

MTH02

Temperature & Humidity Sensor Specification

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- | | |
|---|-------------------------------|
| - Relative humidity and temperature sensor | - No Extra Component Required |
| - Pre-calculated temperature and humidity read out, no extra calculation needed | - Ultra Low Power Consumption |
| - Dew Point Calculation possible | - Fully Interchangeable |
| - Fully Calibrated, Digital Output | - Small Size |
| - Excellent Long Term Stability | - Automatic Power Down |
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Product Summery

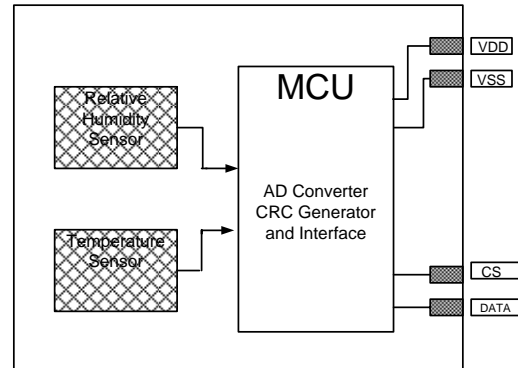
The MTH02 is a MCU based temperature and relative humidity sensor module, comprising one wire interface for direct temperature and humidity read out. The digital output is pre-calculated and no extra calculation is required. The system applied two sensor elements: built in NTC type high precision temperature sensor

and resistor type relative humidity sensor from Japan. With a very unique and patented relative humidity calculation algorithm, the system can assure accurate relative humidity output through fine tuned temperature compensation mechanism. Thus very high accurate reading of humidity in the full temperature range (0-50C) can be assured.

Applications

- HVAC
- Consumer Products
- Weather Stations
- Humidifiers
- Dehumidifiers
- Test and Measurements
- Data Logging
- White Goods

Block Diagram



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1. Module Performance Specification

Parameter	Conditions	Min	Typ	Max	Unit
Humidity					
Resolution				1	%
Repeatability			1		%
Accuracy Uncertainty	Temperature at 0C – 50C range	0	3	5	%
Interchangeability		Fully Inter Changeable			
Nonlinearity			1		%
Range	Temperature at 0C – 50C range	18		98	%
Response Time	63% slowly move air		60		Second
Hysteresis	Non-condensate	1		2	%
Long Term Stability	Non-condensate		2		%/yr
Temperature					
Resolution			0.1		° C
Repeatability			0.1	0.2	° C
Range		-40		70	° C
Accuracy	25		+/-0.5	+/-1.0	° C
Response Time	delta T=1.0		60		S

2. Sensor Interface

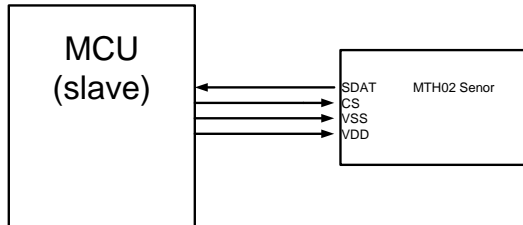


Figure 1: Typical Application

2.1 Power Pins

The MTH02 sensor module requires a voltage supply between 2.2 to 5.5. After power up, the sensor needs 20ms to complete its internal reset process. After reset finished, the sensor will make a measurement automatically and if the CS pin is low, then the measured data will be output automatically.

Power pins should be decoupled through a 10-100nF capacitor. Where in those applications with high power noise

environment, it is strongly recommended to use a 10uF tantalum capacitor to protect the sensor from interferences.

2.2 Serial Interface

The serial interface is optimized for convenient reading and reducing IO usage. Application engineer should be kept in mind the characteristics of the IO pins for applications where current consumption is critical.

CS, INPUT pin, has 50k pull up resister connected internally, thus during normal application, the pin should not be tied to low unless read operation is really needed.

DATA, OUTPUT pin in push pull mode. During the power down mode, DATA pin is kept low, and data is modulated through this pin when CS is kept low.

3. Bus Timing

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The diagram shows two digital signals over time. The top signal, labeled 'CS', is a single pulse with a width indicated as $T1$. The bottom signal, labeled 'DATA', consists of three distinct pulse sequences. The first sequence has a pulse width of $1.5ms$. The second sequence has a pulse width of $500\mu S$. The third sequence has a pulse width of $1ms$. The signals are shown as black lines on a white background.

T1: 10ms Nominal
1.5ms - 0
500us - 1

Data output bit stream starts with MSB of temperature (2 byte) data, followed with one byte humidity , two bytes of external sensor temperature and one byte CRC.

CRC=0xFF is not used for the CIR2 project !

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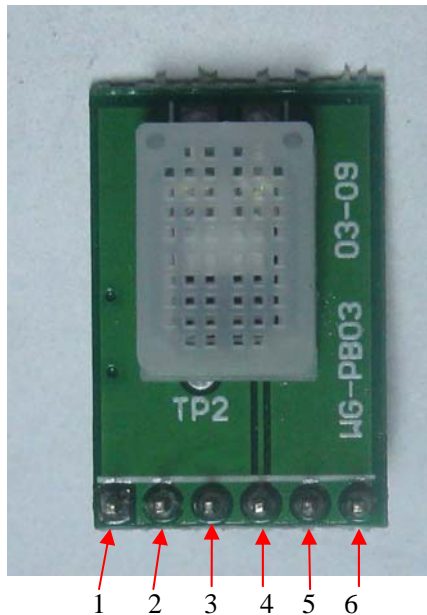
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4. DC Characteristics

Parameter	Conditions	Min	Typ	Max	Unit
Power Supply DC		2.2	3	5.5	V
Power Supply Current	AD measuring		100	200	uA
	data transferring		0.2		mA
	standby		0.2		uA
Low Level Output Voltage		0		20%	Vdd
High Level Output Voltage		80%		100%	Vdd
Low Level Input Voltage	Negative Edge	0%		30%	Vdd
High Level Input Voltage	Positive Edge	70%		100%	Vdd
Pads Leakage Current			1		uA
Output High Current	80%VDD		10		mA
Output Low Current	20%VDD		20		mA

5. Package Information

The module is in 10 x 20 mm size, with six pins:



5.1 Pin Definition

1. VDD
2. VSS
3. PON
4. DATA
5. SNSA
6. SNSB

Figure5: outline of the sensor module

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7. Important Notice

Do not use this product as safety or emergency stop devices or in any other applications where failure of the product could result in personal injury. Failure to comply with this instruction could result in death or fatal injury.

7.1 ESD precautions

To prevent ESD related damage and/or degradation, take normal ESD precautions when handling the device.

7.2 Warranty

We make no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor do we assume any liability arising out of the application or use of any product or circuit and specifically disclaims any and all liability, including without limitation consequential or incidental damages.