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Features

- High sensitivity to ammonia (NH₃). Fast response time.
- Small sensitivity to ethanol (C₂H₆O). Slow response time.

Application

- Detection of refrigerant gases with ammonia sensors. For example, for explosive risks in industries.
- Detection of Volatile Organic Compounds (VOCs) such as ethanol. It can be used to monitor the presence of flammable vapours.

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General specifications

Technical conditions: 21°C (ambient temperature). No gas.

Sensor type		Semiconductor
Encapsulation		10 Lead T0-5 Metal Can
V_B	Sensor bias voltage (V)	20
V_P	Nominal poly resistance voltage (V)	12
$V_{P,max}$	Maximum poly resistance voltage (V)	15
R_L	Load Resistance (Ω)	Adjustable
R_{poly}	Heating resistance (Ω)	120,93
$R_{0\text{ alu}}$	Heat mesure resistance (Ω)	47,94
$\rho_{0\text{ alu}}$	Aluminium resistivity ($\Omega.m$)	28.10^{-8}
P_H	Heating consumption (W)	1,19

Nominal domain

T_{range}	Package temperature range (°C)	20-250
I_{alu}	Aluminium resistor current (mA)	± 150
V_{alu}	Aluminium resistor voltage (V)	± 20
I_{poly}	Polysilicium resistor current (mA)	± 125
V_{poly}	Polysilicium resistor voltage (V)	± 15
I_{mes}	Nanoparticle resistor current (uA)	-8 to +2
V_{mes}	Nanoparticle resistor current (V)	± 20

We tested the sensor in the lab with those values, and we observed no degradation. We can assume that it is safe to use the sensor within this domain.

No deterioration domain / No destruction domain

We did not perform enough tests to alter the metrological characteristics of the sensor. Therefore, we cannot give values for the no deterioration domain and for the no destruction domain.

Ammonia and ethanol specifications

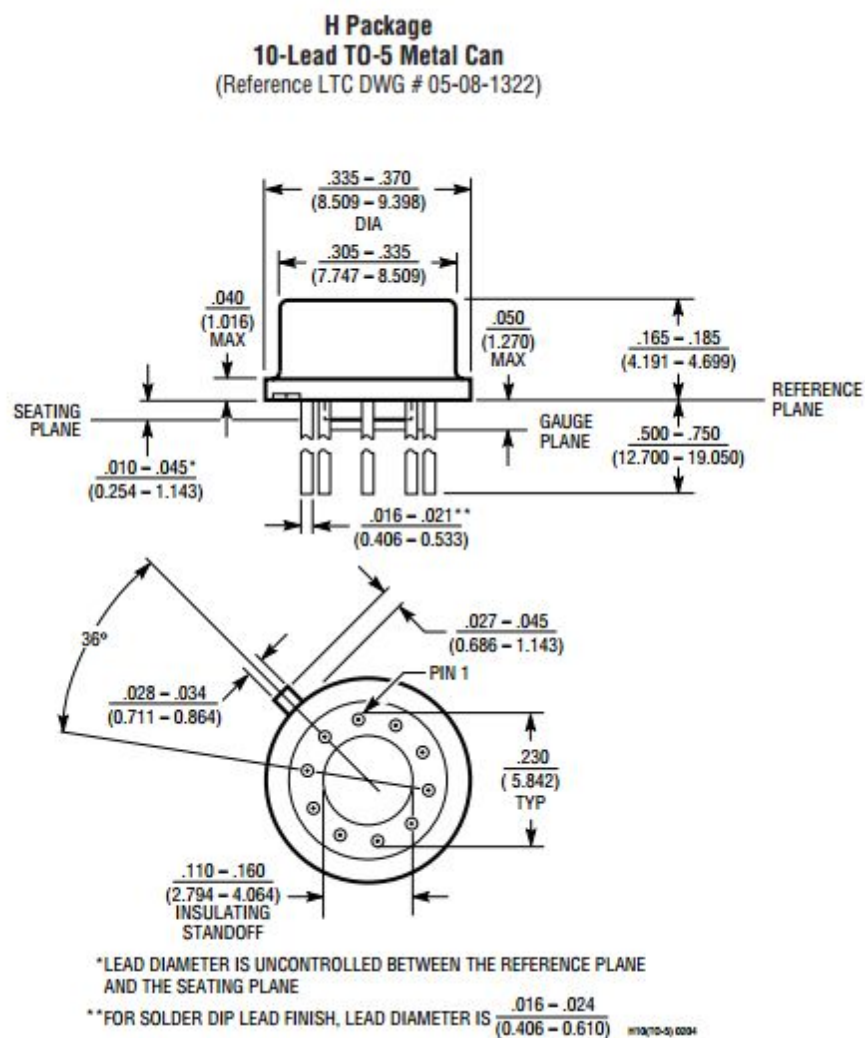
Technical conditions: gas flow = 1.5 cm³/min

