XC3202 Series

ETR0412-005

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).

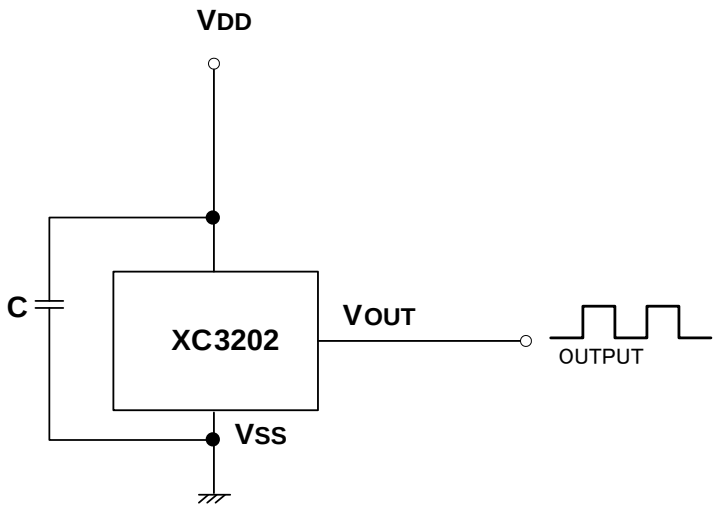
■APPLICATIONS

- ●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	: 8μA	
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	

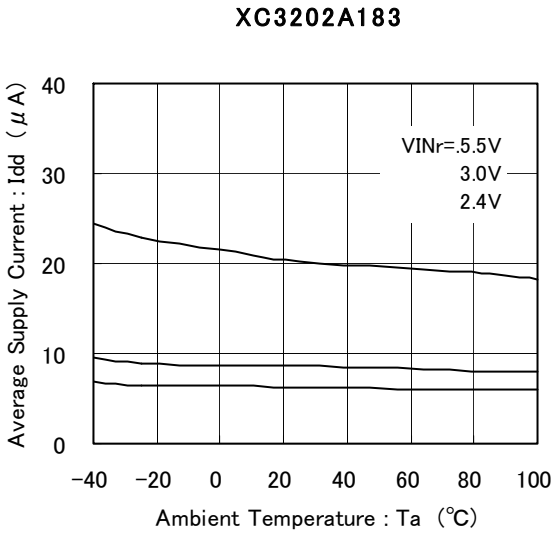
■TYPICAL APPLICATION CIRCUIT



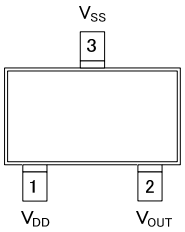
*C is a capacitor for noise reduction and input voltage stability.
The recommended value is 10nF～100nF

■ TYPICAL PERFORMANCE CHARACTERISTICS

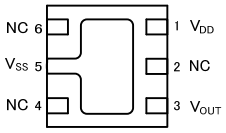
●Supply Current (avg) vs. Ambient Temperature



■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

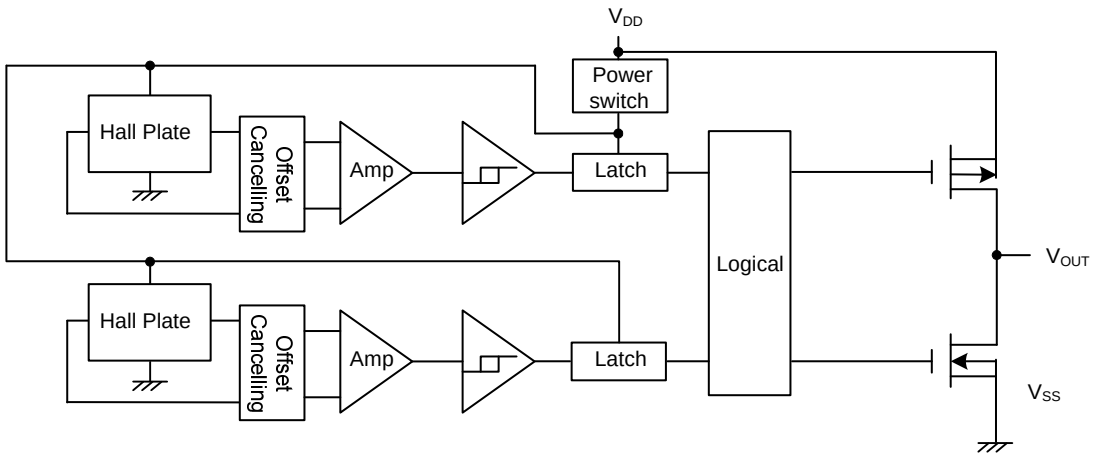
XC3202①②③④⑤⑥-⑦ (*1)

DESIGNATOR	DESCRIPTION	SYMBOL	DESCRIPTION
①	Product Type	A	CMOS Output
②③④	Product No.	183	Based on the internal standard
⑤⑥-⑦	Packages Taping Type (*2)	MR-G	SOT-23D (Halogen & Antimony free)
		ZR-G	QFN-0601 (Halogen & Antimony free) (under development)

* QFN-0601 is under development.

