

HTX3515

Relative Humidity Module

DESCRIPTION

HTX3515 is a dedicated humidity and temperature transducer designed for OEM applications where a reliable and accurate measurement is needed. Direct interface with a micro-controller is made possible with the module's humidity linear voltage. HTX3515 is designed for high volume and demanding applications.



FEATURES

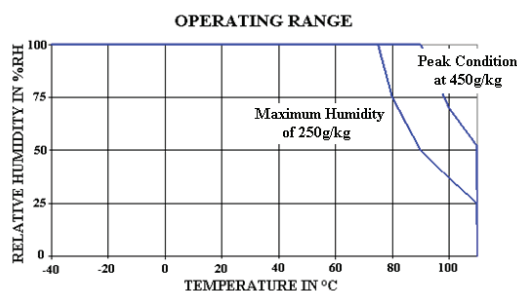
- Demonstrated reliability and long term stability
- Reliability not affected by repeated condensation
- Typical 1 to 3.6 Volt DC output for 0 to 100% RH at 5VDC supply
- Humidity calibrated within +/-3%RH @ 55%RH
- Operation Temperature : -40°C to 110°C
- 1.5mm Pitch Side Connector(JST)
- Size : 27 x 12 x 7 mm

PERFORMANCE SPECS

MAXIMUM RATINGS

Ratings	Symbol	Value	Unit
Storage Temperature	T _{stg}	-40 to +125	°C
Supply Voltage (Peak)	V _{cc}	20	V _{dc}
Humidity Operating Range	RH	0 to 100	%RH
Temperature Operating Range	T _a	-40 to +110	°C
Maximum Output Current (Peak)	I _{peak}	3	mA
Maximum Power	P _d	10	mW

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



ELECTRICAL CHARACTERISTICS

(@T=23°C, R_L>1MΩ unless otherwise noted)

Humidity Characteristics	Symbol	Min	Typ	Max	Unit
Humidity Measuring Range	RH	0		100	%RH
Relative Humidity Accuracy (10% to 95%RH)			±3	±5	%RH
Temperature coefficient (10°C to 50°C)	T _{cc}		-0.05	-0.1	%RH/°C
Recovery time after 150 hours of condensation	t		10		s
Humidity hysteresis			+/-1		%RH
Output impedance	Z			50	Ω
Sink current capability (R _L Min = 8 kOhms) ⁽¹⁾	I			1	mA
Warm up time (90% of signal)	t _w		150		ms
Time Constant (at 63% of signal) 33%RH to 75%RH ⁽²⁾	τ		5	10	s
Voltage Supply ^{(3) (4)}	V _{cc}	4.75	5	5.25	V _{dc}
Nominal Output @55%RH	V _{out}	2.401	2.480	2.559	V
Humidity Average Sensitivity	ΔmV/RH	-	+26	-	mV/%RH
Current consumption	I _{cc}	-	1.2	1.5	mA dc

(1) Conditions of sink current: V_{out} + 0.054V (3%RH) at V_{out} = 0.600 V (V_{out} min)

(2) At 1m/s air flow

(3) Module is ratiometric to voltage supply

(4) Maximum power supply ramp up time to VCC should be less than 20ms

TYPICAL PERFORMANCE CURVES

- HTX3515 Modeled Voltage Output ($V_{cc} = 5V$)

RH (%)	Vout (mV)	RH (%)	Vout (mV)
10	1235	55	2480
15	1390	60	2605
20	1540	65	2730
25	1685	70	2860
30	1825	75	2990
35	1960	80	3125
40	2090	85	3260
45	2220	90	3400
50	2350	95	3530

POLYNOMIAL EQUATIONS

$$V_{out} = 8.43E^{-4} RH^3 - 0.1485 RH^2 + 34.16 RH + 909$$

$$RH = -1.564E^{-9} V_{out}^3 + 1.205E^{-5} V_{out}^2 + 8.22E^{-3} V_{out} - 15.6$$

with V_{out} in mV and RH in %

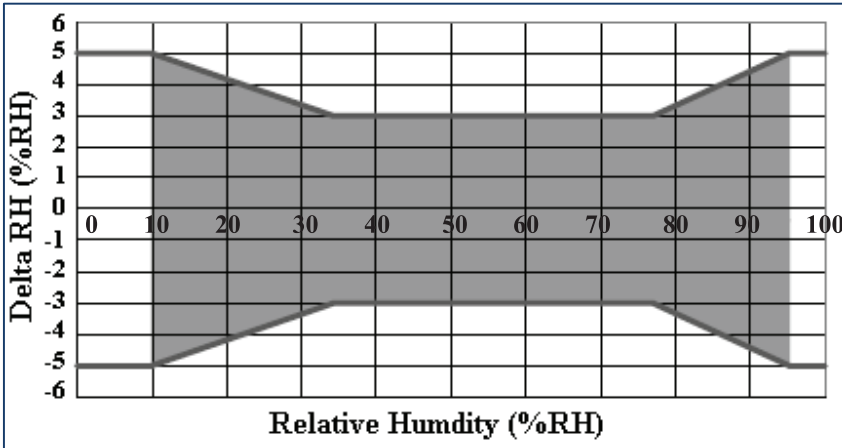
LINEAR EQUATIONS

$$V_{out} = 26.23 RH + 1032$$

$$RH = 0.03812 V_{out} - 39.36$$

with V_{out} in mV and RH in %

- Humidity error budget conditions at 23°C



HTX3515 modules are specified for maximum accuracy measurements within 10 to 95 %RH.

Excursion out of this range (< 10% or > 95% RH, including condensation) does not affect the reliability of HTX3515 characteristics.

RESISTANCE TO PHYSICAL AND CHEMICAL STRESSES

- HTX3515 have passed through qualification processes of MEAS-FRANCE/HUMIREL including vibration, shock, storage, high temperature and humidity, ESD.
- HTX3515 contain circuits to protect its inputs and outputs against Electrostatic discharges (ESD) up to $\pm 15kV$, air discharge.
- HTX3515 is protected against EMC interferences.
- HTX3515 is protected against reverse polarity.
- Additional tests under harsh chemical conditions demonstrate good operation in presence of salt atmosphere, SO_2 (0.5%), H_2S (0.5%), O_3 , NO_x , NO , CO , CO_2 , Softener, Soap, Toluene, acids (H_2SO_4 , HNO_3 , HCl), HMDS, Insecticide, Cigarette smoke, a non-exhaustive list.
- HTX3515 is not light sensitive.

CONNECTING AND MECHANICAL CHARACTERISTICS

Pin Out Assignment (with wires)

N°	Colour	Function
1	Black	Ground
2	Red	Vcc - Voltage Supply
3		
4	White	Vout - Humidity

Package Outline With CH connector

Dim	Typ (mm)
A	27 ± 0.25
B	11.9 ± 0.2
C	5.7 ± 0.5
D	24.65 ± 0.25
E	$\varnothing 2.5 \pm 0.2$
F	6.7 ± 0.3
G	1.5 ± 0.5
H	6.8 ± 0.5
I	10.7 ± 0.5
J	13.3 ± 0.5

Color : Black Weight : 1.5g

MECHANICAL CHARACTERISTICS: HTX3515 PACKAGE OUTLINE

