

Unipolar Hall Switch - High Sensitivity

◆ Product Description

The G230 is a unipolar hall switch designed in CMOS technology. The IC internally includes a voltage regulator, Hall sensor with dynamic offset cancellation system, Schmitt trigger and an open-drain output driver.

While the magnetic flux density(B) is larger than operate point(Bop),the output will be turned on(low),the output is held until the magnetic flux density(B) is lower than release point(Brp),then turn off.

It has wide operating voltage range and extended choice of temperature range, it is quite suitable for use in automotive, industrial and consumer applications.

◆ Features

- 3.5V to 24V DC Operation Voltage
- CMOS Technology
- Chopper-stabilized amplifier stage
- 25mA Output Sink Current
- Operating Temperature: $-40\sim +125^{\circ}\text{C}$
- High Magnetic Sensitivity:Bhyst=10Gauss(Typ.)
- Lead Free Package: SIP-3L and SC59
(Commonly known as TO-92S and SOT-23-3L in Asia)
- Lead Free Finish/RoHS Compliant

◆ Application

- Rotor Position Sensing
- Current Switch
- Encoder
- RPM Detection
- Proximity detection

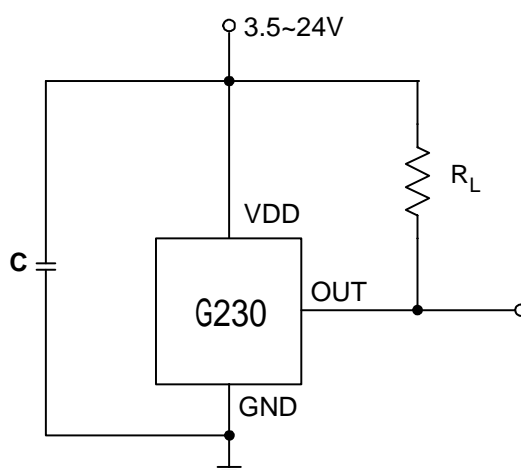


Fig.1 Typical Application Circuit of G230.

◆ Pin Description

Table 1-1 Pin definition and description for SIP-3L(TO-92S)

PIN #	NAME	P/I/O	FUNCTION DESCRIPTION
1	VDD	P	Input Power Supply
2	GND	P	Ground
3	OUT	O	Output Stage of Open Drain

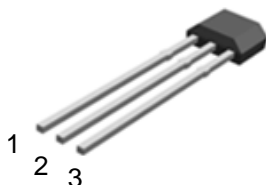
Table 1-2 Pin definition and description for SC59(SOT-23-3L)

PIN #	NAME	P/I/O	FUNCTION DESCRIPTION
1	VDD	P	Input Power Supply
2	OUT	O	Output Stage of Open Drain
3	GND	P	Ground

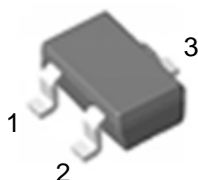
◆ Pin Configuration

(Top View)

SIP-3L(TO-92S)



SC59(SOT-23-3L)





◆ Absolute Maximum Rating (Note 1)

SYMBOL	PARAMETER	RATING
VDD	Supply Voltage	+28VDC
Vout (off)	Voltage externally applied to output	+28VDC max, OFF condition only -0.5 V min., OFF or ON condition
Io (sink)	Output "ON" Current	50 mA
PD	Power Dissipation	450mW(SIP-3L);230mW(SC59)
Top	Operation Temperature Range	-40 to +125 °C
Tst	Storage Temperature Range	-65 to +150 °C
B	Magnetic Flux	No limit.

Note 1: Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.

