

Magnetic Compass Sensor

HM55B

Data Sheet

3. Absolute Maximum Ratings

No.	Item	Symbol	Limitation	Unit
1	Power Supply	AVcc/DVcc	-0.3_+6.7	V
2	Terminal Voltage	Vin	-0.3_Avcc/DVcc_+0.3	V
3	Operating Temp.	TOPE	-20_+85	degC
4	Storage Temp.	TSTG	-40_+95	degC
5	Max. Acceptable Loss	P	126	mW

Note) In case being operated out of the Absolute Maximum Ratings, the sensor/circuit may permanently be destroyed. It is necessary to be used following specified operating conditions as shown 4. If it is exceeded, the product(s) may work improperly and/or its reliability may be affected.

4. Electrical Characteristics

(Vcc:2.7 -- 3.3V, Ta: -20 -- +85degC)

	Item	Symbol	Condition for measurement	Min.	Typ.	Max.	Unit
	Supply Voltage	Vcc		2.7	3.0	3.3	V
*1	Current Consumption (active)	Icc1	Measurement operation	---	9	13	mA
	Current Consumption (standby)(1)	Iccst(1)	Ta= -20degC - +60degC, Vcc=3.0V	---	---	1	uA
	Current Consumption (standby)(2)	Iccst(2)	Ta= +60degC - +85degC, Vcc=3.0V	---	---	5	uA
*1	Current Consumption(ave)	Iccave	Measurement period:100ms	---	3	5	mA
	Measuring Time	Tmes		---	30	40	ms
	Sensitivity	Bse	Ta= 25degC, Vcc=3.0V	1.0	---	1.6	LSB/uT
	Magnetic field range	H	Ta= 25degC, Vcc=3.0V	-180	---	180	uT
	Linearity	linia	Ta= 25degC, Vcc=3.0V, F.S.=+/-180uT	-5	---	5	% / FS
	Low-Level Input Voltage	VIL		-0.3	---	Vcc x 0.2	V
	High-Level Input Voltage	VIH		Vcc x 0.8	---	Vcc + 0.3	V
	Low-Level Output Voltage	VOL	Vcc=3V, IL=1mA	-0.3	---	Vcc x 0.1	V
	High-Level Output Voltage	VOH	Vcc=3V, IL= -1mA	Vcc x 0.9	---	Vcc + 0.1	V

