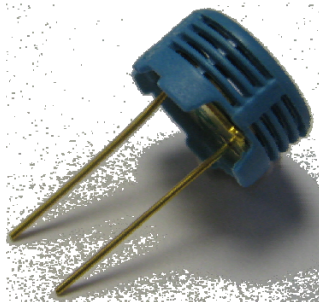


# HS24LF – Relative Humidity Sensor



- Lead free product
- Patented solid polymer structure
- Suitable for easy linear voltage output circuitry
- Individual marking for compliance to stringent traceability requirements



## DESCRIPTION

Based on a unique resistive cell, these relative humidity sensors are designed for high volume, cost sensitive applications such as **air-conditioner, humidifier, dehumidifier, weather-forecast barometer, copying machine, humidity controller and most of the indoor applications.** They are also useful in all applications where humidity compensation is needed.

## FEATURES

- Full interchangeability and outstanding repeatability
- Compatible with automatized assembly processes, including Pb free wave soldering and reflow processes <sup>(1)</sup>
- High reliability and long term stability
- Fast response time

(1) Soldering temperature profiles available on request

## APPLICATIONS

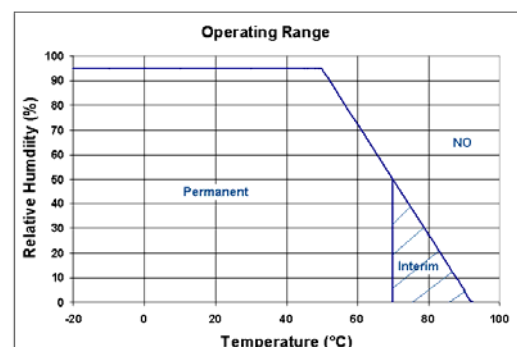
- Air condition, Humidifier, Dehumidifier
- Humidity controller, Humidity transmitter
- Hygrometer, Hygro-recorder
- Copying machine
- Clock, Weather-forecast barometer

## PERFORMANCE SPECS

### MAXIMUM RATINGS

Ratings	Symbol	Value	Unit
Storage Temperature	Tstg	-20 to 70	°C
Supply Voltage (Peak)	Vs	tbd	Vdc
Humidity Operating Range	RH	≤95	% RH
Temperature Operating Range	Ta	-20 to 70	°C

