



Elektronische Bauelemente

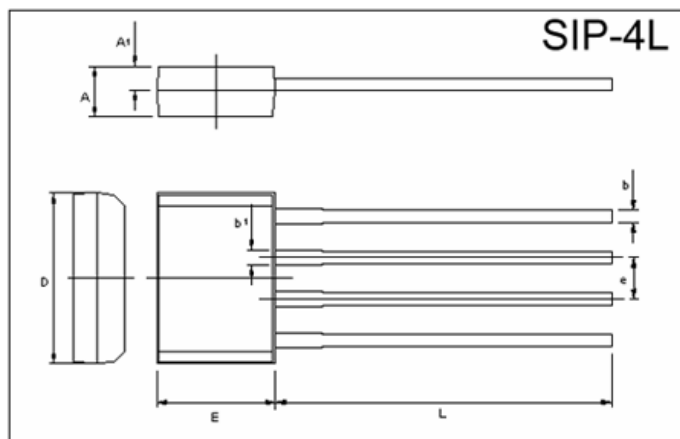
SH236

Complementary Output
Hall Effect Latch Sink Driver IC

RoHS Compliant Product

Description

The SH236 is an integrated Hall effect latched sensor with output pull-high resistor driver designed for electronic commutation of brushless 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 complementary open-collector drivers for sinking large current loads. 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 Bop, DO is turned on (low) and DOB is turned off (high). The output state is held until a magnetic flux density reversal falls below Brp causing DO to be turned off and DOB turned on. SH236 is rated for operation over temperature range from -20°C to 85°C and voltage range from 3.5V to 20V. The devices are available in low cost die forms or rugged 4 pin SIP packages.



Features

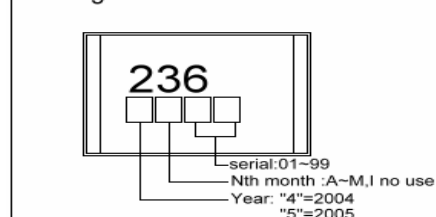
- * High Output Sinking Capability Up To 200mA For Driving Large Load
- * Build In Protection Diode For Chip Reverse Power Connecting
- * On-Chip Hall Sensor IC With Two Different Sensitivity And Hysteresis Settings For SH236
- * Lower Current Change Rate Reduces The Peak Output Voltage During Switching
- * Internal Bandgap Regulator Allows Temperature Compensated Operations And A Wide Operating Voltage Range
- * Package : SIP-4L

REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	1.295	1.803	D	5.105	5.359
A1	0.610		E	3.531	3.785
b	0.330	0.432	L	14	16
b1	0.406	0.508	e	1.27REF	

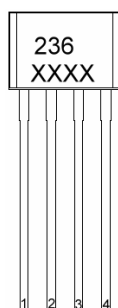
Applications

- * Brushless DC Motor
- * Speed Measurement
- * Revolution Counting
- * Brushless DC Fan

Marking:

