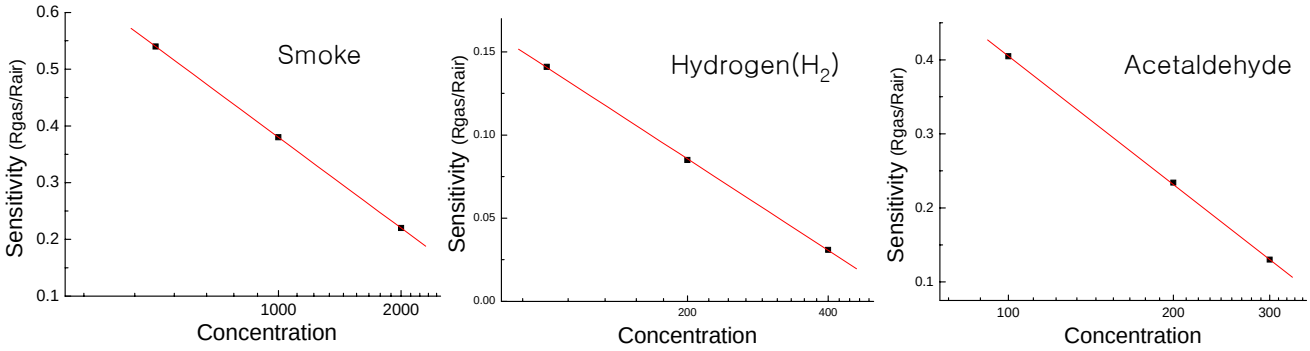
Smoke Sensor for the detection of Hydro Carbon, Smoke, Organic Solvent

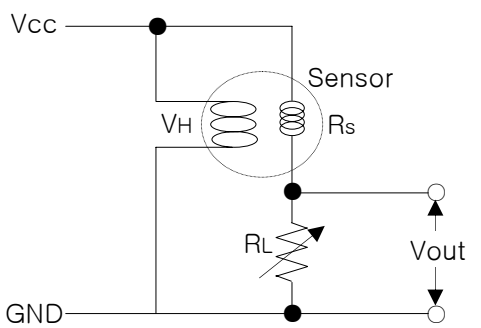
< Package(MS5100) >

<Module(MS5100-110)>

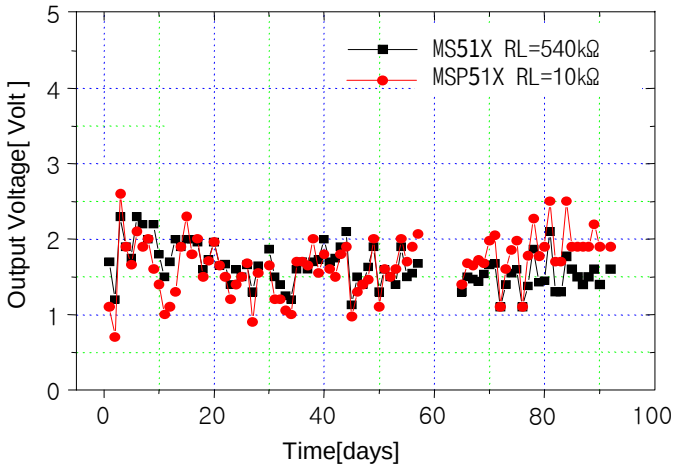
1. Sensitivity characteristic slope



2. Basic Measuring Circuit & Long Term Stability



Vcc : Circuit Voltage(5V) VH : Heater Voltage(5V)
RL : Load Resistance Rs : Sensor Resistance



