



High-Sensitive Unipolar Hall Effect Switch CYD9639

Applications

- Automotive brake pedal position detection
- Proximity detection
- Speed measurement
- Weak magnetic field applications
- Solid state switches etc.

Features

- 3.8V to 24V operation voltage
- High accuracy unipolar switch
- Built-in dynamic offset cancellation
- Open drain output
- Low thermal drift of magnetic sensing

Order Information

- CYD9639-PA-T
Package (PA): UA, LH or LT
Temperature (T): A or K

Package Type

P/N: CYD9639-XX-X

TO92-3L (UA)



SOT23-3L (LH)



SOT89-3L (LT)



Absolute Maximum Ratings (T_A=25°C)

Parameter	Symbol	Conditions	Rating	Unit
Maximum supply voltage	V _{DDMAX}		28	V
Allowable power dissipation	P _D	TO-92 (UA)	550*	mW
		SOT-23-3L(LH)	300*	mW
		SOT-89-3L(LT)	500*	mW
Operating temperature	T _A	Suffix 'A'	-40~+150	°C
		Suffix 'K'	-40~+125	°C
Storage temperature	T _S		-55~+150	°C
Maximum output current	I _{OMAX}		50	mA

Electrical Characteristics (T_A=25°C, V_{DD}=12VDC)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Supply voltage	V _{DD}		3.8		24	V
Output sink voltage	V _{OL(ON)}	@ I _{OUT} = 20mA		130	280	mV
Output leakage current	I _{OH}	Output switch off			0.1	µA
Output breakdown voltage	V _{BV}			28	30	V
Supply current	I _{DD}	Output open		4	6	mA

Magnetic Characteristics (T_A=25°C, V_{DD}=12VDC)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Operating point	B _{OP}		-72	-55	-38	G
Release point	B _{RP}		-50	-35	-20	G
Hysteresis	B _{HYS}		15	20	27	G

Magnetic Characteristics (T_A=-40°C~+150°C, V_{DD}=12VDC)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Operating point	B _{OP}		-77		-34	G
Release point	B _{RP}		-54		-18	G
Hysteresis	B _{HYS}		10		28	G



General Specifications

The CYD9639 is a high sensitive unipolar Hall Effect switch IC. The built-in dynamic offset cancellation and temperature compensation of pre-amplifier stage achieves accuracy magnetic sensing. The supply voltage range is from 3.8V to 24VDC and the maximum output current is 50mA.

This Hall Effect switch IC integrates a Hall plate, pre-amplifier with dynamic offset cancellation, hysteresis comparator and protection circuit in single chip. The architecture block diagram is shown in Fig. 1.

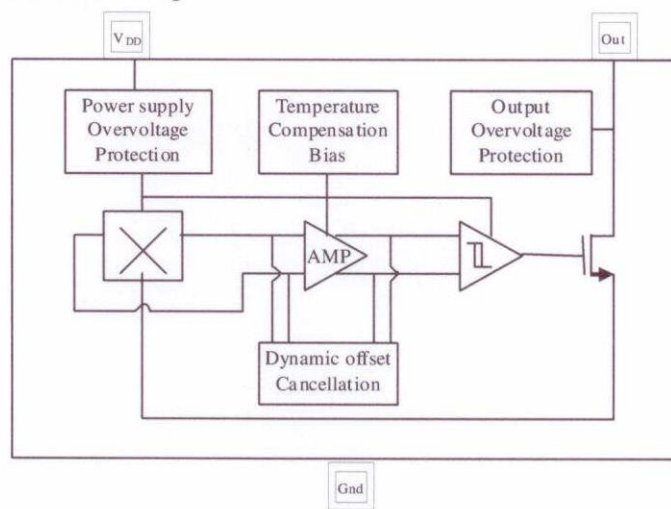
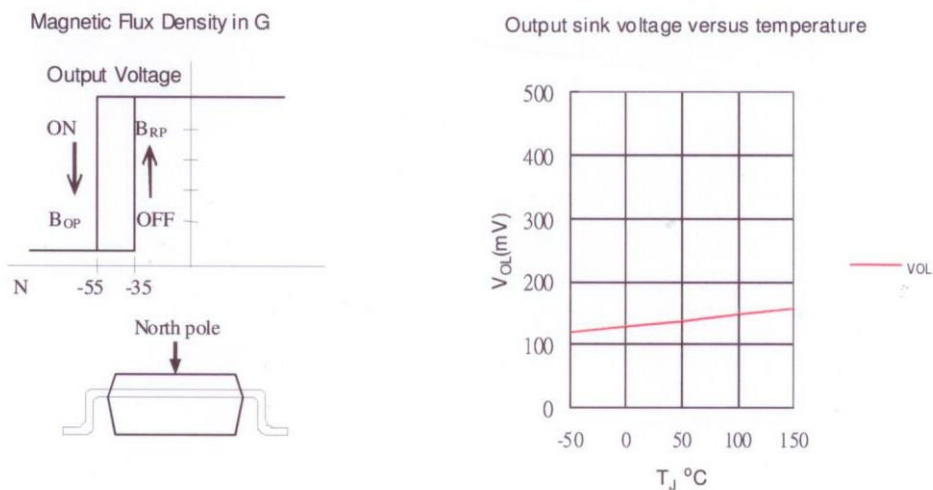
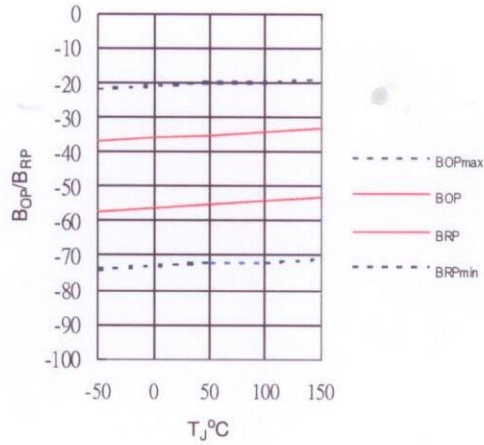


