



# H177

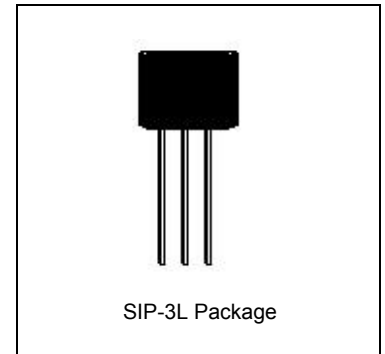
Single Output Hall Effect Latch IC

## General Description

H177 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).

H177 is rated for operation over temperature range from  $-20^{\circ}\text{C}$  to  $85^{\circ}\text{C}$  and voltage range from 3.5V to 28V. The devices are available in low cost die forms or rugged 3 pin SIP packages.



## Features

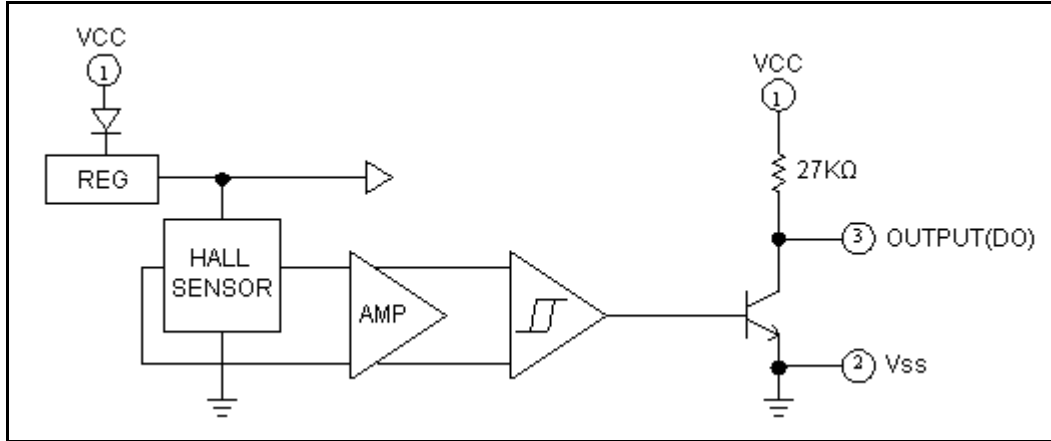
- Wide range of supply voltage: 3.5V to 28V.
- Internal bandgap regulator allows temperature compensated operations and a wide operating voltage range.
- High sensitivity with a small magnet.
- TTL and MOS ICs directly drivable by output.
- Built-in protection diode for chip reverse power connecting.
- Package: SIP-3L.

## Applications

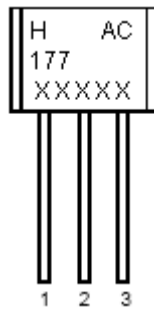
- Brushless DC Motor
- Brushless DC Fan
- Position Sensors
- Rotation Sensors
- Revolution Counting
- Speed Measurement
- Keyboard Switches
- Micro-switches



### Functional Block Diagram



### Pin Assignment



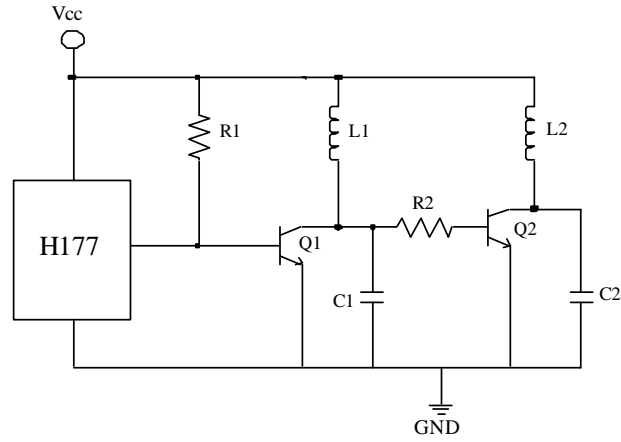
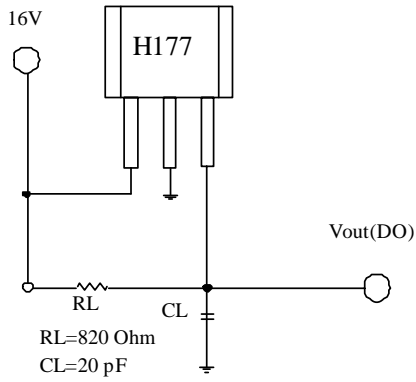
Name	P/I/O	Pin No	Description
VCC	P	1	Positive Power Supply
Vss	P	2	Gnd
DO	O	3	Output Pin

