

# Humidity Sensor



## Type HCZ-J3

### Description

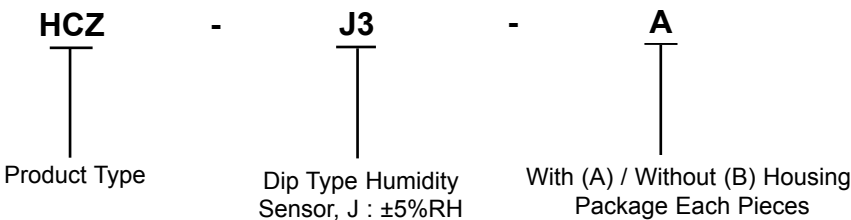
This product specification is applied to the Humidity Sensor Type HCZ-J3. The terminal electrode material uses lead free solder (Sn / Ag / Cu). This product is conformity with RoHS directive which means that lead, cadmium, mercury, hexavalent chromium and specific bromine-based flame retardants have not been used.



### Applications

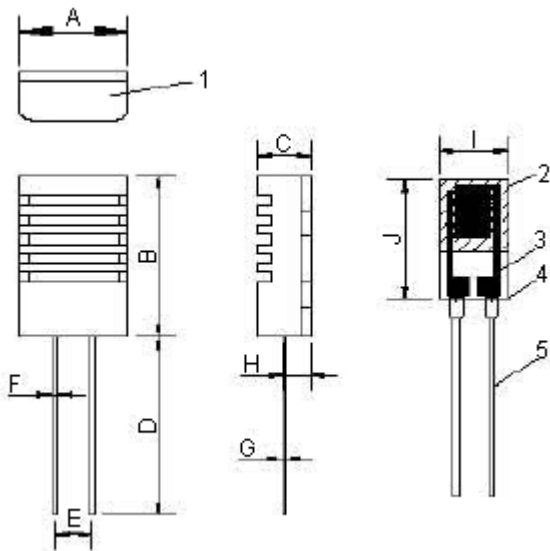
The applications of the component are used in relative humidity measurement, control and display. There are many end products can be used. Fox example air conditioner, humidifier, dehumidifier, hygrometer, recorder, transmitter etc.

### Model Number



### Configuration and Main Parts

Configuration : (Units : mm)



Symbol	Dimensions (mm)
A	8.3 ±0.2
B	13.5 ±0.2
C	4 ±0.5
D	15 ±2
E	2.54 ±0.2
F	0.5 ±0.1
G	0.2 ±0.1
H	2 ±0.5
I	5.08 ±0.3
J	10 ±0.3



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### Main Parts

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

### Electrical Characteristics

#### General Characteristics

	Units	Min.	Typ.	Max.
Rated voltage	$V_{rms}$	-	-	1
Rated power	mW	-	-	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**	K $\Omega$	14.2	-	38.5
Humidity accuracy	% RH	-5	-	+5
Hysteresis (40% RH to 80% RH)		-		2
Temperature dependence (Reference)	% RH / °C	-	0.6	-

\*\*Measurement by LCR meter at 1 KHz, 1  $V_{rms}$  (sine wave)

#### Relative Humidity - Impedance - 25°C, 1 KHz, 1 $V_{rms}$ (Sine wave)

% RH	20	30	40	50	60	70	80	90
Normal Value (K $\Omega$ )	5,000	920	220	66	23	9	4.2	1.9

Relative humidity - Impedance curve is shown in page 4

### Mechanical Characteristics

No.	Item	Description	Criteria*
6.1	Shock resistance	Drop down 3 times at 80 cm.	No abnormal appearance and electrical properties.
6.2	Vibration resistance	2 hours each in the directions of X-Y-Z, at the frequency of 10-55 Hz, and amplitude of 1.5 mm.	
6.3	Resistance to soldering heat	The lead terminal shall be immersed by 3 mm from the substrate for 3 s in solder bath of 330 $\pm$ 5°C.	
6.4	Strength of terminations	500 g at 10 s in the axial direction of lead terminal.	Secured

