

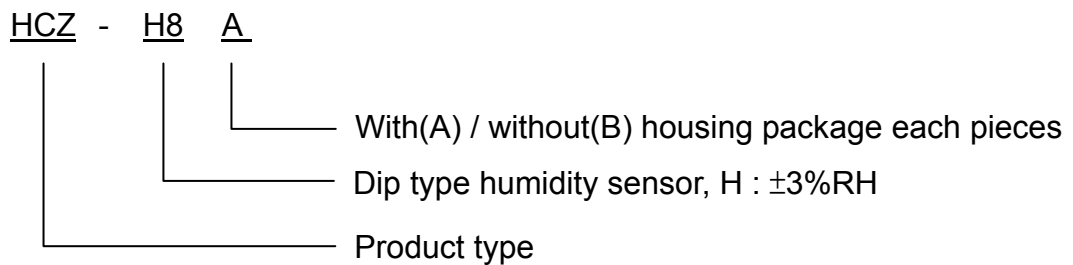
## 1 Description

This product specification is applied to the Humidity Sensor Type HCZ – H8. The terminal electrode material uses Lead free solder (Sn/Ag/Cu ). This product is conformity with RoHS directive which means that lead, cadmium, mercury, hexavalent chromium and specific bromine-based flame retardants have not been used.

## 2 Applications

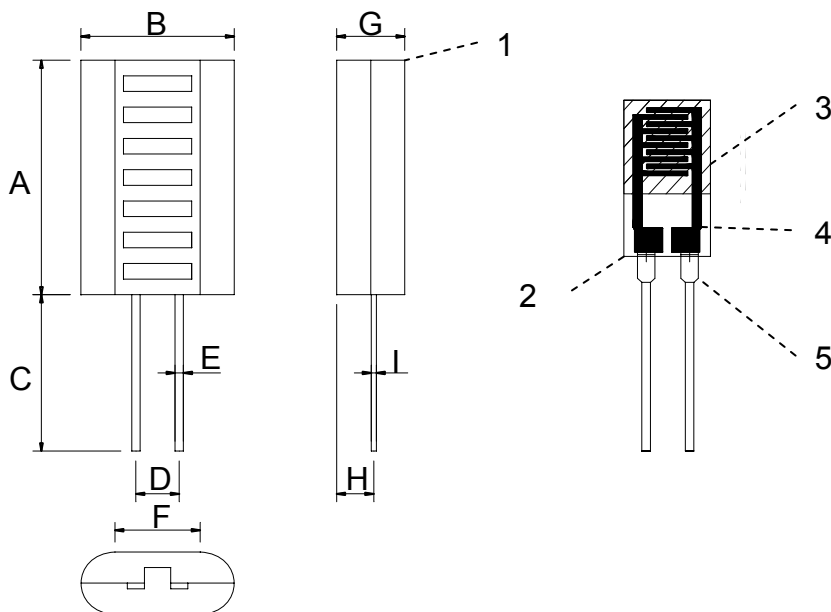
The applications of the component are used in relative humidity measurement, control and display. There are many end products can be used. For example air conditioner, humidifier, dehumidifier, hygrometer, recorder, transmitter...etc.

## 3 Model no.



## 4 Configuration & main parts

### 4.1 Configuration



# PRODUCT SPECIFICATIONS

HCZ-H8

Units : mm

| Symbol | Specification | Symbol | Specification |
|--------|---------------|--------|---------------|
| A      | 15            | F      | 5             |
| B      | 9             | G      | 4             |
| C      | 15 ± 2        | H      | 2             |
| D      | 2.5           | I      | 0.25          |
| E      | 0.5           |        |               |

## 4.2 Main parts :

| No. | Parts            | Reference       |
|-----|------------------|-----------------|
| 1   | Sensor case      | ABS             |
| 2   | Substrate        | Alumina         |
| 3   | Sensing material | Polymer         |
| 4   | Electrode        | Ag/Carbon       |
| 5   | Lead frame       | Phosphor bronze |

## 5 Electrical characteristics :

### 5.1 General Characteristics :

|                                     | Units  | Min. | Typ. | Max. |
|-------------------------------------|--------|------|------|------|
| Rated voltage                       | Vrms   | -    | -    | 1    |
| Rated power                         | mA     | -    | -    | 0.2  |
| Operating frequency range           | kHz    | 0.5  | 1    | 2    |
| Operating temperature range         | °C     | 0    | -    | 60   |
| Operating humidity range            | %RH    | -    | -    | 90   |
| Impedance range at 60%RH and 25°C** | kΩ     | 22.9 | -    | 41.9 |
| Humidity accuracy                   | %RH    | -3   | -    | +3   |
| Hysteresis (40%RH~80%RH)            | %RH    | -    | -    | 2    |
| Temperature dependence(reference)   | %RH/°C | -    | 0.3  | -    |

\*\* Measurement by LCR meter at 1KHz, 1 Vrms(sine wave)

### 5.2 Relative humidity - Impedance – 25°C, 1kHz, 1 Vrms(sine wave)

| %RH               | 20    | 30    | 40  | 50 | 60 | 70   | 80  | 90  |
|-------------------|-------|-------|-----|----|----|------|-----|-----|
| Normal value (kΩ) | 6,300 | 1,400 | 310 | 87 | 31 | 11.8 | 4.8 | 2.0 |