◆ Electrical Characteristics (TA = 25°C)

SYMBOL	PARAMETER		CONDITIONS	MIN.	TYP.	MAX.	UNIT
VDD	Supply Voltage		Operating	3.5		24	V
VO(SAT)	Output Saturation Voltage		VDD = 12V, OUT "ON", Io = 10mA			300	mV
			VDD = 12V, OUT "ON", Io = 20mA			500	mV
IDD	Supply Current		VDD =3.5~24V, OUT "OFF"		2.0	5.0	mA
ILE	Output Leakage Current (Leakage into sensor output)		Released			10	μA
Tr	Output Switching Time	Rise Time	RL=820Ω, CL=20pF			0.45	μS
Tf		Fall Time	RL=820Ω, CL=20pF			0.45	μS
F _{SW}	Maximum Switching Frequency				10		KHz

◆ Magnetic Characteristics (TA = 25°C, VDD=12V)

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
Bop	Operation Point	15	30	45	Gauss
Brp	Release Point	10	20	30	Gauss
Bhy	Hysteresis	5	10	15	Gauss

◆ Functional Block Diagram

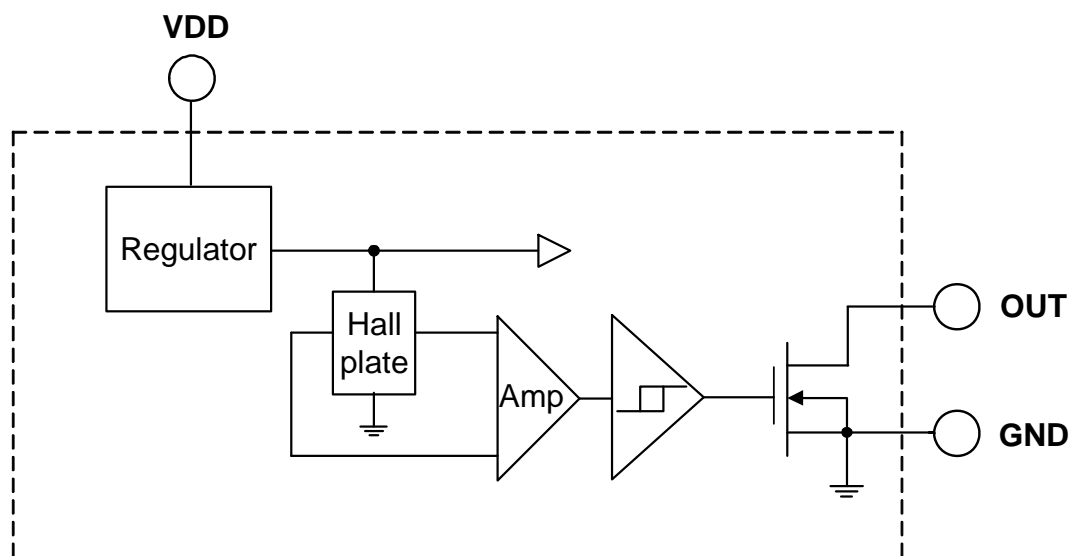
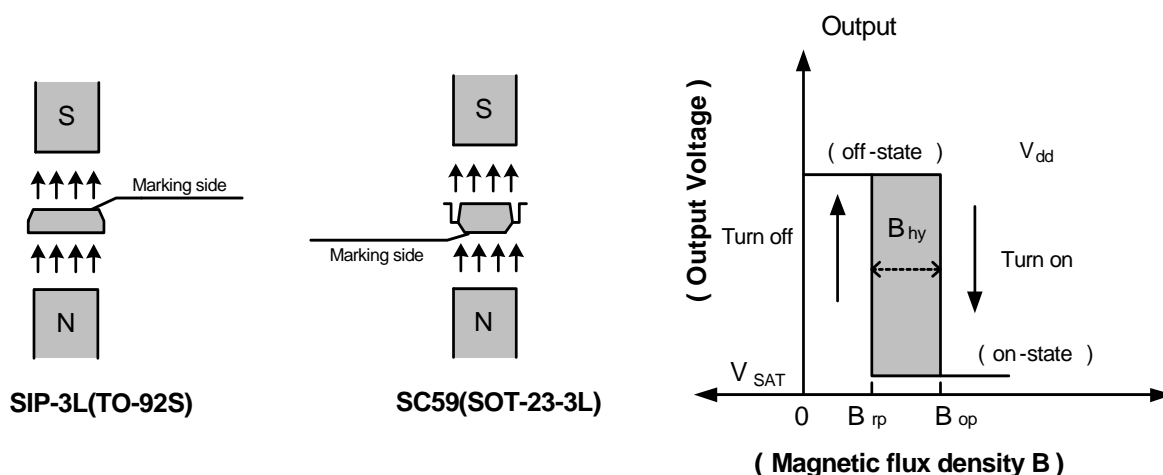


Figure 1. Function Block Diagram of G230

◆ Operating Characteristics



The SC59 package is south pole active; The SIP-3L package is north pole active; Removing the magnetic field ($B=0$) switches the output high.

