

HumiChip®

Humidity & Temperature Solution

Features

- ◆ Fully Calibrated & Temperature Compensated
- ◆ Digital or Analog Output with Alarm Function
- ◆ Precision & Accuracy ($\pm 2\%RH$, $\pm 0.3^{\circ}C$, 14 bit)
- ◆ Free Operating Voltage (min 2.3V to max 5.5V)
- ◆ Low Current Consumption
- ◆ SMD Package for Automated Assembly
- ◆ Reliable in Harsh Environment



Product Summary

HumiChip® offers the most advanced and cost effective humidity and temperature sensing solution for virtually any type of applications.

Capacitive polymer sensor chip developed and fabricated in-house and CMOS integrated circuit with EEPROM are integrated into one embedded system in a reflow solder-able SMD package.

Individually calibrated and tested, **HumiChip®** performs $\pm 2\%$ from 20% to 80%RH ($\pm 3\%$ over entire humidity range), and yet, is simple and ready to use without further calibration or temperature compensation.

HumiChip® provides linear output signals in various interfaces to customer requirements - the **standard I²C interface** with an optional **SPI** output, **PDM** convertible to analog signal, and an **Alarm function** for preset control at min/max humidity.

Designed and manufactured by industry leading humidity and temperature sensing technology of **SAMYOUNG S&C** – field proven in HVAC and Auto industry for over 10 years, **HumiChip®** offers another sensible sensing solution for excellent reliability, high accuracy, and cost effective sensing applications.

Application

Energy Saving HVAC Control

Air Conditioning, Refrigeration, IAQ monitoring, Vent Fans, Home Appliances, Humi/Dehumidifiers

Process Control & Instrumentations

Medical Instruments, Handheld Devices, Weather Stations, Food Processing, Printers, RFIDs ...

Automobile & Transportation

Cabin Climate Control, Defogging Control
Condensing Preventive Device ...

Mass Quantity Application

OEM custom specification available

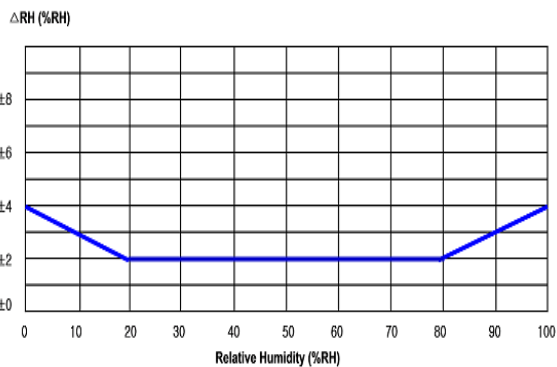
Sensor Performance

Relative Humidity (RH%)

Resolution	14 bit (0.01%RH)
Accuracy ¹	±2.0 %RH (20~80%RH)*
Repeatability	±0.2 %RH
Hysteresis	±2.0 %RH
Linearity	<2.0 %RH
Response time ²	7.0 sec (τ 63%)
Temp Coefficient	0.05 %RH/°C
Operating range	0 ~ 100 %RH (Non-Condensing)
Long term drift	<0.5 %RH/yr (Normal condition)

* Custom Accuracy Tolerance Available

Figure 1.. Typical RH% Accuracy at 25 °C

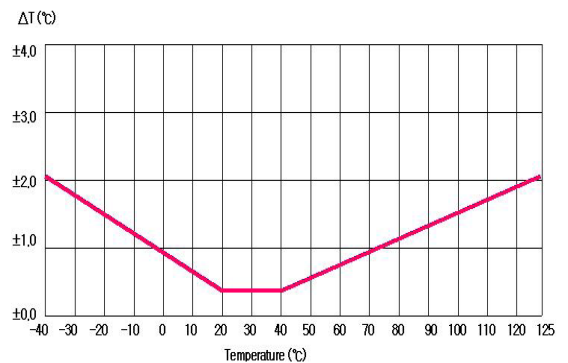


Temperature (°C)

