

Complementary Output Hall Effect Sensor

■ Features

- Bipolar Hall effect sensor
- 4V to 20V operating voltage
- 300mA (avg) output sink current
- Build-in protecting diode only for chip reverse power connecting
- 20°C to 85°C operating temperature
- Low profile 4 pin SIP package

■ Applications

- Dual coils Brush-less DC Motor
- Dual coils Brush-less DC Fan
- Revolution Counting
- Speed Measurement

■ General Descriptions

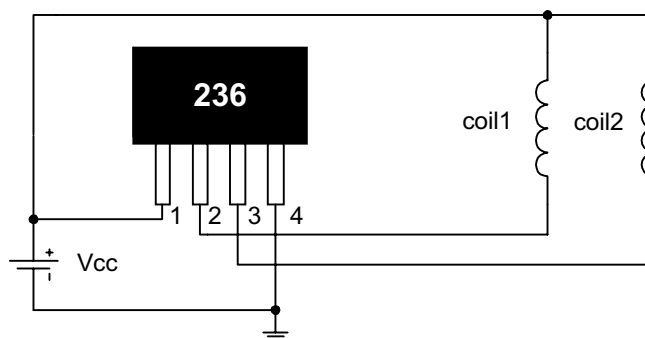
ATS236 is a four terminal Hall effect sensor device with output drivers, mainly designed for electronic commutation of brush-less DC Fan. This IC internally includes the regulator, protecting diode, Hall plate, amplifier, comparator, and a pair of complementary open-collector outputs (**DO**, **DOB**).

While the magnetic flux density (**B**) is larger than operate point (**Bop**), **DO** will turn on (low), and meanwhile **DOB** will turn off (high). Each output is latched until **B** is lower than release point (**Brp**), and then **DO** 、 **DOB** transfer each state.

■ Ordering Information

Number	Bop (max)	Brp (min)	Operating Temp.	Package	Packing
ATS236	150 Gauss	-150 Gauss	-20°C ~ +85°C	SIP4	Bulk

