

# A177 Single Output Hall Effect Latch IC

## Description

The A177 is an integrated Hall effect latched sensor with output pull-high resistor driver designed for electronic commutation of brushless DC motor applications and contactless switches. The device includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifies the Hall voltage, and a Schmitt trigger to provide switching hysteresis for noise rejection, and output driver with pull-high resistor. An internal bandgap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range.

If a magnetic flux density larger than threshold  $B_{op}$ , DO is turned on (low). The output state is held until a magnetic flux density reversal falls below  $B_{rp}$  causing DO to be turned off (high).

A177 is rated for operation over temperature range from  $-40^{\circ}\text{C}$  to  $150^{\circ}\text{C}$  and voltage range from 3.5V to 28V. The devices are available in low cost die forms or rugged 3 pin SIP packages.

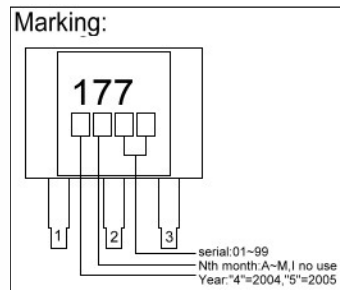
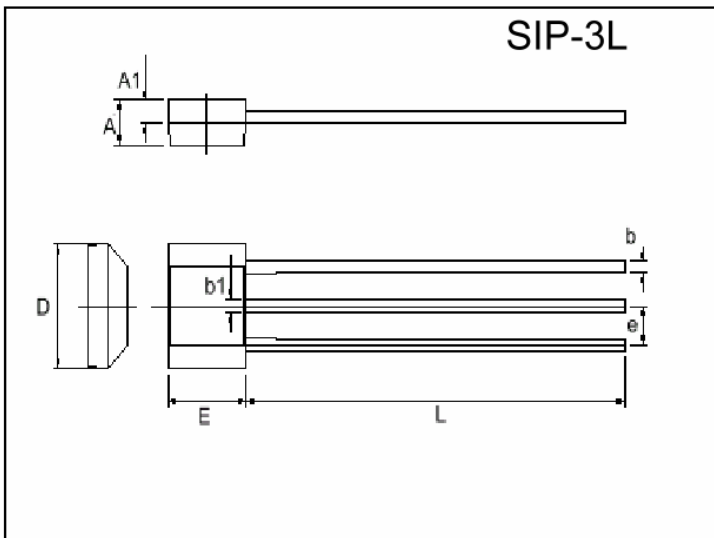
## Features

- \* Wide range of supply voltage: 3.5V to 28V.
- \* Internal bandgap regulator allows temperature compensated operations and a wide operating voltage range.
- \* High sensitivity with a small magnet.
- \* TTL and MOS ICs directly drivable by output.
- \* Build in protection diode for chip reverse power connecting.

## Application

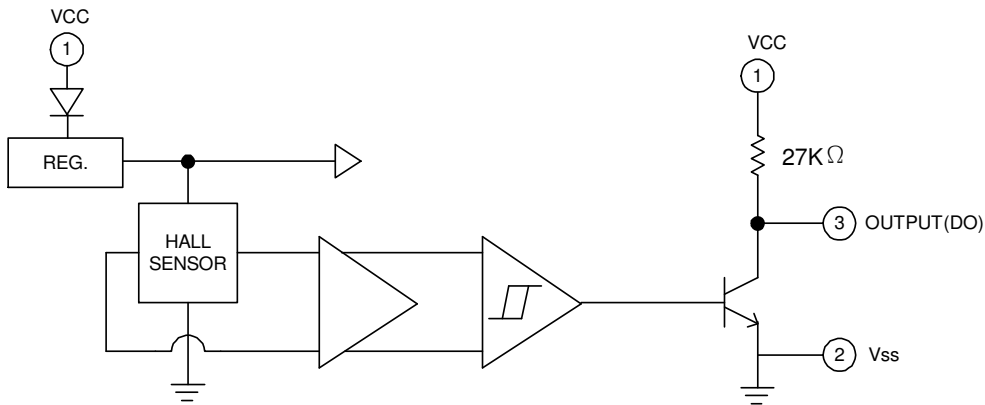
- |                     |                        |
|---------------------|------------------------|
| 1) Brushless DC Fan | 5) Revolution Counting |
| 2) Brushless DC Fan | 6) Speed Measurement   |
| 3) Position Sensors | 7) Keyboard Switches   |
| 4) Rotation Sensors | 8) Microswitches       |

## Package Dimensions

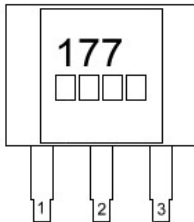


REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	1.245	1.753	D	3.962	4.216
A1	0.750 REF.		E	2.870	3.124
b	0.330	0.432	L	13.60	15.60
b1	0.406	0.508	e	1.27 REF.	

