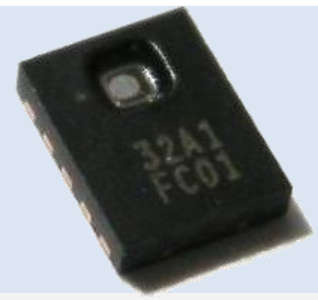


MXH2101

Temperature & Humidity Sensor
Low power Multi-output module (DFN-10)



Features

- Fully calibrated, Linearized Temp compensated sensor
- Excellent Long term stability
- Low power consumption (68 μ A~)
- Multi-output: I²C/SPI, PWM/PDM,
- Small foot print 3.6x2.8x0.75mm (10pins)

Application

- HVAC
- Automotive
- Humidifiers
- Medical
- Automation
- Measurement
- Weather station
- Data Logger
- White Goods
- Consumer Goods

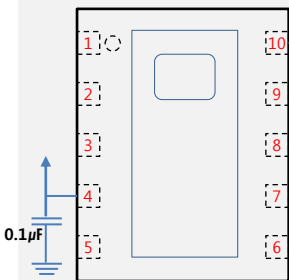
Humi Specifications

Range	0~100%RH
Accuracy (@ 25°C)	±2.0%RH(20 to 80%RH)
	±4.0%RH(Other Range)
Hysteresis	±1.0%RH
Resolution	0.04%RH (12bit)
Response time	time < 10s (τ 63)

Temp Specifications

Range	-40~125°C
Accuracy	±0.3°C (10 to 60°C)
	±0.9°C(Other Range)
Resolution	0.01°C (14bit)
Response time	>30s (τ 63)

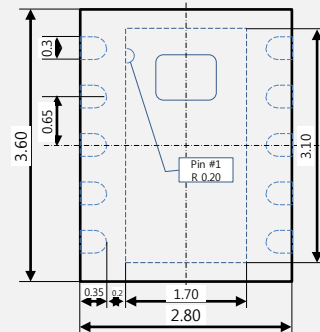
Pin layout



Top view through package

PIN	I/O	Description
1	NC	No connect
2	CSB	SPI : chip select input I2C,PWM PDM : floating(NC)
3	DA	SPI : data available output signal I2C,PWM PDM : floating(NC)
4	VDD	VCC Power supply
5	NC	No connect
6	SDA/SDIO	I2C/SPI serial data & PWM/PDM output
7	SCL/SPC	I2C/SPI serial clock
8	SEL[0]	Mode selection
9	SEL[1]	Mode selection
10	VSS	Ground
11	EP	Exposed Pad / Connect to GND

Dimensions

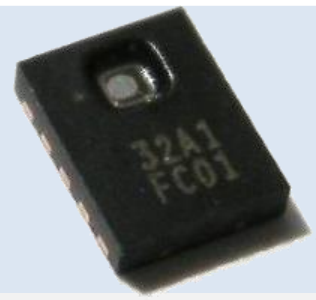


Top view through package

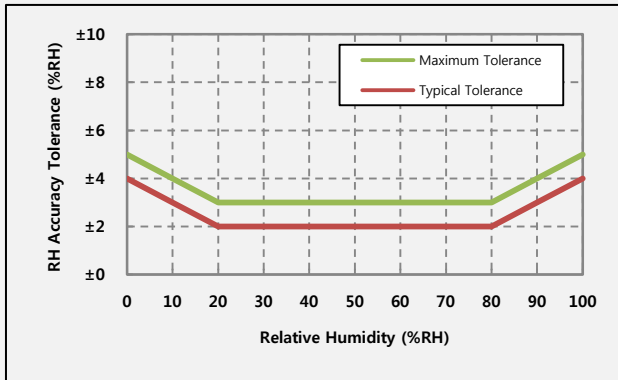
(단위:mm)

MXH2101

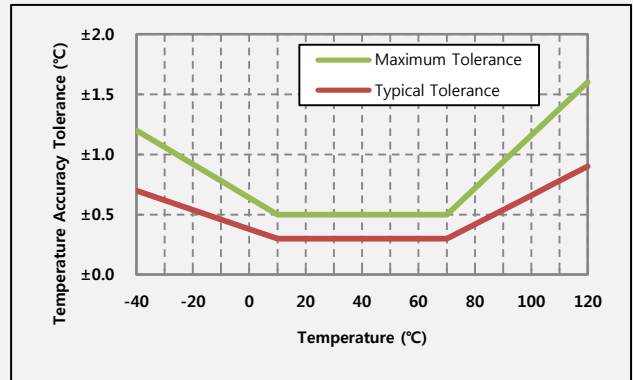
Temperature & Humidity Sensor
Low power Multi-output module (DFN-10)



