



**TO :**

---

---

**CAPACITIVE HUMIDITY SENSOR**

**P/N : SY-HC-1 SERIES**

=====

**SPECIFICATIONS**

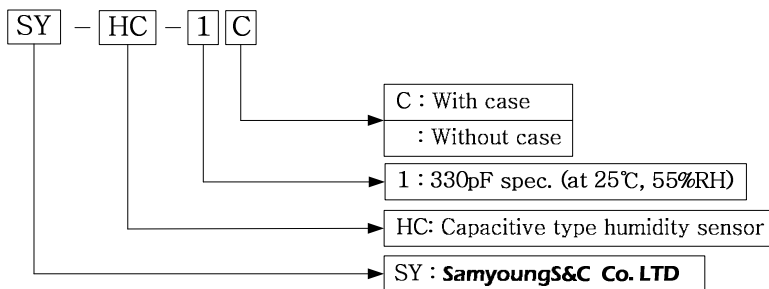
=====



## 1. Scope of application

This specification is applicable to the capacitive type humidity sensor SY-HC-1

## 2. Type



2-1. SY-HC-1 C : Humidity sensor unit with case

2-2. SY-HC-1 : Humidity sensor unit

## 3. Configuration

The configuration of the humidity sensor unit is shown on the Fig.-1.