## Functional Block Diagrams



## Pin Descriptions



Name	P/I/O	Pin#	Description
Vcc	P	1	Positive power supply
Vss	P	2	Ground
DO	O	3	Digital output

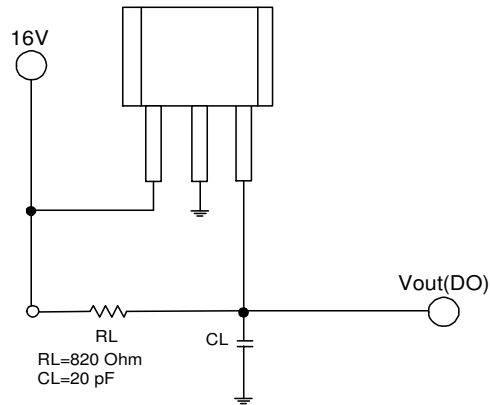
## Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	VALUE	Unit
Supply Voltage	Vcc	28V	V
Reverse Vcc Polarity Voltage	V <sub>RCC</sub>	-28V	V
Magnetic flux density	B	Unlimited	
Output OFF Voltage	Vce	35	V
Output ON Current	I <sub>c</sub> Continuous	25	mA
Operating Temperature Range	T <sub>a</sub>	-40~150	°C
Storage Temperature Range	T <sub>s</sub>	-65~150	°C
Package Power Dissipation	PD	250	mW
Maximum Junction Temp.	T <sub>j</sub>	175	°C

## Electrical Characteristics (TA=+25°C)

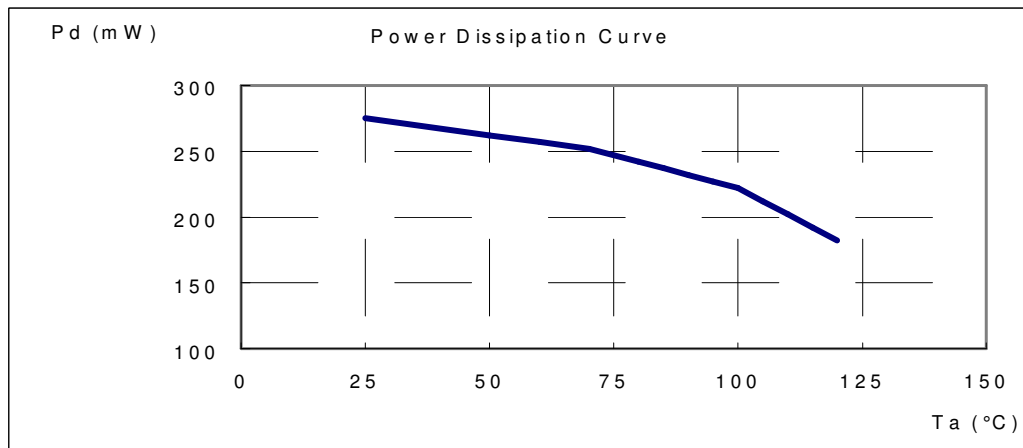
Parameter	SYMBOL	Test Conditions	Min	Typ.	Max.	Unit
Supply Voltage	Vcc	-	3.5	-	28	V
Low output voltage	V <sub>OL</sub>	Vcc=16V, I <sub>o</sub> =12mA, B=130 Gauss	-	-	0.4	V
		Vcc=3.6V, I <sub>o</sub> =12mA, B=130 Gauss	-	-	0.4	V
High output voltage	V <sub>OH</sub>	Vcc=16V, I <sub>o</sub> =-30μA, B=-130 Gauss	14.6	-	-	V
		Vcc=3.6V, I <sub>o</sub> =-30μA, B=-130 Gauss	2.2	-	-	V
Output Leakage Current	I <sub>cex</sub>	Vcc=16V, Vcc=16V	-	<0.1	10	μA
Output Short-circuit Current	-I <sub>OS</sub>	Vcc=16V, V <sub>o</sub> =0V, B=-130 Gauss	0.4	-	0.9	mA
Supply Current	I <sub>CC</sub>	Vcc=24V, Output Open	-	5	10	mA
Output Rise Time	t <sub>r</sub>	Vcc=16V, R <sub>L</sub> =820Ω CL=20pf	-	0.3	1.5	us
Output Falling Time	t <sub>f</sub>	Vcc=16V, R <sub>L</sub> =820Ω CL=20pf	-	0.3	1.5	us