Table 2: Switching Function

Parameter	Magnetic Field (B)	OUT (SIP-3L/TO-92S)	OUT (SC59/SOT23-3)
South Pole	$B > B_{OP}$	Low	High
Null or Weak Magnetic Field	$B=0$ or $B < B_{RP}$	High	High
North Pole	$B > B_{OP}$	High	Low

◆ Typical Characteristics

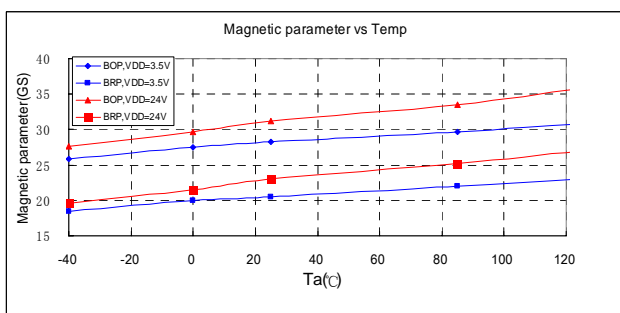


Figure 3-1. Magnetic parameters Vs. Ta

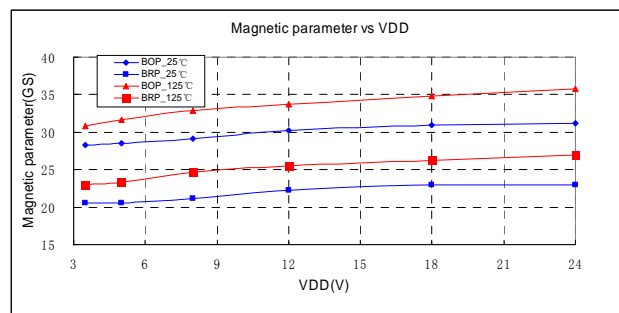


Figure 3-2. Magnetic parameters VS VDD

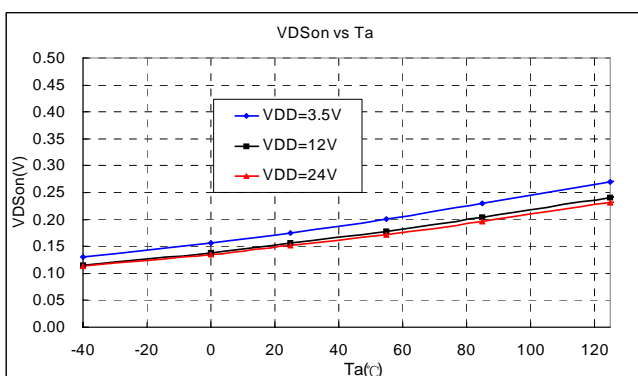


Figure 3-3. VDSon Vs. Ta

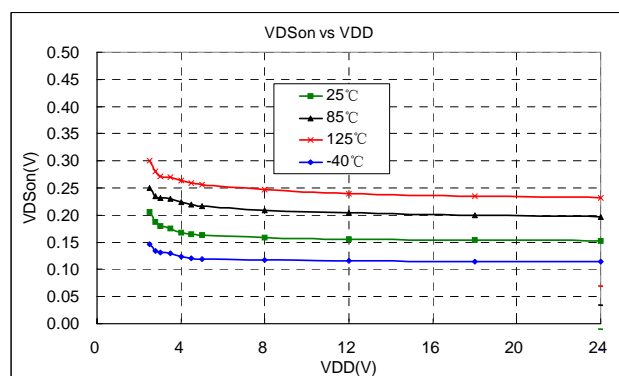


Figure 3-4. VDSon Vs. VDD

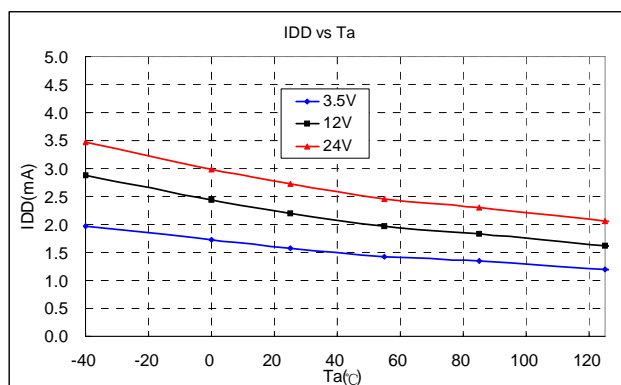