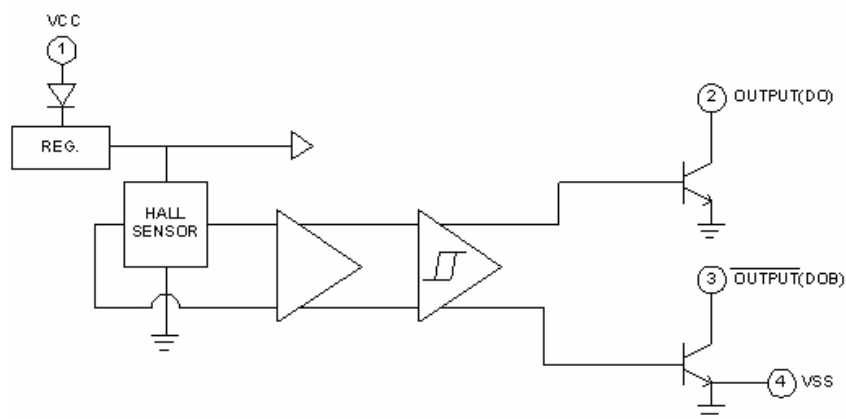


Pin Descriptions



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

Function Block Diagrams



Absolute Maximum Ratings at Ta= 25°C

Parameter		Symbol	Value	Unit
Supply Voltage		V _{CC}	20	V
Reverse V _{CC} Polarity Voltage		V _{RCC}	-35	V
Magnetic Flux Density		B	Unlimited	
Output OFF Voltage		V _{CE}	35	V
Output ON Current	Continuous	I _C	200	mA
	Hold		400	
	Peak (Start UP)		700	
Operating Temperature Range		T _A	-20~85	°C
Storage Temperature Range		T _S	-65~150	°C
Package Power Dissipation		P _D	550	mW
Max. Junction Temperature		T _J	175	°C

Electrical Characteristics (Ta=+25°C, Vcc=4.0V to 20V)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Low Supply Voltage	V _{ce}	V _{CC} =3.5V, I _L =100mA	-	0.4	-	V
Supply Voltage	V _{CC}	-	3.5	-	20	V
Output Saturation Voltage	V _{ce(sat)}	V _{CC} =14V, I _L =300mA	-	0.6	0.9	V
Output Leakage Current	I _{Cex}	V _{ce} =14V, V _{CC} =14V	-	<0.1	10	uA
Supply Current	I _{CC}	V _{CC} =20V, Output Open	-	13	20	mA
Output Rise Time	T _r	V _{CC} =14V, R _L =820Ω, C _L =20pf	-	3.0	10	us
Output Falling Time	T _f	V _{CC} =14V, R _L =820Ω, C _L =20pf	-	0.3	1.5	us
Switch Time Differential	Δt	V _{CC} =14V, R _L =820Ω, C _L =20pf	-	3.0	10	us



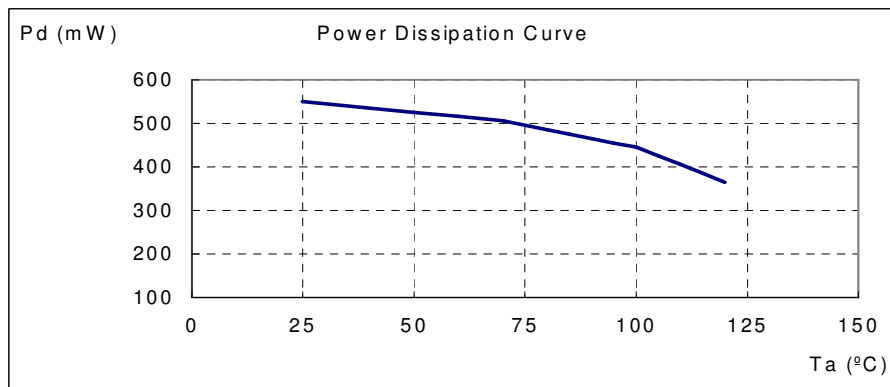
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Power dissipation VS. Environment Temperature

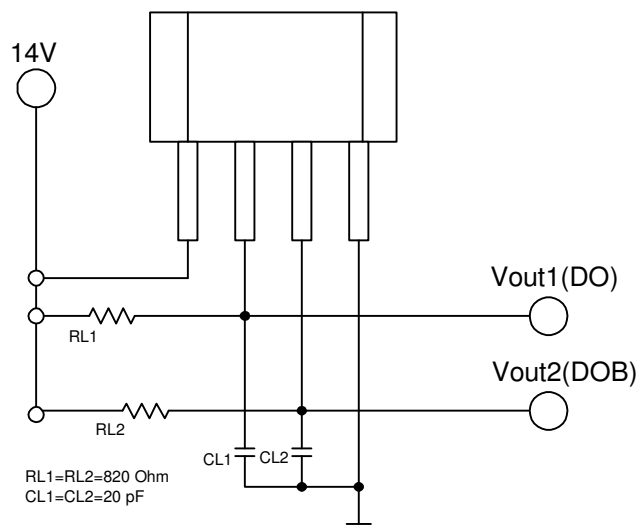
Ta(°C)	25	50	60	70	80	85	90	95	100	105	110	115	120
Pd(mW)	550	525	515	505	485	475	465	455	445	425	405	385	365