### 5.3 Relative humidity - Impedance curve is shown in page 5

# PRODUCT SPECIFICATIONS

HCZ-H8

## 6 Mechanical characteristics :

| No. | Item                         | Description  | Criteria*                                      |
|-----|------------------------------|--|--|
| 6.1 | Shock resistance             | Drop down 3 times@75cm   | No abnormal appearance & electrical properties |
| 6.2 | Vibration resistance         | 2 hours each in the directions of X-Y-Z, at the frequency of 10-55Hz, and amplitude of 1.5mm           | No abnormal appearance & electrical properties |
| 6.3 | Resistance to soldering heat | The lead terminal shall be Immersed by 3 mm from the substrate for 3 seconds in solder bath of 260±5°C | No abnormal appearance & electrical properties |
| 6.4 | Strength of terminations     | 500g@10 seconds in the axial direction of lead terminal  | Secured  |

## 7 Reliability :

| No. | Item                | Description   | Criteria* |
|-----|---------------------|---|-----------|
| 7.1 | Heat resistance     | 1000 hours@70°C   | < ±3%RH   |
| 7.2 | Cool resistance     | 1000 hours@-30°C  | < ±3%RH   |
| 7.3 | Humidity resistance | 1000 hours@40°C , 90%RH   | < ±3%RH   |
| 7.4 | Humidity cycle      | Repeat 500 cycles<br>One cycle:<br>30 minutes@25°C , <30%RH<br>30 minutes@25°C , >90%RH | < ±3%RH   |
| 7.5 | Temperature cycle   | Repeat 100 cycles<br>Each cycle:<br>30 minutes@-30°C<br>30 minutes@85°C                 | < ±3%RH   |
| 7.6 | Voltage resistance  | 3000 hours@1KHz, 1Vrms  | < ±3%RH   |

\* The criteria test that the sensors finish the description process after 2 hours under normal temperature and humidity. The test condition is fixed at 25°C , 60%RH by LCR meter at 1KHz, 1 Vrms(sine wave)

## 8 Packaging :

### 8.1 HCZ-H8A

- 8.1.1 100 pieces of sensor to be packed in a bag.
- 8.1.2 In case of fractional package, the above bag and carton box may not be used.

### 8.2 HCZ-H8B

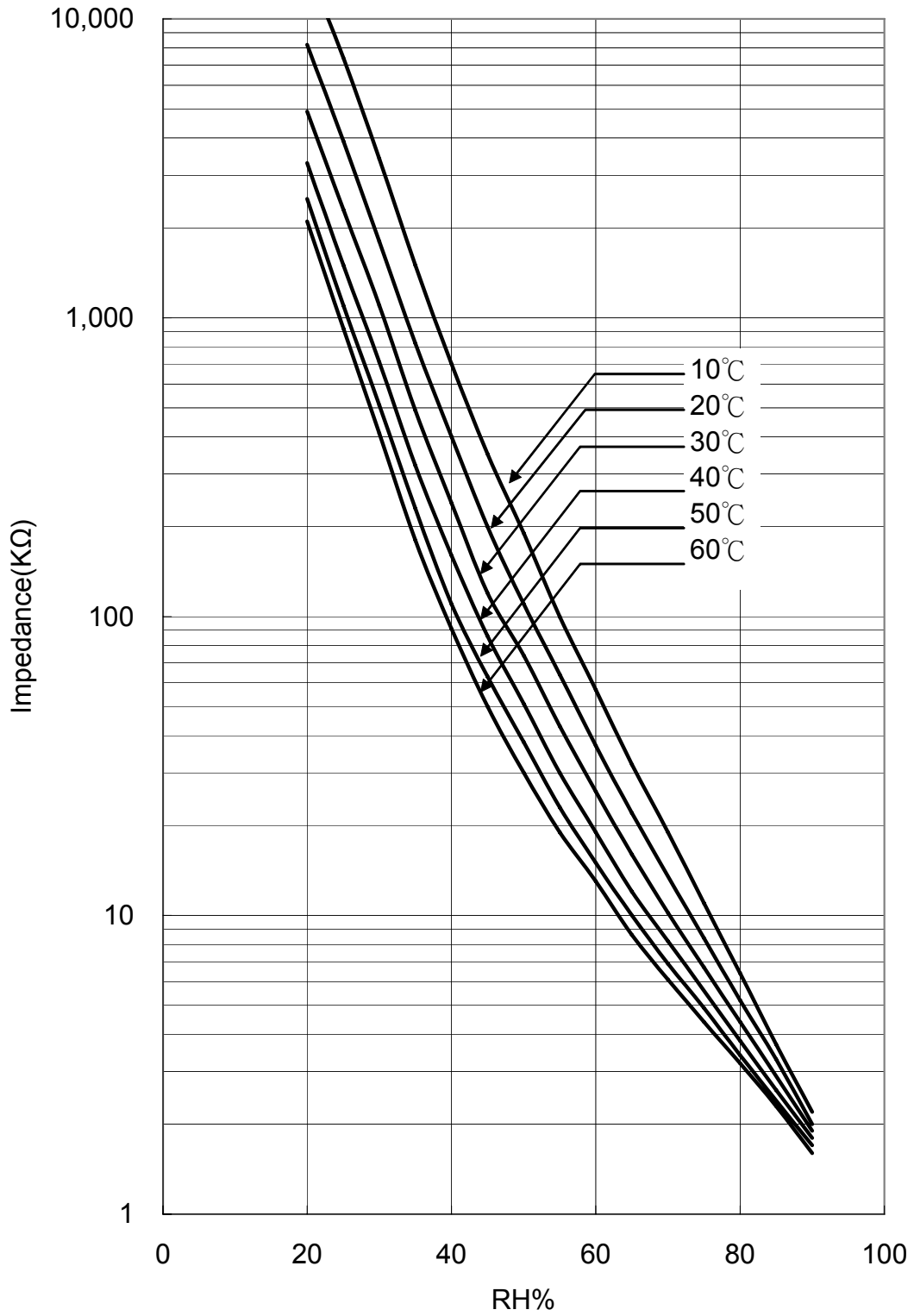
- 8.2.1 245 pieces were layed in tray, and 5 trays envelope in bag.
- 8.2.2 10,000 pieces packed in a shipping carton box (430\*360\*390mm).
- 8.2.3 In case of fractional package, the above tray and carton box may not be used.

