

General Purpose Unipolar Hall Effect Switch CYD9821A

Applications

- VCD/DVD loader, CD/DVD-Rom
- Cover detector
- Speed Measurement
- Home applications
- Home safety etc.

Features

- 2.5V to 18V operation voltage
- Built-in dynamic offset cancellation
- Small size
- High balance and low thermal drift of magnetic sensing

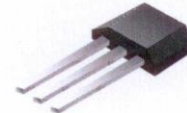
Order Information

- CYD9821A-PA
Package(PA): UA or LH or LT

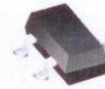
Package Type

P/N: CYD9821A-xx

TO92-3L (UA)



SOT23-3L (LH)



SOT89-3L (LT)



Specifications

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$)

Parameter	Symbol	Conditions	Rating	Unit
Maximum supply voltage	V_{DDMAX}		18	V
Allowable power dissipation	P_D	TO-92(UA)	550*	mW
		SOT-23(LH)	300*	
		SOT-89(LT)	500*	
Operating temperature	T_A		-40~+125	$^{\circ}\text{C}$
Storage temperature	T_S		-55~+150	$^{\circ}\text{C}$
Maximum output current	I_{OMAX}		25	mA

* On 50mm x 50 mm x 1.6mm glass epoxy board

Electrical Characteristics ($T_A=25^{\circ}\text{C}$, $V_{DD}=12\text{VDC}$)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Supply voltage	V_{DD}		2.5		18	V
Supply voltage	V_{DD}	$R_{DD} \geq 200\Omega$	2.5		26	V
Supply current through protection device	I_{DD}	$R_{DD} \geq 200\Omega$			50	mA
Output sink voltage	$V_{DS(ON)}$	@ $I_{OUT} = 20\text{mA}$		0.3	0.5	V
Output breakdown voltage	V_{BV}			22	30	V
Supply current	I_{DD}	Output open		6	10	mA



Magnetic Characteristics ($T_A=25^\circ\text{C}$, $V_{DD}=12\text{VDC}$)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Operating point	B_{OP}		90	105	120	G
Release point	B_{RP}		55	85	110	G
Hysteresis	B_{HYS}		10	20	35	G

General Specifications

The CYD9821A is designed for magnetic actuating using a unipolar magnetic field. The built-in dynamic offset cancellation of pre-amplifier stage achieves optimal symmetrical magnetic sensing. The supply voltage range is from 2.5V to 18V and the maximum output current is 25mA. This Hall Effect switch IC integrates the sensor, pre-amplifier with dynamic offset cancellation and hysteresis comparator in single chip. The architecture block diagram is shown in Fig. 1.

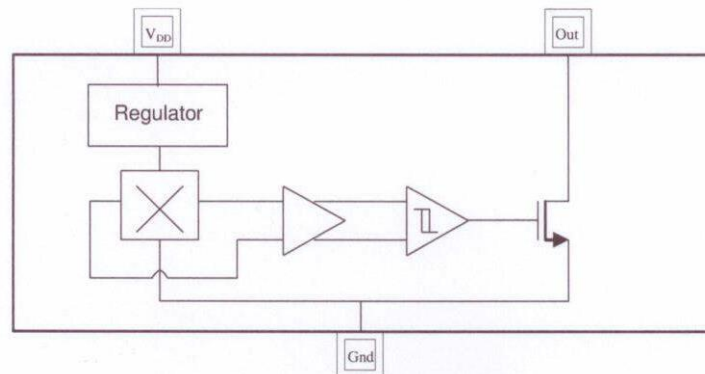
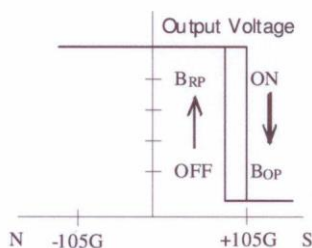
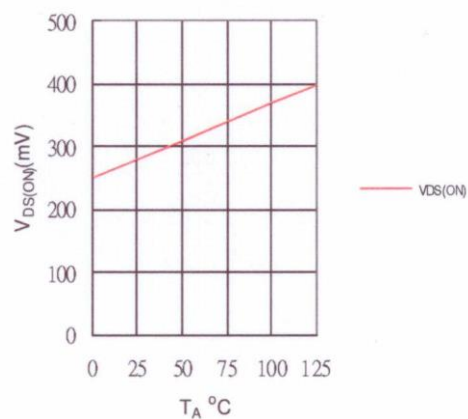


