

## Temperature drift identification in semiconductor gas sensors

### ABSTRACT

The efficiency of metal-oxide (MOX) semiconductor gas sensor is depends on the high accuracy of its performance. In real monitoring situation, the responses of gas sensor are inclined to substantial drift effects that caused by environmental factors (i.e., ambient temperature and humidity) that have reduced the sensor's accuracy. Therefore, the study aims to identify the probable span of drift in sensor responses that was introduced by ambient temperature variation. Two gas sensors (TGS2600 and TGS2602) were used to observe the drift due to ambient temperature variation (25, 30, 35 and 40°C) in exposure of clean air and 6 ppm toluene. The ambient temperature of 25 °C was set as the starting temperature for drifting point, and used as the baseline for identification of drift occurrence. The probable span of drift was later translated into percentage for easy interpretation. Results show that the sensors resistances were drifted in a wide range with their respective drift percentage as the ambient temperature were increased. The resistances for TGS2600 and TGS2602 were drifted up to 57.61 and 61.21 % in clean air while 40.13 and 9.7 % in 6 ppm toluene, respectively. It can be concluded that the probable span of drifted responses has been identified for TGS2600 and TGS2602 in clean air and 6 ppm toluene due to the variation of ambient temperature beyond 25 °C.

**Keyword:** Drift percentage; Semiconductor gas sensor; Temperature drift