

RELATIVE HUMIDITY SENSOR FAMILY



Renesas' humidity sensors offer high accuracy, lowest power with the fastest measurement response time of comparable devices currently on the market.

The HS300x & HS400X families of relative humidity sensors feature a $\pm 1.5\%$ RH accuracy, both digital & analog outputs covering supply voltages of 1.8V – 5.5V and waterproof IP67 options available.

The HS400X offers the lowest power consumption on the market with an average of 1.0 μA average (one RH + T measurement per second)

This is especially important for battery-powered applications where lower power consumption equates to longer battery life. In addition to high-accuracy and fast response times, the HS300x & HS400X family features excellent long term stability of 0.1% RH per year as a result of a robust silicon carbide construction and an innovative design.

This improves useful lifetime and lowers effective cost.

Features

- $\pm 1.5\%$ Relative Humidity Accuracy (HS3101, HS3011, HS4001, HS4101)
- Fast RH response time (Typical 3 seconds)
- 14-bit resolution, 0.01%RH (Typical, HS300X, HS3101)
- Low power consumption, 0.62 μA average (one RH + T measurement per second, 14-bit, HS400X, HS401X)
- Standby current: 25nA (HS400X, HS401X)
- Temperature sensor accuracy of $\pm 0.2^\circ\text{C}$
- Digital and Analog Output (HS3X0X, HS40XX, HS41XX)
- Waterproof IP67 rated Hydrophobic membrane
- Supply voltage, 1.71V to 3.6V (HS40XX, HS41XX) & 1.8V – 5.5V (HS3X0X)
- 2.5 x 2.5 x 0.9 mm, 8-LGA (HS40XX, HS41XX)

Applications

- Battery operated devices such as weather stations
- Climate control systems
- Home appliance
- Industrial automation
- Process controls and monitoring
- Automotive climate control

HUMIDITY SENSORS PRODUCT DETAILS

Benefits

- Integrated temperature and humidity sensing solution
- Small form factor solution with lower system cost
- Low power consumption saves battery
- 14-bit high resolution provides extremely tight accuracy
- Insensitive to environmental contaminants like dirt and dust
- Small solution size saves space and BOM for compact designs
- On-board calibration reduces time to market
- Wide supply voltage range eliminates the need for LDO/DC-DC
- Fast RH response time (typical 4 seconds)

High-Performance Relative Humidity and Temperature Sensors

Part Number	Output	%RH Accuracy	Ultra Low Power
HS30xx*	Digital	1.5, 1.8, 2.5, 3.5	No
HS40xx*	Digital	1.5, 1.8, 2.5, 3.5	Yes
HS41xx*	Analog	1.5, 1.8, 2.5, 3.5	Yes

*Waterproof package available

HS40xx Key Operating Parameters

Parameter	Condition	Minimum	Typical	Maximum	Units	
Average Current	One RH + Temperature Measurement/ second VDD = 3.3V	8-bit resolution	0.27	0.30	0.32	μA
		10-bit resolution	0.31	0.34	0.37	
		12-bit resolution	0.39	0.43	0.47	
		14-bit resolution	0.55	0.62	0.69	

To request samples, download documentation or learn more, visit:

renesas.com/humidity



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