CC6104

Chopper Stabilized, High Precision, Low Temperature Drift, Latch Hall Effect Switch

FEATURES

- Symmetric Switch Point
- High Chopper stability with good consistent
- Superior Temperature Stability, up to 150°C
- Resistance to mechanical stress
- ESD HBM 4kV

APPLICATION

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

GENERAL DESCRIPTION

The CC6104 is a latch Hall effect switch IC, using an advanced BiCMOS process with excellent temperature stability and high resistance to mechanical stress, and the product can operate at a maximum temperature of 150°C. The CC6104 adopts the Dynamic Offset Cancellation technology and the CrossChip's patented temperature compensation technology, which significantly reduces the offset voltage caused by package stress, ambient temperature change and other factors, and makes the product magnetic sensitivity highly consistent.

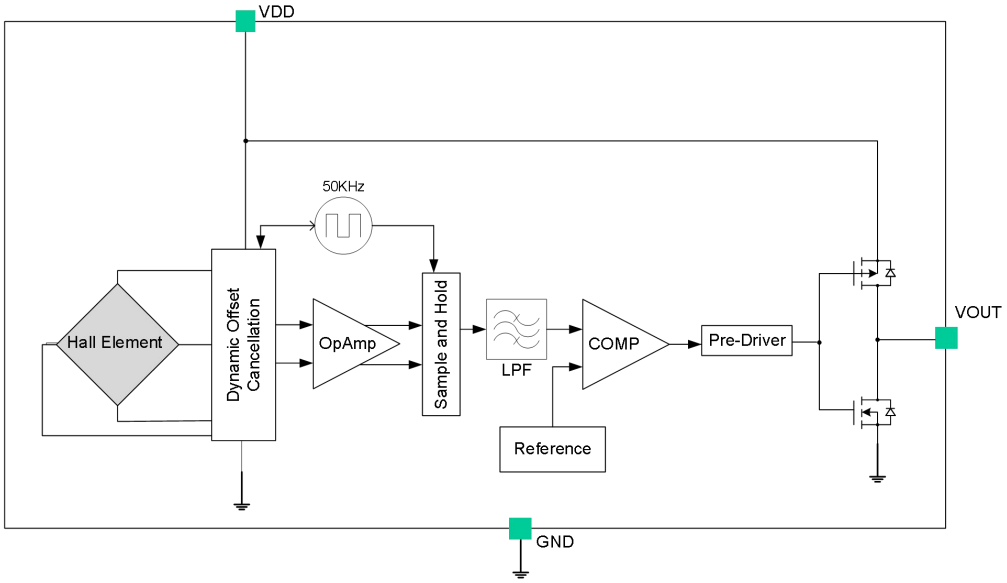
The CC6104 contains a power supply regulator module, Hall thin film, signal amplifier module, dynamic offset cancellation module, and a power output stage with limited current protection. Internal regulator permits operation with supply voltage in the range of 3.3~5.5V.

A south polarity magnetic field of sufficient strength is required to turn the output on (CC6104ST). A north polarity field of sufficient strength is necessary to turn the output off (CC6104ST).

A south polarity magnetic field of sufficient strength is required to turn the output off (CC6104TO). A north polarity field of sufficient strength is necessary to turn the output on (CC6104TO).

CC6104 is available in TO-92S and SOT23-3 packages. The operating temperature range is from -40~150°C. Complies with RoHS requirements.

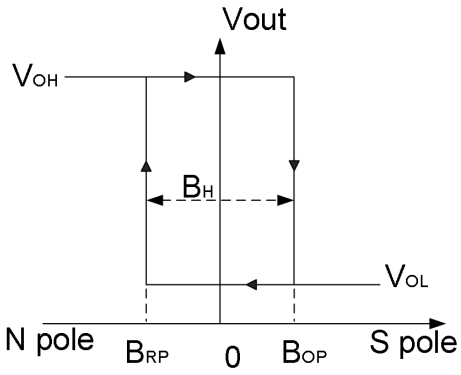
FUNCTION BLOCK DIAGRAM



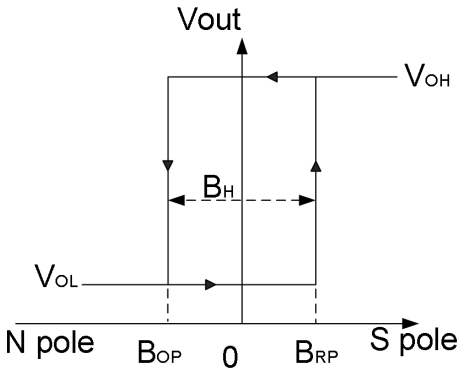
ORDERING INFORMATION

Part No.	Package Code	Packing Form
CC6104TO	TO-92S	bulk，1000 pcs/bulk
CC6104ST	SOT23-3	tape reel，3000 pcs/reel