Note) *1

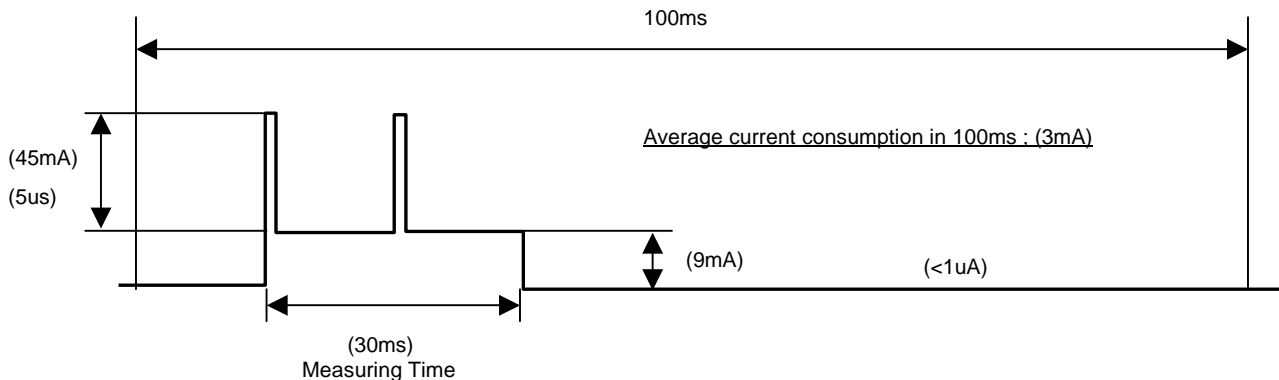


Fig. Average current consumption in measurement

5. Interface

5 - 1. Command

1	2	3	4	Mode
0	0	0	0	Reset
1	0	0	0	Measurement
1	1	0	0	Read
0	1	0	0	-----

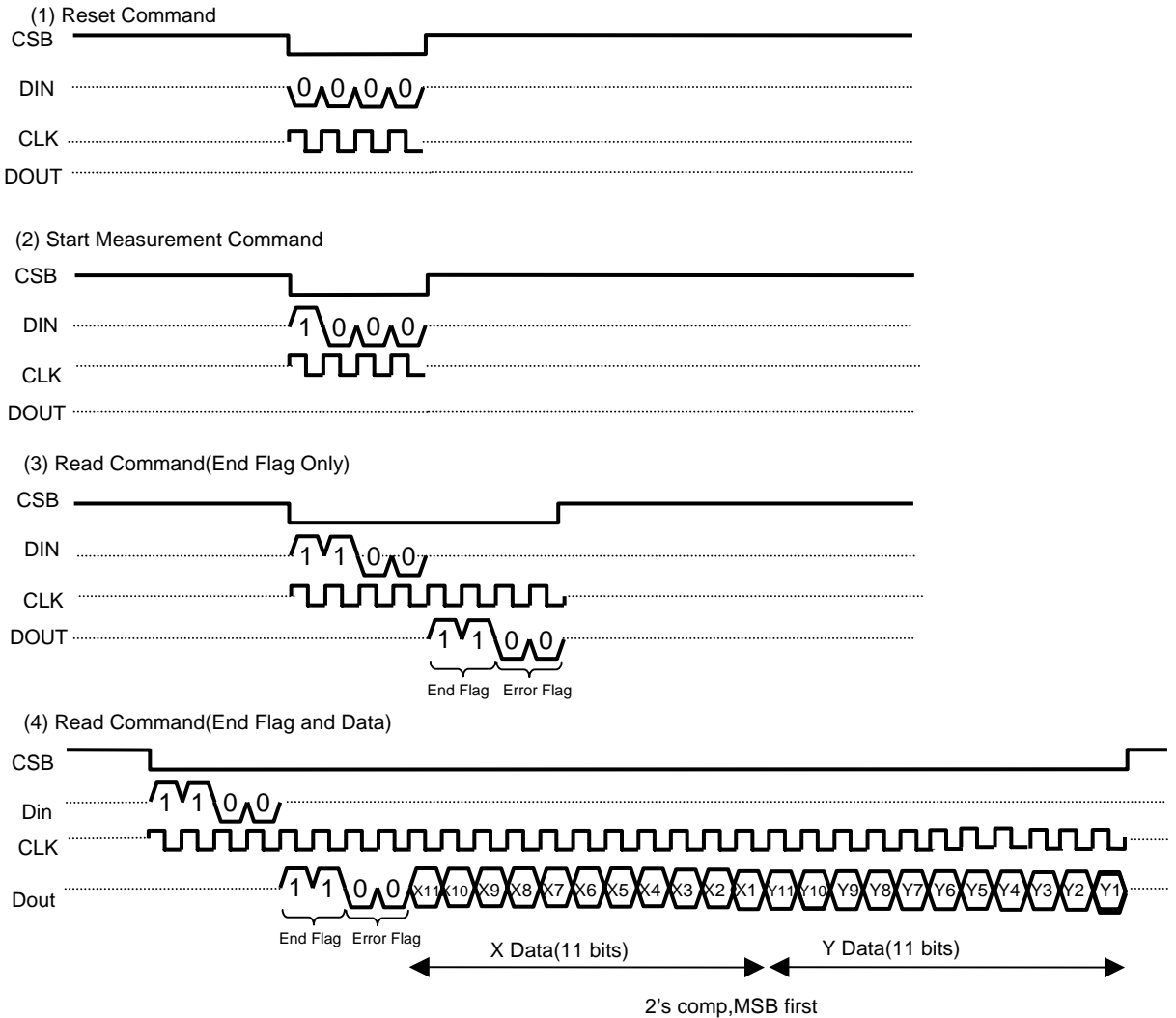
5 - 2. End flag

End flag state	Description
"00"	(1)In measurement (2)RESET operation
"11"	(1) Completion of measurement
"01" "10"	Not defined

