



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**, **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

Automobile & Transportation

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

Process Control & Instrumentations

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

Mass Quantity Application

OEM custom specification available



TUV

JIN ZON ENTERPRISE CO., LTD.

TEL:886-2-2711-1093~5 FAX:886-2-2731-0902

Email:jinzon@ms2.hinet.net <http://www.jinzon.com>

Address : 4F-3. No.171. Sec.2. Chang An E. Rd. Taipei. Taiwan. R.O.C.



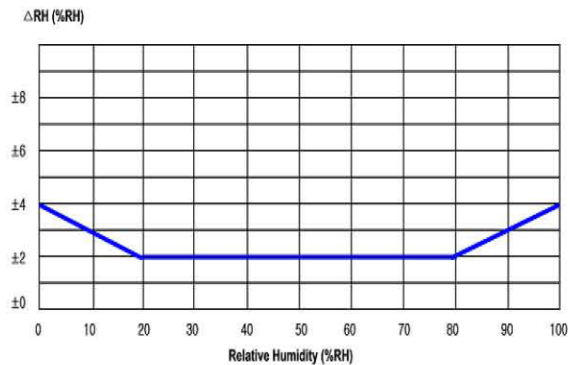
Sensor Performance

Relative Humidity (RH%)

* Custom Accuracy Tolerance Available

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	Max 0.13 %RH/°C (at 10~60°C, 10~90%RH)
Operating range	0 ~ 100 %RH (Non-Condensing)
Long term drift	<0.5 %RH/yr (Normal condition)

Figure 1. Typical RH% Accuracy at 25 °C

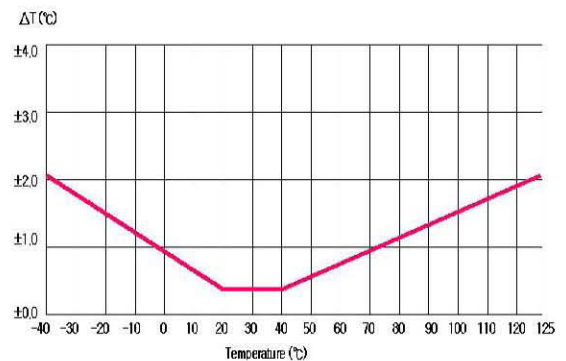


Temperature (°C)

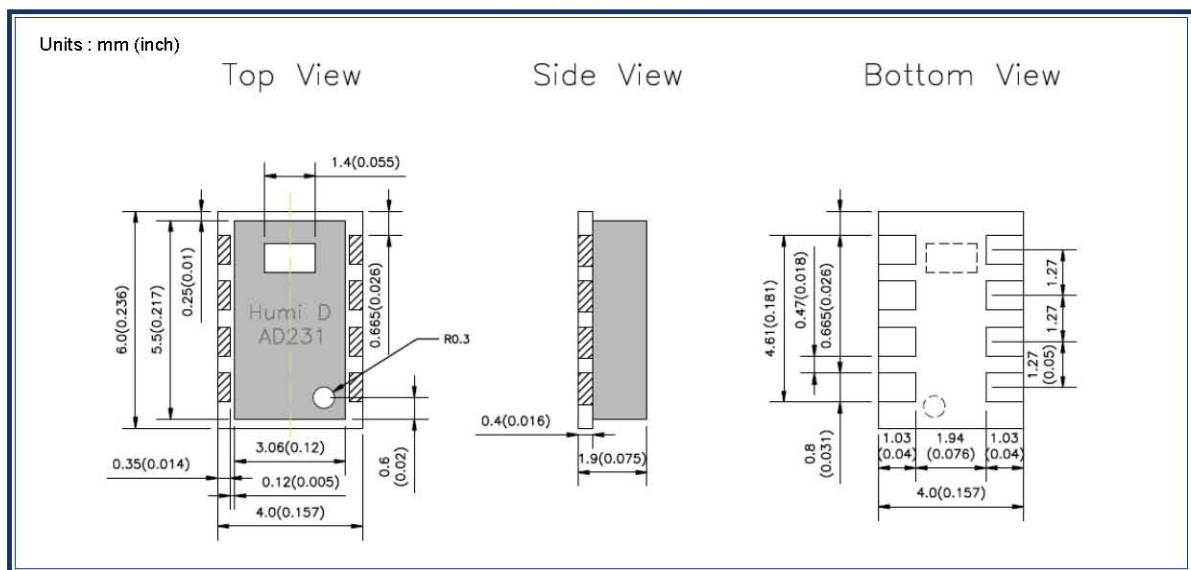
Resolution	14 bit (0.01°C)
Accuracy ³	±0.3 °C (Figure 2)
Repeatability	±0.1 °C
Response time ⁴	5.0 sec (τ 63%)
Operating range	- 40 ~ 125 °C
Long term drift	<0.05 °C/yr (Normal condition)

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



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Electrical Specification

Supply Voltage ^{*1}	min 2.3V ~ max 5.5V
Supply Current (I _{DD})	750 μ A (typical)
Sleep Current (I _{sleep}) ^{*2}	0.6 μ A (typical)

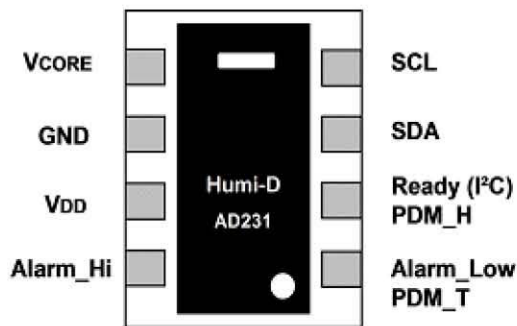
*1. Lower than 2.7V supply voltage may increase the accuracy tolerance of the Temperature.