(*1) The "-G" suffix indicates that the products are Halogen and Antimony free as well as being fully RoHS compliant.
(*2) 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℃

PARAMETER		SYMBOL	RATINGS	UNITS
Supply Voltage		V_{DD}	7	V
Magnetic Flux Density		B	Unlimited	-
Operating Temperature Range		Topr	-40～+85	℃
Storage Temperature Range		Tstg	-55～+150	℃
Power Dissipation	SOT-23D	Pd	150	mW
	QFN-0601		under development	
Maximum Junction Temperature		Tjc	125	℃
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℃, 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	tawake		-	75	150	μs	②
Detection Period	tperiod		-	75	150	ms	
Duty Cycle	DTY		-	0.1	-	%	②

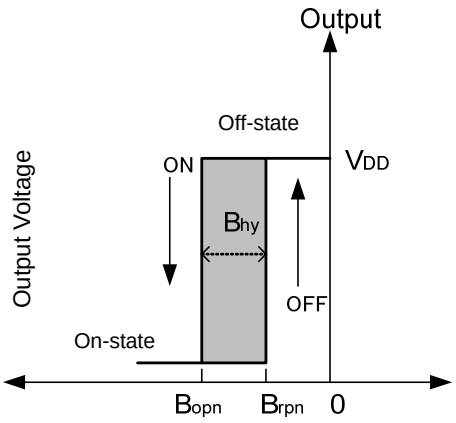
■MAGNETIC CHARACTERISTCS

Ta=25°C, V_{DD}=3V, 1mT=10Gauss

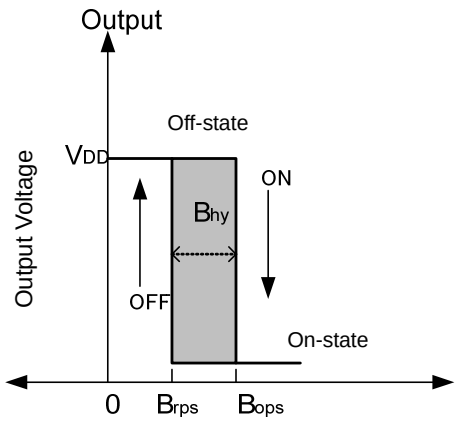
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	CIRCUIT
Operating Magnetic Flux Density: South Pole	Bops	2	3	4	mT	③
Operating Magnetic Flux Density: North Pole	Bopn	-4	-3	-2	mT	③
Release Magnetic Flux Density: South Pole	Brps	1	2	-	mT	③
Release Magnetic Flux Density: North Pole	Brpn	-	-2	-1	mT	③
Hysteresis Width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