Fig. 1. Functional diagram

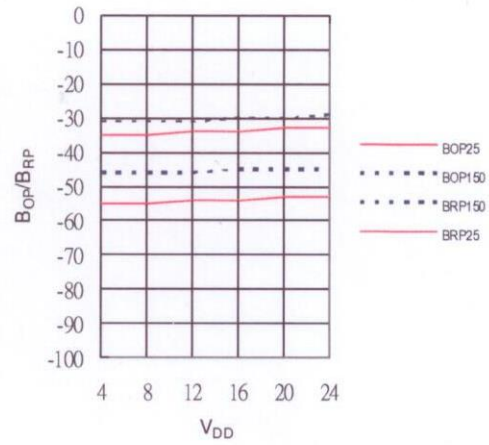




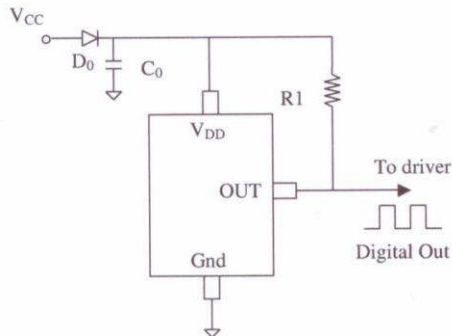
B_{OP} , B_{RP} versus temperature



B_{OP} , B_{RP} versus supply voltage



Application Circuit

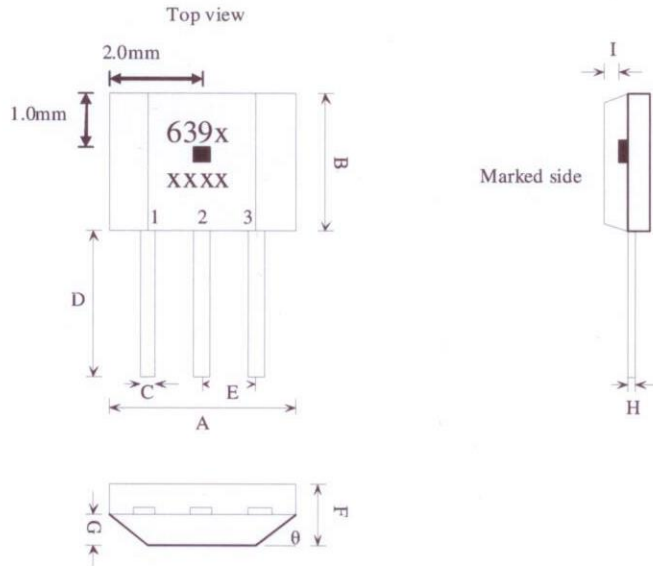


NOTE:

- D_0 : general diode
- C_0 : decoupling capacitor $1\mu F$ (recommended)
- R_1 : $1k\sim 10k\ \Omega$



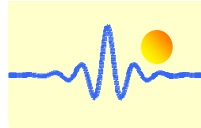
Package Outline
TO-92(UA)



Marking:
Part Number : 639 Temperature code : x
Date Code : xx(Year) xx(Week)