### 8.3 Caution remarks on operation :

- 8.3.1 To avoid direct application of DC voltage on humidity sensor.
- 8.3.2 To protect sensor from dewfall and drenching.
- 8.3.3 To avoid any operation of humidity sensors in the following environmental ambient.
  - 8.3.3.1 Salt
  - 8.3.3.2 Inorganic gas – Sulfide dioxide, Chlorine, Ammonia etc.
  - 8.3.3.3 Organic gas – Alcoholic, Glycols, Aldehydes etc.
- 8.3.4 Recommended storage condition
  - Temperature range 10~40°C
  - Humidity range 90%RH or less
- 8.3.5 Do not store humidity sensors long period of time in an over 60%RH ambient due to some occasion of degradation on sensor housing case.

## REFERENCES

- Relative humidity - Impedance curve – measured at 1kHz, 1 Vrms(sine wave)



# PRODUCT SPECIFICATIONS

HCZ-H8

Impedance -- %RH VS. Temperature

Unit:KΩ

| RH% | 5°C    | 10°C   | 15°C   | 20°C  | 25°C  | 30°C  | 35°C  | 40°C  | 45°C  | 50°C  | 55°C  | 60°C  |
|-----|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 20  |        | 15,000 | 11,000 | 8,200 | 6,300 | 4,900 | 4,000 | 3,300 | 2,800 | 2,500 | 2,200 | 2,100 |
| 25  | 10,000 | 7,400  | 5,300  | 3,900 | 3,000 | 2,300 | 1,800 | 1,500 | 1,300 | 1,100 | 1,000 | 920   |
| 30  | 4,800  | 3,400  | 2,400  | 1,800 | 1,400 | 1,100 | 870   | 710   | 600   | 510   | 450   | 410   |
| 35  | 2,100  | 1,500  | 1,100  | 820   | 630   | 490   | 390   | 320   | 270   | 230   | 200   | 180   |
| 40  | 980    | 700    | 520    | 400   | 310   | 240   | 190   | 160   | 130   | 110   | 100   | 91    |
| 45  | 480    | 350    | 260    | 200   | 160   | 120   | 100   | 86    | 73    | 63    | 55    | 50    |
| 50  | 250    | 190    | 140    | 110   | 87    | 74    | 61    | 51    | 44    | 38    | 34    | 30    |
| 55  | 130    | 100    | 80     | 64    | 49    | 43    | 36    | 30    | 26    | 23    | 21    | 19    |
| 60  | 73     | 57     | 46     | 37    | 31    | 26    | 22    | 19    | 17    | 15    | 14    | 13    |
| 65  | 41     | 32     | 27     | 22    | 19    | 16    | 14    | 12    | 11    | 10    | 9.2   | 8.6   |
| 70  | 23     | 19     | 16     | 14    | 11.8  | 10.2  | 9.1   | 8.2   | 7.5   | 6.9   | 6.5   | 6.1   |
| 75  | 13     | 11     | 9.5    | 8.4   | 7.5   | 6.7   | 6.1   | 5.6   | 5.2   | 4.9   | 4.6   | 4.4   |
| 80  | 7.2    | 6.4    | 5.8    | 5.2   | 4.8   | 4.4   | 4.1   | 3.8   | 3.6   | 3.4   | 3.3   | 3.2   |
| 85  | 4.0    | 3.7    | 3.5    | 3.3   | 3.0   | 2.9   | 2.8   | 2.6   | 2.5   | 2.4   | 2.4   | 2.3   |
| 90  | 2.2    | 2.2    | 2.1    | 2.0   | 2.0   | 1.9   | 1.8   | 1.8   | 1.7   | 1.7   | 1.7   | 1.6   |