

Low Power Consumption Hall IC (Magnetic Sensor)

■ GENERAL DESCRIPTION

The XC3202 series is a Hall effect magnetic sensor IC with a built-in CMOS output driver. The device features low power consumption and small packaging which is ideally suited for battery powered portable applications such as mobile phones, electronic dictionaries and handheld game consoles. When the magnetic flux density (Omnipolar) is larger than the operating magnetic flux density (Bop), the CMOS output driver will be turned on (Detect Low). The output driver will be turned off (Release High) when the output is lower than the release magnetic flux density (Brp).

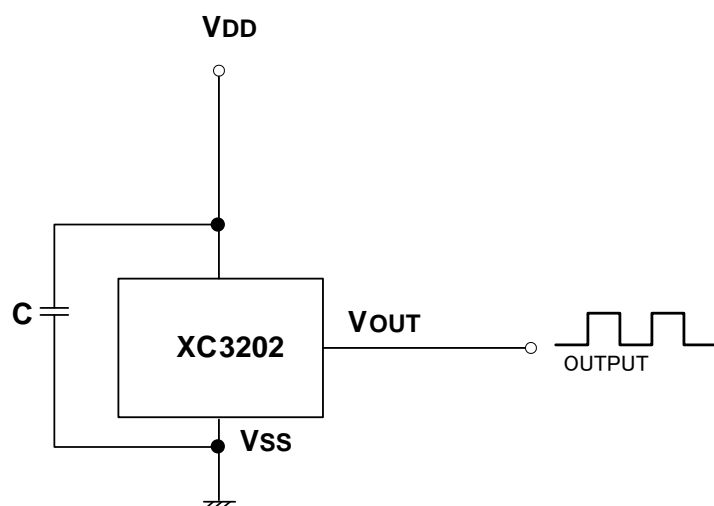
■ APPLICATIONS

- Cover detector, Home security systems
- Mobile phones
- Electronic dictionaries
- Portable game consoles
- Home electronics (refrigerators, washing machines etc)

■ FEATURES

Supply Voltage Range	: 2.4~5.5V
Average Supply Current	: 8 μ A
Operating Magnetic Flux Density	: South Pole 3mT(TYP.) North Pole -3mT(TYP.)
Release Magnetic Flux Density	: South Pole 2mT(TYP.) North Pole -2mT(TYP.)
Hysteresis Width	: South Pole 1mT(TYP.) North Pole 1mT(TYP.)
Packages	: SOT-23D QFN-0601 (under development)
Environmentally Friendly	: EU RoHS Compliant, Pb Free

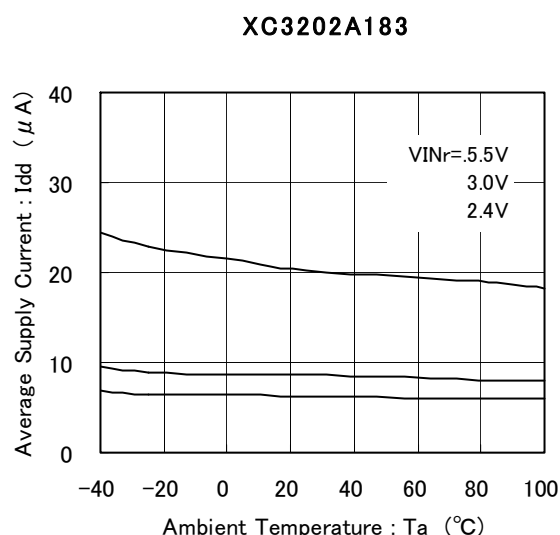
■ TYPICAL APPLICATION CIRCUIT



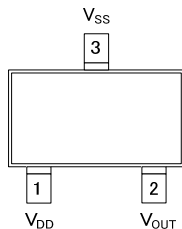
* C is a capacitor for noise reduction and input voltage stability.
The recommended value is 10nF~100nF

■ TYPICAL PERFORMANCE CHARACTERISTICS

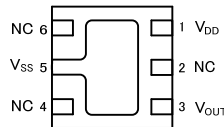
- Supply Current (avg) vs. Ambient Temperature



PIN CONFIGURATION



SOT-23D
(TOP VIEW)



QFN-0601
(BOTTOM VIEW)

* QFN-0601 is under development.