Symbols	Description	Ammonia	Ethanol
T_R	Temperature range (°C)	[120 ; 250]	[200 ; 250]
EM	Measurement range (ppm)	Unknown	Unknown
EM_{min}	Minimum range (ppm)	Unknown	Unknown
EM_{max}	Maximum range (ppm)	Unknown	Unknown
S	Sensitivity	Unknown	Unknown
α	Slope	Unknown	Unknown
	Precision	Unknown	Unknown

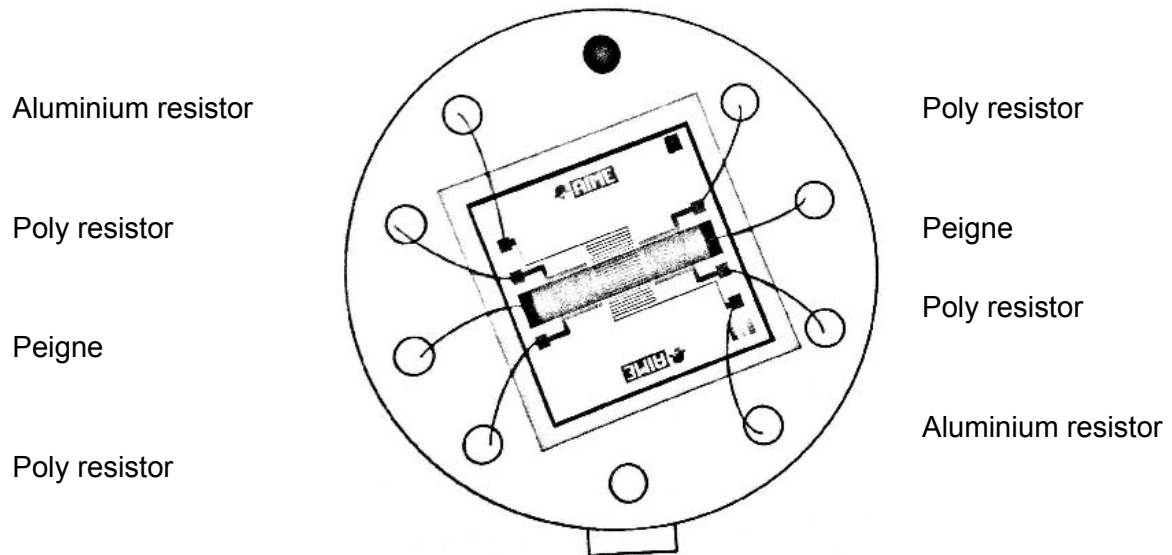
During the lab tests, we measured the tension variation on the poly resistor terminals in function of the time, for a constant gas flow value of 1.5 cm²/min for both gas. Moreover, the volume of the enclosure where the gas was sent is not well defined, so we cannot determine the real concentration of gas in the enclosure.

As a consequence, we cannot determine the measurement range, the minimum range, the maximum range and the sensitivity.