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



# HS24LF – Relative Humidity Sensor

## ELECTRICAL CHARACTERISTICS

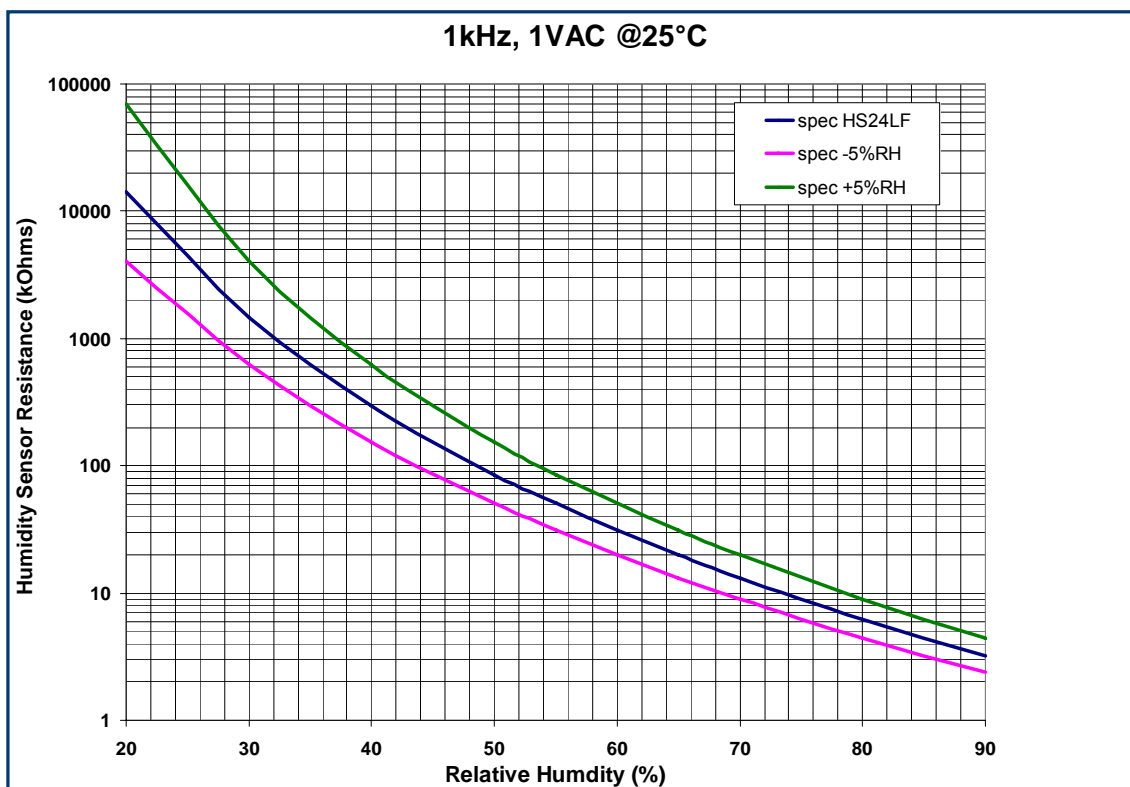
(Ta=25°C, measurement frequency @1kHz / 1Vac unless otherwise noted)

Humidity Characteristics	Symbol	Min	Typ	Max	Unit
Humidity Measuring Range	RH	1		95	%RH
Supply Voltage	Vs		1	tbd	Vdc
Nominal Resistance @60%RH *	R	20	31	50	kΩ
Temperature coefficient (10°C to 40°C)	T <sub>cc</sub>			-0.4	%RH/°C
Operating Frequency Range	F	500	1000	2000	Hz
Humidity Accuracy (@25°C, 60%RH) *	RH		+/-3	+/-5	%RH
Humidity Hysteresis			+/-1		%RH
Time Constant (33%RH to 80%RH, still air @63%RH)	ta		3	5	S
Deviation to typical response curve (25%RH to 80%RH)			+/-3		%RH

