

LPG/NG Sensor – for the detection of LPG, CNG

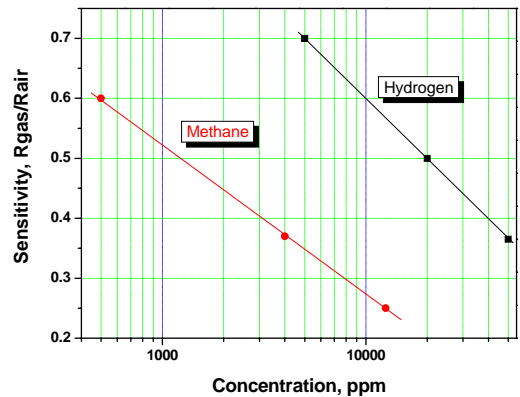
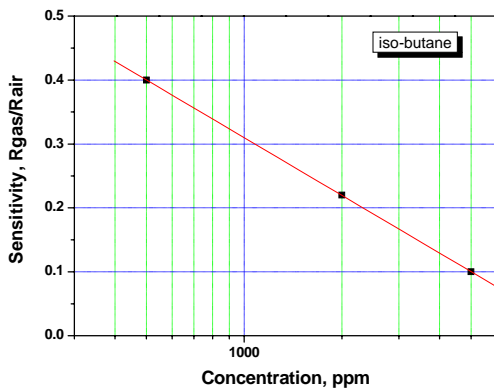


< Package(GSMS61) >

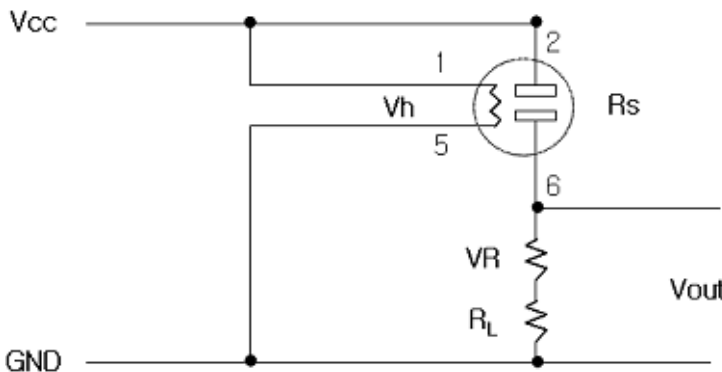


< Module(GSMS61 - P101) >

1. Sensitivity` characteristic slope



2. Basic Measuring Circuit



V_{cc} : Circuit Voltage(5V)

V_h : Heater Voltage(5V)

R_L : Load Resistance

V_R : Semi- Fixed Volume

R_s : Sensor Resistance

1, 2, 5, 6 : Sensor pin number

3. Specifications

3.1 Package (sensor) GSMS61 : Methane-CNG, GSPS61 : Butane-LPG



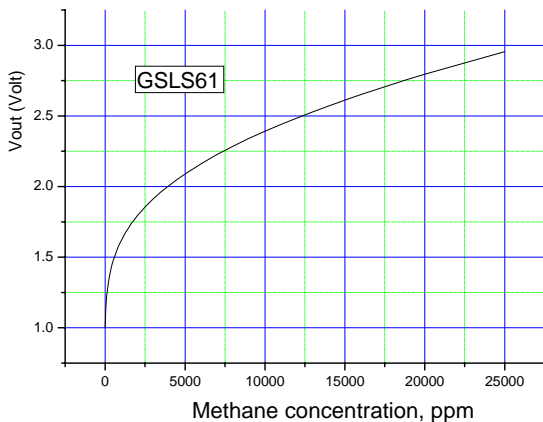
a. General

- Heater input voltage : 5volt±1%
- Resistance : 16.0 ±0.2
- Power consumption : Less than680mW
- Sensor input Voltage : 1 ~ 12Volt

