

# Smoke Sensor for the detection of Hydro Carbon, Smoke, Organic Solvent

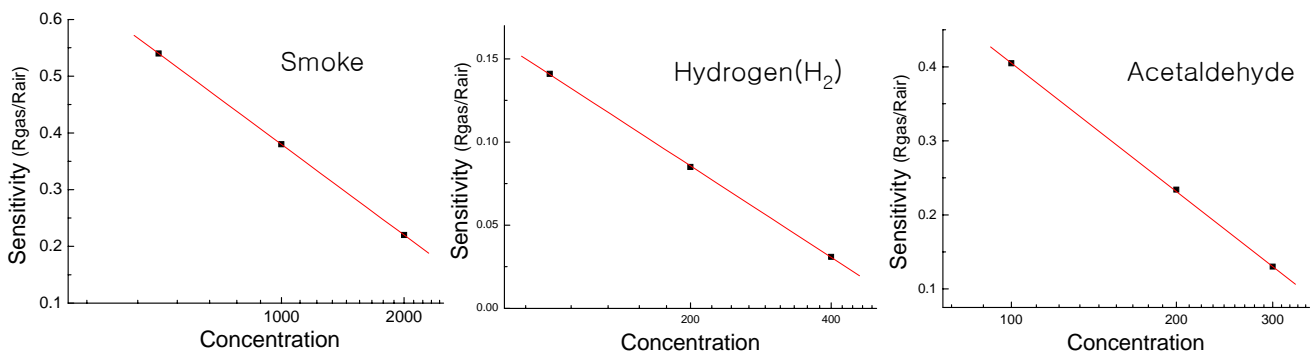


< Package(MS5100) >

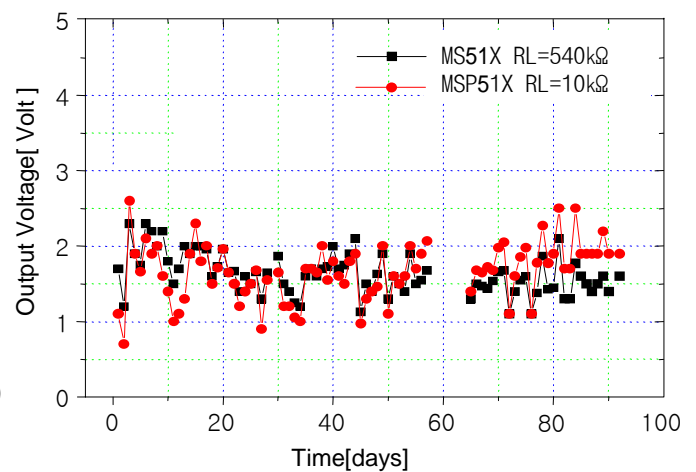
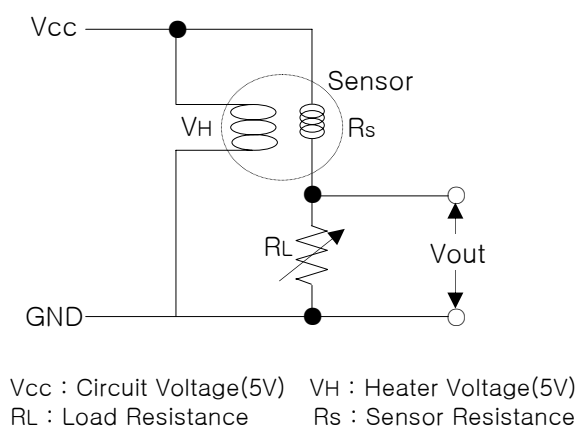


<Module(MS5100-110)>

## 1. Sensitivity characteristic slope



## 2. Basic Measuring Circuit & Long Term Stability

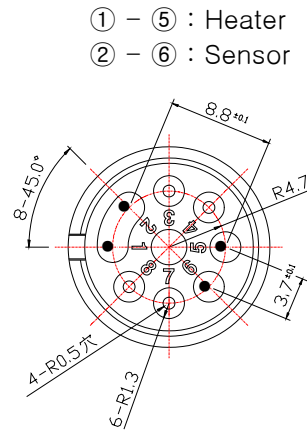
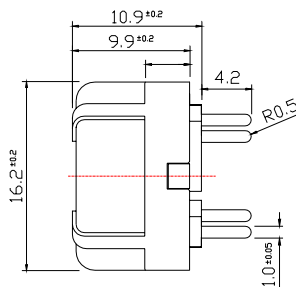
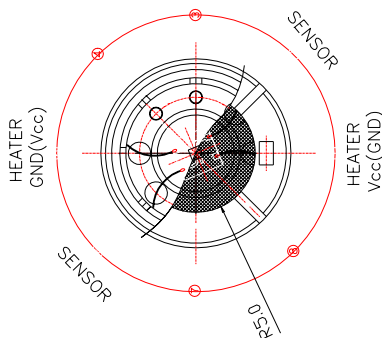


