

# Not Recommended for New Design



## Single Output Hall Effect Latch

## ATS177

### ■ Features

- 3.5V to 20V DC operation voltage
- Temperature compensation
- Wide operating voltage range
- Open-Collector pre-driver
- 25mA maximum sinking output current.
- Reverse polarity protection
- Package: SIP3, SOT23

### ■ Applications

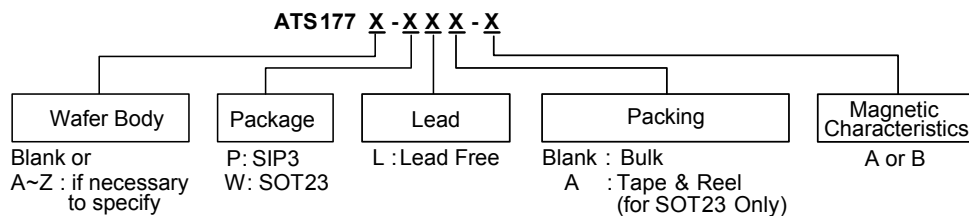
- Brush-less DC Motor
- Brush-less DC Fan
- Revolution counting
- Speed measurement

### ■ General Description

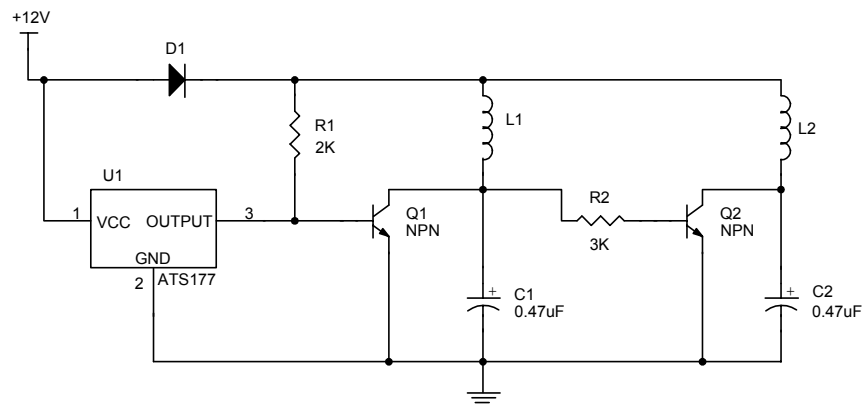
ATS177 is an integrated Hall effect latched sensor designed for electronic commutation of brush-less DC motor applications. The device includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifies the Hall voltage, and a schmitt trigger to provide switching hysteresis for noise rejection, and open-collector output. 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).

### ■ Ordering Information



### ■ Typical Application Circuit



Brush-less DC Fan

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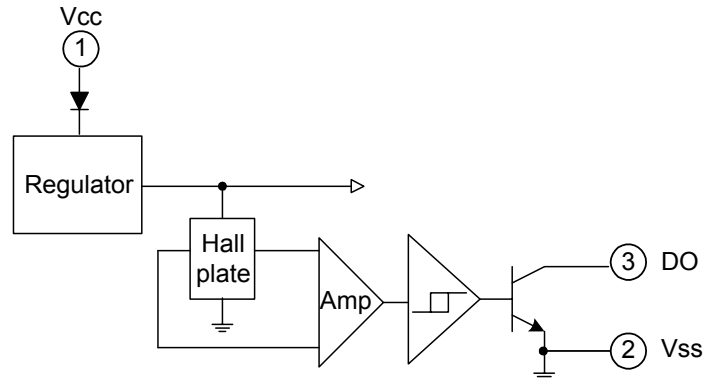


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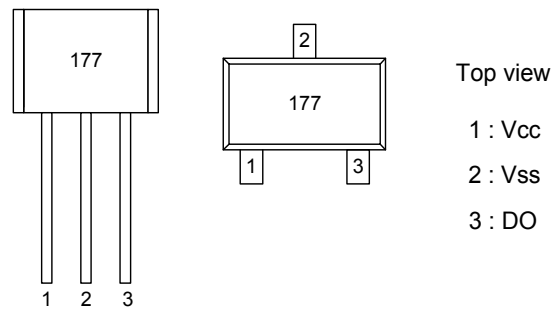
Single Phase Hall Effect Latch

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## ■ 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

