

SENSYLINK Microelectronics

(CHT1305)

Digital Humidity & Temperature Sensor

CHT1305 is a Digital Humidity and Temperature Sensor with $\pm 3.0\%RH$ Accuracy for humidity and $\pm 0.5^{\circ}C$ Accuracy for temperature. Single-Wire Digital interface is Compatible with 1-wire Interface. It is ideally used in Smart HVAC System, Portable/Wearable Weather Monitor and Grain Moisture Monitor etc.

Digital Humidity and Temperature Sensor with Single-Wire Interface

Description

CHT1305 is a digital humidity and temperature sensor with $\pm 3.0\%RH(\text{Max.})$ accuracy for humidity and $\pm 0.5^{\circ}\text{C}(\text{Max.})$ accuracy for temperature. Humidity and Temperature data can be read out directly via Single-Wire digital interface by MCU, Bluetooth Chip or SoC chip.

CHT1305 supports Single-Wire digital interface which is compatible with 1-Wire Interface. It permits multi slave devices communication with one host via DIO pin.

Each chip is specially calibrated for in factory before shipment to customers. There is no need for re-calibration anymore.

It includes a high precision band-gap circuit, a 13-bit analog to digital converter, a calibration unit with non-volatile memory, and a digital interface block.

The chip supports normal power supply mode (forcing power at VCC pin), also support parasitic power supply mode (powered by DIO pin, VCC pin short to GND pin).

Available Package: DFN3x3-6 package

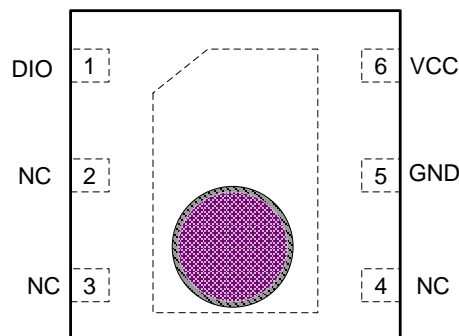
Features

- Operation Voltage: 1.8V to 5.5V
- Average Operating Current: 15uA (Typ.), 30uA (Max.)
- Average Current: 2.5uA (Typ.) at one time temperature & humidity measurement per second.
- Standby Current: 0.1uA (Typ.), 0.3uA (Max.)
- Temperature Accuracy: $\pm 0.5^{\circ}\text{C}$ (Max.) from 0°C to 50°C
- Humidity Accuracy: $\pm 3.0\%RH(\text{Max.})$ at 50%RH
- 13 bit ADC for Temperature and Humidity
- 512-bit EEPROM Available
- Support Parasitic Power Supply Mode
- Temperature Range: -50°C to 150°C
- Humidity Range: 0%RH to 100%RH
- Protection Cover is available

Applications

- Smart HVAC System
- Portable/Wearable Weather Monitor
- Grain Moisture Monitor

PIN Configurations (Top View)



DFN3x3-6 (Package Code DN)

Typical Application

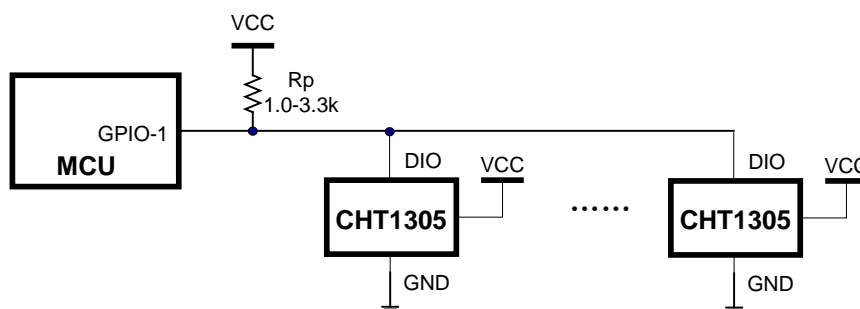


Figure 1. Typical Application of CHT1305

Digital Humidity and Temperature Sensor with Single-Wire Interface

Pin Description

PIN No.	PIN Name	Description
1	DIO	Digital interface data input and output pin, generally it needs a pull-up resistor to VCC in most applications, between 1.0k and 3.3k.
2,3,4	NC	No Connection.
5	GND	Ground pin.
6	VCC	Power supply input pin, using 0.1uF low ESR ceramic capacitor to ground

