

# ATS477

## Single Phase Hall Effect Latch

### ■ Features

- On-chip Hall sensor
- Bi-direction H type output drivers for single coil
- Internal bandgap regulator allows temperature compensated operations and a wide operating voltage range
- High output sinking capability up to 250mA
- Operating voltage: 4V~20V
- Low output switching current noise
- Build-in shunt Zener protection for output driver
- SOP-7L provide FG output pin
- Package: SIP-4L and SOP-7L

### ■ Applications

- Single Coil Brush-less DC Fan
- Single Coil Brush-less DC Motor

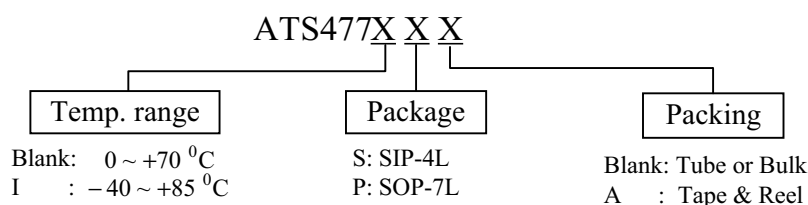
### ■ General Description

ATS477 is the integrated Hall sensor with output drivers designed for electrical commutation of brush-less DC motor application. The device included as follows: on-chip Hall voltage generator for magnetic sensing; the error amplifier that amplifies the Hall voltage; a comparator is to provide switching hysteresis for noise rejection; the bi-direction drivers for sinking and driving large current load, frequency generator (FG) provide a signal proportional to rotation speed. Internal bandgap regulator is used to provide temperature compensated bias for internal circuits and allows a wide operating supply voltage range. Built-in protection circuit and output shunt Zener diodes were applied for protecting output drivers during operating.

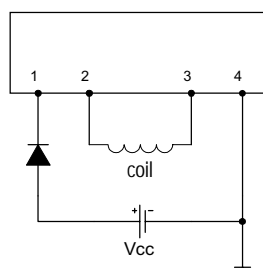
If a magnetic flux density larger than threshold  $B_{op}$ , DO is turned to sink and DOB is turned to drive. The output state is held until a magnetic flux density reversal falls below  $B_{rp}$  causing DO to be turned to drive and DOB turned to sink.

ATS477 is rated for operation over-temperature range from 0 °C to 70 °C and voltage range from 4.0V to 20V. The devices are available in low cost die forms or rugged SIP-4L and power SOP-7L packages.

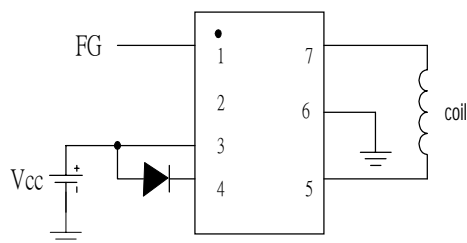
### ■ Ordering Information



### ■ Application Circuit



(SIP-4L)



(SOP 7)

#### Single coil brush-less DC Fan

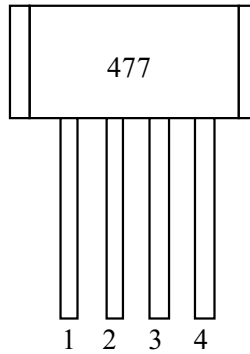
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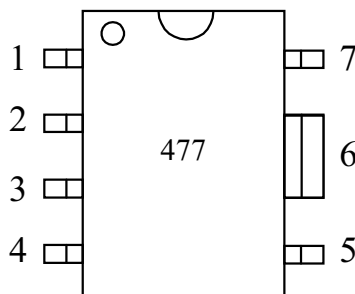
### ■ Pin Configuration

Front View



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

Top view



Name	P/I/O	Pin #	Description
Vcc	P	3,4	Positive Power Supply
DO	O	5	Output Pin
DOB	O	7	Output Pin
FG	O	1	Frequency Generator
Vss	P	6	Ground