\*tighter specification available on request

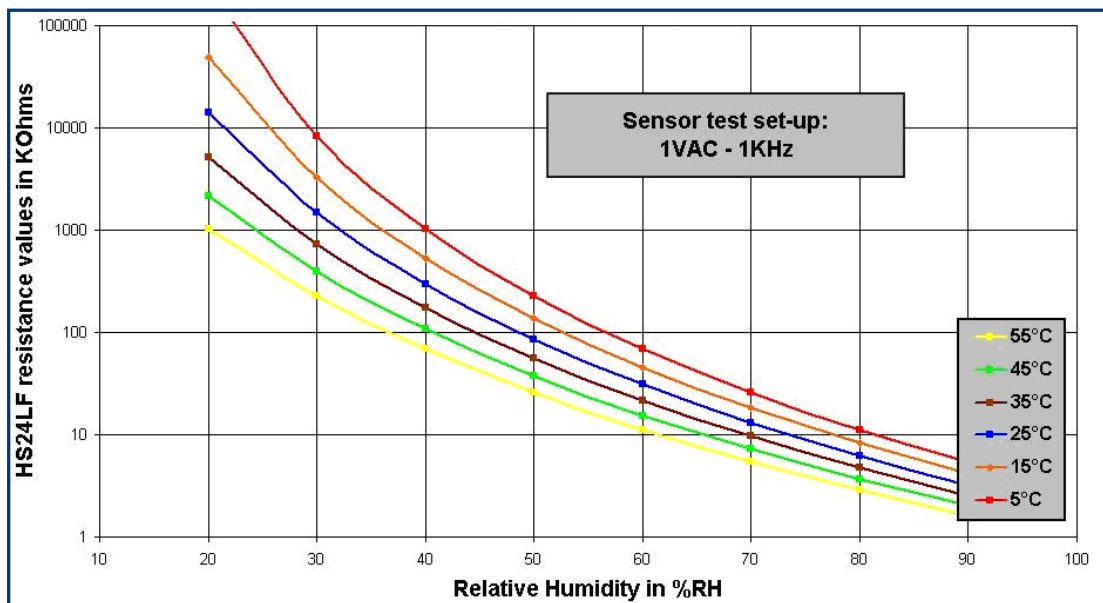
## TYPICAL PERFORMANCE CURVES

### HS24LF CHARACTERISTIC



# HS24LF – Relative Humidity Sensor

## HS24LF : RELATIVE HUMIDITY VS TEMPERATURE TYPICAL RESPONSE

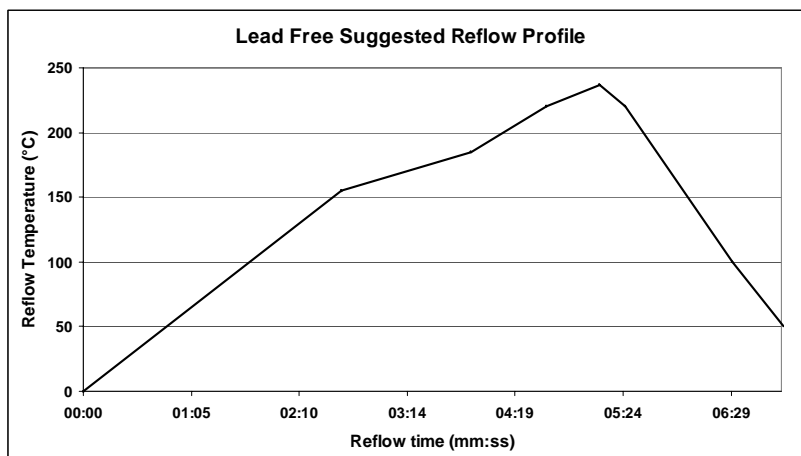


## MEASUREMENT FREQUENCY INFLUENCE

In this data sheet, all resistance measurements are done @ 1 kHz /1VoltAC. However, the sensor can operate without restriction from 500 Hz to 2 kHz.

## SOLDERING INSTRUCTIONS

We recommend taking specific attention to soldering conditions to get the best performance of MEAS France Humirel sensors. See below.



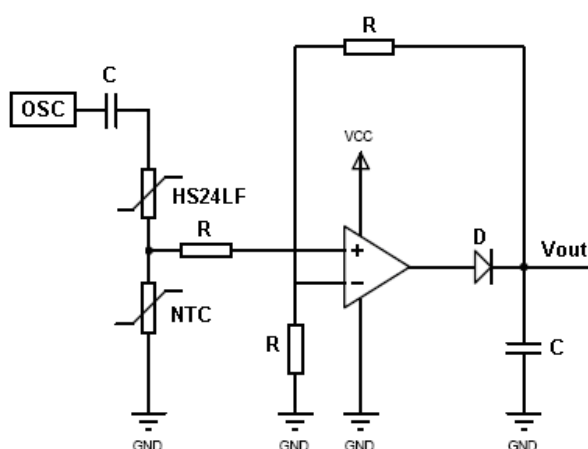
## HS24LF – Relative Humidity Sensor

### PRECAUTIONS FOR USE

Avoid DC voltage directly to humidity sensor.  
 Avoid permanent condensation.  
 Avoid application of the humidity sensor in the salt, inorganic gases and organic gases.