Tolerance



Tolerance of Relative Humidity @ 25°C



Tolerance of Temperature

Electrical Specifications

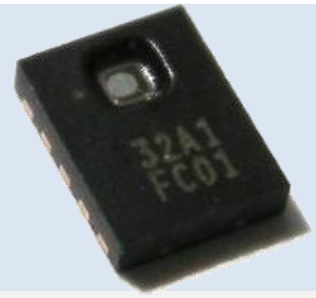
Parameters	Units	Min	Typ	Max
Supply Voltage	V	2.1	3.0	3.6
Average (8bit), SEL[1:0]=00 Measuring, SEL[1:0]=00	μ A(Avr.) μ A	-	1(TBD) 330(TBD)	-
Sleep Current	μ A	-	0.13	-

Environmental conditions

Parameters	Units	Ratings
Operating Temperature range	°C	-40 ~ 125
Storage Temperature range	°C	-55 ~ 150

MXH2101

Temperature & Humidity Sensor
Low power Multi-output module (DFN-10)



Output

1) I²C Communication (No Hold Master) – Data Measurement

- Mode selection : SEL[0] = high, SEL[1] = high, CSB[Pin2] & DA[Pin3] = NC(floating)
- Pull up resistors (e.g 10kΩ) are required for SDA/SCL signal high
- Sensor(Slave) address is **0x40** (=0b1000000, 7bit)

Communication Sequence



I2C Address **0x40=1000000**, Write = 0

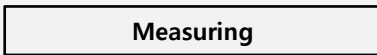
RH cmd : 1111 0101

T cmd : 1111 0011

T+RH cmd : 1111 0001

- S** Start bit from the master
- P** Stop bit from the master

- Bits generated by Master
- Bits generated by Sensor



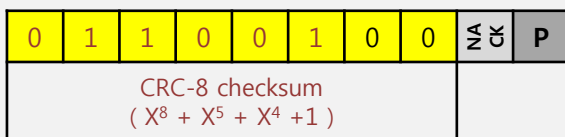
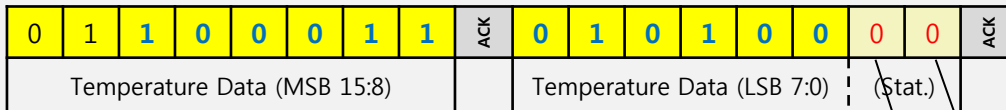
I2C Address **0x40=1000000**, Read = 1



I2C Address **0x40=1000000**, Read = 1

If measuring not finished, Sensor answers NACK, then start again until get ACK

Data transfer



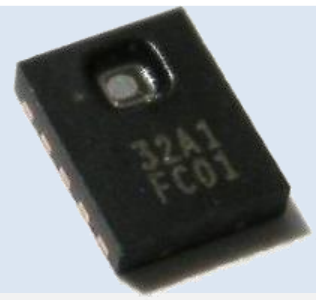
- Not reserved
- [0]:Temp
- [1]:Humidity

RH and Temp formula :

- Set status bits as "00" before calculation (It should be included in Data Bit)
- Temp [°C] = $175.72 \times \{\text{Temperature}[0b\ 01100011\ 01010000] \div 2^{16}\} - 46.85 = 21.318^{\circ}\text{C}$
- Humidity [%RH] = $125 \times \{\text{Humidity}[0b\ 01100011\ 01010000] \div 2^{16}\} - 6 = 42.492\ \%RH$

MXH2101

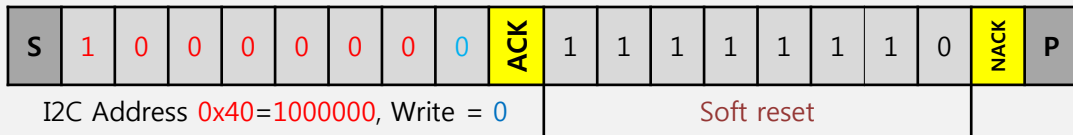
Temperature & Humidity Sensor
Low power Multi-output module (DFN-10)



Output

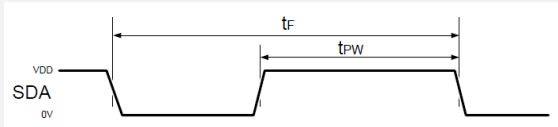
2) I²C Communication – Soft reset : Rebooting sensor w/o power off

Soft reset



3) PWM output (at SDA/SDIO[Pin6])

- Mode selection : SEL[0] = high, SEL[1] = low, CSB[Pin2] & DA[Pin3] = NC(floating)
- Data selection : Humidity → SCL/SPC[Pin7] = high, Temp → SCL/SPC[Pin7] = low
- Measurement interval 2Hz with 10bit(RH) & 12bit(T) resolution
- Base frequency app. 120Hz (t_f is about 8.3ms)



RH and Temp formula :

- Humidity [%RH] = $125 \times (t_{pw} \div t_f) - 6$
- Temperature [°C] = $175.72 \times (t_{pw} \div t_f) - 46.85$

※ For PDM/SPI output and more detailed information, please call to company below.