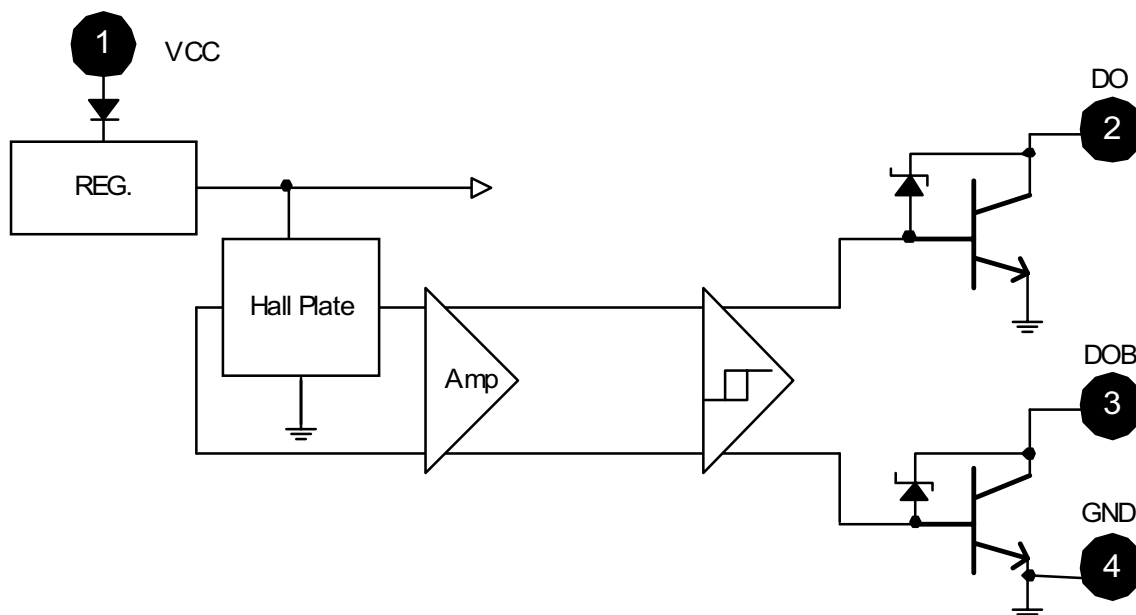
■ Typical Circuit



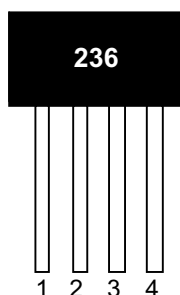
5V/12V Brush-less DC Fan

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■ Block Diagram



■ Pin Assignment



Front View

1 : VCC

2 : DO

3 : DOB

4 : GND

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

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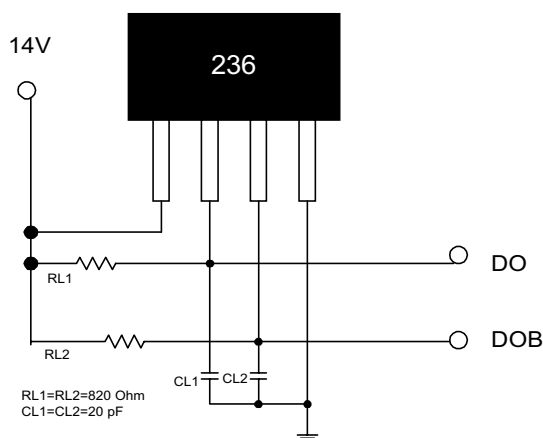
■ Absolute Maximum Ratings (at $T_a=25^{\circ}\text{C}$)

-Supply Voltage, V_{cc} -----	20V
-Reverse V_{cc} Polarity Voltage, V_{RCC} -----	-20V
-Magnetic flux density, B -----	Unlimited
-Output ON Current, I_c -----	
Continuous-----	0.3A
Hold-----	0.4A
Peak (Start Up)-----	0.7A
-Operating Temperature Range, T_a -----	-20°C to +85°C
-Storage Temperature Range, T_s -----	-65°C to +150°C
-Package Power Dissipation, PD -----	500mW
-Maximum Junction Temp, T_j -----	175°C

■ Electrical Characteristics ($T_a = +25^{\circ}\text{C}$ $V_{cc} = 4.0\text{V}$ to 20V)

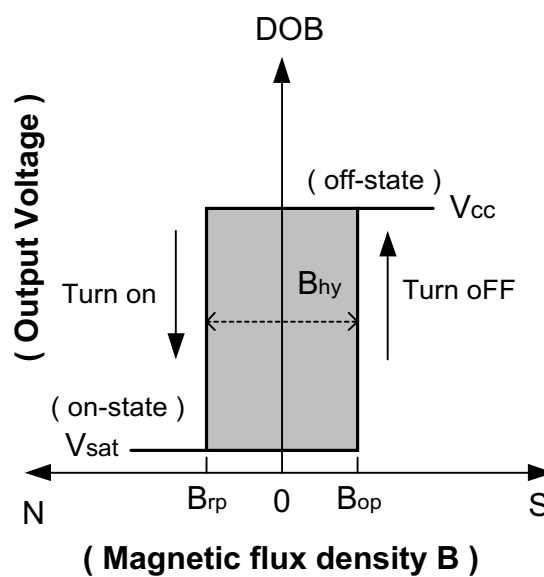
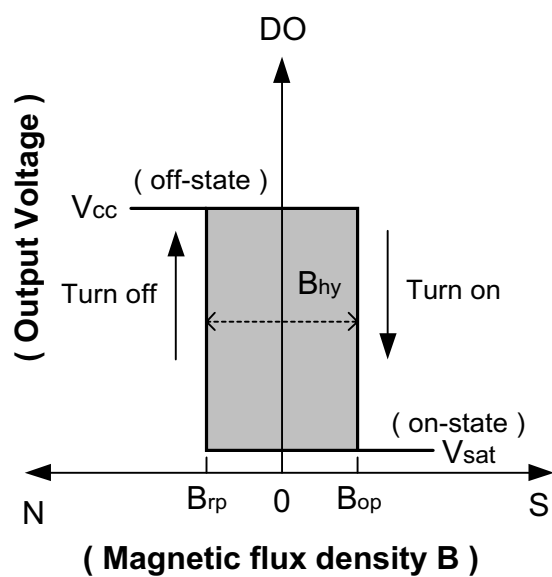
Characteristic	Symbol	Conditions	Min	Typ	Max	Units
Low Supply Voltage	V_{ce}	$V_{cc}=4\text{V}$, $I_L=100\text{mA}$		0.4		V
Supply Voltage	V_{cc}		4		20	V
Output Zener Breakdown	V_z			35		V
Output Saturation Voltage	$V_{ce(sat)}$	$V_{cc}=14\text{V}$, $I_L=300\text{mA}$		0.3	0.7	V
Output Leakage Current	I_{cex}	$V_{ce}=14\text{V}$, $V_{cc}=14\text{V}$		<0.1	10	μA
Supply Current	I_{cc}	$V_{cc}=20\text{V}$, Output Open		16	25	mA
Output Rise Time	t_r	$V_{cc}=14\text{V}$, $R_L=820\Omega$, $C_L=20\text{pF}$		3.0	10	μs
Output Falling Time	t_f	$V_{cc}=14\text{V}$, $R_L=820\Omega$, $C_L=20\text{pF}$		0.3	1.5	μs
Switch Time Differential	Δt	$V_{cc}=14\text{V}$, $R_L=820\Omega$, $C_L=20\text{pF}$		3.0	10	μs

