

## CC6105

### High voltage, High Precision

### Hall Effect Latch

#### General Description

CC6105 Hall effect latches IC is extremely temperature-stable and stress-resistant sensors, especially suited for operation over extended temperature ranges (up to 150°C). Superior high-temperature performance is made possible through Dynamic Offset Cancellation and patent pending temperature compensation circuit, which reduces the residual offset voltage normally caused by device package over molding, temperature dependencies and thermal stresses.

CC6105 includes a voltage regulator, a Hall-voltage generator, a small-signal amplifier, chopper stabilization, a Schmitt trigger, and a short-circuit protected output. A south polarity magnetic field of sufficient strength is required to turn the output on (CC6105TO). A north polarity field of sufficient strength is necessary to turn the output off (CC6105TO). Internal regulator permits operation with supply voltage in the range of 4~36V.

CC6105 is available in TO-92S package and SOT23-3 package. Comply with RoHS standard.

The operating temperature range is -40~150°C.

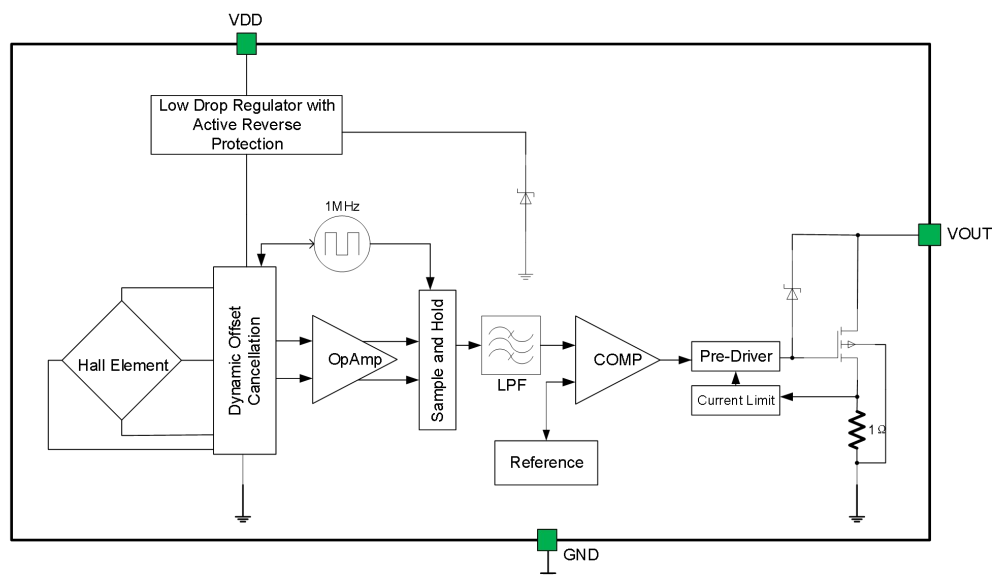
#### Features

- ◆ Symmetric Switch Point
- ◆ Operation Voltage Range: 4~36V
- ◆ Reverse Supply Voltage Protection:-80V
- ◆ Superior Temperature Stability (up to 150°C)
- ◆ Output Short-circuit Protection (20mA)
- ◆ It has chopping stability function and good consistency between batches
- ◆ Small Package Size, TO-92S package and SOT23-3 package
- ◆ Strong resistance to mechanical stress
- ◆ ESD HBM 2000V

#### Application

- ◆ BLDC Motor Commutation
- ◆ Speed Detection
- ◆ Linear Position Detection
- ◆ Angular Position Detection

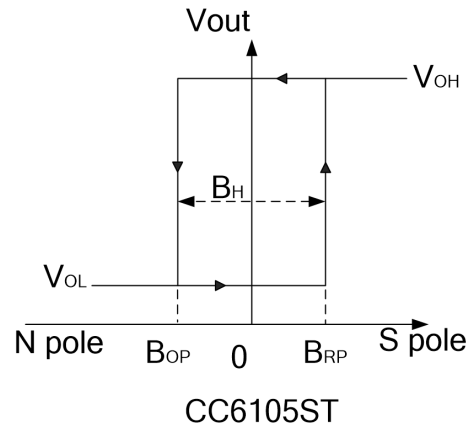
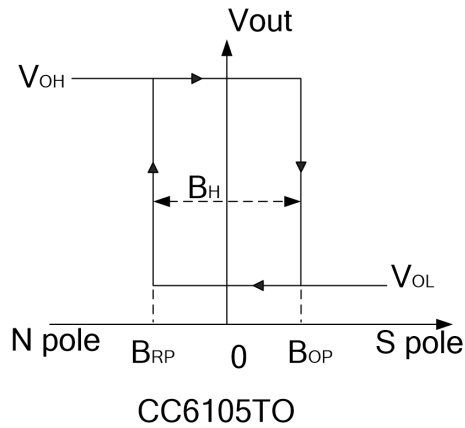
#### Function Block Diagram