### PROPORTIONAL VOLTAGE OUTPUT CIRCUIT

#### BLOCK DIAGRAM



This circuit designed with HS24LF can be supplied by MEAS France Humirel.  
 Ask for HTM226LF (HPP826A031 – ordering reference)

#### HTM226LF TYPICAL RESPONSE LOOK-UP TABLE

RH (%)	20	25	30	35	40	45	50
Vout (mV)	660	825	990	1155	1320	1485	1650
RH (%)	55	60	65	70	75	80	85
Vout (mV)	1815	1980	2145	2310	2475	2640	2805

#### HTM226LF TYPICAL RESPONSE EQUATION

$$V_{out} (V) = 0.033 * RH (\%)$$

## HS24LF – Relative Humidity Sensor

### QUALIFICATION PROCESS

HS24LF sensors have been qualified through a complete qualification process taking in account many of the requirements of the JEDEC standard including:

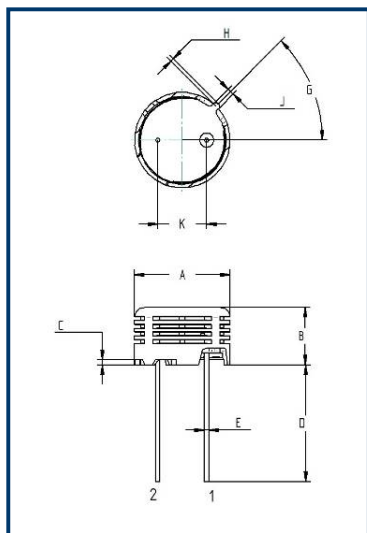
QUALIFICATION PROCESS				
Test Item	Test Description and Conditions	Criteria	Results	
Drop Test	The samples are subjected to drop test, 6 times per direction (18 drops total) from 1 meter height onto concrete surface	Visual : No degradation or physical damage should be observed	PASS	
Vibration Test	The samples are subjected to variable frequency from 20 to 2000Hz in line with JESD-22-B103-A		PASS	
Manual Solder Heat Resistance	The samples are subjected to manual lead free soldering with contact to pins of 4 sec and soldering iron tip temperature adjusted at 380°C		PASS	
Automatic Solder Heat Resistance	The samples are subjected to automatic lead free soldering process		PASS	
Thermal Cycling	The samples are subjected to thermal cycles from -20°C to +85°C during 168 hours		PASS	
High Temperature Storage Test	The samples are stored at +85°C for 1000 hrs		PASS	
Low Temperature Storage Test	The samples are stored at -20°C for 1000 hrs		PASS	
High Humidity and High Temperature Life Test	The samples are subjected to storage at +45°C and 90%RH conditions for 1000 hrs		Electrical : The variation of humidity detection output shall be within +/-5 %RH deviation (final - initial measurement)	PASS
Low Humidity Storage Test	The samples are subjected to low humidity storage condition at 20%RH, 25°C for 1000 hrs			PASS
Low Humidity Storage Test	The samples are subjected to low humidity storage condition at 20%RH, 25°C for 1000 hrs			PASS
Thermal Shocks	The samples are subjected to 100 thermal shocks (Air - Air) between -40°C and +105°C. Dwell time is 1 hour with transition time to extreme temperature < 5sec	PASS		
ESD	The samples are subjected to ESD at +/-15kV by direct contact and air discharge		PASS	

### ENVIRONMENTAL AND RECYCLING

HS24LF sensors are lead free components and are compatible with Pb Free soldering processes.

# HS24LF – Relative Humidity Sensor

## PACKAGE OUTLINE



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

*Dimensions in millimeters*

## ORDERING INFORMATION

**HPP806A001 (MULTIPLE PACKAGE QUANTITY OF 48 PIECES)**  
**HS24LF – RESISTIVE RELATIVE HUMIDITY SENSOR (BLUE CAP)**

Revision	Comments	Who	Date
0	Document creation	D. LE GALL	February 08
A	Electrical characteristics updated, temperature effect on humidity measurement curve added, Qualification Process paragraph updated and Standardized format datasheet	D. LE GALL	October 08

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