



HS1101LF

Relative Humidity Sensor

SPECIFICATIONS

- Lead free component
- High reliability and long term stability
- Patented solid polymer structure
- Suitable for linear voltage or frequency output circuitry
- Fast response time and very low temperature coefficient

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 Pb free wave soldering and reflow processes ⁽¹⁾
- Individual marking for compliance to stringent traceability requirements
- Part may be washed with distilled water

APPLICATIONS

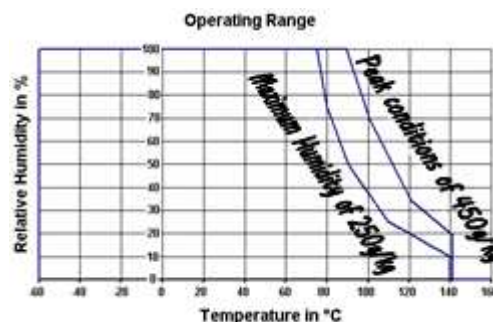
- Automotive
- Home Appliance
- Printer
- Meteorology

PERFORMANCE SPECS

MAXIMUM RATINGS

Ratings	Symbol	Value	Unit
Operating Temperature	Ta	-60 to 140	°C
Storage Temperature	Tstg	-60 to 140	°C
Supply Voltage (Peak)	Vs	10	Vac
Humidity Operating Range	RH	0 to 100	% RH

Peak conditions: less than 10% of the operating time.



ELECTRICAL CHARACTERISTICS OF HUMIDITY SENSOR

(Ta=25°C, measurement frequency @10kHz / 1V unless otherwise noted)

Characteristics	Symbol	Min	Typ	Max	Unit
Humidity Measuring Range	RH	1		99	%RH
Supply Voltage	Vs			10	V
Nominal capacitance @55%RH ⁽¹⁾	C	177	180	183	pF
Temperature coefficient	T _{cc}		-0.01		pF/°C
Average Sensitivity from 33% to 75%RH	ΔC/%RH		0.31		pF/%RH
Leakage Current (V _{cc} =5V)	I			1	nA
Recovery time after 150 hours of condensation	tr		10		s
Humidity Hysteresis				+/-1	%RH
Long term stability	T		+/-0.5		%RH/yr
Time Constant (at 63% of signal, still air) 33%RH to 80%RH	ta		3	5	s
Deviation to typical response curve (10% RH to 90%RH)			+/-2		%RH

(1) Tighter specification available on request

TYPICAL PERFORMANCE CURVES

POLYNOMIAL RESPONSE OF HS1101LF

$$C \text{ (pF)} = C@55\% * (3.903 \cdot 10^{-8} \cdot RH^3 - 8.294 \cdot 10^{-6} \cdot RH^2 + 2.188 \cdot 10^{-3} \cdot RH + 0.898)$$

TYPICAL RESPONSE LOOK-UP TABLE (POLYNOMIAL REFERENCE CURVE) @ 10KHZ / 1V

RH (%)	0	5	10	15	20	25	30	35	40	45	50
Cp (pF)	161.6	163.6	165.4	167.2	169.0	170.7	172.3	173.9	175.5	177.0	178.5
RH (%)	55	60	65	70	75	80	85	90	95	100	
Cp (pF)	180	181.4	182.9	184.3	185.7	187.2	188.6	190.1	191.6	193.1	

REVERSE POLYNOMIAL RESPONSE OF HS1101LF

$$RH \text{ (%) } = -3.4656 \cdot 10^{-3} \cdot X^3 + 1.0732 \cdot 10^{-4} \cdot X^2 - 1.0457 \cdot 10^{-4} \cdot X + 3.2459 \cdot 10^{-3}$$

With $X = C(\text{read}) / C@55\%RH$