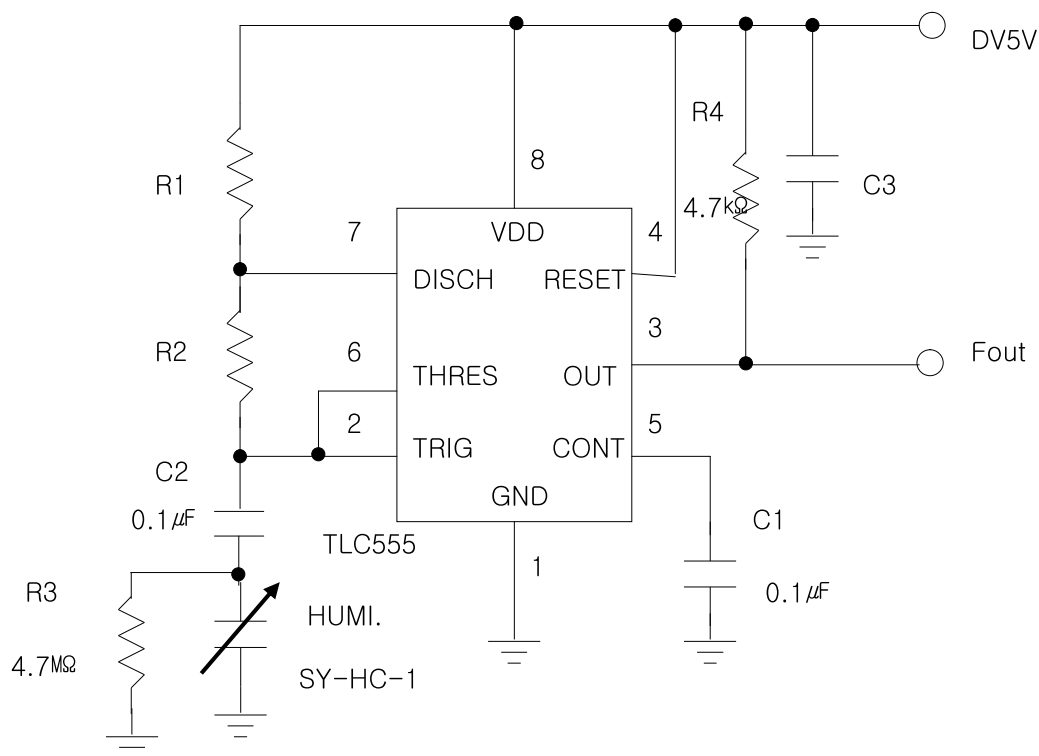
## 4. Electrical characteristics

4-1. Nominal capacitance	: 330 ± 20 pF (@ 25°C, 55%RH, 1 Vrms, 20 kHz)
4-2. Sensitivity	: 0.6 pF/%RH (10%RH to 95%RH)
4-3. Response time(t <sub>80</sub> )	: 15 sec (@ 25°C, 30⇔90%RH)
4-4. Linearity	: ± 2 %RH (20 to 90%RH)
4-5. Hysteresis	: < 2 %RH (@ 20⇔90%RH)
4-6. Dissipation factor	: < 0.02 (@ 90%RH)
4-7. Temperature coefficient	: 0.16 pF/°C (5°C to 70°C)
4-8. Operating temperature	: -40 ~ 120 °C
4-9. Operating humidity range	: 0 ~ 100%RH (Recommend 0~95%RH)
4-10. Operating voltage	: MAX AC 5 V <sub>RMS</sub> (Recommend 1 V <sub>RMS</sub> , No DC Voltage)
4-11. Operating frequency range	: 1~ 100 kHz (Recommend 20 kHz)
4-12. Long-term stability	: drift<0.2%RH/year (@ room condition)

## 5. Packaging :

- 5-1. 50 pcs of sensor unit to be packed in a tray  
(size : 191 X 142.38 X 5mm)
- 5-2. 10 tray(500pcs of sensor unit) to be packed in a inlet box  
(size : 260 X 146 X 74mm)
- 5-3. 24 Inlet box(12000 pcs of sensor unit) to be packed in a outlet box

## 6. Basic circuits



$$T_{\text{high}} = C@ \%RH \times (R1 + R2) \times \ln 2$$

$$T_{\text{low}} = C@ \%RH \times R2 \times \ln 2$$

$$F_{\text{out}} = 1 / (T_{\text{high}} + T_{\text{low}}) = 1 / (C@ \%RH \times (R1+2R2) \times \ln 2)$$

$$\text{Output Duty Cycle} = F_{\text{out}} \times T_{\text{high}} = (R1 + R2) / (R1+2R2)$$

## 7. Warning

### 7-1. DC voltage

Do not apply DC voltage to the humidity sensor. Applying DC voltage to the humidity sensor can cause break of insulator.

### 7-2. Contamination

Do not touch activity area of the sensor to prevent from any damage and contamination.

(Contamination like grease, fingerprints, soldering flux, chemical solution)

### 7-3. Heating stress

Do not contact soldering tool to lead pin long time more than 5 seconds. As best as possible and only minimal soldering paste should be applied

### 7-4. Mechanical stress

Do not fold excessively the sensor lead pin.

### 7-5. Cleaning

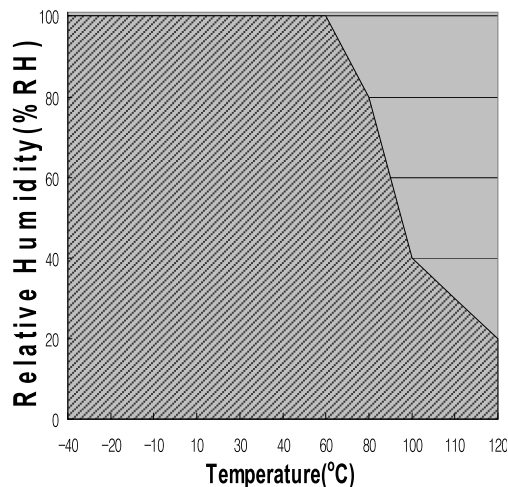
Blowing with oil-free, filtered compressed air, hydrocarbon-free air or nitrogen 30 sec ultrasonic rinse in methanol at 25 °C

### 7-6. Application

Do not recommend the use of the sensor for application Where a very high speed or response is require. Do not expose sensor to condensing environment for long-term

