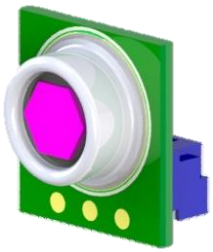
MEMS Infrared Thermal sensor MMS701 Data Sheet

DESCRIPTION



MMS701 is an infrared sensor using MEMS thermopile technology. This sensor can measure surface temperature of objects without touching them by capturing infrared radiation from the objects. The product outputs a digital value of surface temperature of object. I2C is adopted for the interface. Temperature of the sensor itself can also be measured.

FEATURES

- Low noise level
  - Noise-equivalent temperature (NETD): below 0.06℃
- Temperature value directly available
  - Ambient temperature compensated value of object temperature is output. Easy for rapid application engineering.
- Easily mountable with a connector
  - No need to prepare dedicated board for the sensor.
- Good temperature accuracy even at in sub-zero temperatures

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BLOCK DIAGRAM

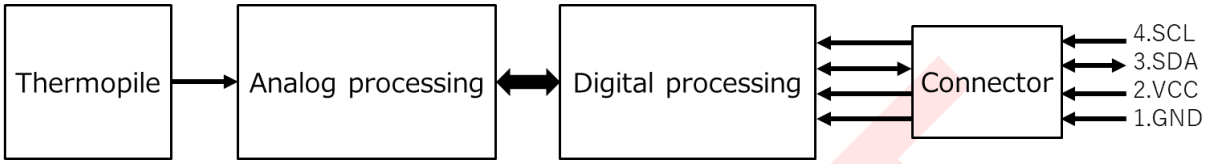
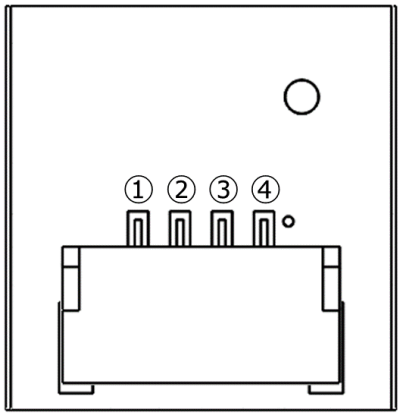


Fig.1 Block diagram

PIN CONFIGURATION



Pin No.	Pin Name
1	GND
2	VCC
3	SDA
4	SCL

Fig. 2 Pin configuration (Top view)

ABSOLUTE MAXIMUM RATINGS

(unless otherwise specified, Ta=25°C)

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Power-supply Voltage	Vcc	-0.2		6.0	V	
Voltage at I/O	-	-0.3		Vcc	V	SCL, SDA terminal

RECOMMENDED OPERATING CONDITIONS

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Operating Voltage	Vcc	4.5	5.0	5.5		
Storage Temperature	Ts	-40		100	°C	note[1]
Operating Temperature	To	-40		80	°C	note[1]
Storage Humidity	Hs			95	%RH	note[1]
Operating Humidity	Ho	20		95	%RH	note[1]

note[1]: With no icing or condensation

ELECTRICAL CHARACTERISTICS

(unless otherwise specified, Ta=25°C)

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Input Low Voltage	VIL	0.0	-	0.2 x Vcc	V	SCL, SDA Terminal
Input High Voltage	VIH	0.8 x Vcc	-	Vcc	V	SCL, SDA Terminal
Output Low Voltage	VOL	0.0	-	0.2 x Vcc	V	SCL, SDA Terminal IOL = 200uA
Consumption Current	-	-	3.5	7.0	mA	

OPERATING CHARACTERISTICS

Item		Typ.	Unit	Remark
Field of view	X-axis	25	Degree	note2
	Y-axis	25	Degree	note2
Temperature accuracy	Calibration point	±1.5	℃	note3
	Test point	±3.0	℃	note3
Object temperature range		-40 to 80	℃	Fig. 4

note[2]: Definition of Field of view (FOV)
Maximum sensor output relative to the case of changing the angle of the sensor.
The field of view is defined as angle range obtained 50% or more sensor output.
(Refer to Fig 3.)

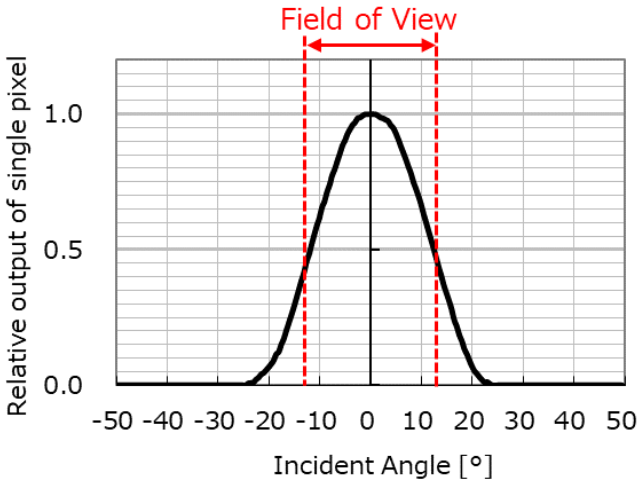


Fig. 3 FOV Characteristic

note[3]: Accuracy of the output of object temperature is guaranteed by our equipment.