Magnetic Characteristics

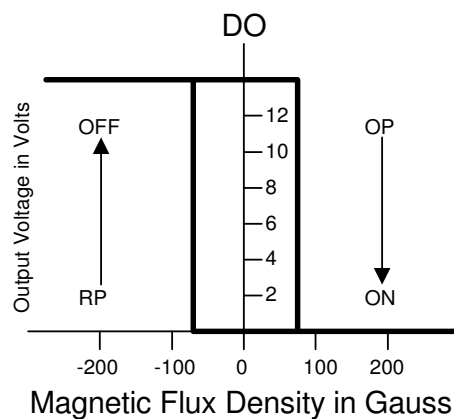
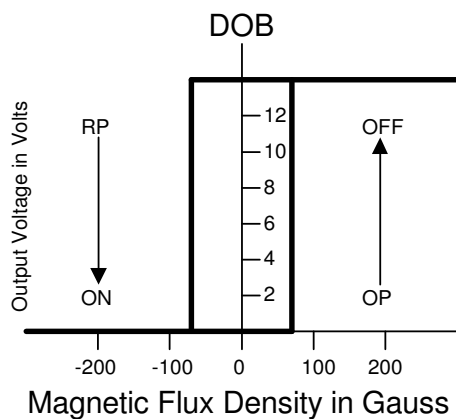
Characteristic		Symbol	Ta=+25°C		Ta=0°C to 70°C		Unit
			Min	Max	Min	Max	
Operate Point	BIN A	Bop	-	70	-	70	Gauss
	BIN B	Bop	-	100	-	100	Gauss
	BIN C	Bop	-	130	-	130	Gauss
Release Point	BIN A	Brp	-70	0	-70	0	Gauss
	BIN B	Brp	-100	-	-100	-	Gauss
	BIN C	Brp	-130	-	-130	-	Gauss
Hysteresis	BIN A	Bhys	40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

Test Circuit

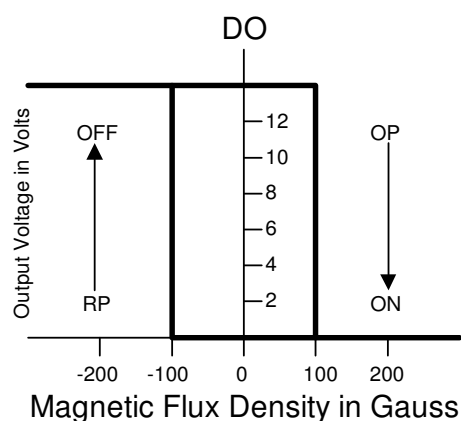
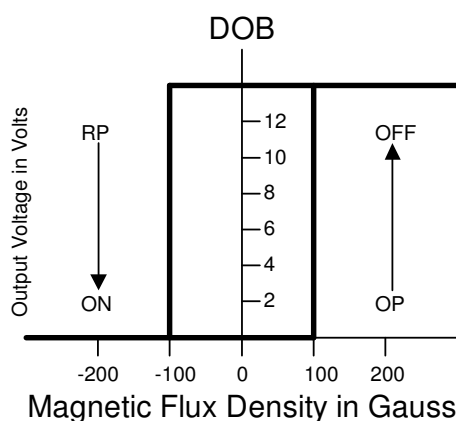