Function Block

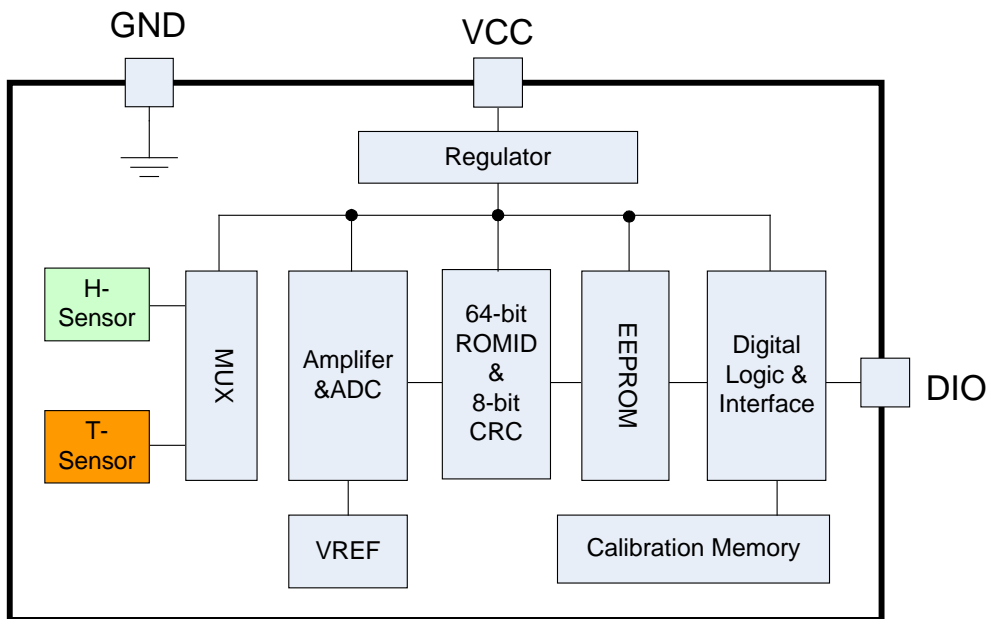
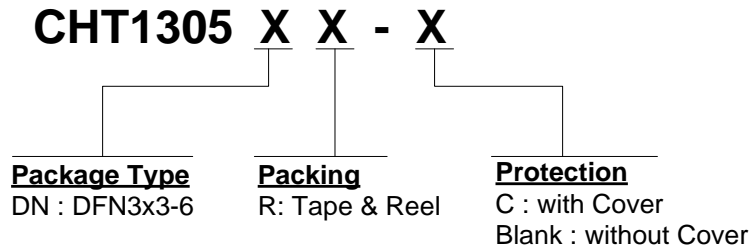


Figure 2. CHT1305 function block

Digital Humidity and Temperature Sensor with Single-Wire Interface

Ordering Information



Order PN	Accuracy	Green ¹	Package	Marking ID ²	Packing	MPQ	Operation Temperature	Protection Cover
CHT1305DNR	±0.5°C ±3%RH	Halogen free	DFN3x3-6	1305 YWWAXX	Tape & Reel	3,000	-40°C~+125°C	No
CHT1305DNR-C	±0.5°C ±3%RH	Halogen free	DFN3x3-6	1305 YWWAXX	Tape & Reel	3,000	-40°C~+125°C	Yes

Notes

1. Based on ROHS Y2012 spec, Halogen free covers lead free. So most package types Sensylink offers only states halogen free, instead of lead free.

2. Marking ID includes 2 rows of characters. In general, the 1st row of characters are part number, and the 2nd row of characters are date code plus production information.

- 1) Generally, date code is represented by 3 numbers. The number stands for year and work week information. e.g. 501 stands for the first work week of year 2015; 621 stands for the 21st work week of year 2016.
- 2) Right after the date code information, the next 2-3 numbers or letters are specified to stand for supplier or production location information.

Digital Humidity and Temperature Sensor with Single-Wire Interface

Absolute Maximum Ratings (Note3)

