

CC6121

Orthogonal Dual Output, Low Temperature Drift Bipolar Latch type Hall effect switch

General Description

CC6121 is a Hall-effect latch with dual output, which has integrated two independent channel Hall devices and signal processing circuits. The two Hall devices have a fixed relative position with an error accuracy of 0.5 μ m, it solves the consistency problem of fine pitch detectors in mass production.

CC6121 based on BiCOMS process, and each channel contains a voltage regulator, a Hall-voltage generator, a small-signal amplifier, chopper stabilization, a Schmitt trigger, and a short-circuit protected output. CC6121 adopts technology of dynamic offset elimination and temperature compensation to greatly reduce offset voltage caused by package stress, environmental temperature change and other factors, so that the magnetic sensitivity is highly consistent, with excellent temperature stability and high mechanical stress resistance. The distance between the two Hall devices is 1.56mm, and the use of appropriate customized magnetic rings can ensure that the two outputs are orthogonal, which is suitable for the detection system in automotive and industrial fields with strict environmental requirements.

CC6105 is available in TO-94 package . Comply with RoHS standard.

The operating temperature range is -40~150 $^{\circ}$ C.

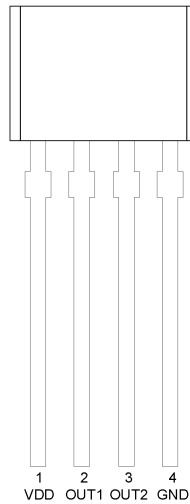
Features

- ◆ Operation Voltage Range: 2.8~28V
- ◆ Dual highly matched Hall switch
- ◆ Reverse Supply Voltage Protection: up to - 40V
- ◆ It has chopping stability function and good consistency between batches
- ◆ Over-voltage protection (36V) to avoid IC damage due to power supply voltage pulse
- ◆ Superior Temperature Stability (up to 150 $^{\circ}$ C)
- ◆ Output Short-circuit Protection (30mA)
- ◆ Over-voltage protection of output stage(36V) to avoid breakdown of output pin by interference voltage
- ◆ Small Package Size: TO-94 Package
- ◆ Strong resistance to mechanical stress
- ◆ ESD HBM 4000V

Application

- ◆ Rotor position detection
- ◆ Current commutation
- ◆ Encoder
- ◆ BLDC Motor Commutation
- ◆ Tachometer
- ◆ Speed and direction measurement

PIN Configurations



Pin Name	Number(TO-94)	Function
VDD	1	Supply Voltage
OUT1	2	Output1
OUT2	3	Output2
GND	4	Ground

Absolute Maximum Ratings

Parameter	symbol	value	unit
Supply Voltage	VDD	30	V
Reverse Voltage	V_{RDD}	-40	V
Continuous Output Current	I_{OUT}	30	mA
withstand voltage (Output pin)	V_{OUT}	30	V
Magnetic Flux Density	B	Unlimited	Gauss
Operating Temperature	T_A	-40~150	°C
Storage Temperature	T_s	-50~160	°C
ESD(HBM)		4000	V

Note: Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute-maximum rated conditions for extended periods may degrade device reliability.

Electrical Parameters

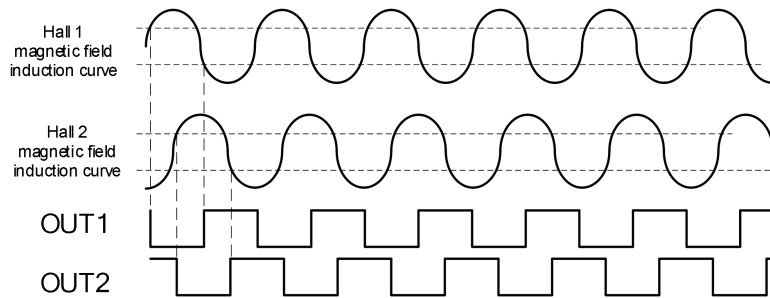
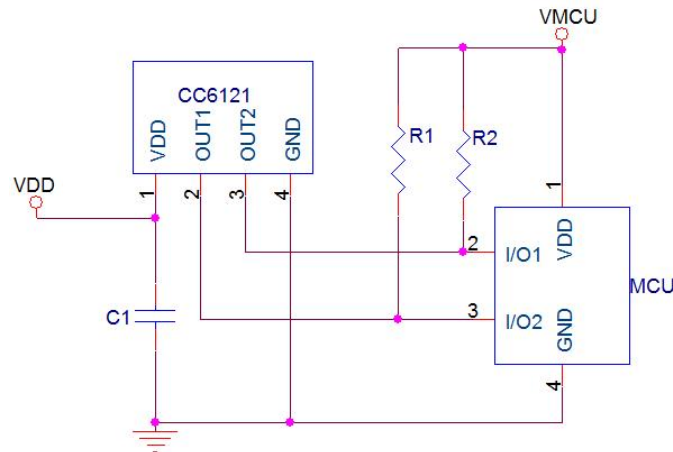
Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Supply Voltage	VDD	-	2.8	-	28.0	V
Supply Current	I_{DD}	25°C, VDD=12V	-	4	-	mA
Output V_{SAT} (sink)	V_{SAT}	25°C, $I_{OUT}=20mA$	-	-	0.4	V
Output Current Limit	I_{limit}		30	-	60	mA
Output Rise Time	t_r	$R_L=820\Omega$, $C_L=20pF$	-	0.2	-	us
Output Fall Time	t_f	$R_L=820\Omega$, $C_L=20pF$	-	0.1	-	us
Reverse Current	I_{RDD}	VDD=-40V	-	-	5	mA

