MicroPower, Ultra-sensitive Hall Effect Switch

❖ GENERAL DESCRIPTION

MA7005 is a three-terminal Hall Effect sensor device with an output driver. The device is using CMOS process includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifies the Hall voltage, and a Schmitt trigger to provide switching hysteresis for noise rejection, and open-drain output, and an internal temperature compensated circuits. This method reduces the offset voltage normally caused by device over molding and thermal stress.

The output is switch with either north or South Pole of sufficient strength will turn the output on (low). The output will be turned off (high) under no magnetic field. While the magnetic flux density (B) is larger than operate point (Bop), the output will be turned on (low); the output is latched until B is lower than release point (Brp) and then turned off (high).
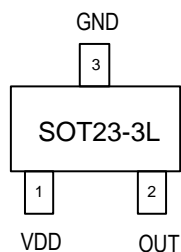
❖ FEATURES

- 1.65V to 5.5V battery operation
- Chopper Stabilized Technology
- Operation with North or South Pole
- High sensitivity and high stability of the magnetic switching points
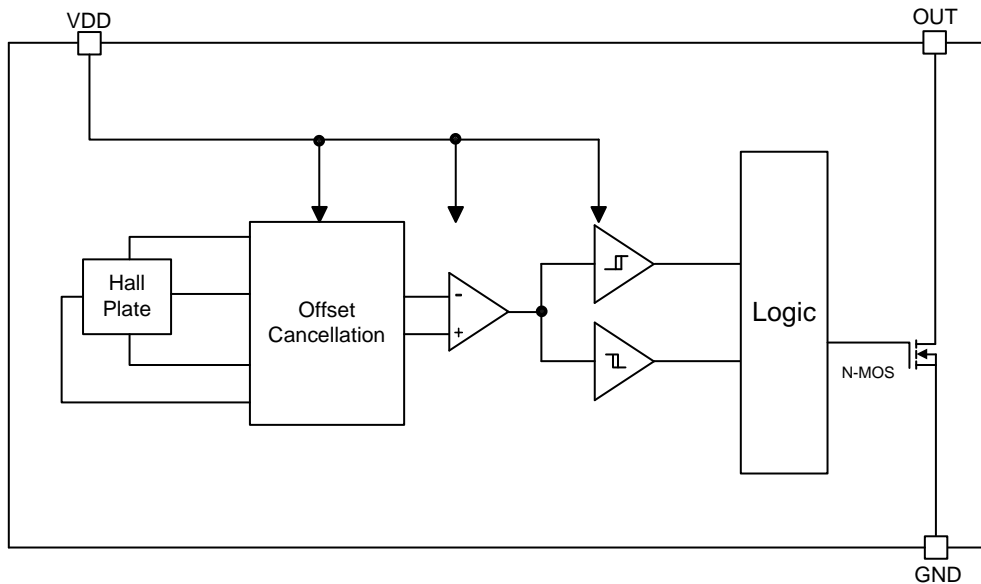- Low Profile SOT23-3L Package

❖ PIN ASSIGNMENT

The package of MA7005 is SOT23-3L ; the pin assignment is given by:

(Top View)

Name	Description
VDD	Supply Voltage
OUT	Output
GND	Ground.

❖ **BLOCK DIAGRAM**

❖ **RDER/MARKING INFORMATION**

| Order Information	Top Marking

MA7005X X
 	
Package Type Packing
A: SOT23-3L   Blank: Bag
              A : Taping
	H G Y W X→ ID Code: Internal
	Week: 01~26(A~Z)
	       27~52(a~z)
	Year : 7 = 2017

❖ **A BSOLUTE MAXIMUM RATINGS** (at T_A=25°C)

| Characteristics	Symbol	Rating	Unit
VDD Pin Voltage	V_{DD}	- 0.3 to 7V	V
Output Pin Voltage	V_{OUT}	- 0.3 to 7V	V
Output Current	I_{OUT}	±1	mA
Storage Temperature Range	T_{ST}	-65 to +150	°C
Operating Junction Temperature	T_J	+125	°C
Operating Temperature Range	T_{OP}	-40 to +125	°C
Thermal Resistance from Junction to case	θ_{JC}	140	°C/W
Thermal Resistance from Junction to ambient	θ_{JA}	250	°C/W
Power Dissipation[PD=(T_J-T_A) / θ_{JA}]	PD	400	mW

Note : θ_{JA} is measured with the PCB copper area of approximately 0.5 in^2(Multi-layer).

❖ **ELECTRICAL CHARACTERISTICS**

(V_{DD} = 5.0V, T_A = +25°C, unless otherwise noted.)