b. Output Voltage

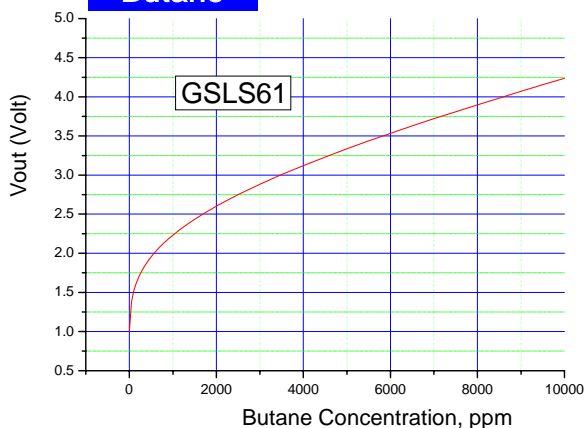
- Ref. → RL : 100kΩ, Sensor resistance : 400kΩ, Vout,air : 1.0volt (Input Voltage 5volt)
- Error : ±7%

Methane



(ppm)	(Volt)	(ppm)	(Volt)	(ppm)	(Volt)	(ppm)	(Volt)
0	1.00	700	1.54	1,900	1.78	10,000	2.39
50	1.14	800	1.57	2,000	1.79	11,000	2.44
100	1.22	900	1.59	2,500	1.86	12,000	2.49
150	1.28	1,000	1.62	3,000	1.91	13,000	2.53
200	1.32	1,100	1.64	3,500	1.96	14,000	2.57
250	1.35	1,200	1.66	4,000	2.01	15,000	2.61
300	1.38	1,300	1.68	4,500	2.05	16,000	2.65
350	1.41	1,400	1.70	5,000	2.09	17,000	2.69
400	1.43	1,500	1.71	6,000	2.16	18,000	2.73
450	1.45	1,600	1.73	7,000	2.23	19,000	2.76
500	1.47	1,700	1.75	8,000	2.29	20,000	2.80
600	1.51	1,800	1.76	9,000	2.34	25,000	2.96

Butane



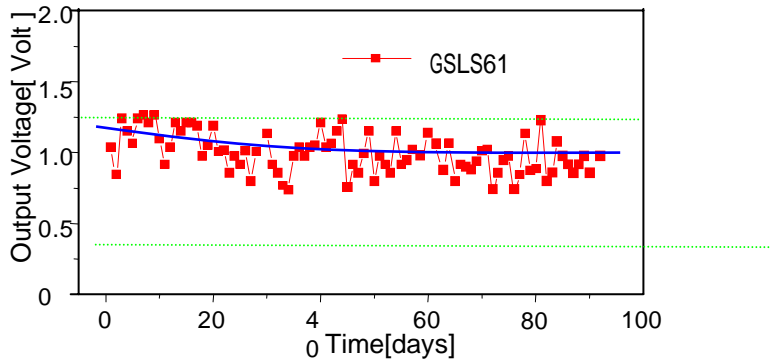
(ppm)	(Volt)	(ppm)	(Volt)	(ppm)	(Volt)	(ppm)	(Volt)
0	1.00	600	2.02	1,400	2.40	5,000	3.33
50	1.38	650	2.05	1,500	2.43	5,500	3.44
100	1.51	700	2.08	1,600	2.47	6,000	3.53
150	1.61	750	2.11	1,700	2.50	6,500	3.63
200	1.68	800	2.13	1,800	2.54	7,000	3.72
250	1.74	850	2.16	1,900	2.57	7,500	3.81
300	1.79	900	2.18	2,000	2.60	8,000	3.90
350	1.84	950	2.21	2,500	2.75	8,500	3.98
400	1.88	1,000	2.23	3,000	2.88	9,000	4.07
450	1.92	1,100	2.28	3,500	3.01	9,500	4.15
500	1.95	1,200	2.32	4,000	3.12	10,000	4.24
550	1.99	1,300	2.36	4,500	3.23		