### 3. Specifications

Model number		MS5100	MS5100-110	
Sensing element type		Semiconductor	←	
Target gas		HC, Smoke, Organic compounds	←	
Electrical characteristics under standard Test conditions	R <sub>H</sub>	Heater resistance	15Ω±0.2Ω	
	V <sub>H</sub>	Heater Voltage	5.0V±2%	
	R <sub>L</sub>	Road resistance	Variable	
	P <sub>H</sub>	Power consumption	Less than 760mW	
	V <sub>c</sub>	Circuit Voltage	Less than 12.0V	
Sensitivity Characteristic β=Rs,gas/Rs,air ΔV= Vout,air- Vout,gas	Rs,air Vout,air	Sensor resistance Out of Voltage	Rs,air = 85kΩ to 3,255 kΩ (Refer to Rank Table)  Vout,air = 2.0V±0.2	
	β ΔV	H <sub>2</sub> :200ppm Smoke:1,000ppm (ESSE)	0.060 ≤ β ≤ 0.167  β ≤ 0.3  ΔV=2.0 ~ 2.7V ΔV ≥ 0.6V (Vout,air = 2.0V)	
	Response time		Reaction :less than 10sec Recovery :less than 20sec	←
	* Standard test condition (balance gas : clean air, or special air) • Temp. : 20℃±5℃, • Humidity : RH65%±10%, • Pressure : 1atm • Test chamber : more than 1ℓ/EA, • Pre-heating time : more than 1hr			
Environmental condition	* Operation temp. & Relative humidity : -10℃ to 60℃, less then dew point * storage temp. : -20℃ to 80℃ * Oxygen concentration : 21% ± 2%(The sensitivity characteristics are influenced by variation in oxygen concentration)			

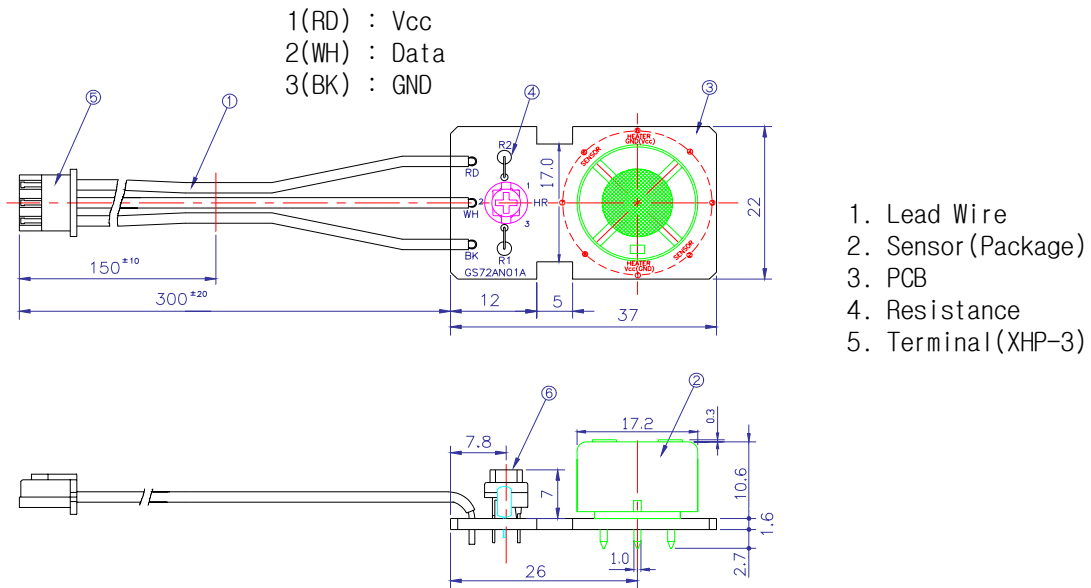
### 4. Structure and Dimensions

MS5100(Package)

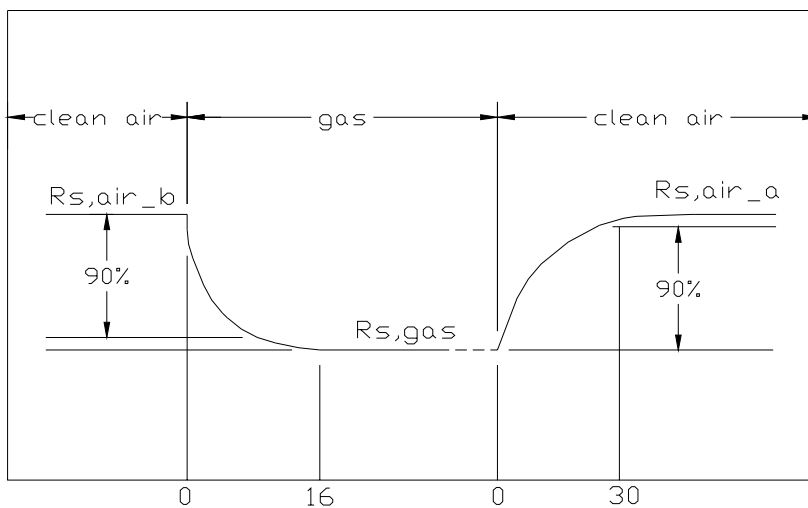


- ① - ⑤ : Heater  
② - ⑥ : Sensor

## MS5100 – 110(Module)



## 5. Reaction Time



Reaction Time(90%) : Less then 10sec [Between  $R_{s,air\_b}$  &  $R_{s,gas}$ ]