■OPERATIONAL

●Operating by flux density

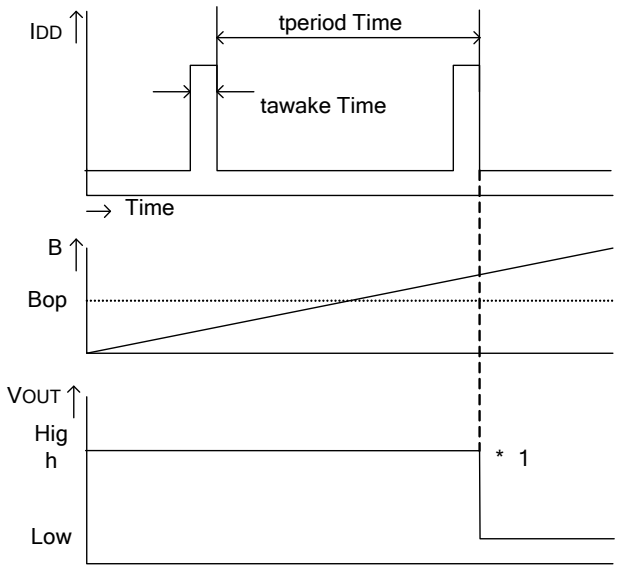


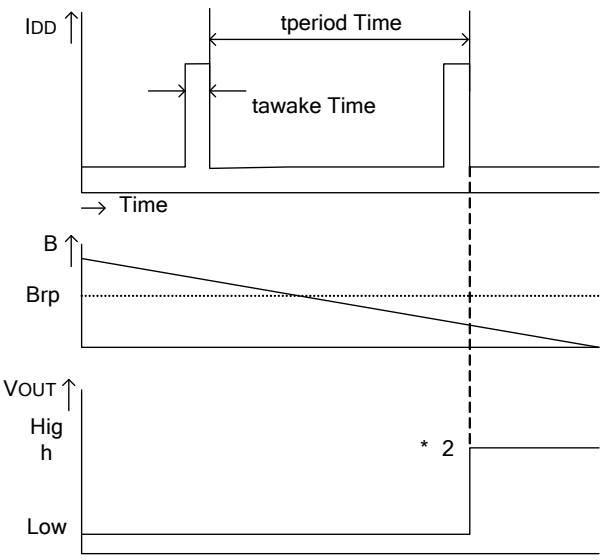
Magnetic flux density (North Pole)



Magnetic flux density (South Pole)

●Timing chart



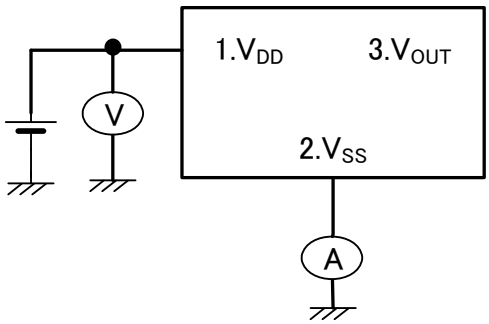


*1: When the magnetic flux density to the IC becomes larger than Bop, the IC goes into an on-state and outputs a low signal (V_{OUT}=Low) at the leading edge of the next “tawake” pulse.

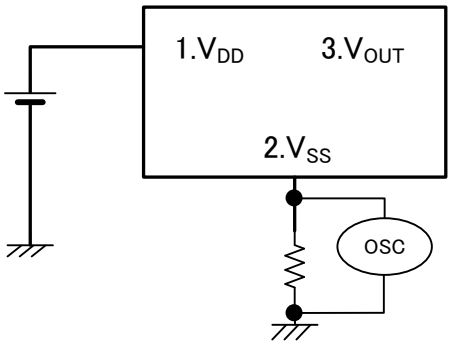
*2: When the magnetic flux density to the IC becomes lower than Brp, the IC goes into an off-state and outputs a high signal (V_{OUT}=High) at the leading edge of the next “tawake” pulse.
During the other periods, the previous state is maintained.