*2. at -40 ~ 85°C

Environmental

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

Pin Connection



Absolute Maximum Rating

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

Soldering Information

Standard or IR Solder Reflow.

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

Package Contents

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

RoHS Compliant

Shipping

Reel & Tape: 2,500 / 500 ea

Ordering Information

Output	Accuracy	VDD	MODE	Ordering P/N	
D	I ² C	±2%RH	3.3	Update	HCPD- 3V-U2
		±3%RH	5.0		HCPD- 5V-U3
	I ² C	±2%RH	3.3	Sleep	HCPD- 3V-S2
		±3%RH	5.0		HCPD- 5V-S3
A	PDM	±2%RH	3.3	Update	HCPA- 3V-U2
		±3%RH	5.0		HCPA- 5V-U3

➤ Standard **Digital (I²C) Output** :

Factory setting is **Sleep Mode** and calibrated at **3.3V**.

Humidity, Temperature, and 2 Alarm (Hi / Low) functions for relative humidity.

➤ Standard **Analog (PDM) Output** :

Update Mode is calibrated at **5.0V**.

Humidity, Temperature, and an Alarm (high) function.

◆ For more detail **Part Numbers**,
Please refer to the **Table 7-1**



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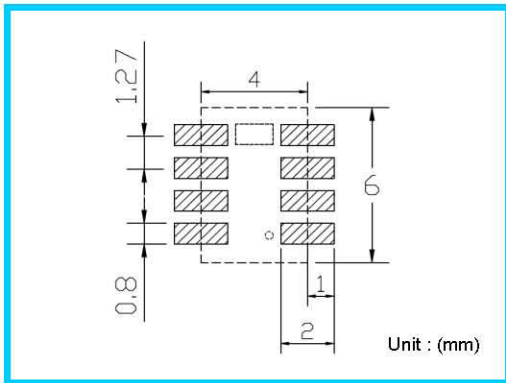


1.9 Shipping Package

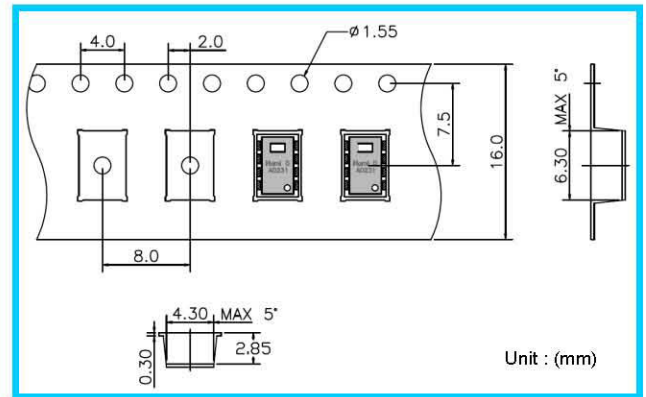
HumiChip® is provided in a tape & reel shipment packaging, sealed into antistatic ESD trays. Standard packaging sizes are 2,500 or 500 units per

reel. The drawing of the packaging tapes with sensor orientation and packing box dimensions are shown in **Drawing 2** and **Drawing 3** below.

Drawing 1 Land Pattern



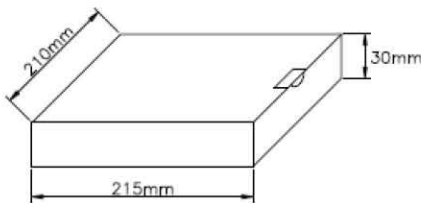
Drawing 2 Packing Reel & Tape



Drawing 3 Packing (Box)

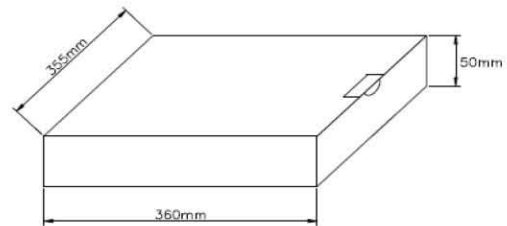
Inbox: 500ea

Dimension: 215 x 210 x 30 mm



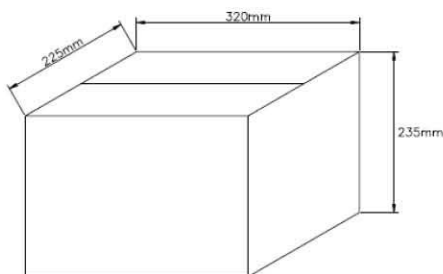
Inbox: 2,500ea

Dimension: 360 x 355 x 50 mm



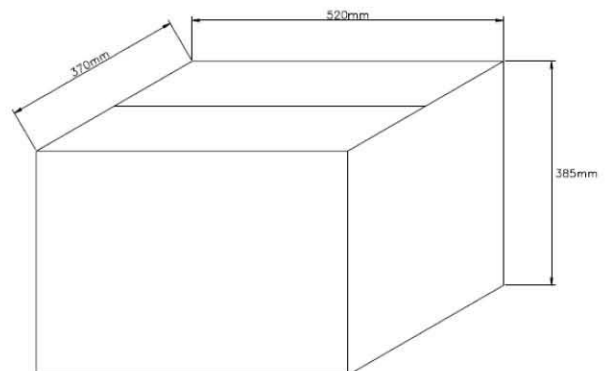
Outbox: 5,000ea (5 x Inbox 500)

Dimension: 320 x 225 x 235 mm



Outbox: 25,000ea (10 x Inbox 2500)

Dimensions: 520 x 370 x 385 mm



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