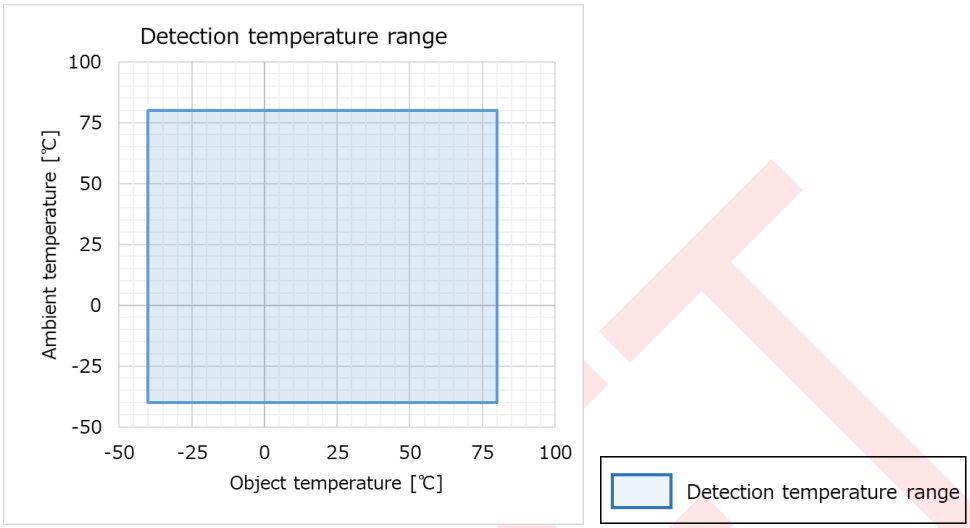
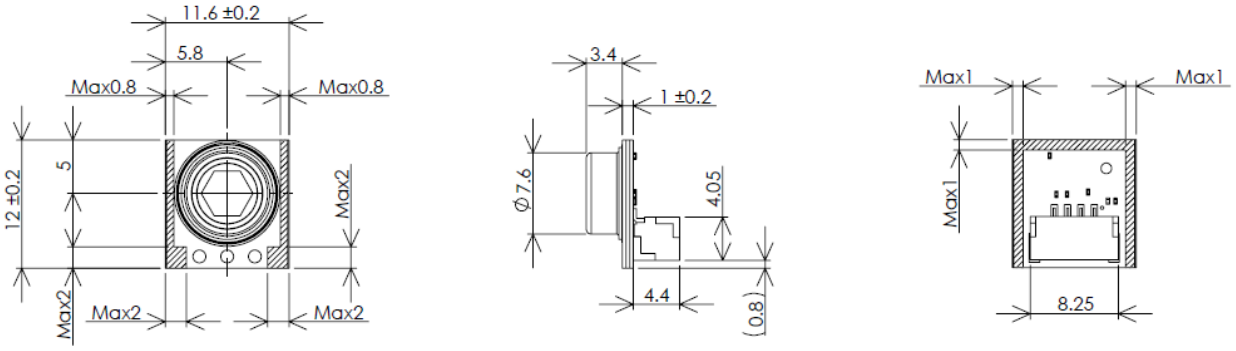
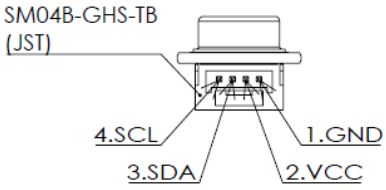


Fig.4 Detecting temperature range (Reference)

DIMENSIONS

UNIT	mm





Note1 : Hatched area show accesible part. Accesibul part is only insulating material not metal.

note[4]: The dimension is for reference only and not guaranteed by design.

HANDLING PRECAUTIONS

• Please review in advance by your actual equipment before using sensor.
Because of the mounted location and the ambient environment, may not exhibit the characteristics of the sensor.

• Please don't use the sensor that is contaminated by Oil or dust on the lens or sensor cover. Temperature may be unable to measure correctly.

• In the following environments: Do not use sensors.
- Environments with water and oil
- Outdoor
- Locations subject to direct sunlight
- Environments with corrosive gases (chlorine, sulfide gas, ammonia gas, etc.)
- Where to extreme temperature changes
- Locations where icing or condensation may occur
- Locations of high impact shock and vibration

• Please consider a proper method to remove static electricity.

• About Noise-proof
-This product is not equipped with a protection circuit, so, please give the electrical load exceeds the absolute maximum rating even momentarily.
-Equipment that generates radio frequency (RF Welder, sewing machines and high frequencies) and from the equipment that generates surges, please set up as far as possible.
-Peripherals that generate noise (in particular, motors, transformers, solenoids, and having a magnet coil inductance), the surge and noise filter installed please.
- In order to prevent inductive noise, the arrangement of the connector body, high voltage, high current power lines, please separate wires or adopt effective ways such as using shielded wire.
- When you use a switching regulator, please use after confirming that it may cause malfunction of the power supply switching noise.

• About handling
- This product is a precision instrument.
Please do not give excessive force or shock and not drop.
Because failure and cause characteristic changes.
Please do not use products that fall.
Please do not let cleaning liquid adhere to the sensor directly.
- The setting of the sensor, please turn off the power supply.
- Please fix the light beam to slip.
- Please attach to the plane.
If such a step mounting surface, the sensor is deformed and cannot be measured correctly.
- Lease does not screw mounting.
Cause the substrate resists peeling.
Please attach a fixed time so as not resist peeling.
- Use the specified connector, please connect securely to prevent removal.
Also, please do not soldered directly to the connector pins.
- So please do not miss-wiring.
- Please do not disassemble.

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Notes:
Any products mentioned this datasheet are subject to any modification in their appearance and others for improvements without prior notification. The details listed here are not a guarantee of the individual products at the time of ordering. When using the products, you will be asked to check their specifications.