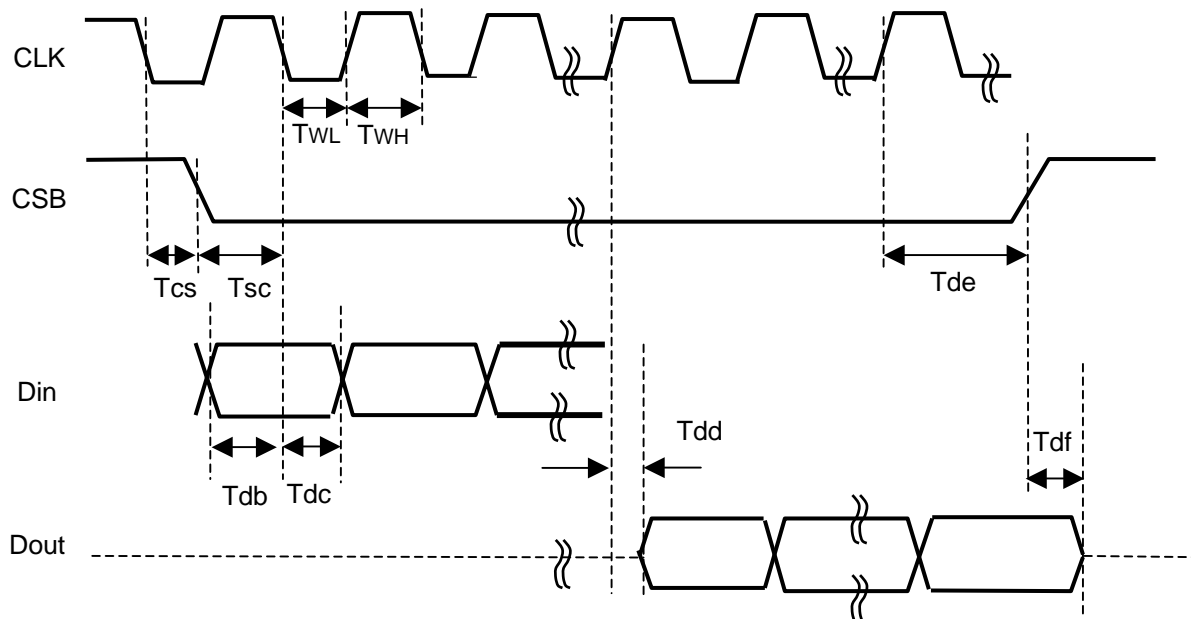
5 - 3. Error flag

Error flag state	Description
"00"	(1)Normal completion of measurement (2)RESET operation
"11"	(1) A/D overflow in measurement
"01" "10"	Not defined

5 - 4. I/O Timing Chart



5 - 5. I/O Timing Chart (Details)