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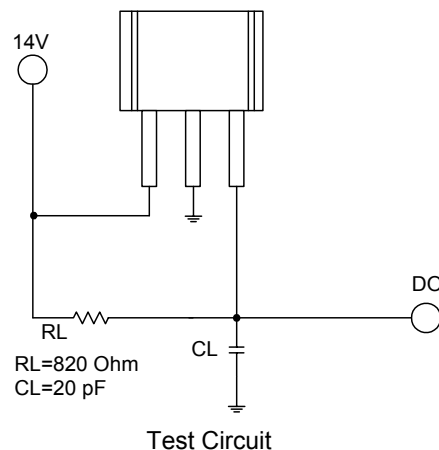
## ■ Absolute Maximum Ratings (at Ta=25°C)

Characteristics		Symbol	Values	Unit
Supply Voltage		V <sub>CC</sub>	20	V
Reverse Vcc Polarity Voltage		V <sub>RCC</sub>	-20	V
Magnetic Flux Density		B	Unlimited	
Output OFF Voltage		V <sub>ce</sub>	30	V
Output "ON" Current	Continuous	I <sub>c</sub>	25	mA
Operating Temperature Range		T <sub>a</sub>	-20~+85	°C
Storage Temperature Range		T <sub>s</sub>	-65~+150	°C
Maximum Junction Temp.		T <sub>j</sub>	150	°C
Package Power Dissipation	SIP-3L	P <sub>d</sub>	550	mW
	SOT23-3L		230	mW

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

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Units
Supply Voltage	V <sub>cc</sub>	—	3.5	-	20	V
Output Saturation Voltage	V <sub>ce(sat)</sub>	V <sub>cc</sub> =14V, I <sub>c</sub> =20mA	-	300	700	mV
Output Leakage Current	I <sub>ceX</sub>	V <sub>ce</sub> =14V, V <sub>cc</sub> =14V	-	<0.1	10	uA
Supply Current	I <sub>cc</sub>	V <sub>cc</sub> =20V, Output Open	-	5	10	mA
Output Rise Time	t <sub>r</sub>	V <sub>cc</sub> =14V, 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> =14V, R <sub>L</sub> =820Ω, C <sub>L</sub> =20pF	-	0.3	1.5	us

## ■ Test Circuit



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## ■ Magnetic Characteristics (Ta= 25°C)

(1mT=10Gauss)

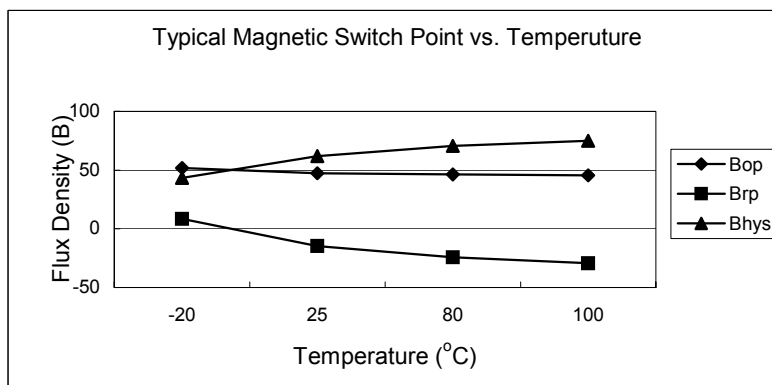
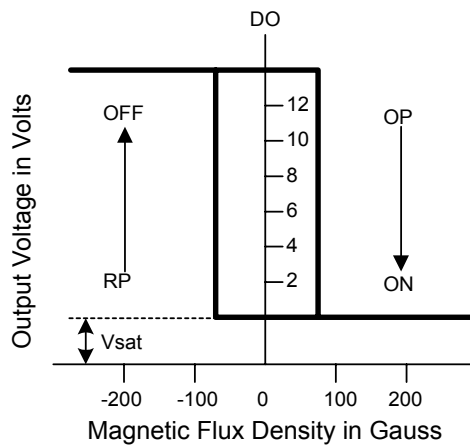
### A grade

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operate Point	Bop	5	-	70	Gauss
Release Point	Brp	-70	-	-5	Gauss
Hysteresis	Bhys	-	80	-	Gauss

### B grade

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operate Point	Bop	-	-	100	Gauss
Release Point	Brp	-100	-	-	Gauss
Hysteresis	Bhys	-	80	-	Gauss

\*B grade is for SIP package only.