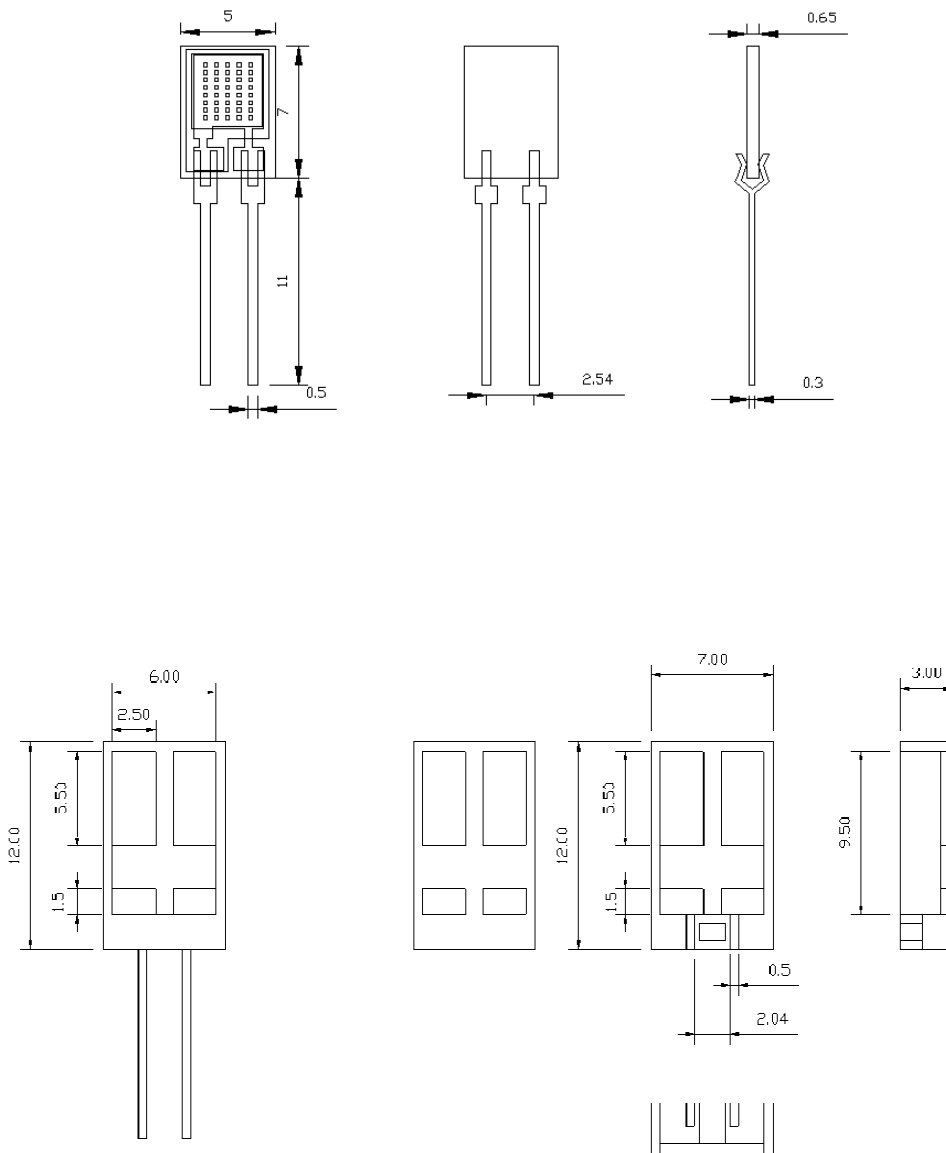
### 7-7. Working range

Use extent of SY-HC-1 is limited in reserved area of temperature and humidity condition, and may not act sensor normally in case of over limit operating range. Sensor operates at range of temperature -40~120 °C and humidity 0~100%RH, and temperature coefficient in these range is 0.16 pF/ °C.