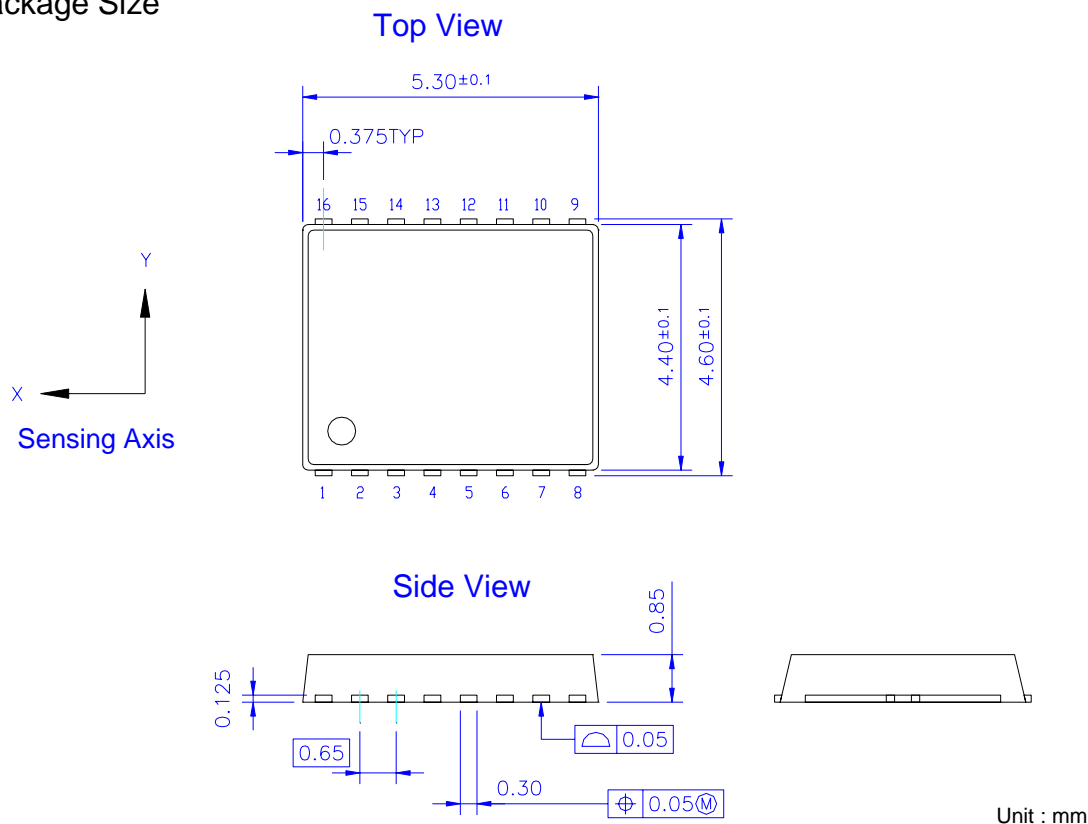
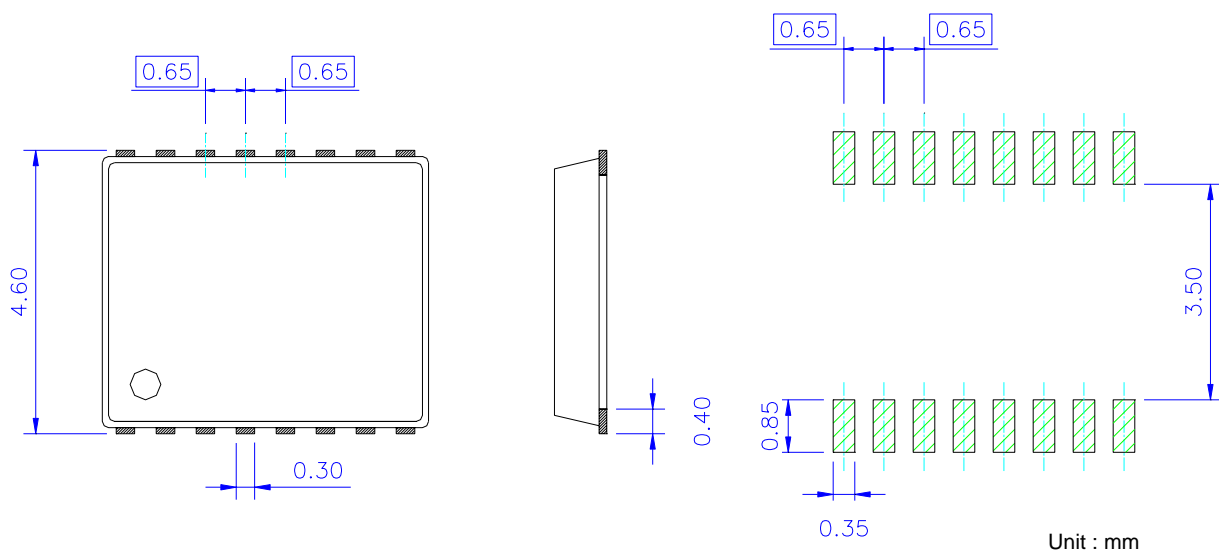


AC Timing Spec.

Item	Symbol	Min.	Typ.	Max.	Unit
CSB-CLK margin(1)	T cs	30	-	-	ns
CSB-CLK margin(2)	T sc	100	-	-	ns
CLK-Data setup time	T db	30	-	-	ns
CLK-Data hold time	T dc	30	-	-	ns
CLK-Data delay time	T dd	-	-	40	ns
CSB margin	T de	100	-	-	ns
CSB-Data delay time	T df	-	-	30	ns
CLK high time	T WH	100	-	-	ns
CLK low time	T WL	100	-	-	ns
CLK frequency	f CLK	-	1	5	MHz