OUTPUT VS. POLE

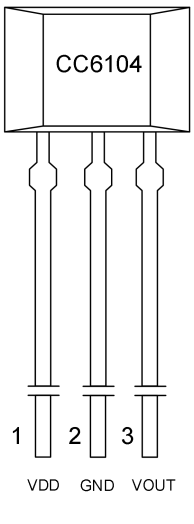


CC6104ST

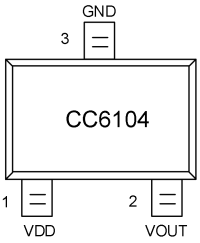


CC6104TO

PIN CONFIGURATIONS



SOT23-3



TO-92S

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}	-0.3~5.5	V
withstand voltage (Output pin)	V_{OUT}	-0.3~V_{DD}+0.3	V
Ambient Temperature	T_A	-40~150	°C
Storage Temperature	T_S	-50~160	°C
Magnetic Flux Density	B	Unlimited	Gauss
ESD Susceptibility	HBM	4	kV

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

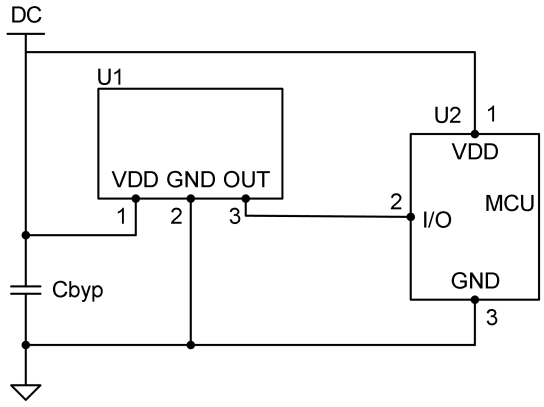
Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Supply Voltage	V_{DD}	-	3.3	-	5.5	V
Supply Current	I_{DD}	T_A = 25°C, V_{DD}=5.0V	-	-	2	mA
Output V_{SAT}（sink）	V_{SAT}	T_A = 25°C, I_{OUT} =30mA	-	-	0.4	V
Output Current	I_{OUT}	T_A = 25°C, V_{DD}=5.0V, Pure resistive load	-	-	30	mA
Output Rise Time	tr	R_L=820Ω, C_L=10pF	-	6	-	us
Output Fall Time	tf	R_L=820Ω, C_L=10pF	-	2	-	us

MAGNETIC SPECIFICATIONS

Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Operate Point	B_{OP}	T_A = 25°C	5	20	35	Gauss
Release Point	B_{RP}	T_A = 25°C	-35	-20	-5	Gauss
Hysteresis	B_{HYS}	T_A = 25°C	25	40	55	Gauss

