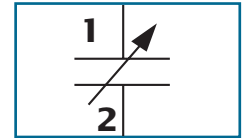




RELATIVE HUMIDITY SENSOR

HS 1100 / HS 1101

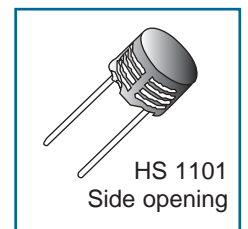
Based on a unique capacitive cell, these relative humidity sensors are designed for high volume, cost sensitive applications such as **office automation, automotive cabin air control, home appliances, and industrial process control systems**. They are also useful in all applications where humidity compensation is needed.



FEATURES

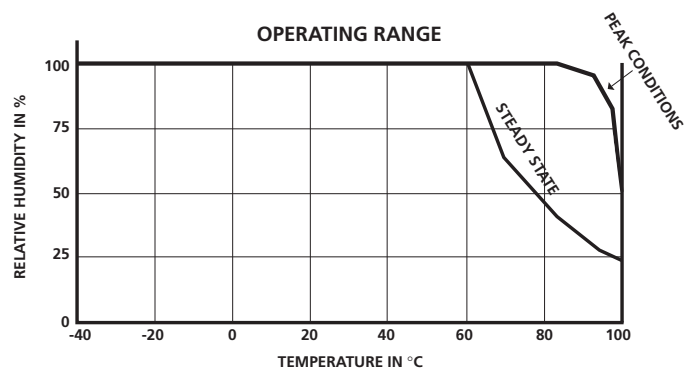
- **Full interchangeability** with no calibration required in standard conditions
- **Instantaneous desaturation** after long periods in saturation phase
- Compatible with automatized assembly processes, **including wave soldering, reflow and water immersion** (1)
- High reliability and long term stability
- Patented solid polymer structure
- Suitable for linear voltage or frequency output circuitry
- Fast response time
- Individual marking for compliance to stringent traceability requirements

(1) soldering temperature profiles available on request



MAXIMUM RATINGS (Ta= 25°C unless otherwise noted)

Ratings	Symbol	Value	Unit
Operating Temperature	Ta	-40 to 100	°C
Storage Temperature	Tstg	-40 to 125	°C
Supply Voltage	Vs	10	Vac
Humidity Operating Range	RH	0 to 100	% RH
Soldering @ T = 260°C	t	10	s



CHARACTERISTICS

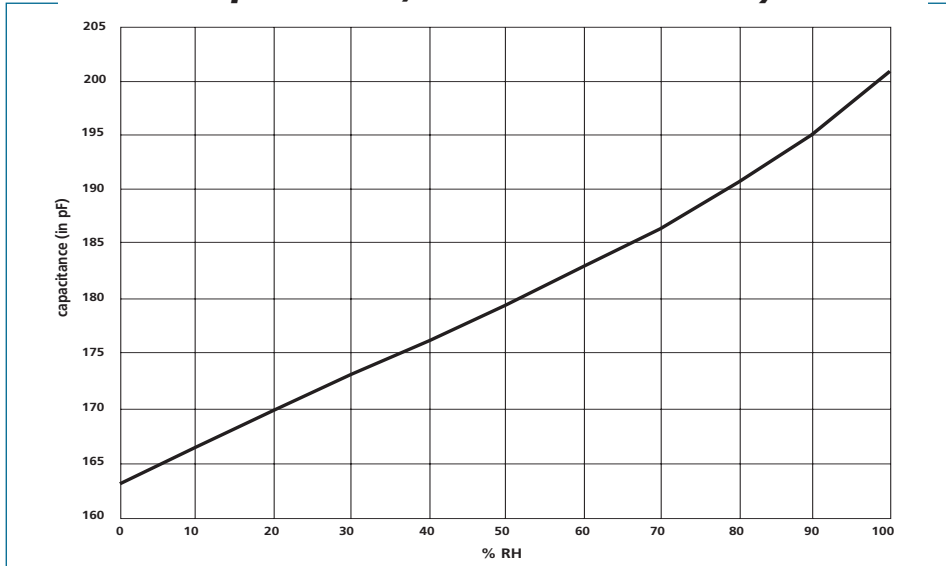
(Ta = 25°C, measurement frequency @ 10kHz unless otherwise noted)

Characteristics	Symbol	Min.	Typ.	Max.	Unit.
Humidity measuring range	RH	1		99	%
Supply voltage	Vs		5	10	V
Nominal capacitance @ 55% RH*	C	177	180	183	pF
Temperature coefficient	Tcc		0.04		pF/°C
Averaged Sensitivity from 33% to 75% RH	$\Delta C/\%RH$		0.34		pF/%RH
Leakage current (Vcc = 5 Volts)	Ix		1		nA
Recovery time after 150 hours of condensation	tr		10		s
Humidity Hysteresis			+/-1.5		%
Long term stability			0.5		%RH/yr
Response time (33 to 76 % RH, still air @ 63%)	ta		5		s
Deviation to typical response curve (10% to 90% RH)			+/-2		% RH

* Tighter specification available on request

CHARACTERISTICS (CONT'D)

**Typical response curve
of HS 1100/HS 1101 in humidity**



Calibration data are traceable to NIST standards through CETIAT laboratory.