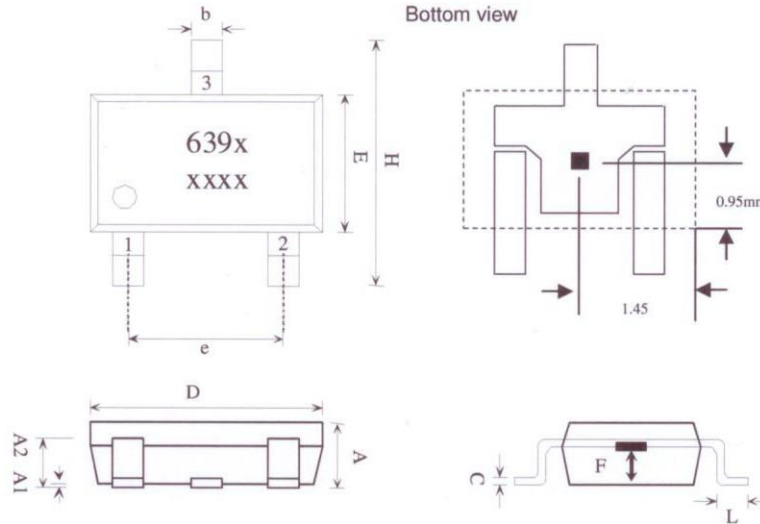
1. VDD/DC power supply
2. GND/DC ground
3. OUT/output pin

SYMBOLS	DIMENSIONS IN MILLIMETERS(mm)		
	MIN	NOM	MAX
A	3.80	4.00	4.20
B	2.90	3.10	3.30
C	0.38	0.45	0.52
D	15.10	15.30	15.50
E	1.24	1.27	1.30
F	1.45	1.50	1.55
G	0.68	0.73	0.78
H	0.36	0.43	0.50
I	0.41	0.43	0.45
θ		45°	



Package Outline
SOT-23(LH)

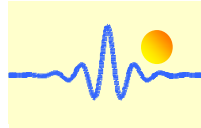
Sensor Location



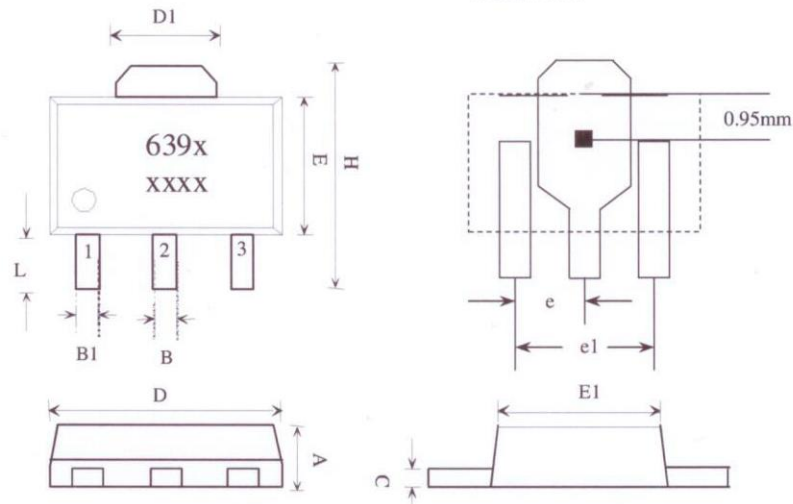
Marking:
Part Number : 639 Temperature code : x
Date Code : xx(Year) xx(Week)

1. VDD/DC power supply
2. OUT/output pin
3. GND/DC ground

SYMBOLS	DIMENSIONS IN MILLIMETERS(mm)		
	MIN	NOM	MAX
A	1.00	1.10	1.30
A1	0.00	-	0.10
A2	0.70	0.80	0.90
b	0.35	0.40	0.50
C	0.10	0.15	0.25
D	2.70	2.90	3.10
E	1.40	1.80	2.00
F	0.35	0.50	0.65
H	2.60	2.8	3.00
e	1.7	1.9	2.1
L	0.20	-	-



Package Outline
SOT-89(LT)



Marking:
Part Number : 639 Temperature code : x
Date Code : xx(Year) xx(Week)

- 1. VDD/DC power supply
- 2. GND/DC ground
- 3. OUT/output pin

SYMBOLS	DIMENSIONS IN MILLIMETERS(mm)		
	MIN	NOM	MAX
A	1.40	1.50	1.60
B	0.44	0.50	0.56
B1	0.36	0.42	0.48
C	0.35	0.40	0.44
D	4.40	4.50	4.60
D1	1.52	1.67	1.83
E	2.30	2.45	2.60
E1	2.13	2.21	2.29
e	-	1.50	-
e1	-	3.00	-
H	3.94	4.10	4.25
L	0.89	1.05	1.20