## Ordering Information

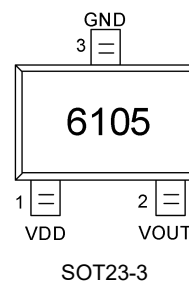
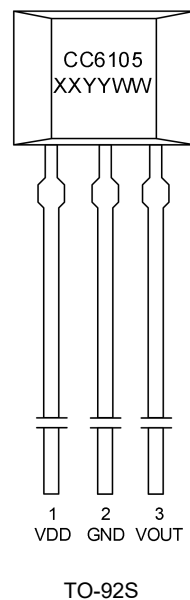
Part No.	Packing Form	Package Code
CC6105TO	bulk, 1000 pcs/bulk	TO-92S
CC6105ST	tape reel, 3000 pcs/reel	SOT23-3

## Output vs. Pole



**Note:** the magnetic pole is applied to the silk screen printing surface of the chip

## PIN Configurations



Pin Name	Number(TO-92S)	Number(SOT23-3)	Function
VDD	1	1	Supply Voltage
GND	2	3	Ground
VOUT	3	2	Output

## Absolute Maximum Ratings

Parameter	symbol	value	unit
Supply Voltage	$V_{DD}$	40	V
Reverse Voltage	$V_{RDD}$	-80	V
Continuous Output Current	$I_{OUT}$	20	mA
withstand voltage (Output pin)	$V_{OUT}$	30	V
Operating Temperature	$T_A$	-40 ~150	°C
Storage Temperature	$T_S$	-50 ~160	°C
Magnetic Flux Density	B	Unlimited	Gauss
ESD Susceptibility	HBM	2000	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

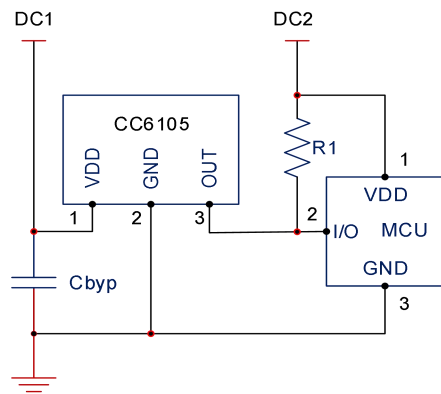
Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Supply Voltage	$V_{DD}$	-	4	-	36	V
Supply Current	$I_{DD}$	25 °C, $V_{DD}=12V$	-	2	-	mA
Output $V_{SAT}$ (sink)	$V_{SAT}$	25 °C, $I_{OUT}=10mA$	-	100	-	V
Output Current Limit	$I_{LIM}$		20	-	30	mA
Output Rise Time	$t_R$	$V_{DD}=24V$ , $R_L=820\Omega$ , $C_L=20pF$	-	700	-	ns
Output Fall Time	$t_F$	$V_{DD}=24V$ , $R_L=820\Omega$ , $C_L=20pF$	-	200	-	ns
Reverse Current	$I_{RDD}$	$V_{DD}=-80V$	-	-	1	mA

## Magnetic Specifications

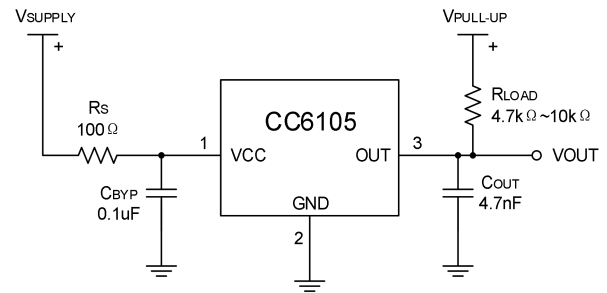
Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Operate Point	$B_{OP}$	25°C	10	25	40	Gauss
Release Point	$B_{RP}$	25°C	-40	-25	-10	Gauss
Hysteresis	$B_{HYS}$	25°C	35	50	65	Gauss