Package Configuration

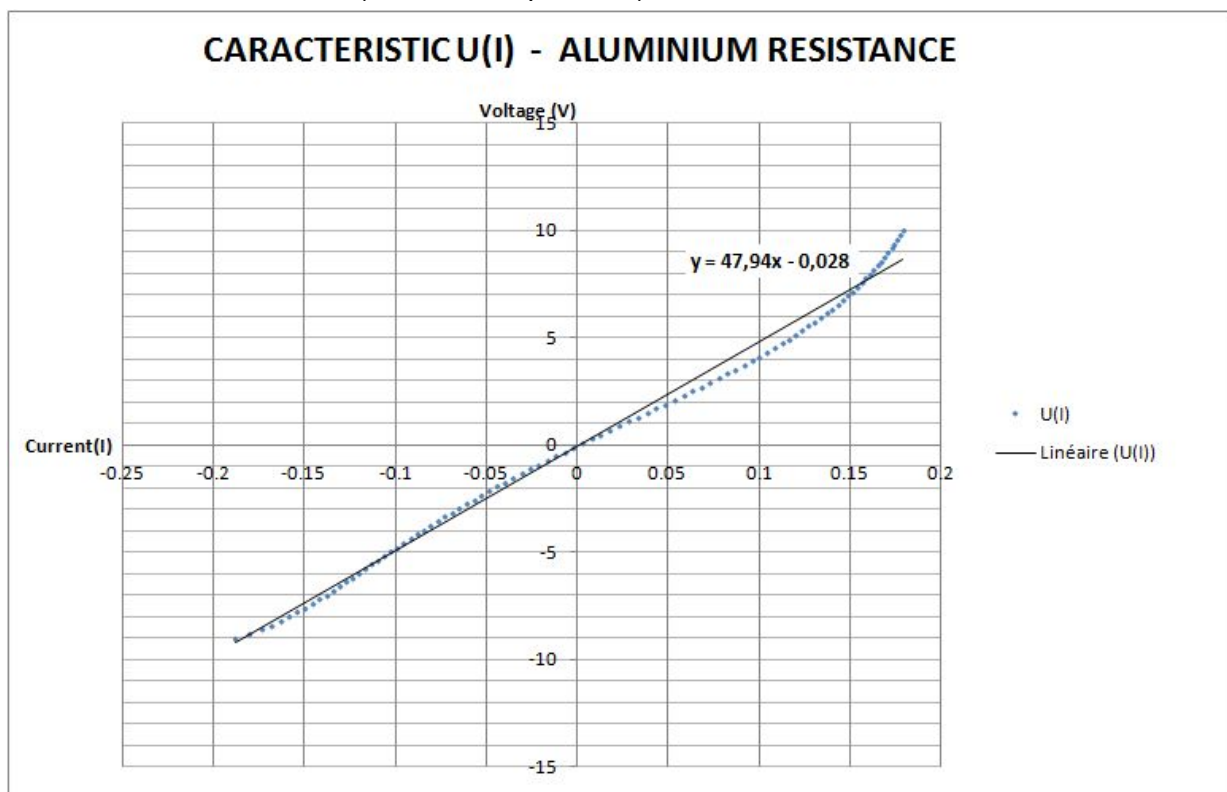


Schematic

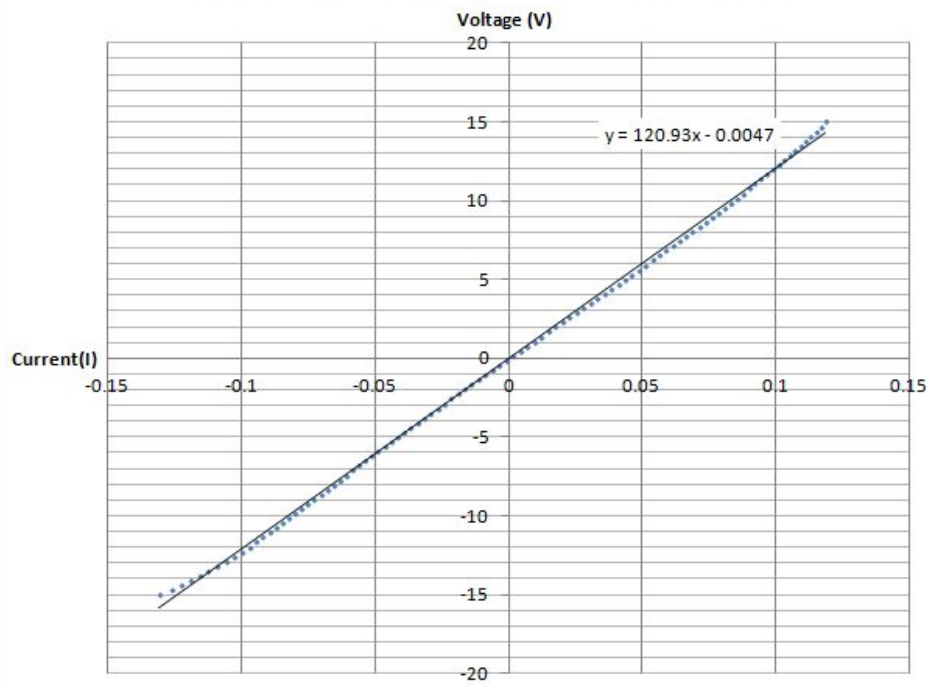


Calibration curves

Technical conditions: 21°C (ambient temperature)