Magnetic Specifications

Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Operate Point	B _{OP}	T _A =25°C	15	30	45	Gauss
Release Point	B _{RP}	T _A =25°C	-45	-30	-15	Gauss
Hysteresis	B _{HYS}	T _A =25°C	50	60	70	Gauss

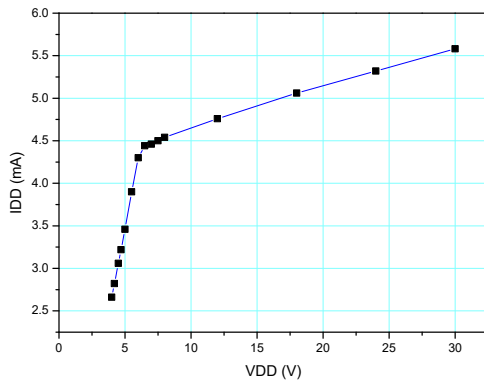
Note: 1mT=10Gauss

Typical Application Circuit

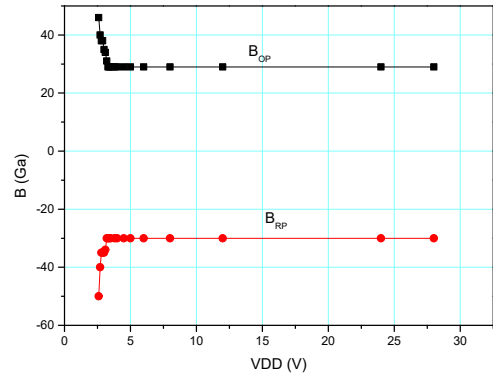


Magnetic field induction of Hall device vs. Output

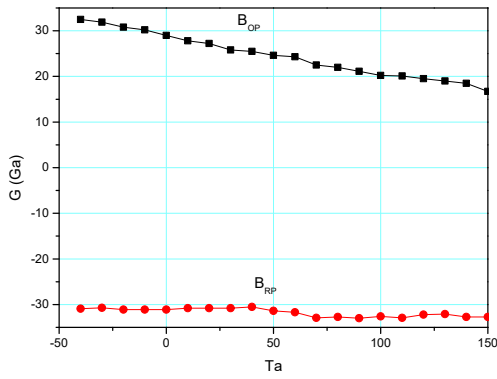
Waveform



IDD vs. VDD



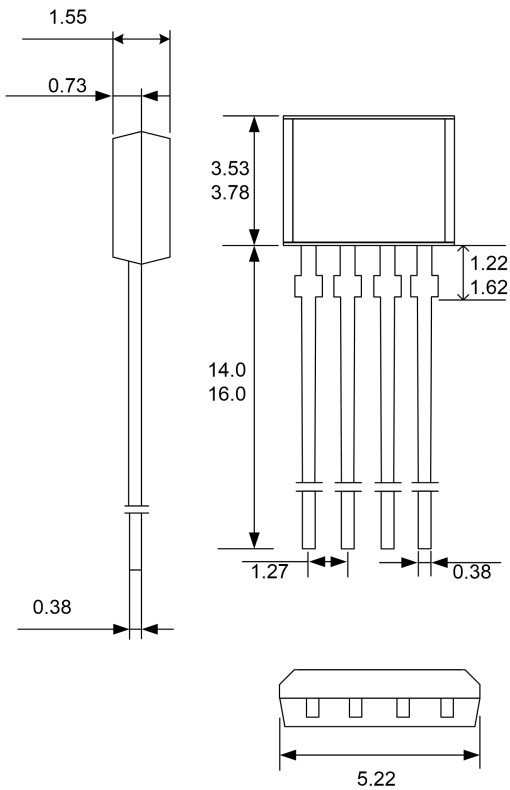
B vs. VDD



B vs. Ta

Package Information

TO-94 Package



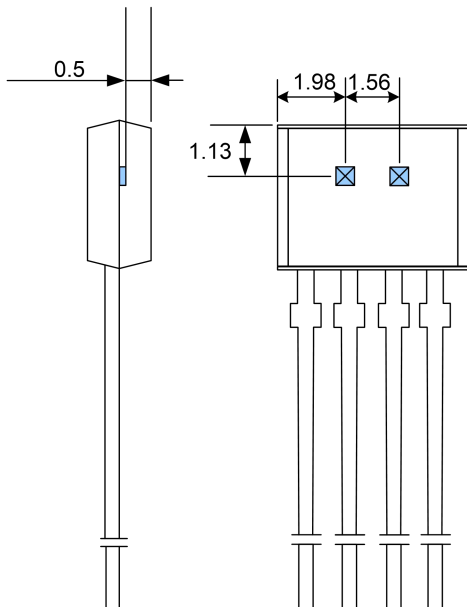
Notes:

1. All dimensions are in millimeters
2. In order to maintain the reliability, it is suggested that the pin length should be greater than 2.5mm.

Marking:

- 1st Line: CC6121 - Name of the device
 2nd Line: XXYYWW
 XX – assembler code
 YY - assembly year (last 2 digits)
 WW - assembly week number

Hall Location



Notes:

- All dimensions are in millimeters

CrossChip

CrossChip Microsystems Inc. was founded in 2013, is a national high-tech enterprise, engaged in integrated circuit design and sales. The company has strong technical strength, has more than 50 kinds of patents, mainly used in Hall sensor signal processing, with the following product lines:

- ✓ High precision linear Hall sensor
- ✓ All kinds of Hall switches
- ✓ Single phase motor drive
- ✓ Single chip current sensor
- ✓ AMR Magnetoresistance sensor

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