Recovering Time(90%) : Less then 20sec [between  $R_{s,gas}$  &  $R_{s,air\_a}$ ]

Beginning stability time : Less then 3 minute

$R_{s,air\_b}$  : Sensor Resistance without gases

$R_{s,gas}$  : Sensor Resistance after blowing gases

$R_{s,air\_a}$  : Sensor Resistance removing gases

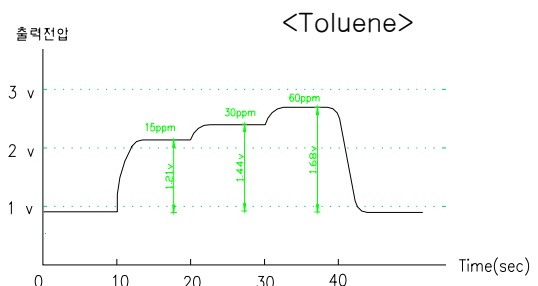
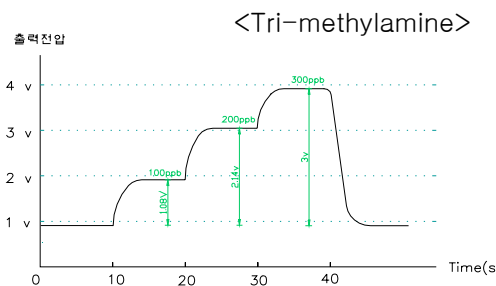
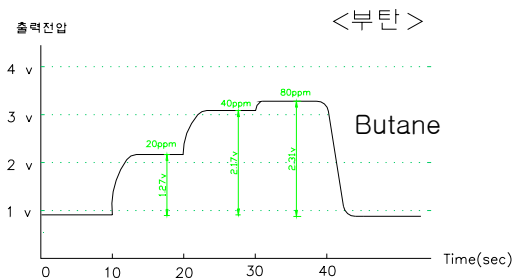
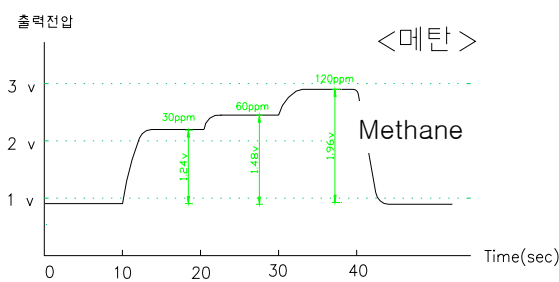
## 6. Characteristic of the other gases ( $\Delta V$ )

Methane	Concentration	30ppm	60ppm	120ppm	폭발성 가스
	Sensitivity	1.2	1.5	2.0	
Butane	Concentration	20ppm	40ppm	80ppm	폭발성 가스
	Sensitivity	1.2	2.1	2.3	
Tri-methylamine	Concentration	0.1ppm	0.2ppm	0.3ppm	음식물 부패가스
	Sensitivity	1.1	2.1	3.0	
Toluene	Concentration	15ppm	30ppm	60ppm	유기용제 가스
	Sensitivity	1.2	1.4	1.6	

\*  $\Delta V = (\text{출력전압}) - (\text{기준전압})$

\* 출력전압 : 해당 농도에서의 출력전압

\* 기준전압 : 청정대기에서의 전압



### Characteristic of gases

물질명	분자식	Explosive Range (Vol.%)	허용농도(ppm)
Methane	CH <sub>4</sub>	5.0 ~ 15.0	-
Butane	CH <sub>3</sub> (CH <sub>2</sub> )CH <sub>3</sub>	1.8 ~ 8.4	-
Tri-methylamine	(CH <sub>3</sub> ) <sub>3</sub> N	1.2 ~ 7.6	10
Toluene	C <sub>6</sub> H <sub>5</sub> CH <sub>3</sub>	2.5 ~ 13.3	1,000

## 7. Rank Table

Rank	Resistance	Rank	Resistance	Rank	Resistance
01A	85 ~ 155kΩ	01D	349 ~ 487kΩ	01G	930 ~ 1,318kΩ
01B	155 ~ 241kΩ	01E	487 ~ 672kΩ	01H	1,318 ~ 1,963kΩ
01C	241 ~ 349kΩ	01F	672 ~ 930kΩ	01I	1,963 ~ 3,255kΩ

## 8. Application

- \* Hood, Ventilator
  - \* Damper
  - \* Gas Leak Alarm (Explosive gases)
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