Other Gases

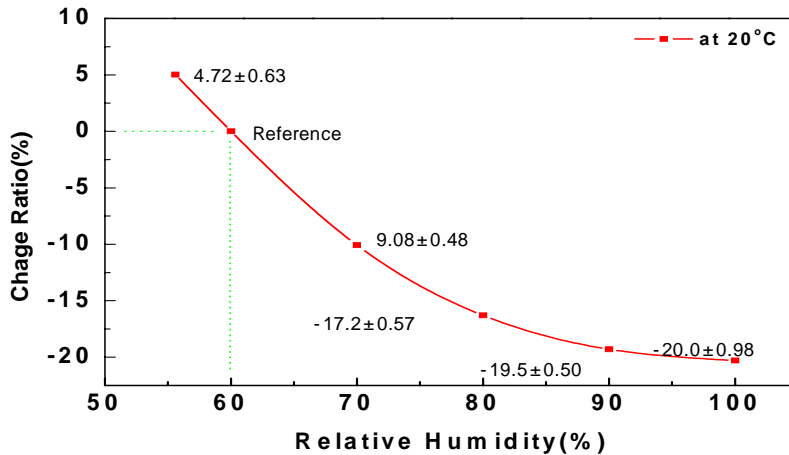
$$= R_{s,gas} / R_{s,air}$$

Name	Sensitivity, (1,000ppm)	Characteristics
Smoke	Less than 0.9	This, Korea
Alcohol	Less than 0.8	Cooking gas
Butyl Acid	Less than 0.8	

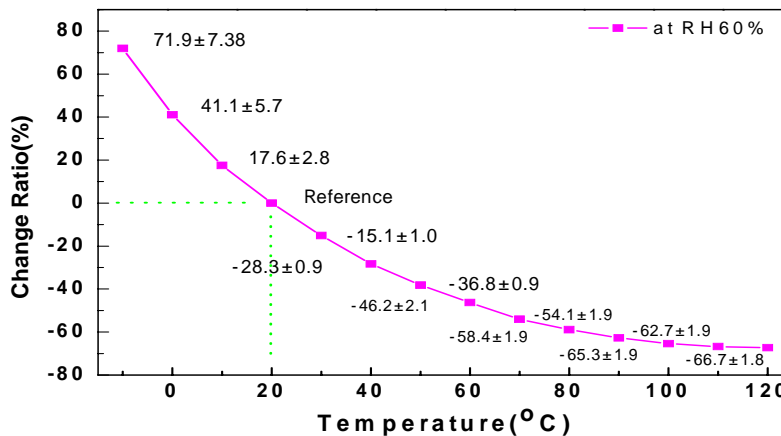
c. Long term stability



d. Humidity dependency



e. Temperature dependency





3.2 Module (Methane/Butane)

a. General

- Input voltage : 5Volt±1%
- Output data : 0.5 ~ 5Volt
- Power consumption : 710mV
- Relay Output : 4.0Volt

