

MX0112 Reinforced ESD/Latchup Protected Ultra-Low-Power Omnipolar Hall-Effect Sensor

1. General Description

- The omnipolar detection hall IC is magnetic switch that can operate with both South and North pole, when the applied magnetic flux density exceeds the Bop threshold, the device outputs a low voltage
- This Hall IC product can be in tablets, smart phones, and other applications in order to detect open and close of the cover
- The device operates from a supply range of 1.65 V to 5.5 V, and is packaged in a standard SOT-23 or TO-92

2. Features and Benefits

- Omnipolar Detection
- Industrial-leading low-power consumption
- Very high sensitivity
- Operation down to 1.65V
- Robust Hysteresis over temperature and supply voltage
- Reinforced ESD/Latch-up protection

3. Applications

- Solid State Magnetic Switch
- Handheld Wireless Handset Awake Switch
- Lid close sensors for battery powered devices
- Magnetic proximity sensor in low/medium duty cycle applications
- Energy metering

4. Key Specifications

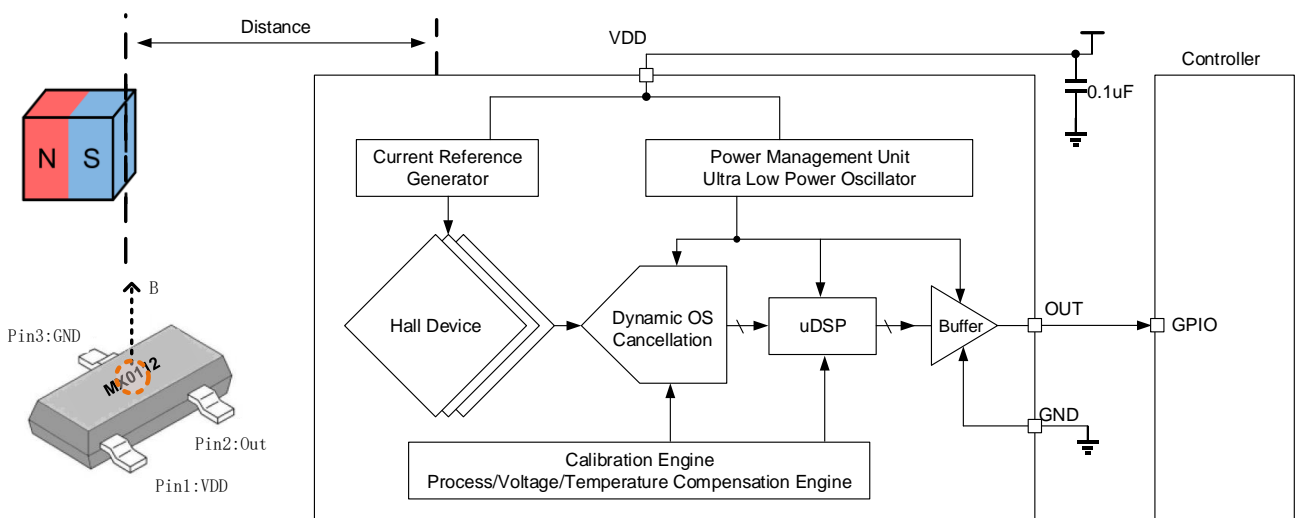
- Wide VDD supply range: 1.65V to 5.5V
- Operation point: ±22GS
- Release point: ±12GS
- Sampling Period: 100mS/10Hz
- Supply Current(Averaged): 0.75uA(VDD=3.3V), 0.45uA(VDD=1.8V)
- Reinforced ESD up to 8KV HBM
- Reinforced Latch-up immunity
- Operating Temperature Range: -40 °C to +125 °C