Hysteresis Characteristics

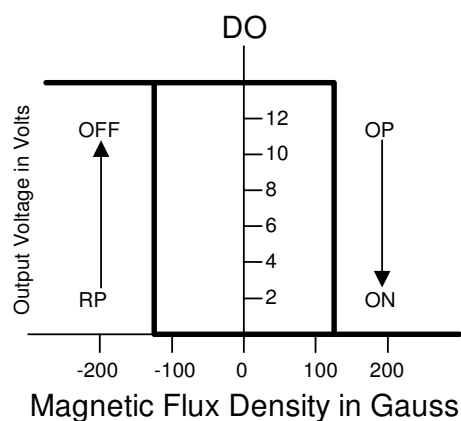
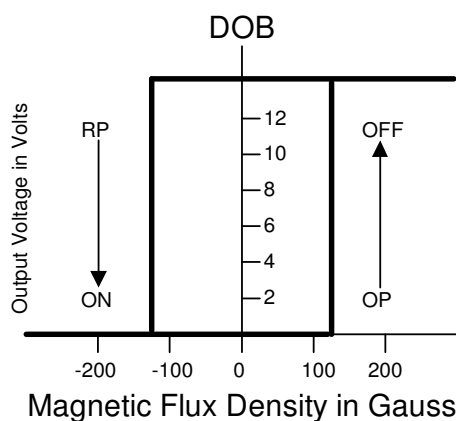
Bin A



Bin B



Bin C





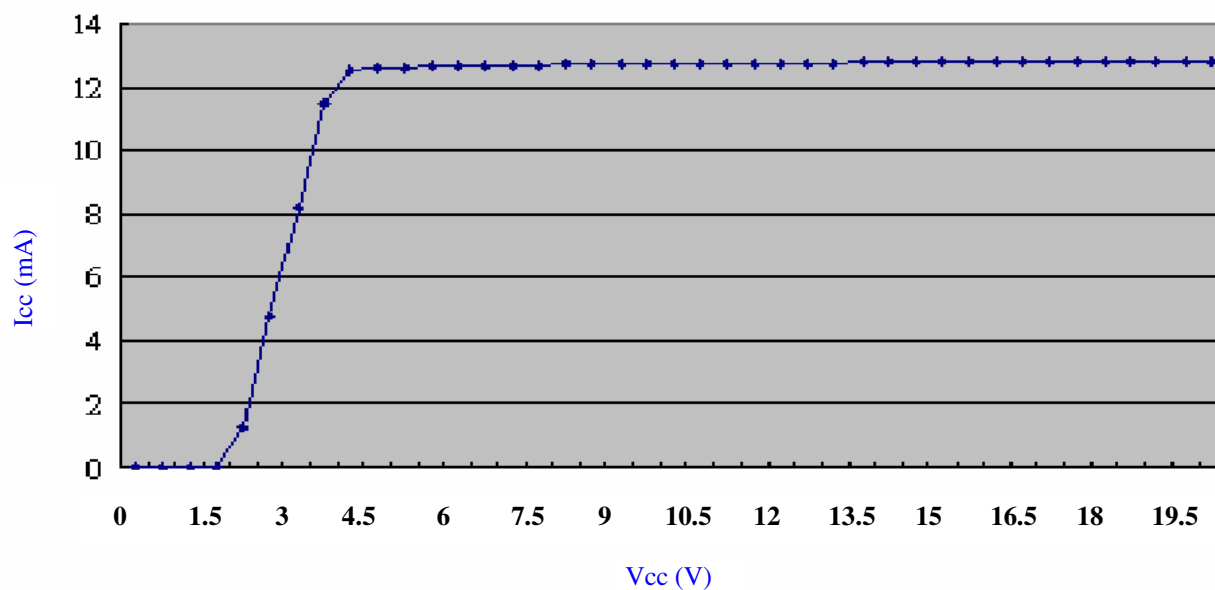
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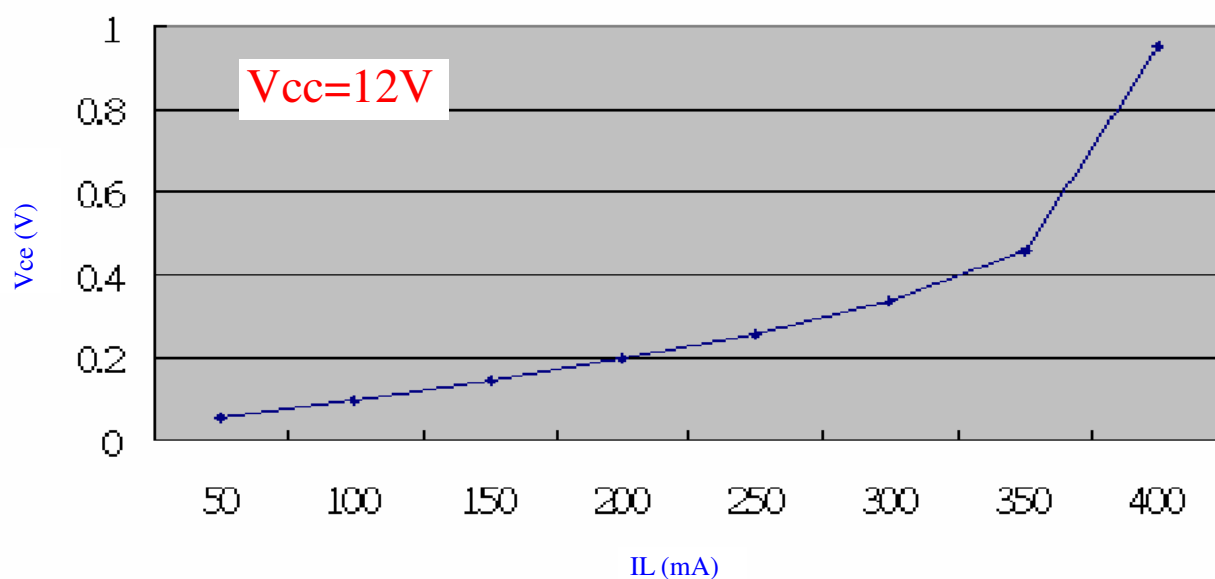
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Electrical Characteristics Curves