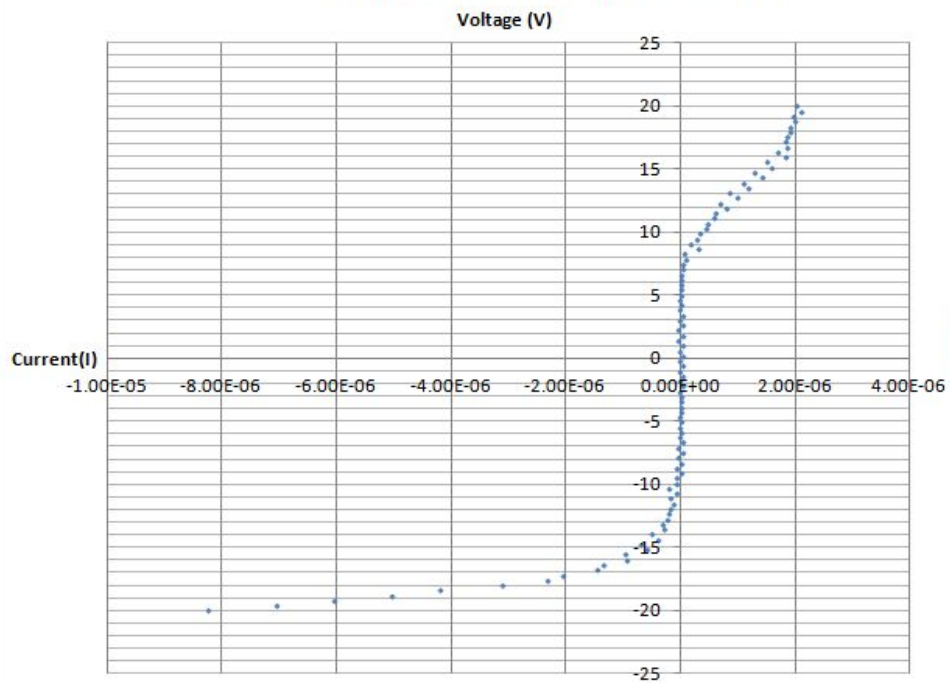


CARACTERISTIC U(I) - POLY RESISTANCE



· U(I)
— Linéaire (U(I))

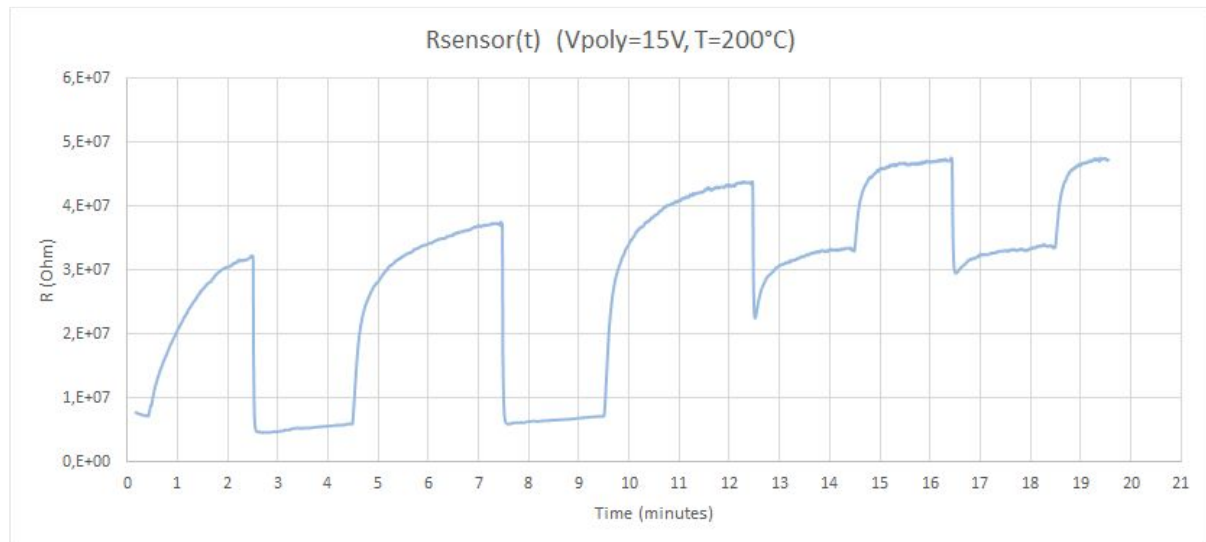
CARACTERISTIC U(I) - PEIGNE



· U(I)

Response curve

The following curve is the resistance of the sensor in function of time, and with different changes in the air composition.



Protocol used :

Start time	Exposition Time	Air flow
0"00	30 sec	Nothing
0"30	2 min	NH ₃
2"30	2 min	Dry air
4"30	3 min	NH ₃
7"30	2 min	Dry air
9"30	3 min	Ethanol
12"30	3 min	Dry air
14"30	2 min	Ethanol
16"30	2 min	Dry air
18"30	2 min	Ethanol