Figure 3-5. IDD Vs. Ta

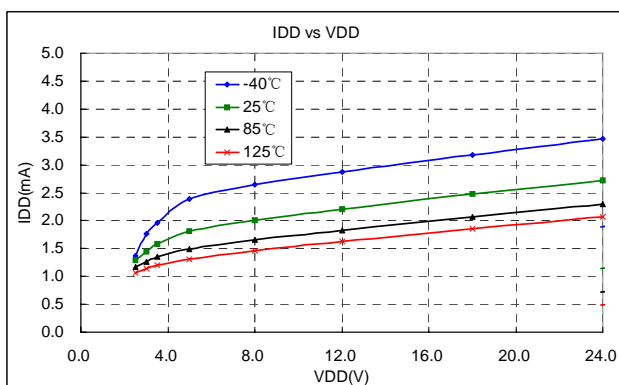


Figure 3-6. IDD Vs. VDD

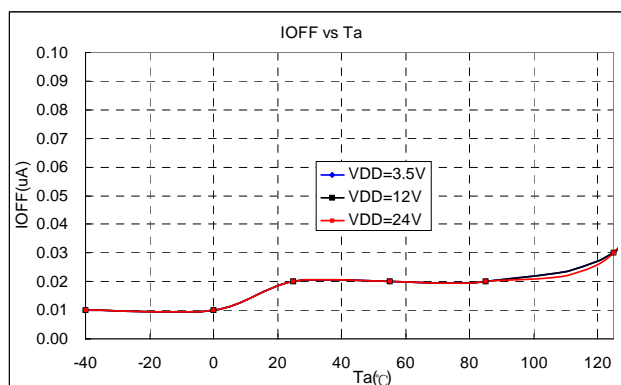


Figure 3-7. IOFF Vs. Ta

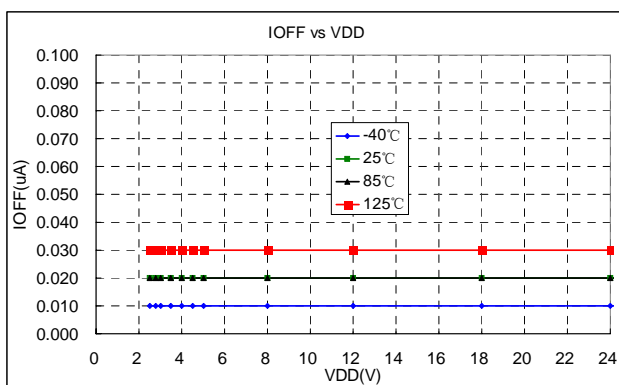


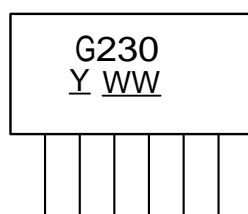
Figure 3-8. IOFF Vs. VDD



◆ Marking Information

(1) SIP-3L(TO-92S)

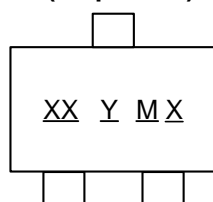
(Top View)



Y : Year : "0" = 2010
 "1" = 2011
WW : Nth Week 01~52

(2) SC59 (SOT-23-3L)

(Top View)



XX : G0 : G230
Y : Year 0~9
M : Month A~L
X : Internal code

◆ Package Information (unit: mm)

(1) Package Type: SIP-3L(TO-92S) for Bulk only

