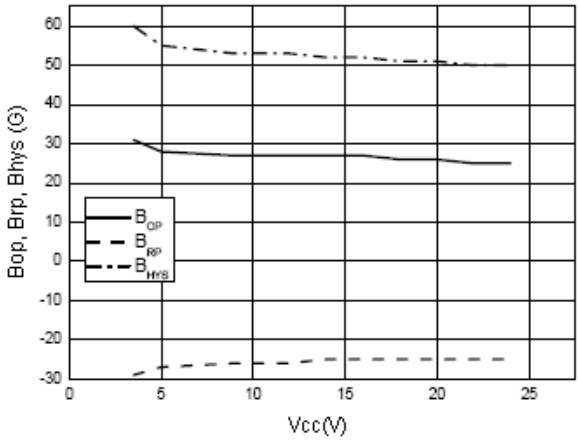


Figure 4. Bop/Brp/Bhys vs. Vcc

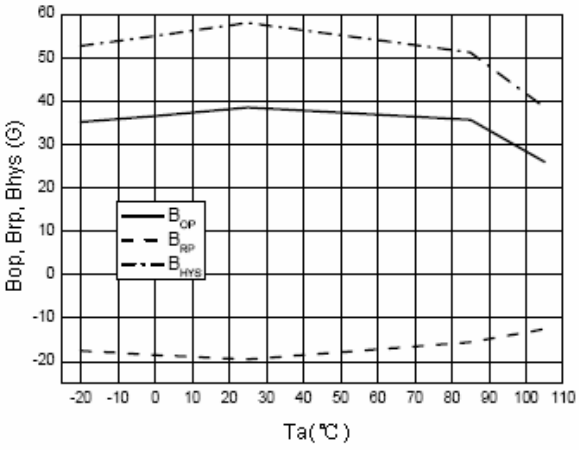


Figure 5. Bop/Brp/Bhys vs. Ambient Temperature

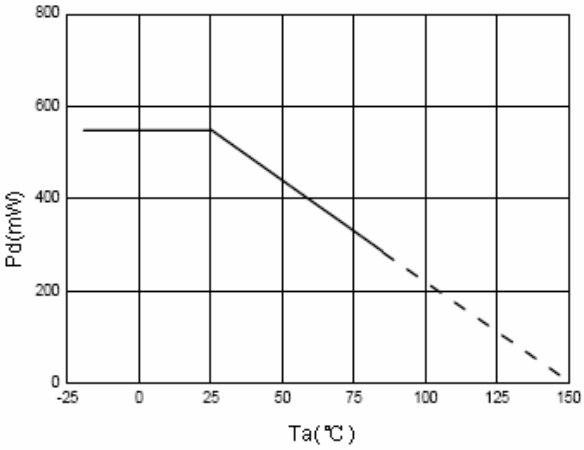
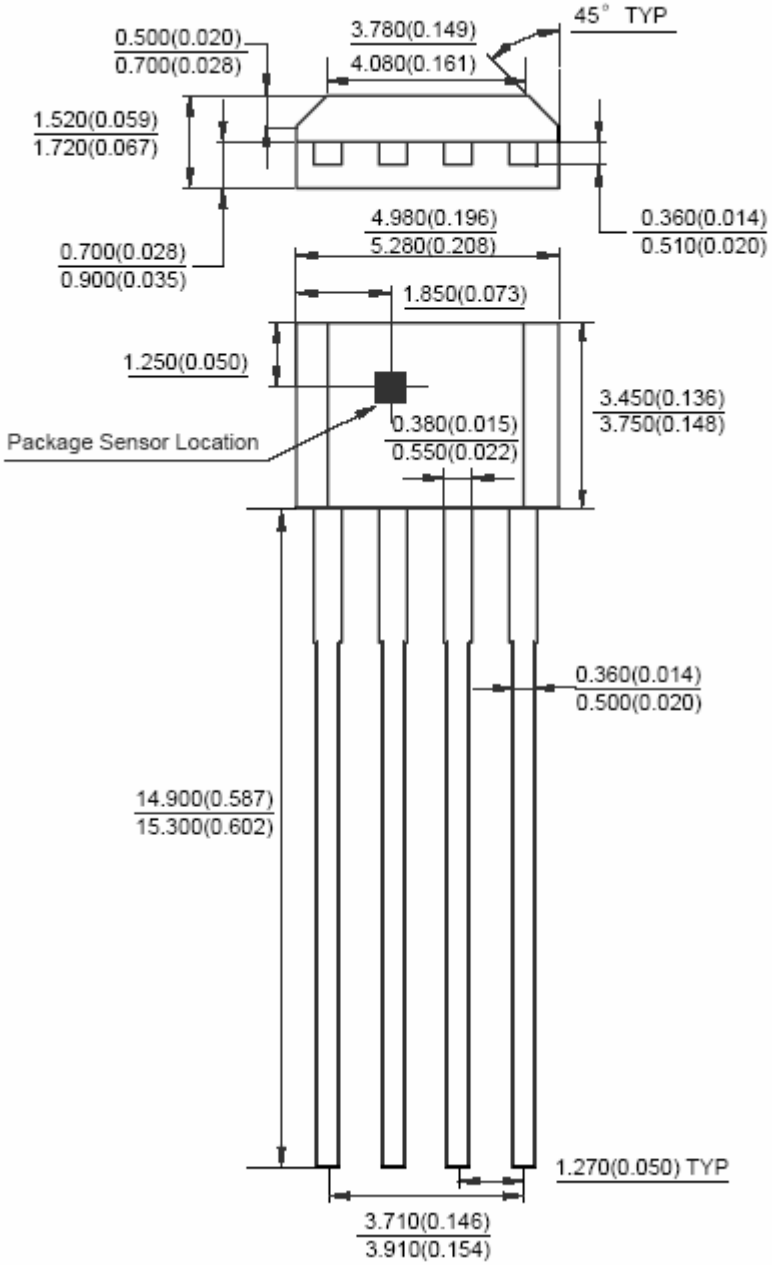


Figure 6. Pd vs. Ambient Temperature

■ Package Mechanical Data (TO-94)

Unit: mm (inch)



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