■TEST CIRCUITS

Circuit ①

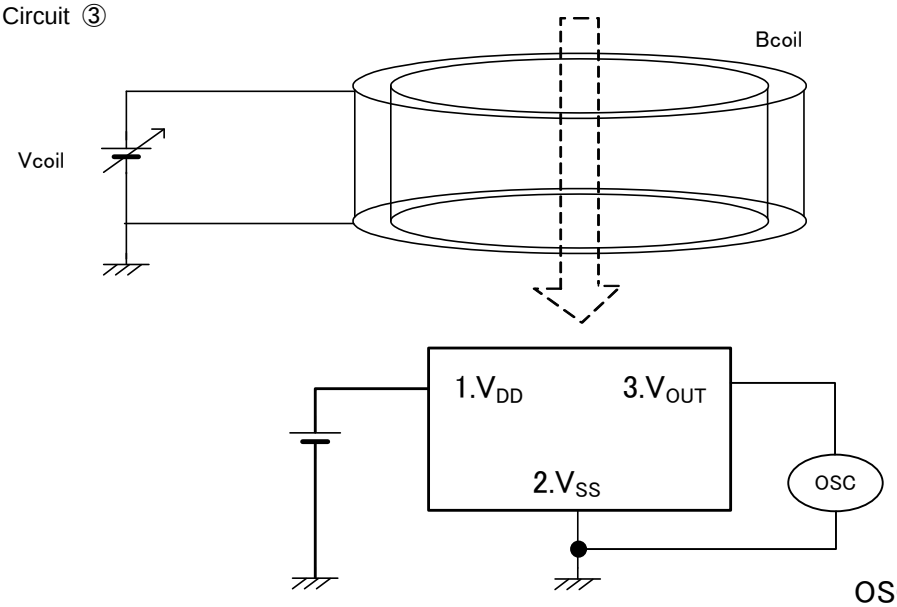


Circuit ②



OSC:Oscilloscope

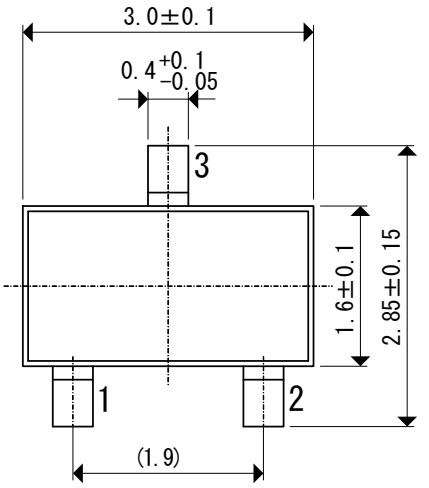
Circuit ③

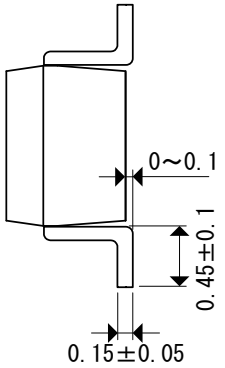


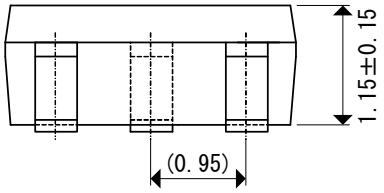
OSC:Oscilloscope

■PACKAGING INFORMATION

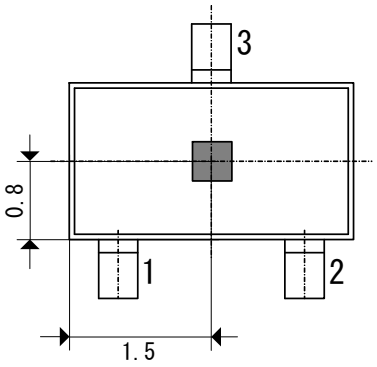
●SOT-23D

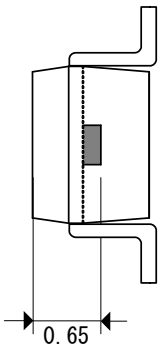




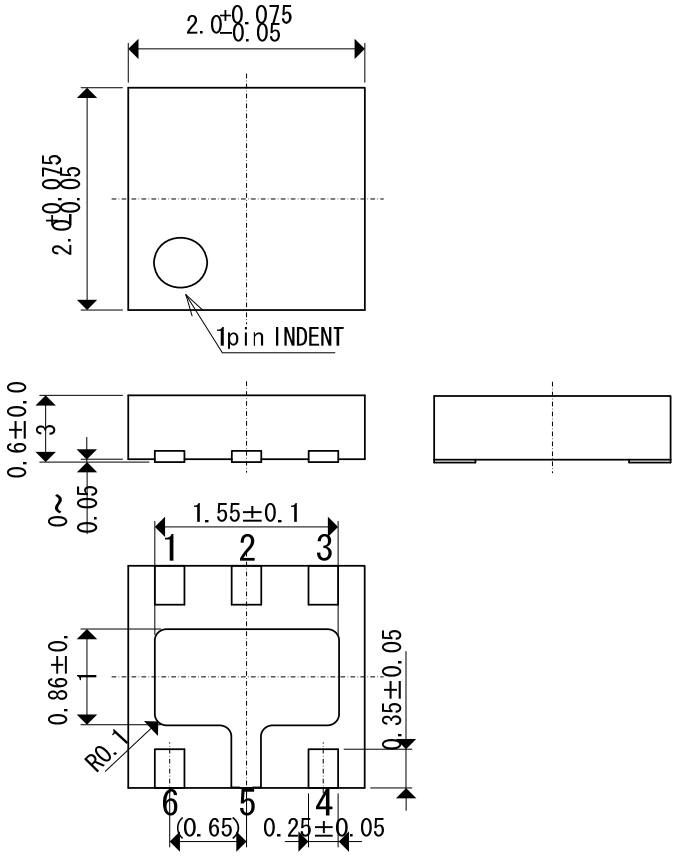


●Position of sensor

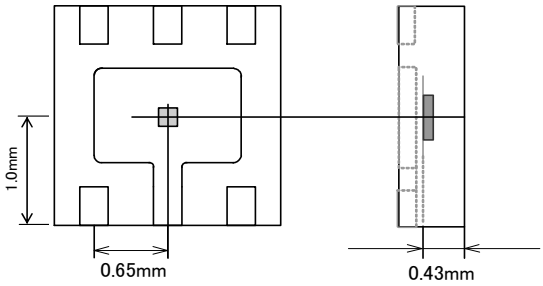




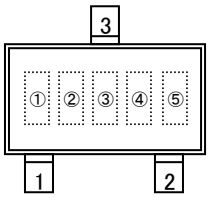
●QFN-0601 (under development)



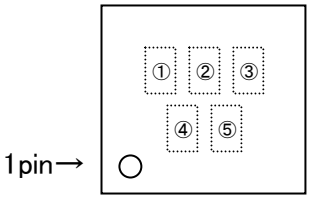
●Position of sensor



SOT-23D



QFN0601



*QFN-0601 is under development

■ 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)

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