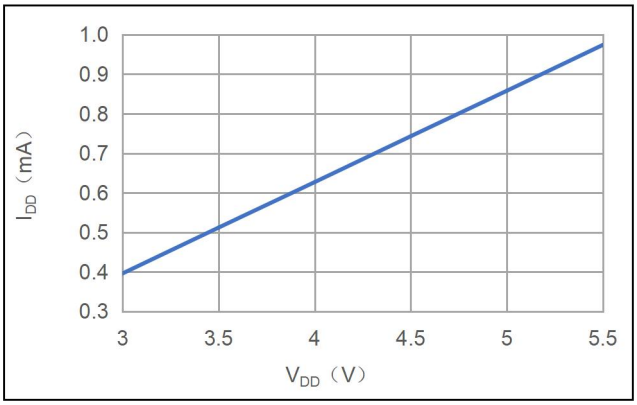
Note: 1mT=10Gauss=10Oe

TYPICAL APPLICATION CIRCUIT

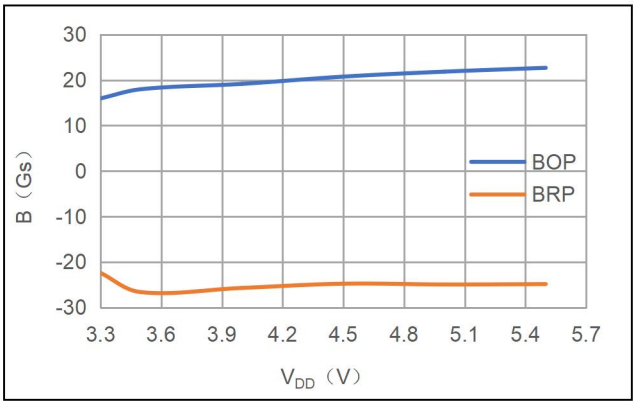


CC6104 Application

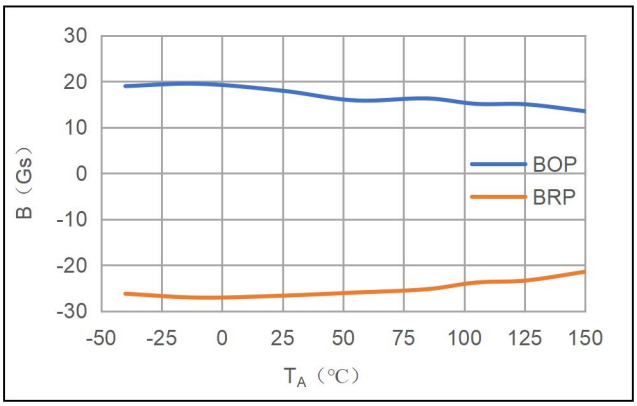
CURVE & WAVEFORM



I_{DD} vs. V_{DD}



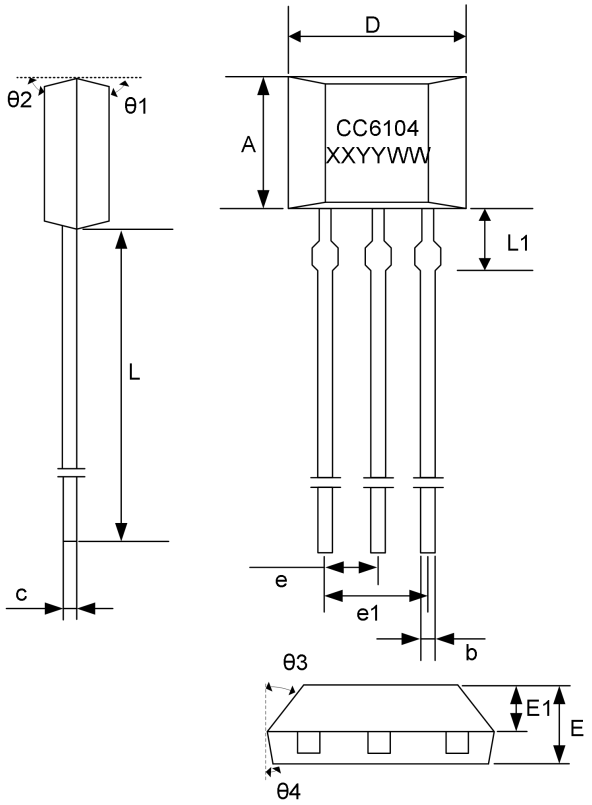
B vs. V_{DD}



B vs. T_A

PACKAGE INFORMATIONS

1)TO-92S package



Symbol	Size (mm)		
	Min.	Typ.	Max.
A	3.10	3.20	3.30
b	0.35	0.39	0.56
c	0.36	0.38	0.51
D	3.90	4.00	4.10
E	1.45	1.55	1.65
E1	0.675	0.775	0.875
e	1.27 BSC		
e1	2.54 BSC		
L	14.00	14.50	15.00
L1	1.33	1.53	1.73
θ1		5°	
θ2		5°	
θ3		45°	
θ4		2°	

Marking:

1st Line: CC6104 - Name of the device

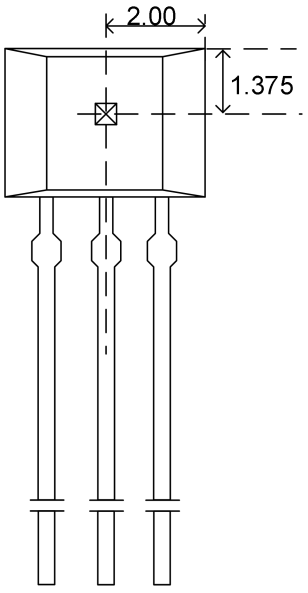
2nd Line: XXYYWW

XX – assembler code

YY - assembly year (last 2 digits)