**Note:** 1mT=10Gauss

## Typical Application Circuit



Typical Application Circuit

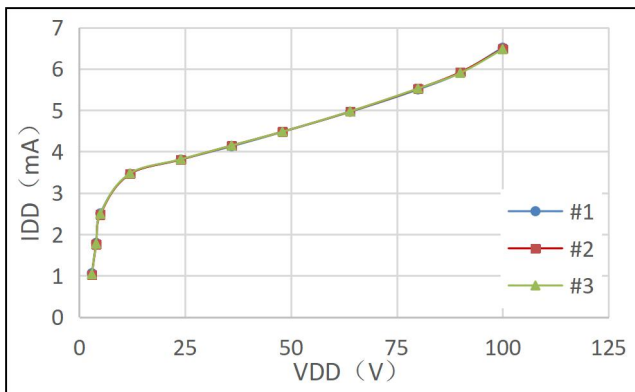


Enhanced protection circuit

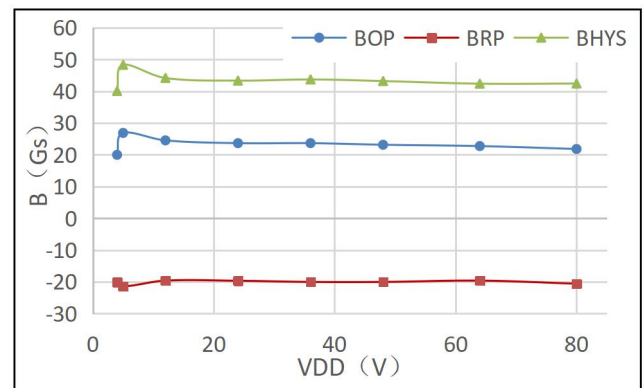
### Note:

1.  $C_{BYP}$  (As close to Hall devices as possible): Ensure normal performance under harsh environmental conditions and reduce noise from internal circuits.
2.  $R_S$  &  $C_{OUT}$ : Enhanced EMC immunity of devices.
3. It is recommended that  $R_S$  and  $C_{OUT}$  have maximum anti-interference performance in harsh environment.

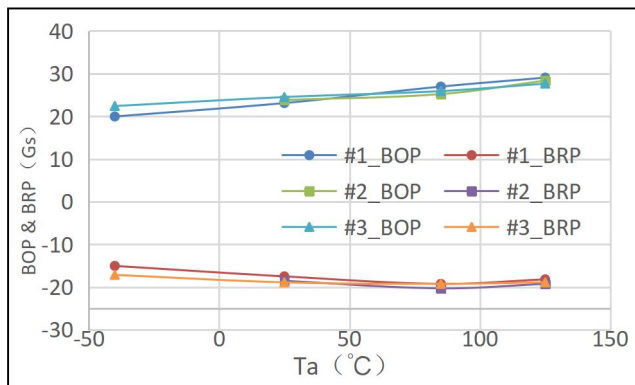
## Waveform



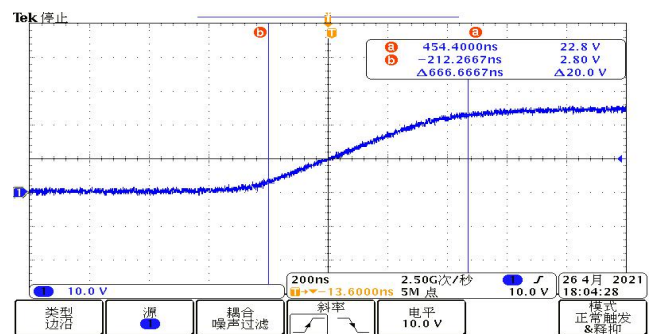
IDD vs. VDD



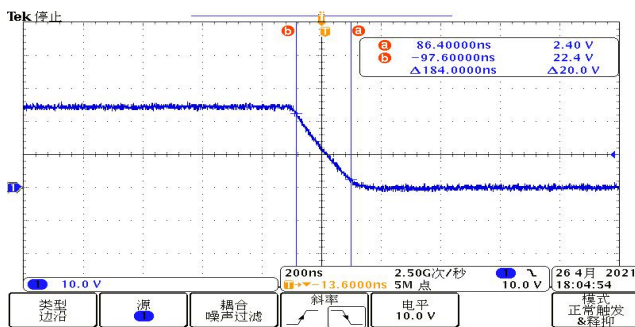
B vs. VDD



B vs. Ta (VDD=24V)