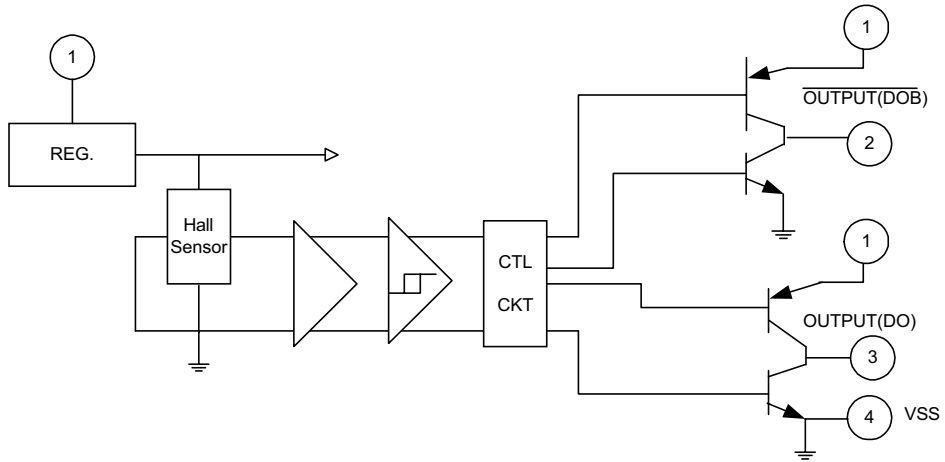
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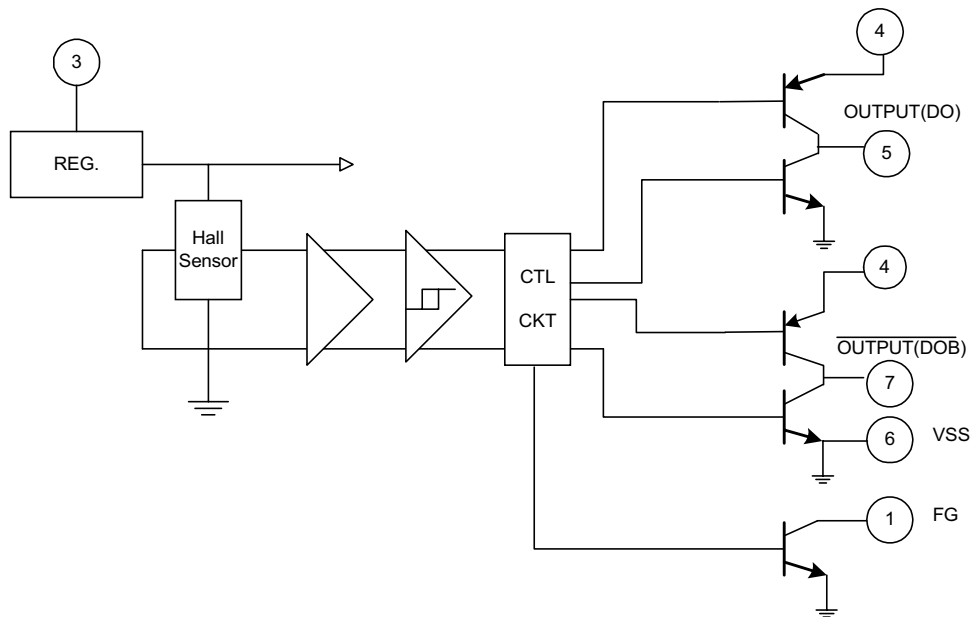


### ■ Block Diagrams

(1). SIP-4L



(2). SOP-7L



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## Single Phase Hall Effect Latch

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

Supply Voltage, Vcc	-----	20V
Magnetic flux density, B	-----	Unlimited
Output ON Current, Ic		
Continuous	-----	250mA
Hold	-----	300mA
Peak (Start Up)	-----	600mA
Operating Temperature Range,		
Ta	-----	0°C to 70°C
Storage Temperature Range,		
Ts	-----	-65°C to +150°C
Package Power Dissipation,		
SIP-4L	-----	500mW
SOP-7L	-----	800mW (Note 1)

(Note 1) Ground pin must connect to large area copper on PCB as possible.