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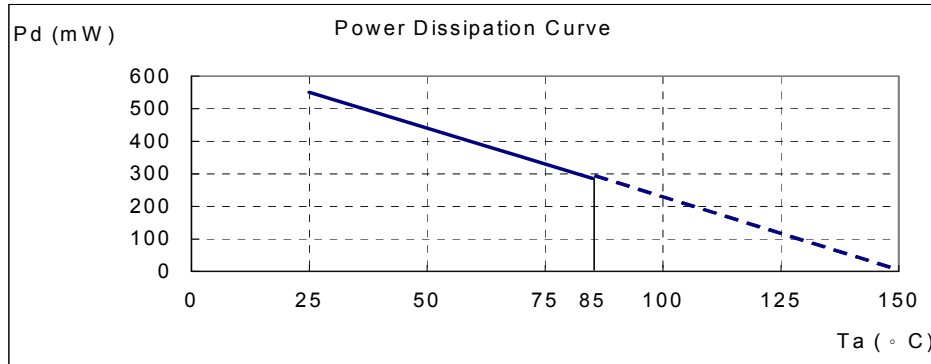


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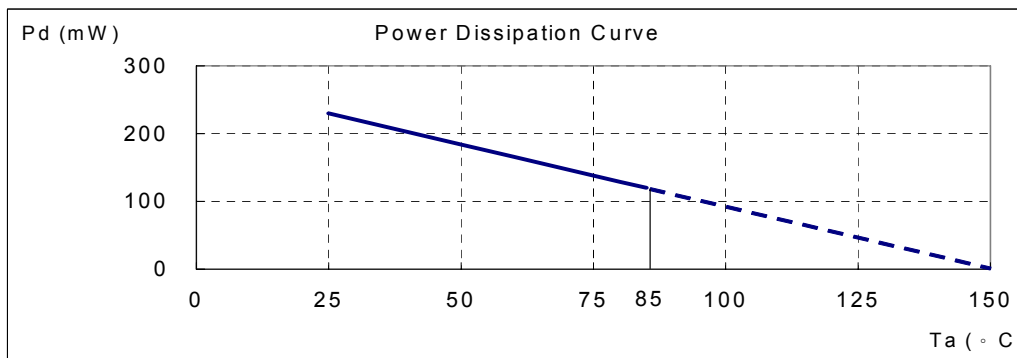
## ■ Performance Characteristics (SIP3)

Ta (°C)	25	50	60	70	80	85	90	95	100
Pd (mW)	550	440	396	352	308	286	264	242	220
Ta (°C)	105	110	115	120	125	130	135	140	150
Pd (mW)	198	176	154	132	110	88	66	44	0



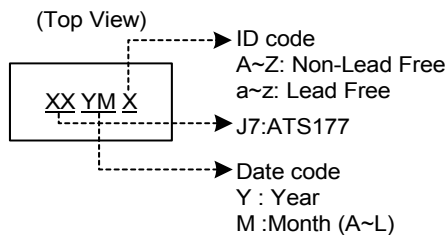
## ■ Performance Characteristics (SOT23-3)

Ta (°C)	25	50	60	70	80	85	90	100	110	120	125	130	140	150
Pd (mW)	230	184	166	147	129	120	110	92	74	55	46	37	18	0

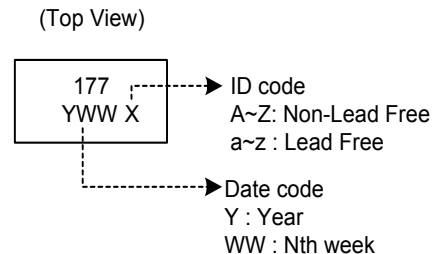


## ■ Marking Information

(1) SOT23



(2) SIP3



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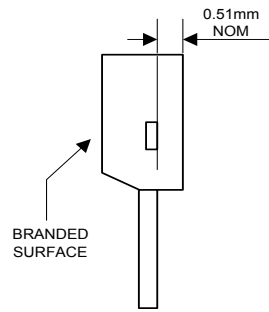


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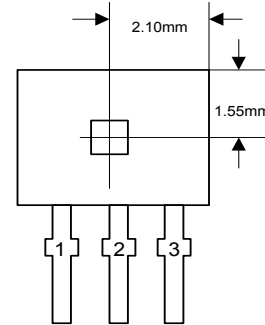
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## ■ Package Information (unit: mm)