## Test Circuit

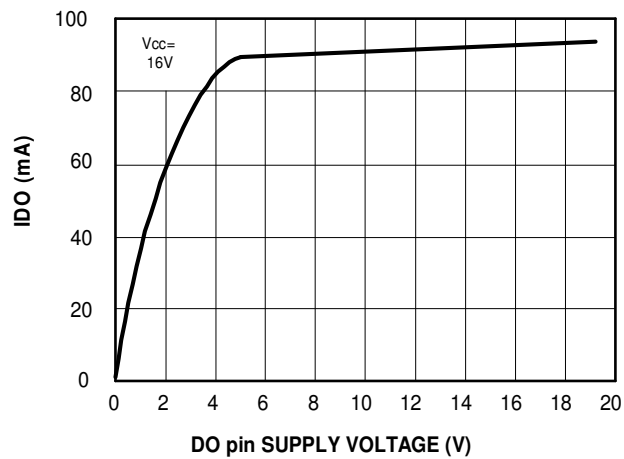


## Power dissipation VS. Environment Temperature

Ta(°C)	25	50	60	70	80	85	90	95	100	105	110	115	120
Pd(mW)	275	262	257	252	242	237	232	227	222	212	202	192	182



## Electrical Characteristics Curves

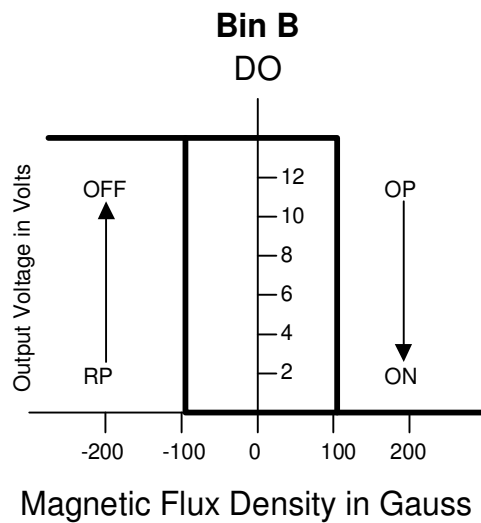
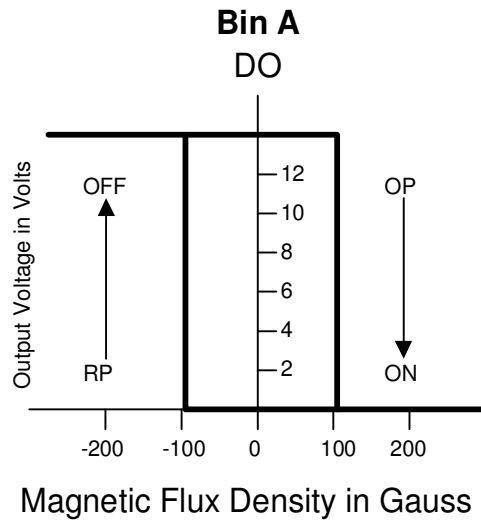


Current capacity vs. supply voltage for DO pin

## Magnetic Characteristics

Characteristic		Symbol	Ta=+25°C		Ta=-40°C to 150°C		Unit
			Min	Max	Min	Max	
Operate Point	BIN A	Bop	5	100	5	100	Gauss
	BIN B	Bop	-20	100	-20	100	Gauss
Release Point	BIN A	Brp	-5	-100	-5	-100	Gauss
	BIN B	Brp	20	-100	20	-100	Gauss
Hysteresis	BIN A	Bhys	75	100	55	120	Gauss
	BIN B	Bhys	70	110	50	130	Gauss

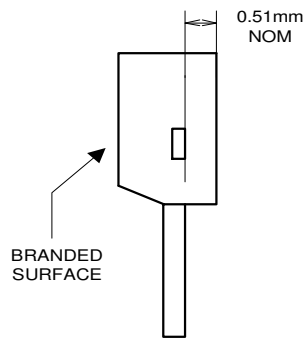
## Hysteresis Characteristics



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## Package Information

Active Area Depth



Package Sensor Location