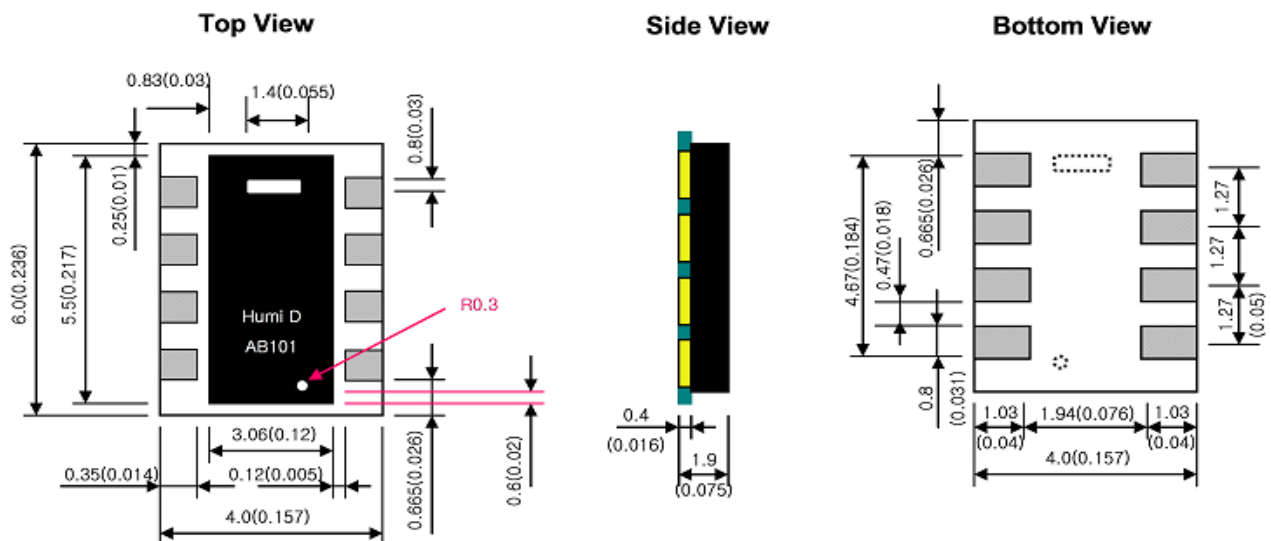
Resolution	14 bit (0.01 °C)
Accuracy ³	±0.3 °C (Figure 2)
Repeatability	±0.1 °C
Response time ⁴	5.0 sec (τ 63%)
Operating range	- 40 ~ 125 °C
Long term drift	<0.05 °C/yr (Normal condition)

1. Accuracies measured at 25 °C, 5.0V.
2. Measured at 25 °C, 1m/sec airflow for achieving 63% of step from 33%RH to 90%RH
3. Accuracies measured at 25 °C, 5.0V.
4. Min 5.0 sec, Max 20 sec

Figure 2. Typical Temperature Accuracy



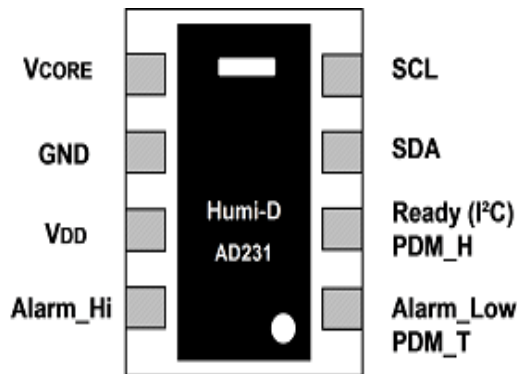
Dimensions



Electrical Specification

Supply Voltage	min 2.3V ~ max 5.5V
Supply Current (I _{DD})	650 μ A (typical)
Sleep Current (I _{sleep})	1 μ A (typical)

Pad Connection



Package Contents

Capacitive polymer RH Sensor, PTA (Proportional to Absolute) Temperature sensor integrated ASIC chip in LCC (Leadless Chip Carrier) package, SMD.

RoHS Compliant

Ordering Information

Output		Accuracy		Package	
D	I ² C	2	$\pm 2\%$ RH	R	Reel
A	PDM	3	$\pm 3\%$ RH		

I²C output: Humidity, Temp, & two (Hi/Lo) Alarm

PDM (Standard) output: Humidity, Temp. & one Alarm (High)

Analog (PDM) output for **Two Alarm** and Humidity only is available for **custom order**.

SPI output available for **custom order**.

Environmental

Operating Temperature	- 40 ~ 125 °C
Operating Humidity	0~100%RH (non condensing)

Absolute Maximum Rating

Parameter	Min	Max
Supply Voltage (V _{DD})	-0.3V	6.0V
Storage Temp	-50 °C	150 °C
Junction Temp (T _j)	-55 °C	150 °C

Soldering Information

Standard or IR Solder Reflow.

T_p: 260 °C, t_p: 40 sec. (qualify Pb free profile)

Shipping

Reel & Tape: 900 or 3,500 ea

To order

I²C output **HumiChip**[®]
 $\pm 3\%$ RH Accuracy (20%~80%RH)
 Reel & Tape shipping package

Ordering Part Number

HumiChip **D3 - R**