Characteristics	Symbol	Conditions	Min	Typ	Max	Units
Supply Voltage	V_{DD}		1.65	5.0	5.5	V
Supply Current	I_{DD}	VDD=3.3V	-	2.8	4	mA
		VDD=5.0V	-	4.6	6	mA
Hall Sense Detect out time	H_{SDT}			40	60	us
Output Low Voltage	V_{OL}	I_{OUT} =1mA (Sink)	-	-	0.2	V
Output Wake-Up Time	$T_{wake-up}$		-	-	-	us
Period	T_{Period}		-	-	-	ms
Hall Sense Detect out time	H_{SDT}					ms
Duty Cycle	D.C		-	-	-	%
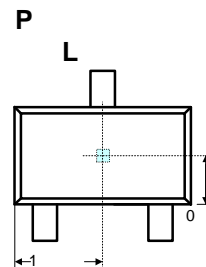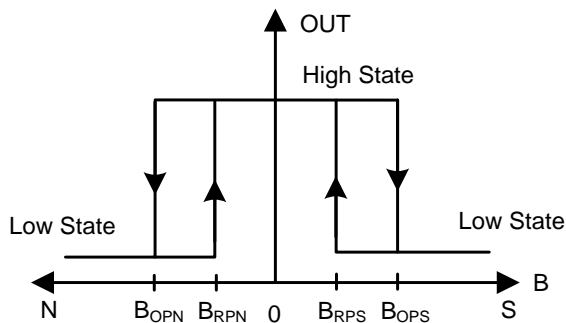
❖ **TEST CIRCUIT**
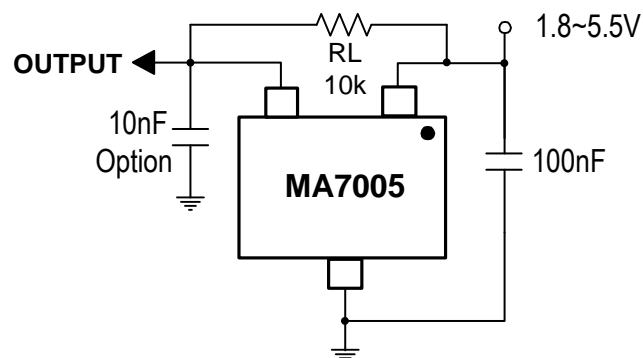
❖ **PACKAGE OUTLINES**

(1) SOT-23-3L

VIEW C

SEE VIEW C
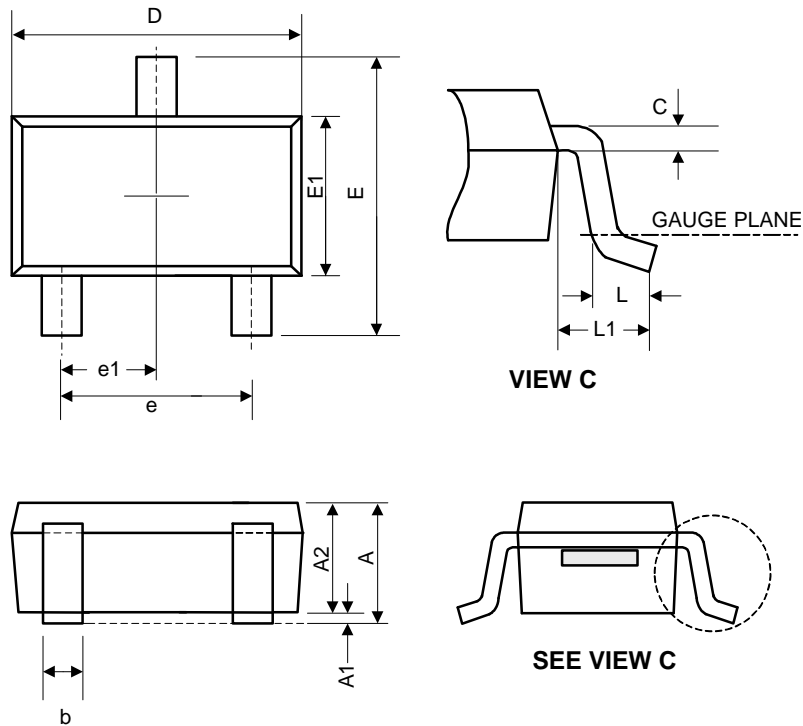
Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	-	-	1.45	-	-	0.057
A1	0	0.08	0.15	-	-	0.006
A2	0.9	1.1	1.3	0.035	0.043	0.051
b	0.3	0.4	0.5	0.012	0.016	0.02
C	0.08	0.15	0.22	0.003	0.006	0.009
D	2.7	2.9	3.1	0.106	0.114	0.122
E	2.6	2.8	3	0.102	0.11	0.118
E1	1.4	1.6	1.8	0.055	0.063	0.071
L	0.3	0.45	0.6	0.012	0.018	0.024
L1	0.5	0.6	0.7	0.02	0.024	0.028
e	1.9 BSC			0.075 BSC		
e1	0.95 BSC			0.037 BSC		

JEDEC outline: NA