Semi-conductor gas senor temperature and humidity dependency

The sensing principle of semi-conductor sensor is based on chemical adsorption and desorption of gases on the sensor's surface, the ambient temperature and humidity will affect sensitivity characteristics easily. From Figure 1, we can see that the relation between the gas sensor resistance and ambient temperature and humidity is negative temperature , different type gas sensor made of various materials has different temperature coefficient.

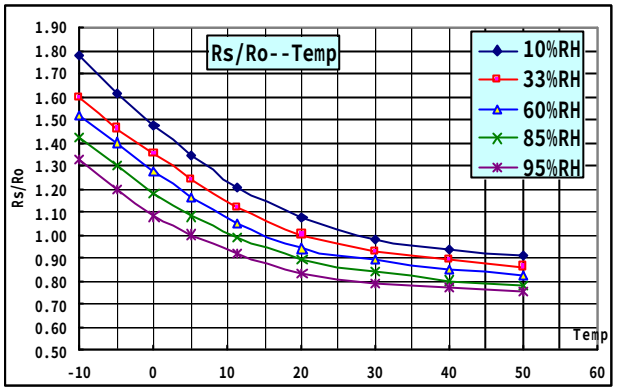


Fig.1

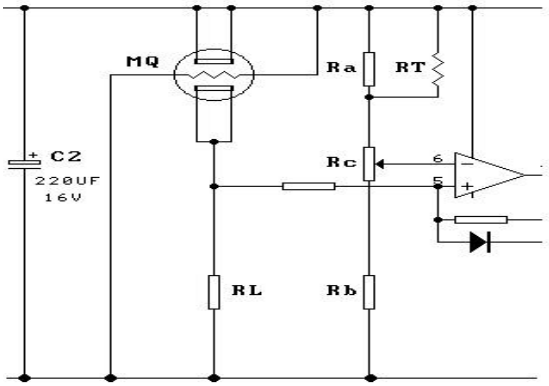


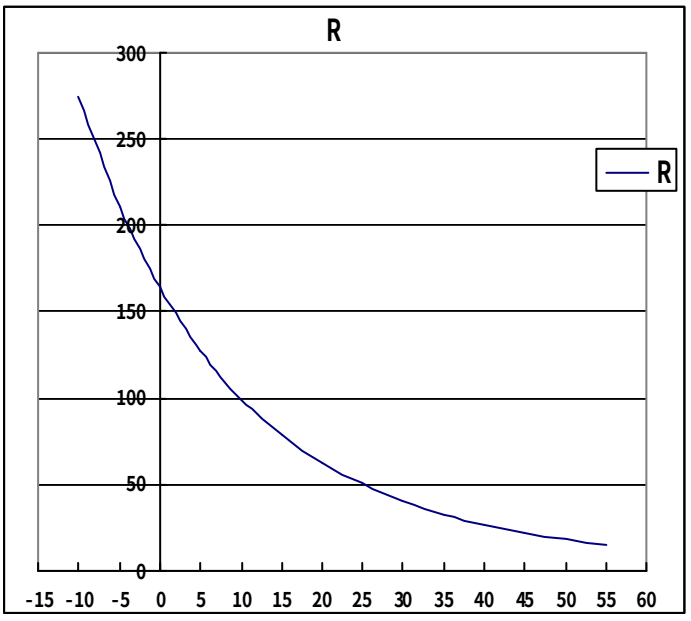
Fig.2

According to the above , A compensation circuit for temperature and humidity dependency must be considered when using semi-conductor gas sensor in the application of better precision and reliability. As the expensive cost of humidity sensor has restricted the introduction of humidity sensor, usually, only the temperature compensation also get a better result. Figure 2 shows the referring circuit of applying thermistor for temperature compensation. You can use MCU in circuit to compensate according to the temperature data table too.

In the above figure, we can use suitable RL, Ra, Rb, Rc and thermistor RT with suitable temperature coefficient, this will get a good compensation result. We suggest to use our MF 58 negative temperature coefficient thermistor, it will compensate gas sensor reach high reproducibility and reliability.

Features of MF 58 negative temperature coefficient thermistor as follows:

Temperature - resistance proportion curve



Thermistor date sheet

T	R(KΩ)
-10	274.40
-5	211.10
0	164.00
5	127.13
10	99.44
15	78.44
20	62.38
25	50.00
30	40.09
35	32.38
40	26.33
45	21.55
50	17.75
55	14.60