WW - assembly week number

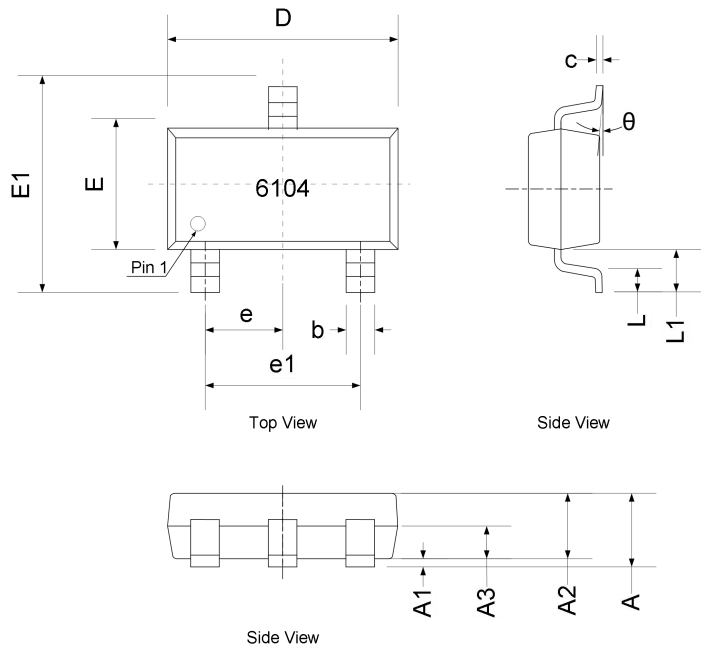
Hall Plate Location



Notes:

All dimensions are in millimeters.

2）SOT23-3 package

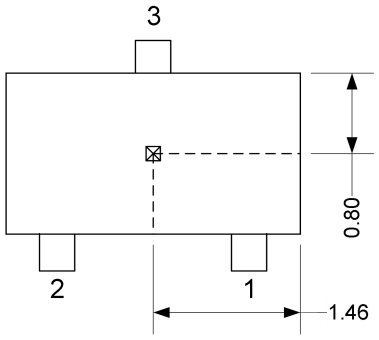


Symbol	Size (mm)		
	Min.	Typ.	Max.
A	-	-	1.25
A1	0.04	-	0.12
A2	1.00	1.10	1.20
A3	0.60	0.65	0.70
b	0.33	-	0.50
c	0.14	-	0.20
D	2.82	2.92	3.02
E	1.50	1.60	1.70
E1	2.60	2.80	3.00
e	0.95 BSC		
e1	1.90 BSC		
LI	0.59 REF		
L	0.35	0.45	0.60
θ	0°	-	8°

Marking:

1st Line: 6104 - Name of the device

Hall Plate Location

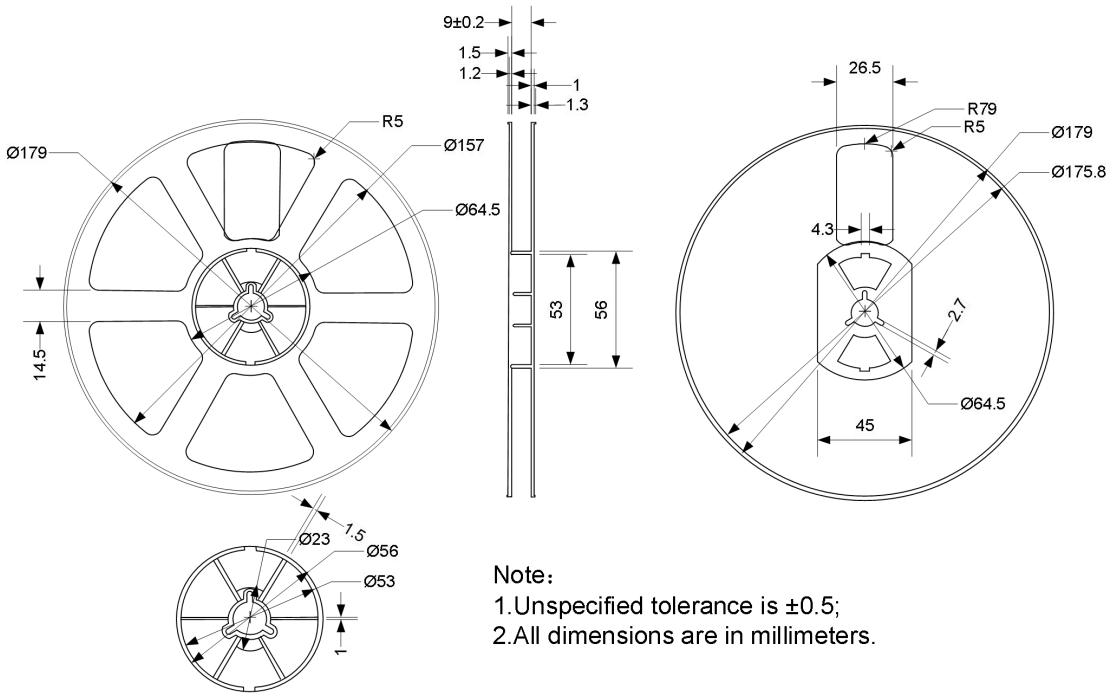


Notes:

All dimensions are in millimeters.

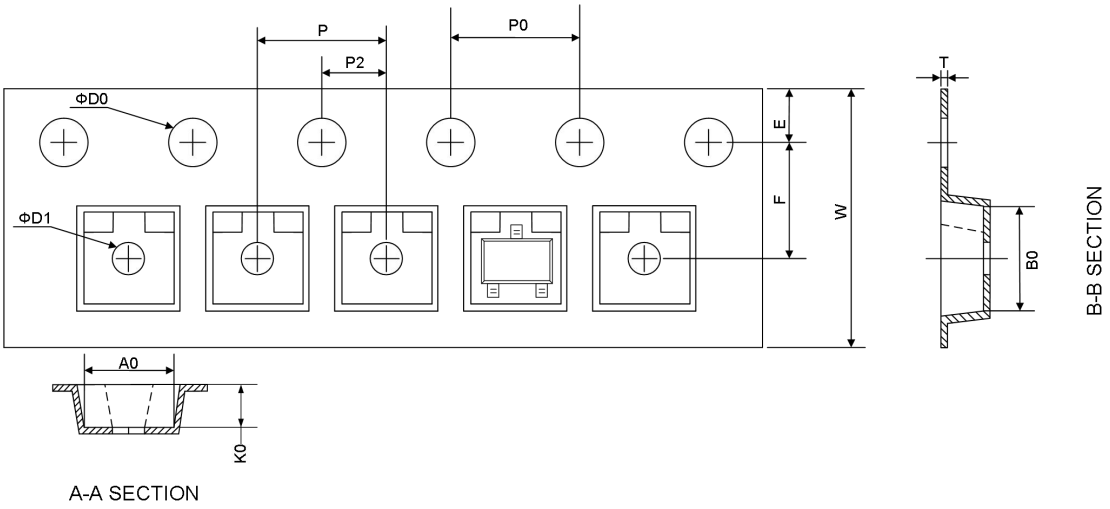
PACKAGING INFORMATION

Reel Dimensions



Note：
1.Unspecified tolerance is ±0.5;
2.All dimensions are in millimeters.

Carrier tape size



Symbol	W	A0	A1	B0	B1	K0	K1	E
Size（mm）	8.00±0.10	3.26±0.10	0.00±0.10	3.4±0.10	0.00±0.10	1.40±0.10	0.00±0.10	1.75±0.10
Symbol	F	P	P0	P2	D0	D1	T	
Size（mm）	3.50±0.10	4.00±0.10	4.0±0.10	2.0±0.10	$1.50^{+0.10}_{-0.00}$	$1.00^{+0.10}_{-0.00}$	0.23±0.05	

REVISION HISTORY

Revision Date	Description of Revision	Revision
2024.02	CC6104 newly issued.	rev1.0

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 60 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
- ✓ Isolation drive class chip

Contact us

Chengdu

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

Tel: + 86 - 028 - 87787685

Email: support@crosschipmicro.com

Website: https://www.crosschipmicro.com

Shenzhen

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

Shanghai

Address: Room 602, Building 1, Shengda Tiandi Yuanchuanggu, No. 88, Shengrong Road, Pudong New District, Shanghai

Suzhou

Address: NO.78 Jinshan Rd East, Suzhou High-tech Zone,Huqiu District, Suzhou City, Jiangsu Province