### Absolute Maximum Ratings (Ta=25°C)

Characteristics	Symbol	Values	Unit
Supply Voltage	V <sub>CC</sub>	28	V
Reverse VCC Polarity Voltage	V <sub>RCC</sub>	-28	V
Magnetic Flux Density	B	Unlimited	
Output OFF Voltage	V <sub>ce</sub>	35	V
Output ON Current (continuous)	I <sub>C</sub>	25	mA
Operating Temperature Range	T <sub>A</sub>	-20 to +85	°C
Storage Temperature Range	T <sub>S</sub>	-65 to +150	°C
Package Power Dissipation	P <sub>D</sub>	250	mW
Maximum Junction Temperature	T <sub>J</sub>	150	°C



## Test Circuit & Application Circuit





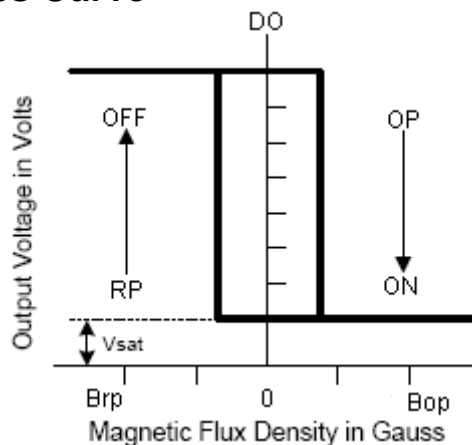
### Electrical Characteristics (Ta=+25°C)

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	V <sub>CC</sub>		3.5	-	28	V
Low output voltage	V <sub>OL</sub>	V <sub>CC</sub> =16V, I <sub>o</sub> =12mA, B=130 G	-	-	0.4	V
		V <sub>CC</sub> =3.6V, I <sub>o</sub> =12mA, B=130 G	-	-	0.4	
High output voltage	V <sub>OH</sub>	V <sub>CC</sub> =16V, I <sub>o</sub> =-30μA, B=-130 G	14.6	-	-	V
		V <sub>CC</sub> =3.6V, I <sub>o</sub> =-30μA, B=-130 G	2.2	-	-	
Output Leakage Current	I <sub>ceX</sub>	V <sub>ce</sub> =16V, V <sub>CC</sub> =16V	-	0.1	10	uA
Output Short-circuit Current	-I <sub>os</sub>	V <sub>CC</sub> =16V, V <sub>o</sub> =0V, B=-130 G	0.4	-	0.9	mA
Supply Current	I <sub>cc</sub>	V <sub>CC</sub> =24V, Output Open	-	5	10	mA
Output Rise Time	t <sub>r</sub>	V <sub>CC</sub> =16V, R <sub>L</sub> =820Ω, C <sub>L</sub> =20Pf	-	0.3	1.5	us
Output Falling Time	t <sub>f</sub>	V <sub>CC</sub> =16V, R <sub>L</sub> =820Ω, C <sub>L</sub> =20Pf	-	0.3	1.5	us

