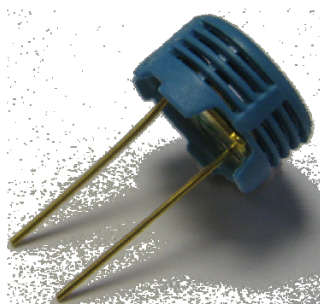


HS24LF – Relative Humidity Sensor



- 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, deshumidifier, 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 ⁽¹⁾
- High reliability and long term stability
- Fast response time

(1) Soldering temperature profiles available on request

APPLICATIONS

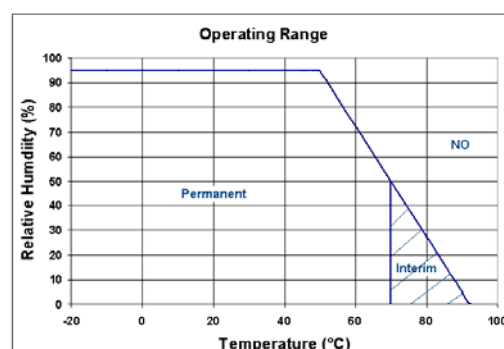
- Air condition, Humidifier, Dehumidifier
- Humidity controller, Humidity transmitter
- Hygrometer, Hygro-recorder
- Copying machine
- Clock, Weather-forecast barometer

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

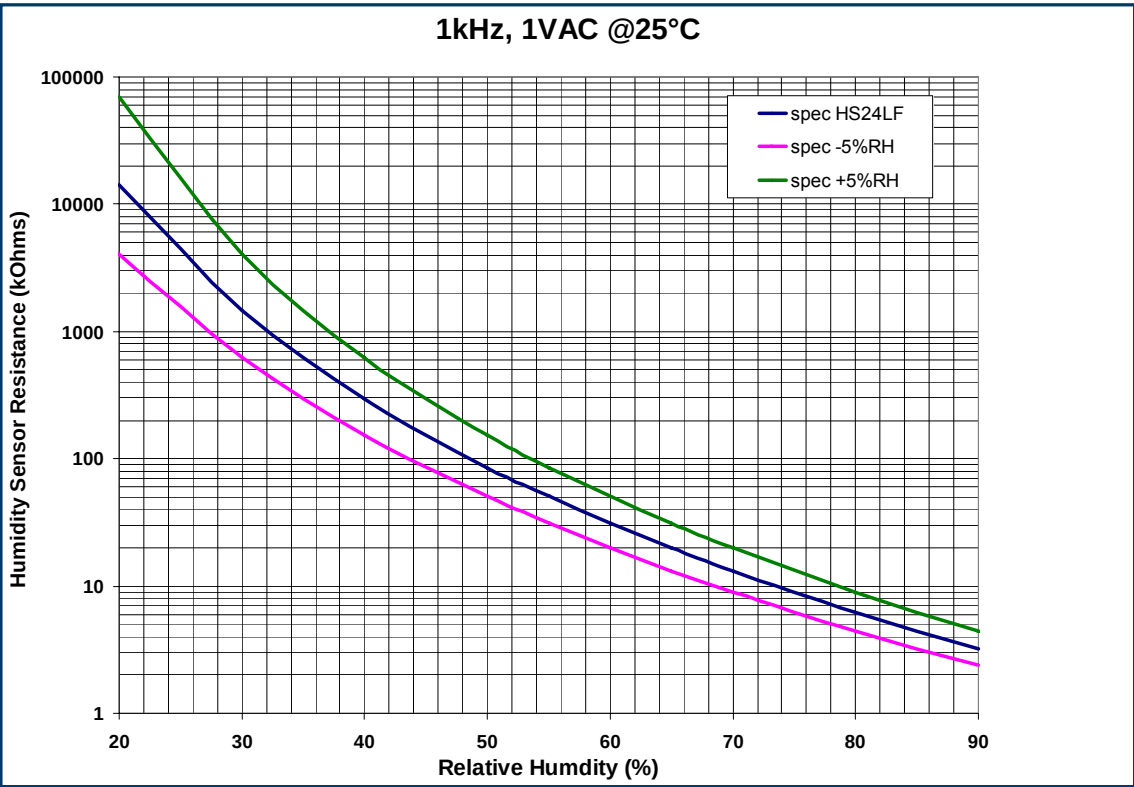
(Ta=25°C, measurement frequency @1kHz / 1Vac unless otherwise noted)

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 _{cc}			-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