■ Test Circuit



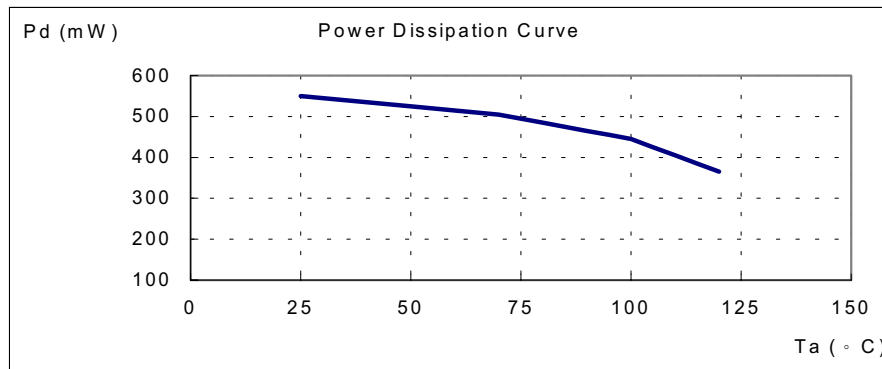
Magnetic Characteristics

Characteristic	Symbol	Ta=-20°C to +85°C		Units
		Min	Max	
Operate Point	Bop	--	150	Gauss
Release Point	Brp	-150	--	
Hysteresis	Bhys	100	200	

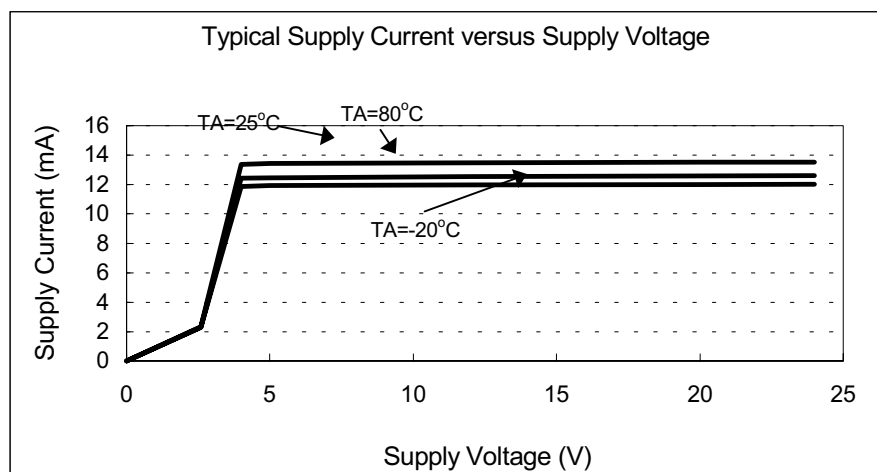
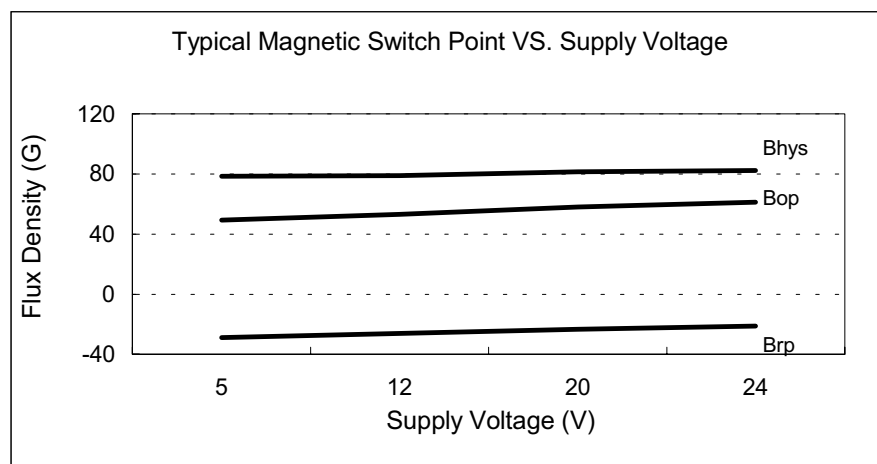


■ Performance Characteristics

Ta (°C)	25	50	60	70	80	85	90	95	100	105	110	115	120
Pd (mW)	550	525	515	505	485	475	465	455	445	425	405	385	365

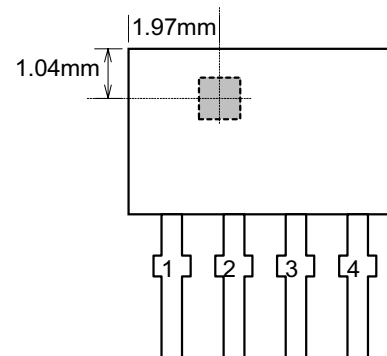


Note : SIP-4L package.



■ Package Information

Package Sensor Location



■ Marking Information