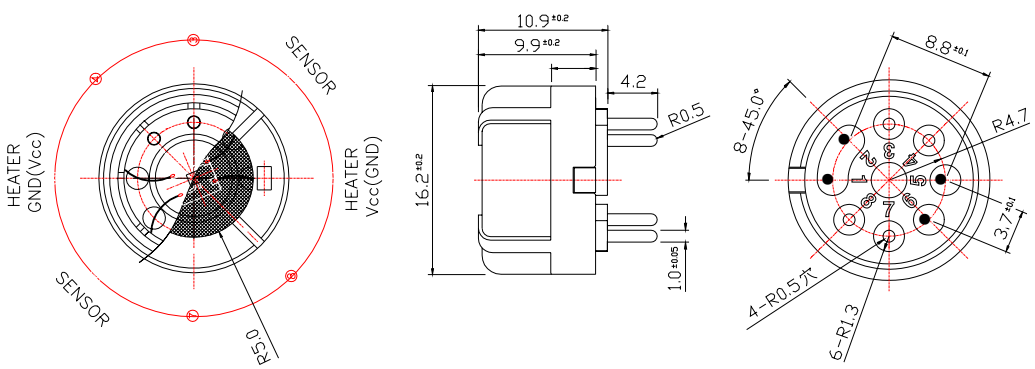
3. Specifications

Model number			MS5100	MS5100-110
Sensing element type			Semiconductor	←
Target gas			HC, Smoke, Organic compounds	←
Electrical characteristics under standard Test conditions	R_H	Heater resistance	15Ω±0.2Ω	P_H : Less than 780㎽ Circuit voltage : 5V±2%
	V_H	Heater Voltage	5.0V±2%	
	R_L	Road resistance	Variable	
	P_H	Power consumption	Less than 760㎽	
	V_C	Circuit Voltage	Less than12.0V	
Sensitivity Characteristic β=Rs,gas/Rs,air ΔV= Vout,air− Vout,gas	$R_{s,air}$ $V_{out,air}$	Sensor resistance Out of Voltage	$R_{s,air}$ = 85kΩ to 3,255 kΩ (Refer to Rank Table)	Vout,air = 2.0V±0.2
	β ΔV	H_2:200ppm 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			

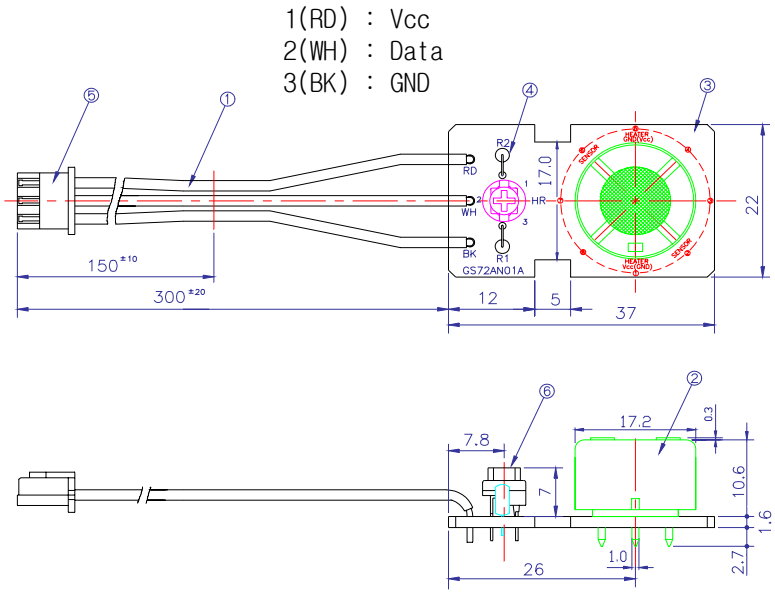
4. Structure and Dimensions

MS5100(Package)

① − ⑤ : Heater
② − ⑥ : Sensor

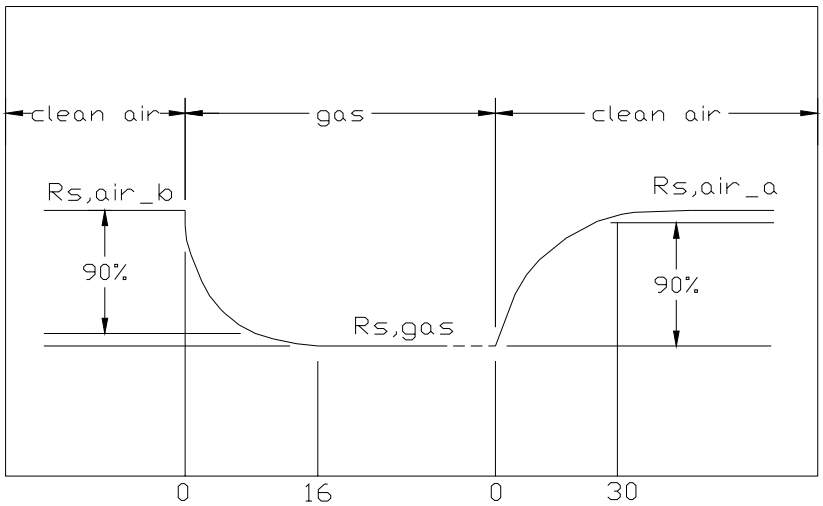


MS5100 – 110(Module)