Measurement frequency : 10kHz
Ta = 25°C

Polynomial response : $C(pf) = C@55\% * (1.2510^{-7} RH^3 - 1.3610^{-5} RH^2 + 2.1910^{-3} RH + 9.010^{-1})$
RH in % RH

Measurement frequency influence

In this data sheet, all capacitance measurements are @ 10kHz. However, the sensor can operate without restriction from 5kHz to 100kHz. To calculate the influence of frequency on capacitance measurements :

$$C@f\text{kHz} = C@10\text{kHz} (1.027 - 0.01185 \ln(f\text{kHz}))$$

Polarization

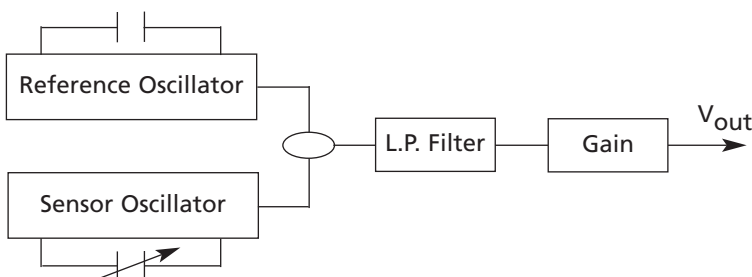
In order to get a better reproducibility during measurements, always connect the case of the header (pin 2) to the ground of the circuit.

The case of the header is located on the opposite side of the tab.

Soldering instructions : see the Application Note HPC007

PROPORTIONAL VOLTAGE OUTPUT CIRCUIT

Internal Block Diagram



$$V_{out} = V_{cc} * (0.00474 * \%RH + 0.2354)$$

for 5 - 99% RH

Typical temperature coefficient :
+0.1% RH/°C - From 10 to 60°C

DEMO BOARD AVAILABLE ON REQUEST (REF HM1510)

Typical Characteristics for Voltage Output Circuit

At V_{CC} 5V - 25°C

RH	0	10	20	30	40	50	60	70	80	90	100
Voltage (V)	-	1.41	1.65	1.89	2.12	2.36	2.60	2.83	3.07	3.31	3.55

● QUALIFICATION PROCESS

- HS1100/HS1101 sensors have been qualified through a complete qualification process taking in account many of the requirements of the MIL STD750 including :

Solder heat and solderability

Wave soldering at 260°C + DI water clean at 45°C

Mechanical shock - 1500 g, 5 blows, 3 directions

Vibration - Variable (F = 100 - 2000Hz), fixed (F = 35Hz)

Constant acceleration

Marking permanency

ESD - Electrostatic Discharge - Human body & Machine model

Salt Atmosphere MIL STD750/Method 1041/96 hours

Temperature Cycling - 40°C / +85°C

High Temperature / Humidity Operating Life - 93%RH / 60°C for 1000 hours

Low humidity storage life - RH < 10%/23°C - 1000 hours

Resistance to immersion in water at ambient temperature and 80°C - 160 hours

Resistance to acid vapors at 75000 ppm for nitric, sulfuric and chlorhydric acids

Resistance to many chemicals linked with home appliances/ automotive or consumer applications.

All these tests are regularly performed on different lots from production. **More information are available on request**

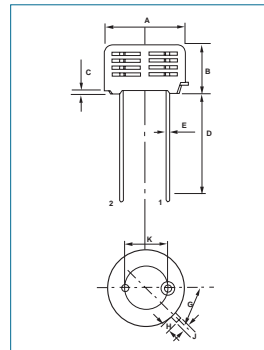
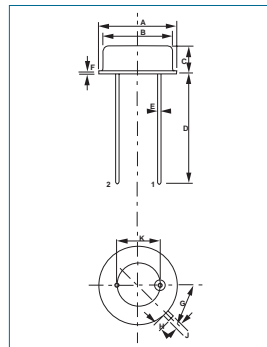
● Environmental and recycling information :

- HS1100/HS1101 sensors are lead free components

- HS1100/HS1101 sensors are free of Cr (VI), Cd and Hg.

PACKAGE OUTLINE HS1100

Dim	Min (mm)	Max (mm)
A	9.00	9.30
B	8.00	8.50
C	3.50	3.90
D	12.00	14.00
E	0.40	0.50
G	45° BCS	
H	0.70	1.10
J	0.70	0.90
K	4.83	5.33



Dim	Min (mm)	Max (mm)
A	9.70	10.20
B	5.70	6.20
C	0.40	0.60
D	12.00	14.00
E	0.40	0.50
G	45° BCS	
H	0.70	1.10
J	0.70	0.90
K	4.83	5.33

PACKAGE OUTLINE HS1101

ORDERING INFORMATION :

HS 1100 : HPP 800 A 001 (MULTIPLE PACKAGE QUANTITY OF 50 PIECES)

HS 1101 : HPP 801 A 001 (MULTIPLE PACKAGE QUANTITY OF 48 PIECES)

CAPACITIVE RELATIVE HUMIDITY SENSOR.

**SAMPLE KIT OF HS1100-HS1101
IS AVAILABLE THROUGH
HUMIREL WEB SITE**

www.humirel.com

email : sales@humirel.com

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