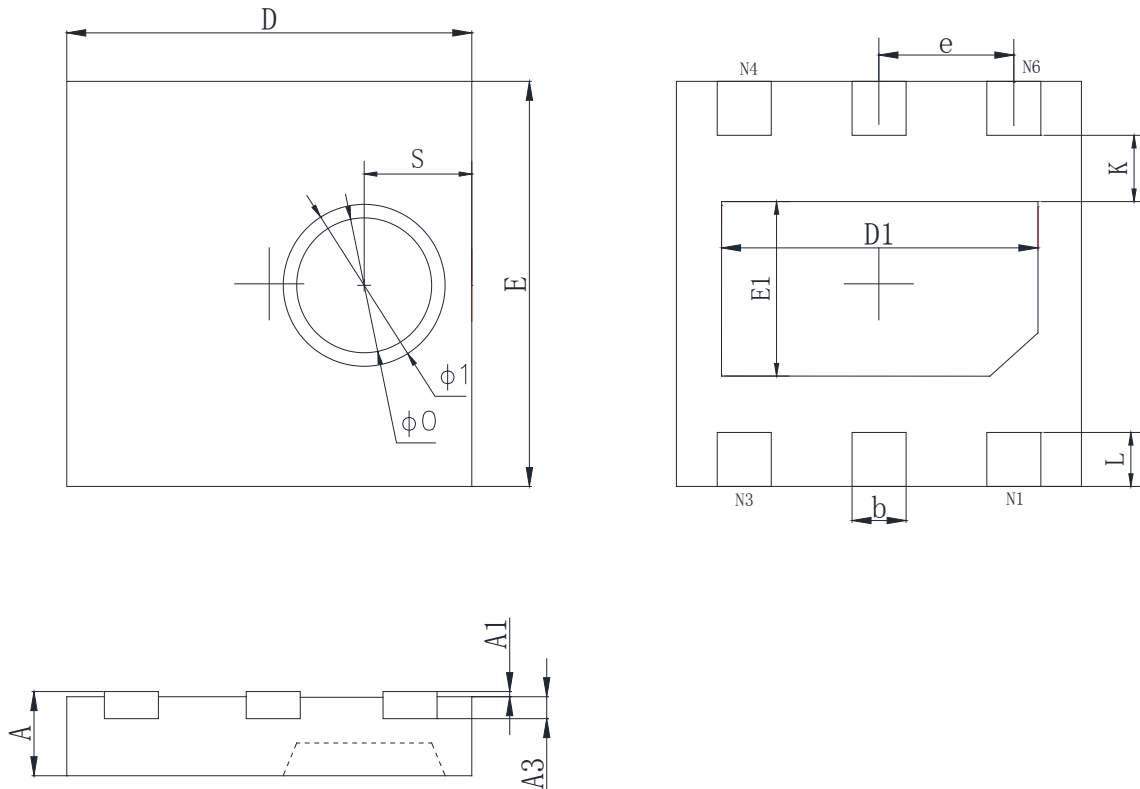
Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC} to GND	-0.3 to 5.5	V
DIO Voltage	$V_{SDA}/V_{SCL}/V_{AD0}$ to GND	-0.3 to 5.5	V
Operation junction temperature	T_J	-50 to 150	°C
Storage temperature Range	T_{STG}	-65 to 150	°C
Lead Temperature (Soldering, 10 Seconds)	T_{LEAD}	260	°C
ESD MM	ESD_{MM}	600	V
ESD HBM	ESD_{HBM}	6000	V
ESD CDM	ESD_{CDM}	1000	V

Note3

1. *Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only. Functional operation of the device at the "Absolute Maximum Ratings" conditions or any other conditions beyond those indicated under "Recommended Operating Conditions" is not recommended. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.*
2. *Using 2oz dual layer (Top, Bottom) FR4 PCB with 2.5x1.4 mm² cooper as thermal PAD*

Recommended Operating Conditions

Parameter		Symbol	Value	Unit
Supply Voltage	Temperature, Humidity measurement, Memory Reading	V_{CC1}	1.8 ~ 5.5	V
	Memory Writing/Erasing	V_{CC2}	4.5 ~ 5.5	V
Ambient Operation Temperature Range		T_{AT}	-50 ~ +150	°C
Ambient Operation Temperature Range for Humidity		T_{ATH}	0 ~ +85	°C
Ambient Operation Humidity Range		T_{AH}	0 ~ 100	%RH

Digital Humidity and Temperature Sensor with Single-Wire Interface
Package Outline Dimensions
DFN3x3-6 Unit (mm)


Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.010	0.050	0.000	0.002
A3	0.203REF.		0.008REF	
D	2.900	3.100	0.114	0.122
E	2.900	3.100	0.114	0.122
D1	2.300	2.500	0.091	0.098
E1	1.400	1.600	0.055	0.063
k	0.350MIN.		0.014REF	
b	0.350	0.450	0.014	0.018
e	1.000YP.		0.040TYP	
L	0.350	0.450	0.014	0.018
S	0.740	0.840	0.029	0.033
φ0	1.000TYP		0.040TYP	
φ1	1.200TYP		0.048TYP	



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