1. Lead Wire
2. Sensor(Package)
3. PCB
4. Resistance
5. Terminal(XHP-3)

5. Reaction Time



Reaction Time(90%) : Less then 10sec [Between Rs,air_b & Rs,gas]

Recovering Time(90%) : Less then 20sec [between Rs,gas & Rs,air_a]

Beginning stability time : Less then 3 minute

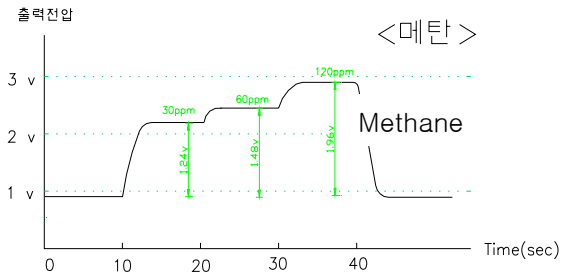
Rs,air_b : Sensor Resistance without gases
Rs,gas : Sensor Resistance after blowing gases
Rs,air_a : Sensor Resistance removing gases

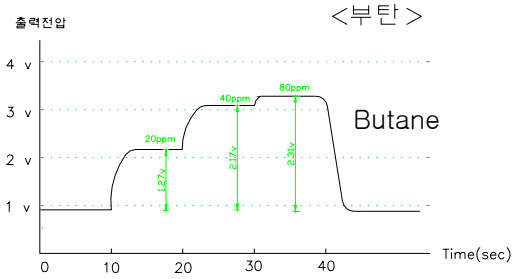
6. Characteristic of the other gases (△V)

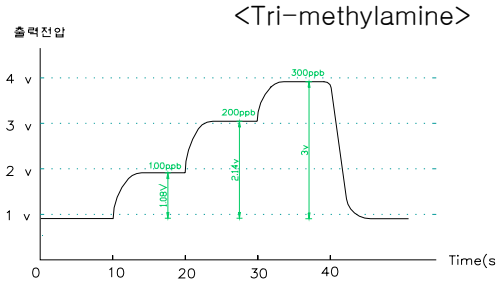
Methane	Concentration	30ppm	60ppm	120ppm	폭발성 가스
	Sensitivity	1.2	1.5	2.0	
Butane	Concentration	20ppm	40ppm	80ppm	폭발성 가스
	Sensitivity	1.2	2.1	2.3	
Tri-methylamine	Concentration	0.1ppm	0.2ppm	0.3ppm	음식물 부폐가스
	Sensitivity	1.1	2.1	3.0	
Toluene	Concentration	15ppm	30ppm	60ppm	유기용제 가스
	Sensitivity	1.2	1.4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

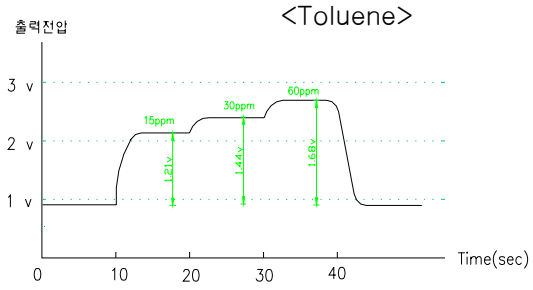
* △V = (출력전압) – (기준전압)
* 출력전압 : 해당 농도에서의 출력전압

* 기준전압 : 청정대기에서의 전압









Characteristic of gases

물질명	분자식	Explosive Range (Vol.%)	허용농도(ppm)
Methane	CH_4	5.0 ~ 15.0	-
Butane	$CH_3(CH_2)CH_3$	1.8 ~ 8.4	-
Tri-methylamine	$(CH_3)_3N$	1.2 ~ 7.6	10
Toluene	$C_6H_5CH_3$	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)