5. Device Information

PART NUMBER	PACKAGE	BODY SIZE
MX0112	SOT23(3)	2.92mm×1.30mm

*Refer to the Ordering Information for more

6. Typical Schematics and Circuit Diagram



7. Electrical and Magnetic Characteristics

7.1 Absolute maximum ratings

Over operating free-air temperature range

Symbol	Parameters	Min	Max	Units	
V _S	Supply Voltage	-	5.5	V	
V _{RCC}	Reverse Battery Voltage	-	-0.5	V	
V _{OUT}	Output Voltage	-	5.5	V	
I _{OUT}	Continuous output current	-	10	mA	
T _A	Operating Ambient Temperature	-40	125	°C	
T _S	Storage temperature	-50	150	°C	
T _J	Junction temperature	-	150	°C	
B	Magnetic flux	No Limit			Gauss

7.2 ESD Rating

Symbol	Parameters		Units
VESD-HBM	Human Body Model, per ANSI/ESDA/JEDEC JS-001	± 8000	V
VESD-CDM	Charged Device Model, per JEDEC specification JESD22-C101	± 1000	V

7.3 Thermal Information

Symbol	Parameters		Units
R _{θJA}	Junction to ambient thermal resistance	356	°C/W
R _{θJB}	Junction to board thermal resistance	94	°C/W

7.4 Electrical Characteristics

At T_A = -40°C to 125°C, V_S = 1.65V to 5.5V (unless otherwise specified)

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V _S	Supply Voltage	Operating	1.65	-	5.5	V
I _{S(AVG)}	Supply Current	B < B _{RP} , V _S = 3.3V	-	0.75	0.85	uA
		B < B _{RP} , V _S = 1.8V		0.3	0.4	uA
I _{S(EN)}		Chip awake, B < B _{RP} , V _S = 3.3V	-	1.6	2	mA
I _{S(DIS)}		Chip asleep, B < B _{RP} , V _S = 3.3V	-	0.4	0.5	uA
V _{SON}	Output Saturation Voltage	B > B _{OP}	-	-	0.4	V
I _{OFF}	Output Leakage Current	B < B _{RP} , V _{OUT} = 5V	-	-	0.1	uA
T _{AW}	Awake Time	V _S = 3.3V	11	12.5	13	us
T _{SL}	Sleep Time	V _S = 3.3V	95	100	105	ms
D.C.	Duty Cycle		-	0.12	-	%
B _{OP}	Magnetic Operating Point	At T _A = 25°C	+/-18	+/-22	+/-26	Gauss
B _{RP}	Magnetic Release Point	At T _A = 25°C	+/-8	+/-12	+/-16	Gauss
B _{HYST}	Hysteresis Window	At T _A = 25°C ABS(B _{OP} - B _{RP})	5	10	15	Gauss

8. Ordering Information

8.1 Device ordering code table

Product Code	Temperature Code	Package Code	Option Code	Packing Form
MX0112PUAST-000-RE	A	ST	PU 000	RE
MX0112PUAFT-000-BP	A	FT	PU 000	BP
MX0112PUAFTS-000-BP	A	FTS	PU 000	BP
MX0112PUAFTR-000-BP	A	FTR	PU 000	BP
MX0112PUAFTSR-000-BP	A	FTRS	PU 000	BP
MX0112NDAST-000-RE	A	ST	ND 000	RE
MX0112NDAFT-000-BP	A	FT	ND 000	BP
MX0112NDAFTS-000-BP	A	FTS	ND 000	BP
MX0112NDAFTR-000-BP	A	FTR	ND 000	BP
MX0112NDAFTSR-000-BP	A	FTRS	ND 000	BP

Notes1:

Temperature Code Definition: A for -40°C to 85°C; B for -40°C to 125°C; C for -40°C to 150°C

Package Code Definition: ST for sot23; FT for flat TO-92; FTS for flat TO-92, short leg; FTR for flat TO-92, radial lead; FTRS for flat TO-92, short leg, radial lead

Option Code Definition: PP for push pull; PU for pull up resistor; ND for NMOS open drain output

Package Form Definition: RE for tape and reel; BP for bulk packaging