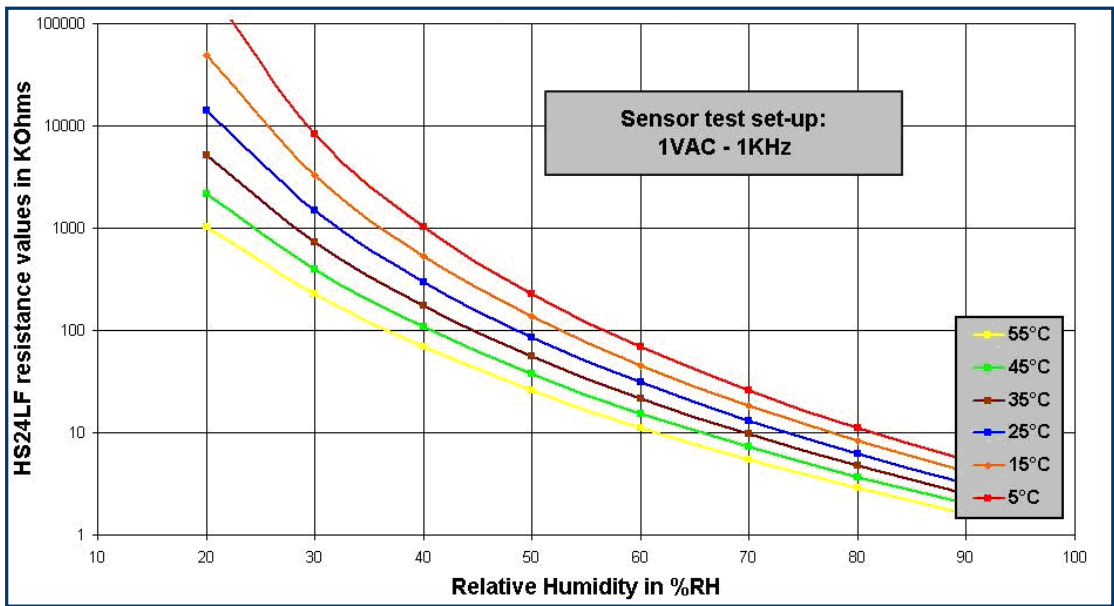
TYPICAL PERFORMANCE CURVES

HS24LF CHARACTERISTIC



HS24LF – Relative Humidity Sensor

HS24LF : RELATIVE HUMIDITY VS TEMPERATURE TYPICAL RESPONSE

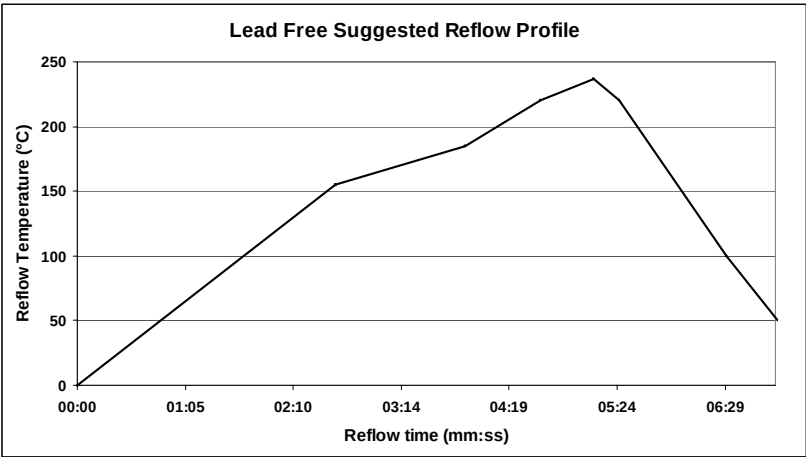


MEASUREMENT FREQUENCY INFLUENCE

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.



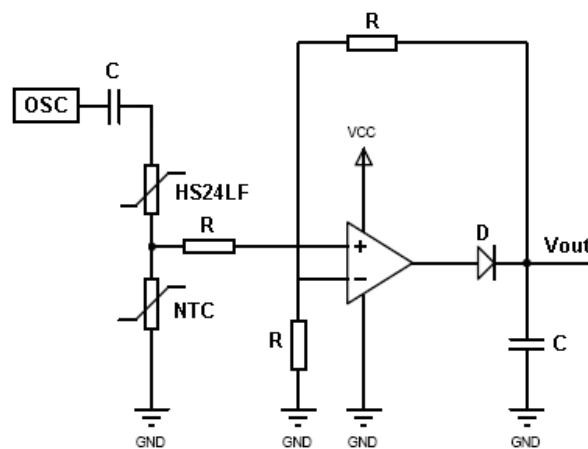
HS24LF – Relative Humidity Sensor

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:

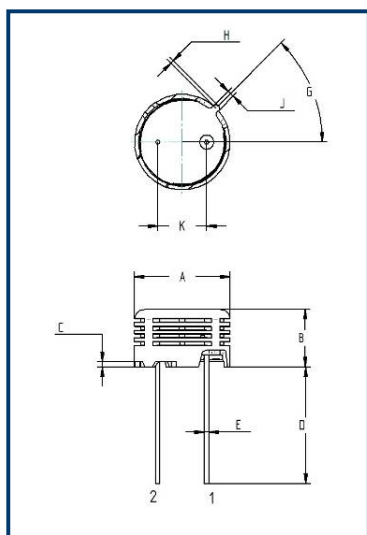
QUALIFICATION PROCESS			
Test Item	Test Description and Conditions	Criteria	Results
Drop Test	The samples are subjected to drop test, 6 times per direction (18 drops total) from 1 meter height onto concrete surface	Visual : No degradation or physical damage should be observed	PASS
Vibration Test	The 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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