PIN ASSIGNMENT

PIN NUMBER		PIN NAME	FUNCTION
SOT-23D	QFN-0601		
1	1	V_{DD}	Power Input
2	3	V_{OUT}	Output Pin
3	5	V_{SS}	Ground
-	2,4,6	NC	No Connection

* QFN-0601 is under development.

PRODUCT CLASSIFICATION

Ordering Information

XC3202①②③④⑤⑥⑦^(*)

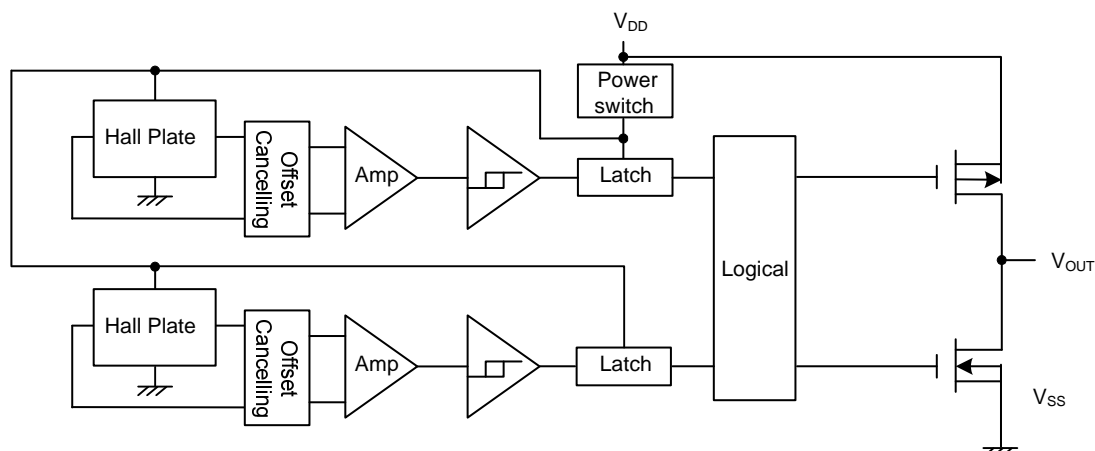
DESIGNATOR	DESCRIPTION	SYMBOL	DESCRIPTION
①	Product Type	A	CMOS Output
②③④	Product No.	183	Based on the internal standard
⑤⑥⑦	Packages Taping Type ^(*)	MR-G	SOT-23D (Halogen & Antimony free)
		ZR-G	QFN-0601 (Halogen & Antimony free) (under development)

* QFN-0601 is under development.

^(*) The “-G” suffix indicates that the products are Halogen and Antimony free as well as being fully RoHS compliant.

^(*) The device orientation is fixed in its embossed tape pocket. For reverse orientation, please contact your local Torex sales office or representative. (Standard orientation: ⑤R-⑦, Reverse orientation: ⑤L-⑦)

■ BLOCK DIAGRAMS



■ ABSOLUTE MAXIMUM RATINGS

Ta=25°C

PARAMETER		SYMBOL	RATINGS	UNITS
Supply Voltage		V _{DD}	7	V
Magnetic Flux Density		B	Unlimited	-
Operating Temperature Range		T _{opr}	-40~+85	°C
Storage Temperature Range		T _{stg}	-55~+150	°C
Power Dissipation	SOT-23D	P _d	150	mW
	QFN-0601		under development	
Maximum Junction Temperature		T _{jc}	125	°C
Maximum Output Current		I _{OUT}	40	mA

* This IC should be used within the stated absolute maximum ratings in order to prevent damage.