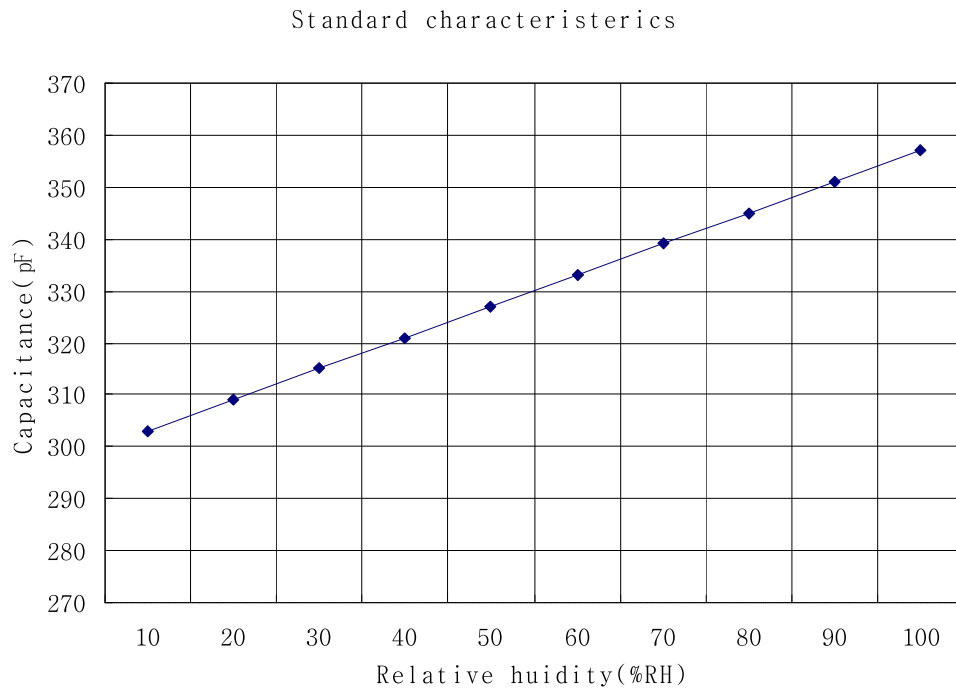
**Fig. -1. Standard Dimension SY-HC-1 series**

(unit : mm)