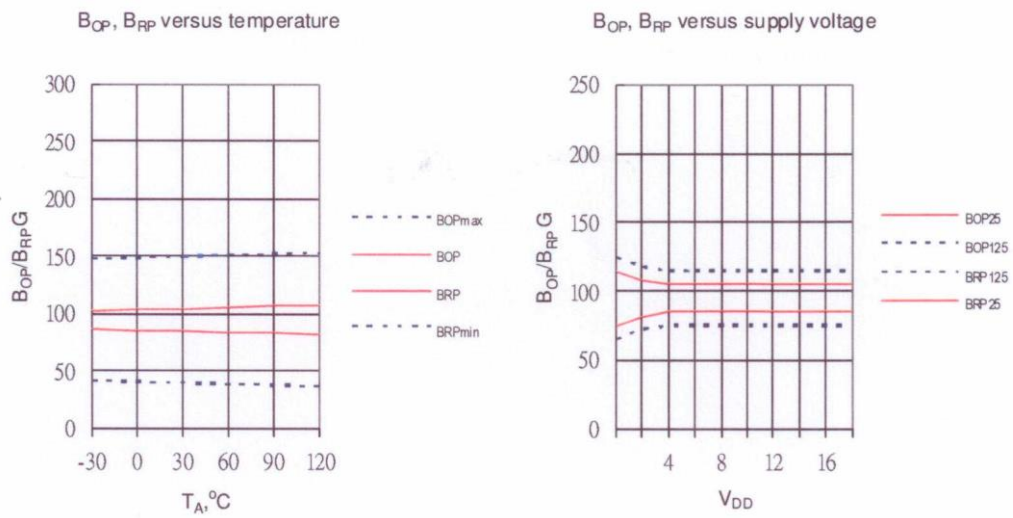
Fig. 1. Functional diagram

Magnetic Flux Density in Gauss

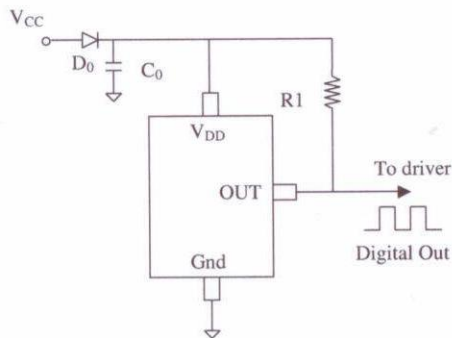


Output sink voltage versus temperature



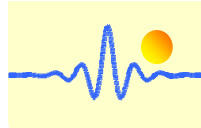


Application Circuit

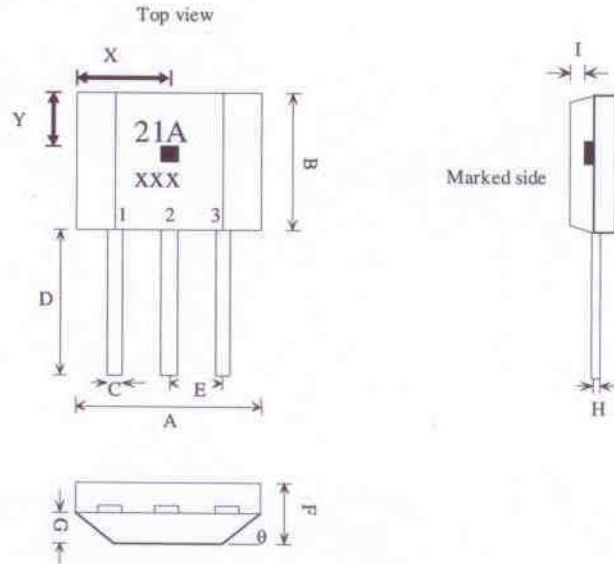


NOTE:

- D0: general diode
- C0: decoupling capacitor 1μF (recommended)
- R1: 1k~10k Ω



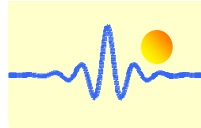
**Package Outline
TO-92(UA)**



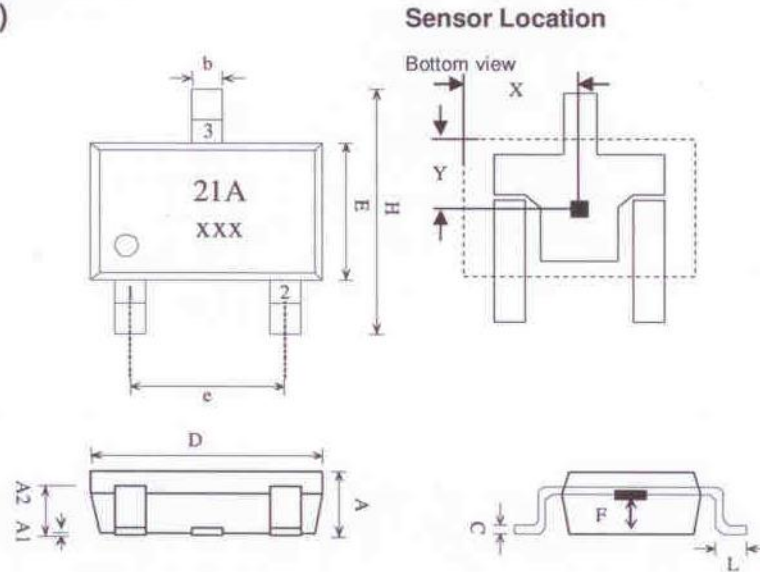
Marking:
Part Number : 21A
Date Code : x(Year) xx(Week)

- 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°	
Sensor Location			
X	1.85	2.0	2.15
Y	0.85	1.0	1.15



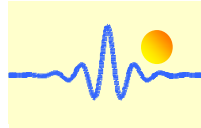
Package Outline
SOT-23(LH)



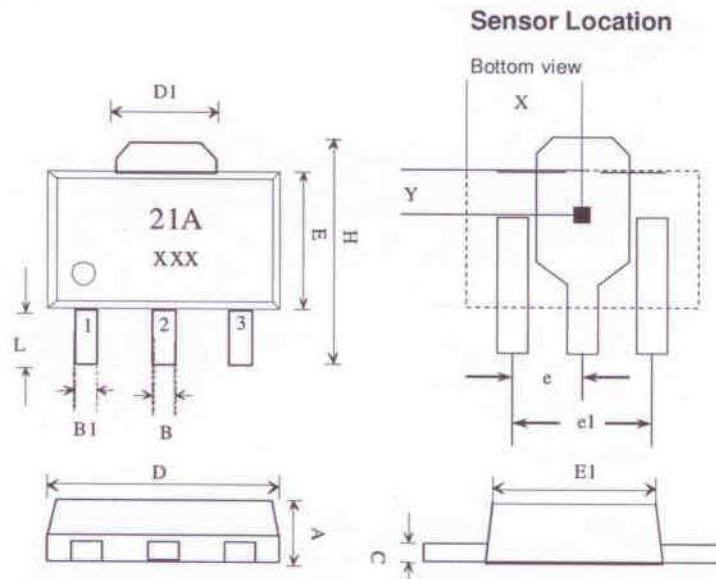
Marking:
Part Number : 21A
Date Code : x(Year) xx(Week)

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	-	-
Sensor Location			
X	1.3	1.45	1.6
Y	0.7	0.85	1.0



Package Outline
SOT-89(LT)



Marking:
Part Number : 21A
Date Code : x(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
Sensor Location			
X	2.1	2.25	2.4
Y	0.8	0.95	1.1