■ OPERATING CONDITION

PARAMETER	SYMBOL	CONDITONS	RATINGS	UNITS	CIRCUIT
Supply Voltage	V _{DD}	Operating	2.4~5.5	V	-

■ ELECTRICAL CHARACTERISTICS

Ta=25°C, V_{DD}=3V

PARAMETER	SYMBOL	CONDITONS	MIN.	TYP.	MAX.	UNITS	CIRCUIT
On-state Output Voltage	V _{OUT}	I _{OUT} =1mA	-	0.1	0.3	V	③
Supply Current	I _{DD} (en)		-	3	6	mA	②
	I _{DD} (dis)		-	5	10	μA	①
	I _{DD} (avg)		-	8	16	μA	②
Detection Time	t _{awake}		-	75	150	μs	②
Detection Period	t _{period}		-	75	150	ms	
Duty Cycle	DTY		-	0.1	-	%	②

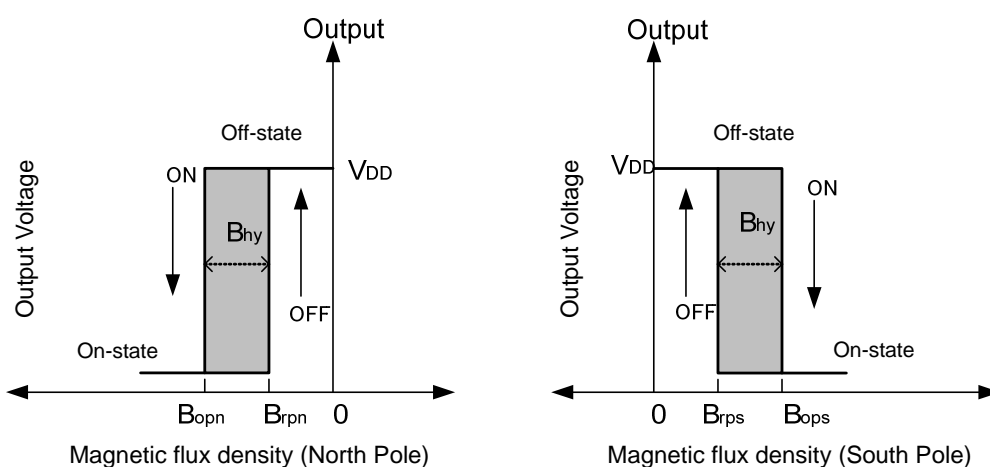
MAGNETIC CHARACTERISTICS

$T_a=25^{\circ}\text{C}$, $V_{DD}=3\text{V}$, $1\text{mT}=10\text{Gauss}$

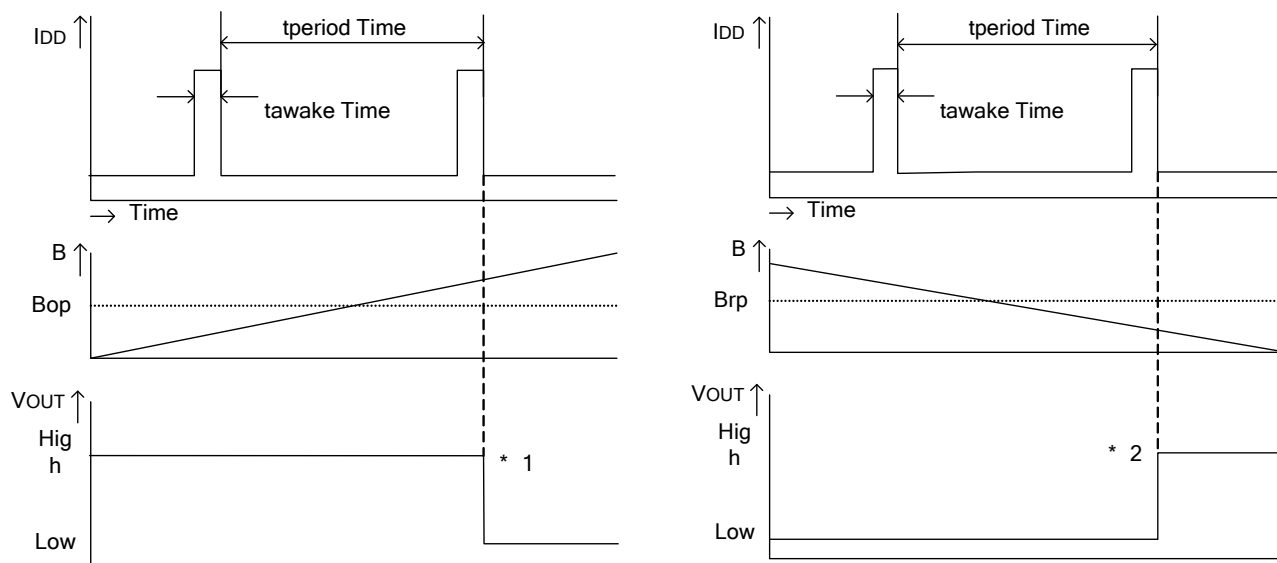
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	CIRCUIT
Operating Magnetic Flux Density: South Pole	Bops	2	3	4	mT	③