Typical Supply Current VS. Supply Voltage

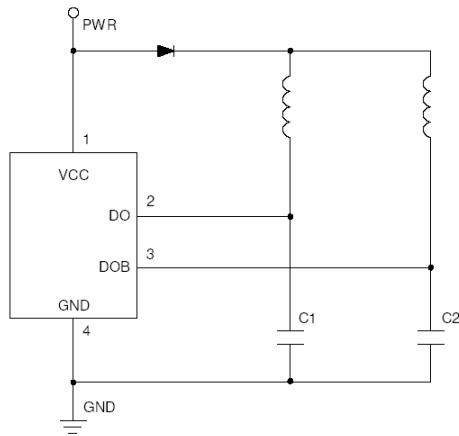


Output Driving Capacity



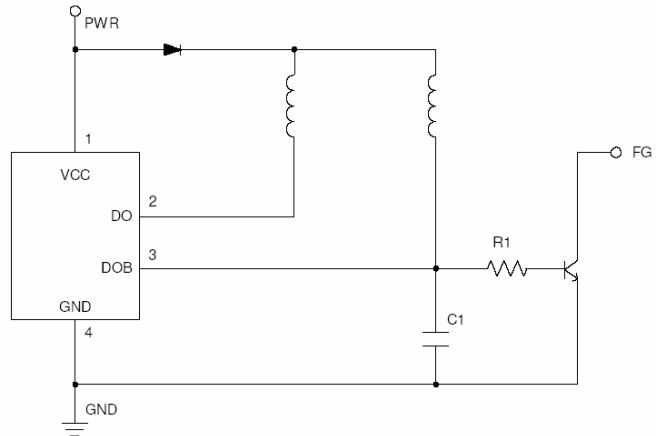
Application Circuit Double Coil

1) Output on current, $I_c > 250\text{mA}$



Remark: C1, C2: Capacitor $2.2\mu\text{F} \sim 4.7\mu\text{F}$ (optional)

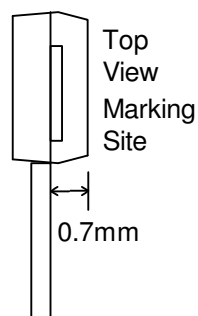
2) With FG output



Remark: C1: Capacitor $0.1\mu\text{F} \sim 1\mu\text{F}$ R1: Resister $1\text{K}\Omega$

Package Information

Active Area Depth



Tolerance: $\pm 0.05\text{mm}$

Package Sensor Location