### Magnetic Characteristics

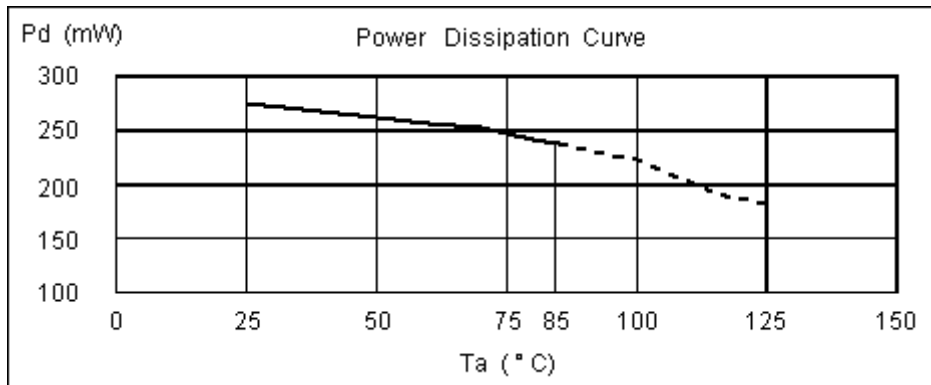
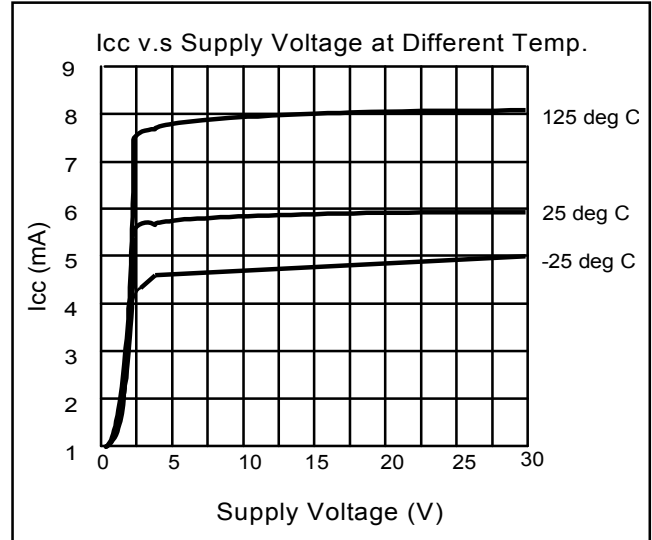
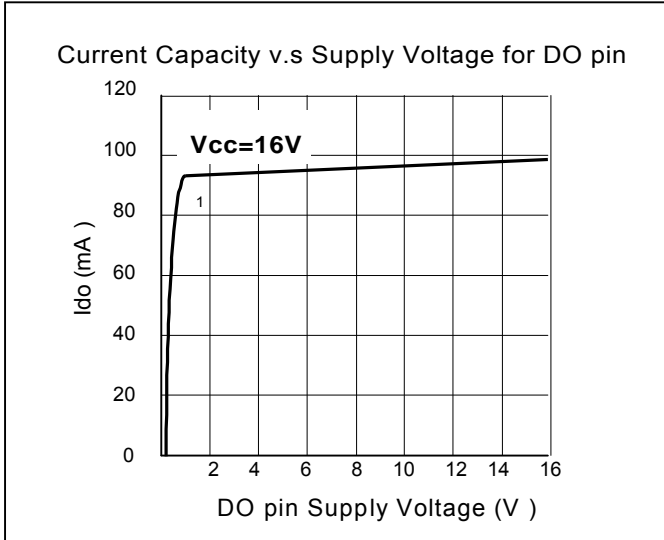
Characteristic	Symbol	Ta=+25°C		Ta=0°C to +70°C		Unit	grade	
		Min.	Max.	Min.	Max.			
H177A	Operate Point	Bop	0	70	0	70	G	A
	Release Point	Brp	-70	0	-70	0	G	
	Hysteresis	Bhys	40	110	20	140	G	
H177B	Operate Point	Bop	-	100	-	100	G	B
	Release Point	Brp	-100	-	-100	-	G	
	Hysteresis	Bhys	50	150	30	200	G	
H177C	Operate Point	Bop	-	130	-	130	G	C
	Release Point	Brp	-130	-	-130	-	G	
	Hysteresis	Bhys	60	160	40	220	G	

### Hysteresis Characteristics Curve





### Electrical Characteristics Curve





### SIP-3L Dimension

**Marking:**

Pb Free Mark  
 Pb-Free: "●" (Noted)  
 Normal: None

Date Code      Control Code

Pin Style: 1. Vcc    2. Gnd    3. Do

Package Sensor Location

**Material:**

- Lead solder plating: Pure-Tin (Pb-free)
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

DIM	Min.	Max.
A	3.962	4.216
B	2.870	3.124
C	13.60	15.60
D	1.245	1.753
E	0.750REF	
F	0.406	0.508
G	0.330	0.432
H	1.27REF	
I	1.87	2.13
J	1.37	1.63

\*: Typical, Unit: mm

**3-Lead SIP-3L Plastic**  
HSMC Package Code: AC

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