Operating Magnetic Flux Density: North Pole	Bopn	-4	-3	-2	mT	③
Release Magnetic Flux Density: South Pole	Brps	1	2	-	mT	③
Release Magnetic Flux Density: North Pole	Brpn	-	-2	-1	mT	③
Hysteresis Width	Bhy(Bop-Brp)	0.5	1	-	mT	③

OPERATIONAL

Operating by flux density



Timing chart



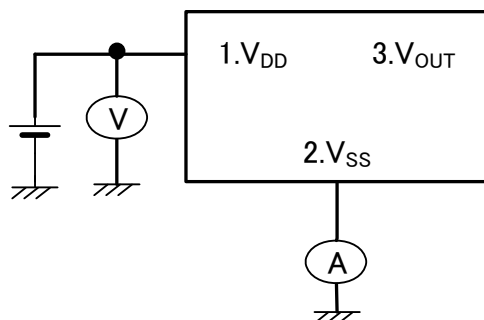
*1: When the magnetic flux density to the IC becomes larger than B_{op} , the IC goes into an on-state and outputs a low signal ($V_{OUT}=\text{Low}$) at the leading edge of the next "tawake" pulse.

*2: When the magnetic flux density to the IC becomes lower than B_{rp} , the IC goes into an off-state and outputs a high signal ($V_{OUT}=\text{High}$) at the leading edge of the next "tawake" pulse.

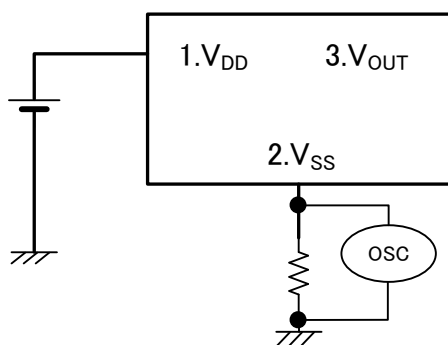
During the other periods, the previous state is maintained.