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### Reliability

No.	Item	Description	Criteria*
7.1	Heat resistance	1,000 hrs at 70°C	< ±5% RH
7.2	Cool resistance	1,000 hrs at -30°C	
7.3	Humidity resistance	1,000 hrs at 60°C, 90% RH	
7.4	Humidity cycle	Repeat 1,000 cycles One cycle: 30 mins at 25°C, < 20% RH 30 mins at 25°C, > 90% RH	
7.5	Temperature cycle	Repeat 100 cycles Each cycle: 30 mins at -30°C 30 mins at 85°C	
7.6	Voltage resistance	3,000 hrs at 1 KHz, 1 V <sub>rms</sub>	

\* The criteria test that the sensors finish the description process after over night under normal temperature and humidity. The test condition is fixed at 25°C, 60% RH by LCR meter at 1 KHz, 1 V<sub>rms</sub> (sine wave).

### Impedance table - % RH vs. Temperature

Unit: KΩ

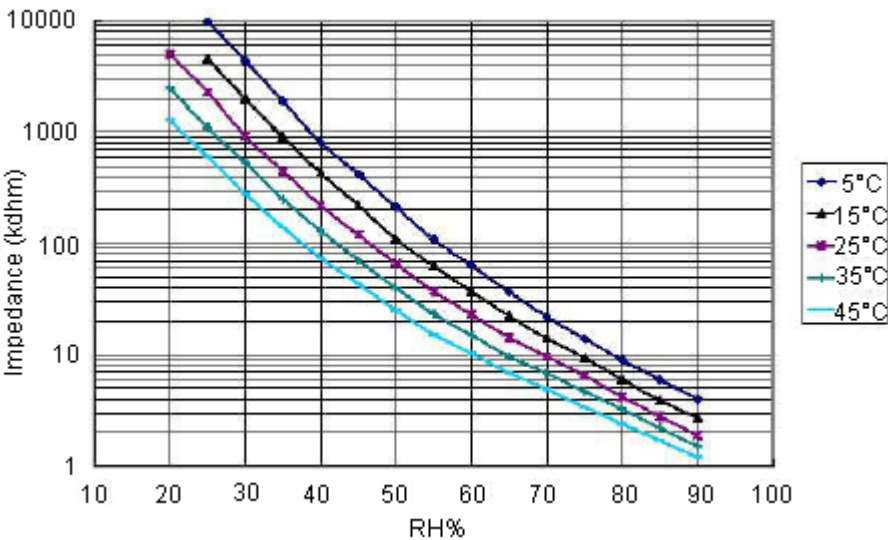
RH%	5°C	10°C	15°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C
20	-	-	-	7,200	5,000	3,600	2,500	1,800	1,300	1,100
25	9,900	6,900	4,600	3,200	2,300	1,700	1,100	920	600	520
30	4,400	3,100	2,000	1,500	920	770	530	430	280	250
35	1,900	1,400	900	670	450	360	250	210	140	114
40	810	600	430	310	220	170	130	96	74	61
45	420	300	220	160	120	90	71	55	43	35
50	211	150	110	83	66	51	40	31	25	20
55	109	83	62	48	37	29	23	19	15	13
60	63	48	37	29	23	18	15	12	10.3	8.7
65	37	28	22	18	14	12	10	8.1	6.9	5.9
70	22	17	14	12	9.6	8	6.8	5.8	4.9	4.3
75	14	12	9.4	7.8	6.5	5.5	4.7	4.1	3.4	3
80	9	7.3	6	5	4.2	3.8	3.3	2.9	2.4	2
85	6	4.8	3.9	3.3	2.8	2.5	2.2	2	1.7	1.4
90	4	3.2	2.7	2.2	1.9	1.7	1.5	1.4	1.2	1.1

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### Impedance-Relative humidity curve



### Part Number Table

Description	Part Number
Humidity Sensor	HCZ-J3-B
	HCZ-J3-A

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