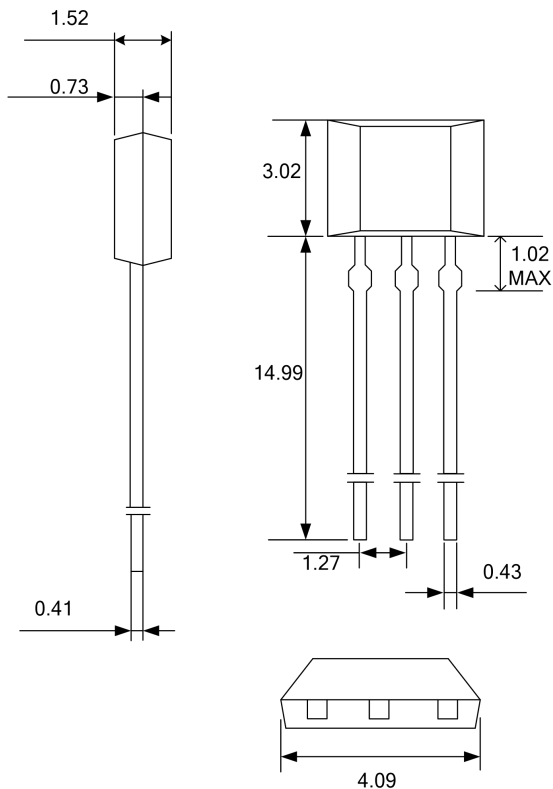
tr (VDD=24V)



tf (VDD=24V)

## Package Information

### (1) TO-92S package



### Notes:

All dimensions are in millimeters

### Marking:

1<sup>st</sup> Line: CC6105 - Name of the device

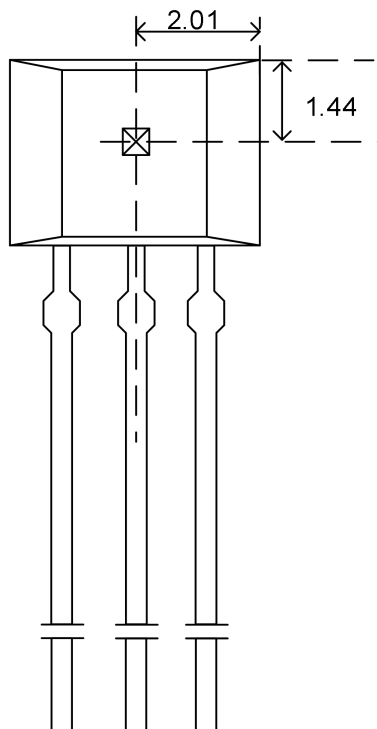
2<sup>nd</sup> Line: XXYYWW

XX – assembler code

YY - assembly year (last 2 digits)

WW - assembly week number

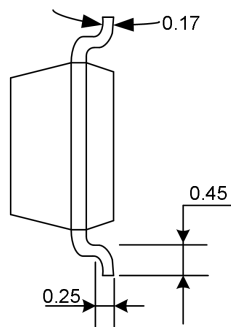
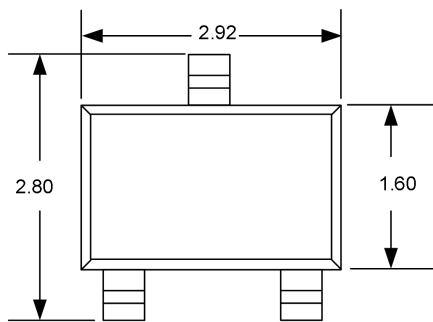
### Hall Location



### Notes:

All dimensions are in millimeters

(2) SOT23-3 package

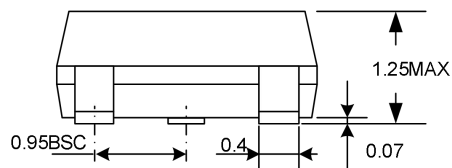


**Notes:**

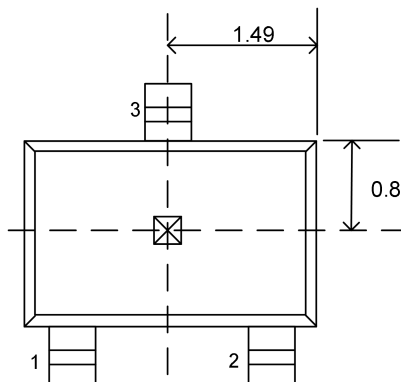
All dimensions are in millimeters

**Marking:**

1<sup>st</sup> Line: 6105 - Name of the device



**Hall Location**



**Notes:**

All dimensions are in millimeters

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## 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

## Contact us

### Chengdu

Address: 4th floor, unit 2, building 3, No. 88, Tianchen Road, Gaoxinxi Zone, Chengdu, Sichuan Province

Tel: + 86 - 28 - 87787685

Email: [support@crosschipmicro.com](mailto:support@crosschipmicro.com)

Website: <http://www.crosschipmicro.com>

### Shenzhen

605 room, 6F, Beike building, NO.18 Keyuan Rd, Yuehai Street, Nanshan District, Shenzhen

### Shanghai

Address: Makeblock, 3 / F, magic square community, 4476 Huyi Road, Jiading District, Shanghai