(1) Package Type: SIP-3L

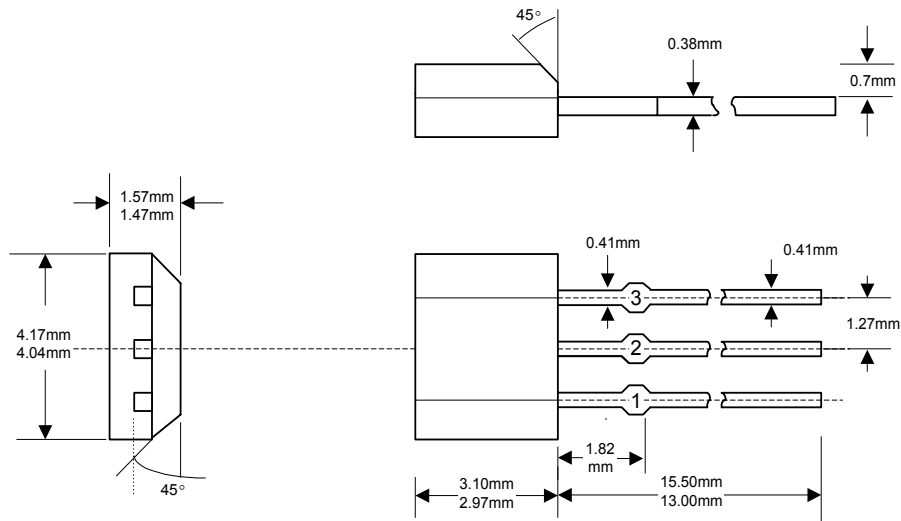


Active Area Depth



Sensor Location

Package Dimension



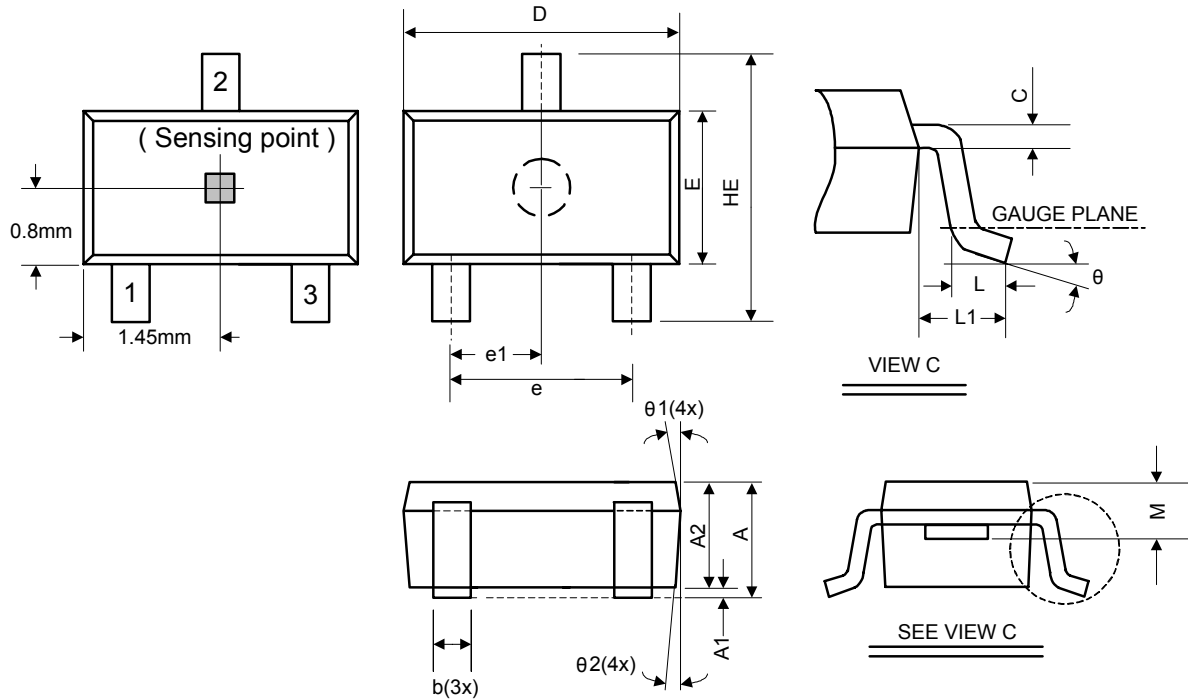
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(2)Package Type: SOT23-3L



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.05	-	1.35	0.041	-	0.053
A1	0.05	-	0.15	0.002	-	0.006
A2	1.00	1.10	1.20	0.039	0.043	0.047
b	0.25	-	0.50	0.010	-	0.020
C	0.08	-	0.20	0.003	-	0.008
D	2.70	2.90	3.00	0.106	0.114	0.118
E	1.50	1.60	1.70	0.059	0.063	0.067
HE	2.60	2.80	3.00	0.102	0.110	0.118
L	0.30	-	0.60	0.012	-	0.024
L1	0.50	0.60	0.70	0.020	0.024	0.028
M	0.73	0.78	0.83	0.029	0.031	0.033
e	1.80	1.90	2.00	0.071	0.075	0.079
e1	0.85	0.95	1.05	0.033	0.037	0.041
theta	0°	5°	10°	0°	5°	10°
theta1	3°	5°	7°	3°	5°	7°
theta2	6°	8°	10°	6°	8°	10°