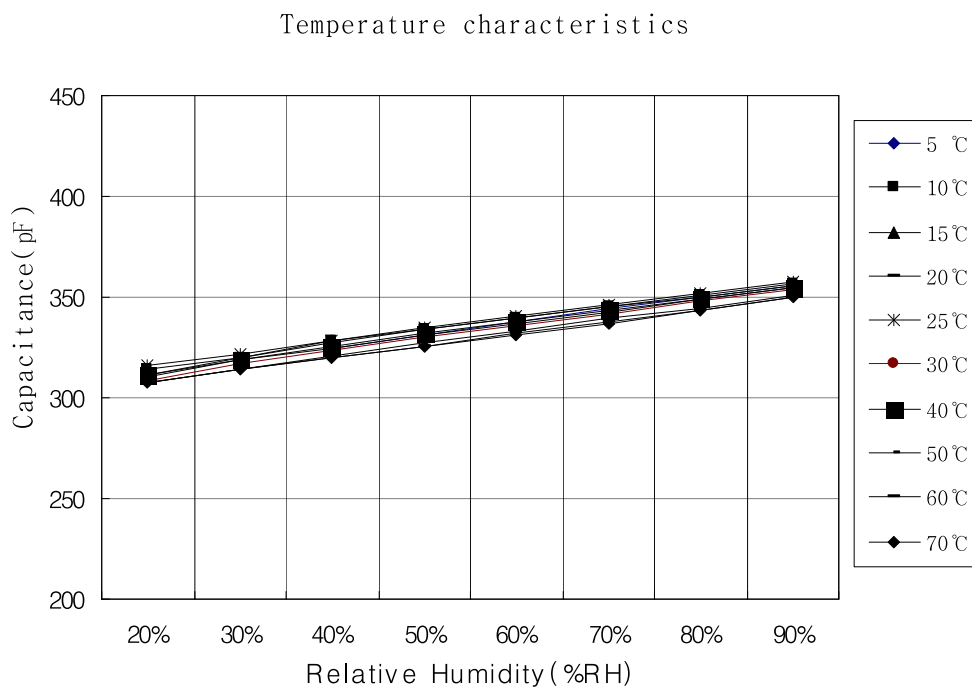


**SY-HC-1C**

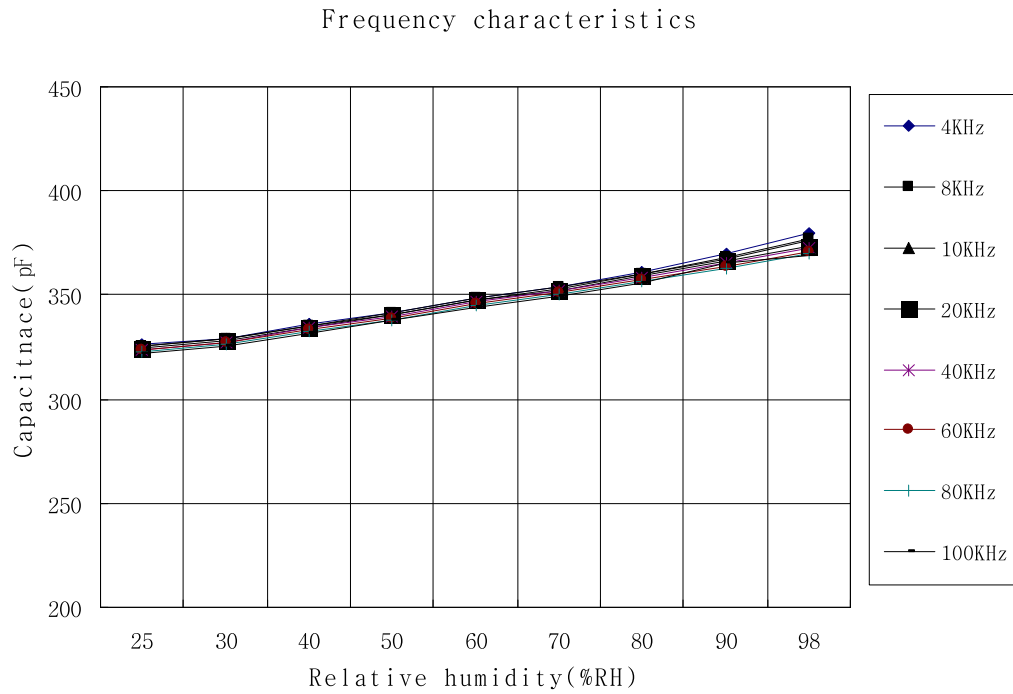
**Fig. -2. Standard characteristics**



**Fig. -3. Temperature characteristics**



**Fig. -4. Frequency characteristics**

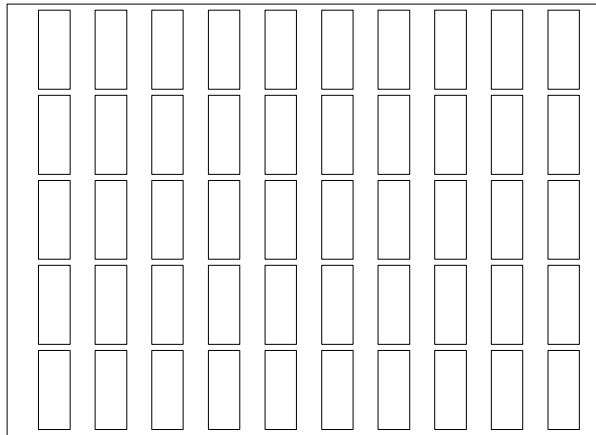


※ Test condition

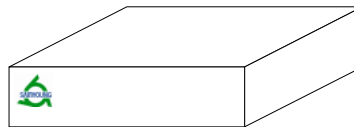
No.	Tool name	Company	Condition
1	Hygrometer	E+E	Chamber in(standard)
2	Chamber	ESPEC	10~95%RH
3	LCR-meter	HOIKI	1Vrms, 20 kHz, Range: Auto

**Fig. -5. Packaging**

Electrostatic discharge Tray (size: 191 X 142.38 X 5mm)



Inlet box(size: 260 X146 X 74mm)



Outlet box(size: 455 X 350 X 285mm)



■ Packaging weight table

Type	Tray		Inlet	Outlet
	Empty	50 pcs	1 Box	1 Box
Without Case	12.4 g (Empty Tray)	1 Tray	10 Tray	24 Inlet Box
		17.6 g	285.57 g	7.75 kg
With Case	(Empty Tray)	1 Tray	10 Tray	24 Inlet Box
		22.4 g	333.57 g	8.9 kg