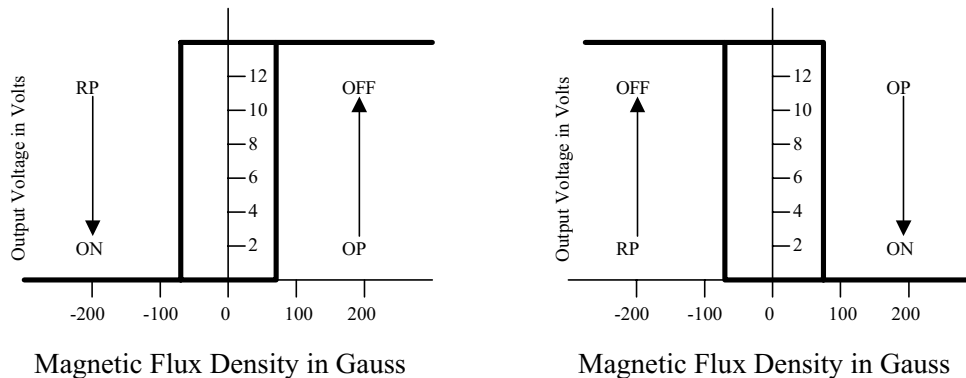
### Electrical Characteristics (T=+25°C, Vcc=4V to 20V)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Units
Supply Voltage	Vcc	—	4.0	—	20	V
Output Saturation Voltage	Vce(sink)	Vcc=14V, Ic=200mA	—	500	800	mV
	Vce(drive)	Vcc=14V, Ic=200mA	Vcc-1.5	—	Vcc	V
FG Saturation Voltage	Vce	Vcc=14V, IFG=20mA	—	0.3	0.7	V
Supply Current	Icc	Vcc=20V, Output Open	—	18	30	mA
Output Rise Time	tr	Vcc=14V, RL=820Ω, CL=20pF	—	1.0	5.0	μs
Output Falling Time	tf	Vcc=14V, RL=820Ω, CL=20pF	—	0.3	1.5	μs
Switch Time Differential	Δt	Vcc=14V, RL=820Ω, CL=20pF	—	1.0	5.0	μs

### Magnetic Characteristics

Characteristic	Symbol	Ta=+25°C		Ta=0°C to 70°C		Units
		Min	Max	Min	Max	
Operate Point	Bop	0	70	0	70	G
Release Point	Brp	-70	0	-70	0	G
Hysteresis	Bhys	20	140	10	140	G

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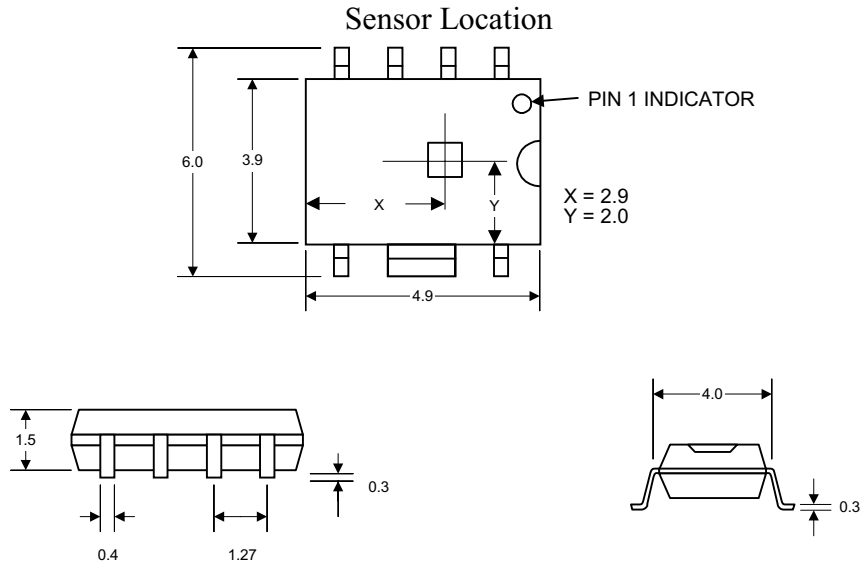
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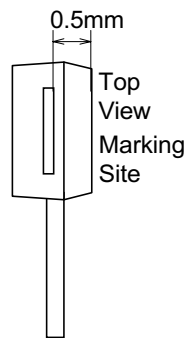
### ■ Package Information (unit: mm)

#### (1). SOP-7L

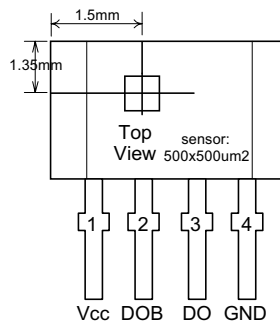


#### (2). SIP-4L

##### Active Area Depth



##### Sensor Location



### Package Dimension