■ TEST CIRCUITS

Circuit ①

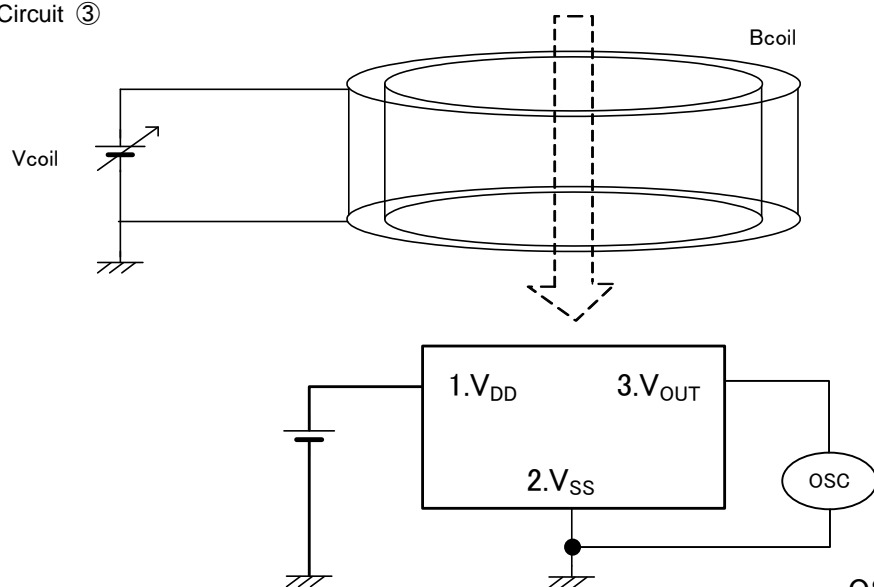


Circuit ②



OSC:Oscilloscope

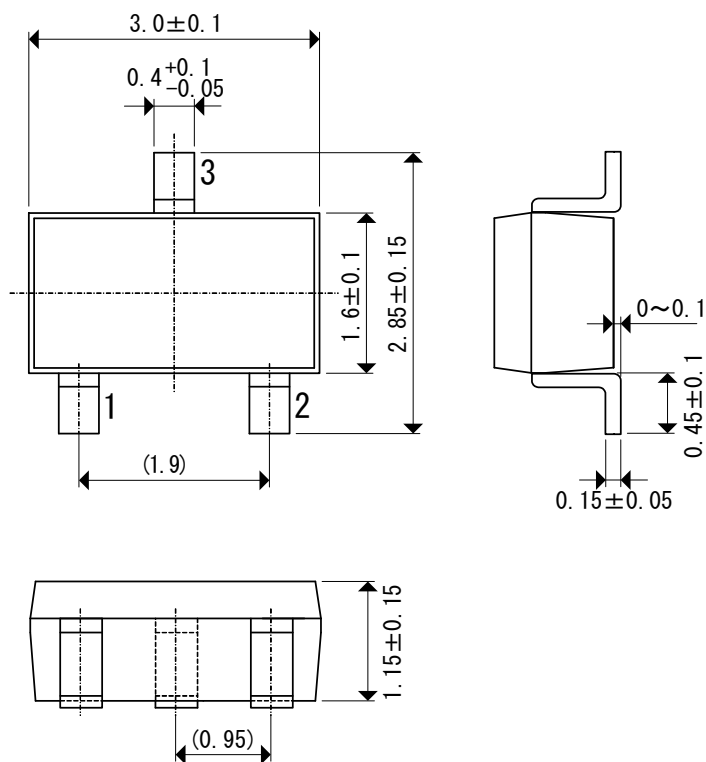
Circuit ③



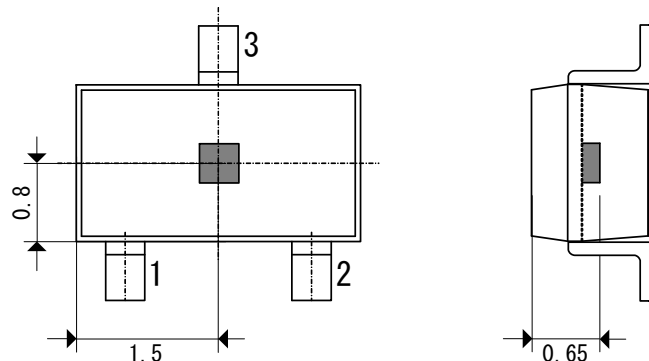
OSC:Oscilloscope

PACKAGING INFORMATION

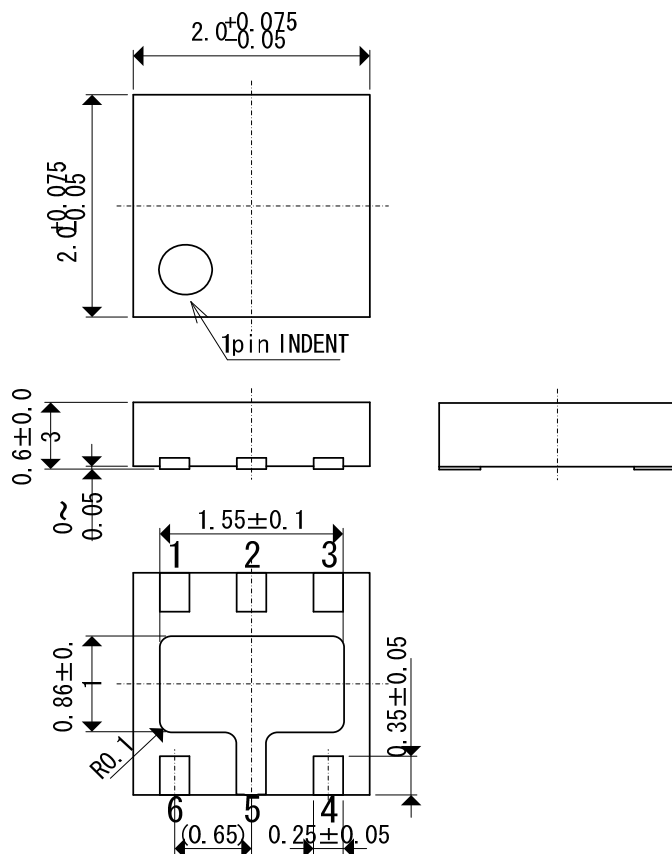
●SOT-23D



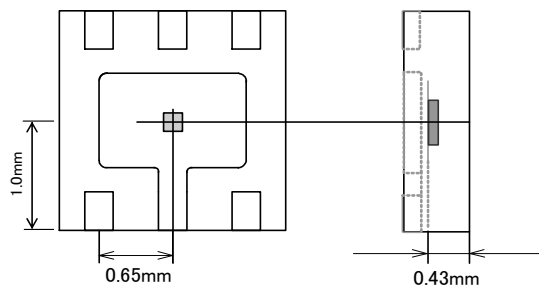
●Position of sensor



●QFN-0601 (under development)



●Position of sensor



■ MARKING RULE

SOT-23D / QFN-0601

① represents production number: standard / custom production

MARK	PRODUCT SERIES
2	XC3202*****

② denotes production registered number: standard / custom production

1, ..., 9, A, ..., Z in order (G, I, J, O, Q, W are excluded)

③ represents the last 1 digit of the manufacturing year: standard / custom production (e.g)

MARK	YEAR
9	2009
0	2010

④ represents manufacturing month: standard / custom production

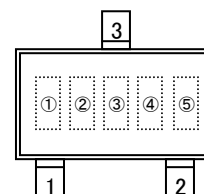
MARK	MANUFACTURING MONTH	MARK	MANUFACTURING MONTH	MARK	MANUFACTURING MONTH
A	January	E	May	J	September
B	February	F	June	K	October
C	March	G	July	L	November
D	April	H	August	M	December

⑤ denotes production lot number

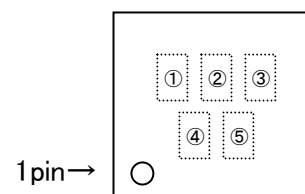
A, ..., Z, in order

(G, I, J, O, Q, W are excluded)

SOT-23D



QFN0601



*QFN-0601 is under development

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