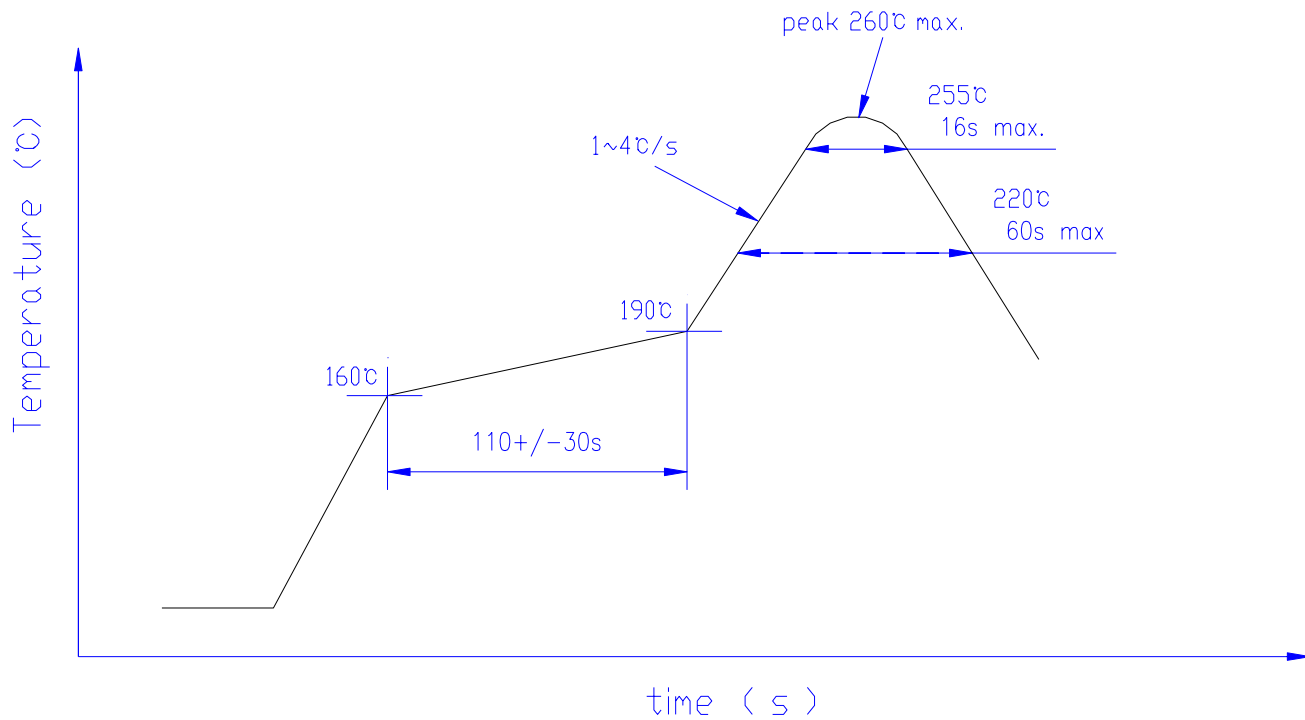
Test Conditions

- (1) $T_a=25 \text{ degC}$
- (2) $V_{cc}=2.7V - 3.3V$
- (3) Load of Output=30 pF
- (4) Input $V_{iL}=0.2V$ $V_{iH}=V_{cc}-0.2V$ $t_r=10ns$ $t_f=10ns$
- (5) CLK Frequency=1MHz Duty=50%

6. Package Size

7. Recommended Foot Pattern


8. Recommended Reflow condition

(Infrared/Hot Air Reflow)



9. Precautions for use

9.1 Sensing accuracy may be degraded by the following environment even if this product is normal.

- 1) Environment that the earth magnetic field is distorted by ferrous materials
ex. near buildings, bridges, railroads, etc.
- 2) Environment that the magnetic circumstance is disturbed by ferromagnetic materials
ex. near speakers.

Please take enough care of external magnetic influence for this product to function properly.

9.2 This product is not designed specially for radiation-proof.

9.3 This product is designed and manufactured to be used for general-purpose products such as mobile phones, and handy type electronic equipments.

Therefore when used for such special-purpose systems as require special quality and reliability, it is necessary to give a special design . Examples of such systems are for space, aviation, nuclear power, electric power, combustion control, safety devices of transportation and traffic, and medical appliances for life support. In these application systems, it is possible that failures or malfunction of the product affect human life or injure human body.

Please contact us before using this product, when you are planning to use it for special-purpose.

In this case please let us know information necessary for special design about usage, purpose, environment of use, risks, and design requirements and inspection specifications to avoid the risks.

9.4 Please observe the 'absolute maximum rating' in using this product. When used exceeding the 'absolute maximum rating', the product may be destroyed permanently. Moreover, please observe the conditions of 'Electric characteristic' in normal operation. If these conditions are exceeded, failures of this product might occur and the reliability of this product might be influenced harmfully.

9.5 Hitachi Metals Ltd. makes maximum efforts to improve the quality and reliability of this product. However, it is unavoidable that this product fails at a certain rate as well as other electronic devices, even though it is used within the specified conditions.

Please take measures in your system design considering redundancy, safety, inflammability and malfunction to avoid fatal damage of the equipment, injury, fire, or other subsequent major damages.

9.6 Please follow the directions indicated in the Specifications.

10. Notice

- 10.1 This product is currently (31 Aug. 2004) not regulated by the “Foreign Exchange and Foreign Trade Law” of Japan, but if, due to amendments to said law or relevant regulations or otherwise, it will be so regulated in the future, the export license specified by the law will be required for exportation.
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