b. Data error : ±5%

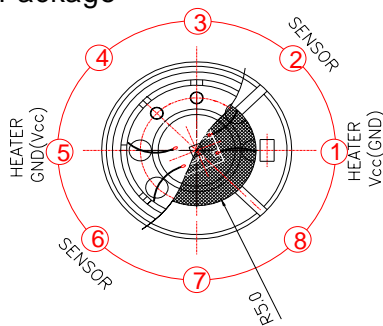
Methane GSMS61-P110

Butane GSPS61-P110

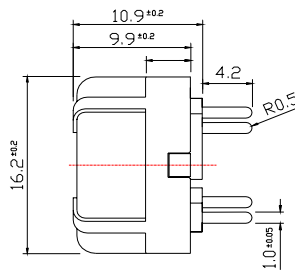
(ppm) (Volt)	(ppm) (Volt)	(ppm) (Volt)	(ppm) (Volt)	(ppm) (Volt)	(ppm) (Volt)	(ppm) (Volt)	(ppm) (Volt)
0 0.58	700 1.89	1,900 2.47	10,000 3.97	0 0.58	450 2.41	1,250 3.26	4,250 4.93
50 0.91	800 1.96	2,000 2.51	11,000 4.09	20 1.05	500 2.49	1,500 3.45	4,500 5.00
100 1.12	900 2.02	2,500 2.67	12,000 4.20	40 1.26	550 2.55	1,750 3.62	
150 1.25	1,000 2.08	3,000 2.80	13,000 4.31	60 1.41	600 2.62	2,000 3.78	
200 1.35	1,100 2.13	3,500 2.93	14,000 4.41	80 1.52	650 2.68	2,250 3.93	
250 1.44	1,200 2.18	4,000 3.04	15,000 4.51	100 1.61	700 2.74	2,500 4.08	
300 1.51	1,300 2.23	4,500 3.14	16,000 4.61	150 1.79	750 2.79	2,750 4.21	
350 1.57	1,400 2.28	5,000 3.24	17,000 4.70	200 1.93	800 2.85	3,000 4.34	
400 1.63	1,500 2.32	6,000 3.41	18,000 4.79	250 2.05	850 2.90	3,250 4.47	
450 1.68	1,600 2.36	7,000 3.57	19,000 4.88	300 2.16	900 2.95	3,500 4.59	
500 1.73	1,700 2.40	8,000 3.71	20,000 4.96	350 2.25	950 3.00	3,750 4.71	
600 1.82	1,800 2.44	9,000 3.85		400 2.33	1,000 3.04	4,000 4.82	

4. Characteristics and Dimensions

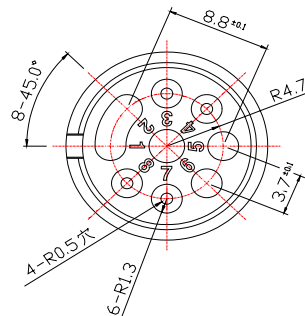
4.1 Package



[Top View]



- : Heater
- : Sensor

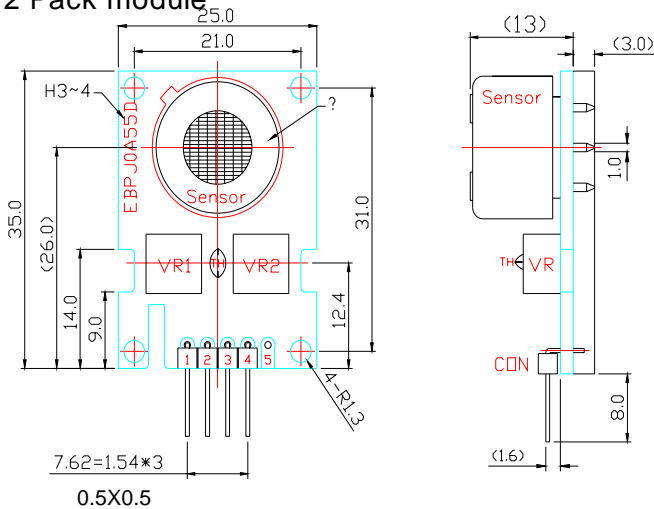


[Bottom View]

Rank Table(J) - Rank

Rank	RL	Rs,	Rank	RL	Rs,	Rank	RL	Rs,
J02	4.22kΩ	13.4 ~ 22.2kΩ	J05	19.1kΩ	60.4 ~ 100kΩ	J08	86.6kΩ	275 ~ 455kΩ
J03	6.98kΩ	22.2 ~ 36.6kΩ	J06	31.6kΩ	100 ~ 166kΩ	J09	143kΩ	455 ~ 751kΩ
J04	11.5kΩ	36.6 ~ 60.4kΩ	J07	52.3kΩ	166 ~ 275kΩ	J10	237kΩ	751 ~ 1,150kΩ

4.2 Pack module



a. Output Data

1	2	3	4
+5V	GND	Vout	Relay

- Calibration (refer to specification)

[Front Side]

VR1 : Offset Calibration

VR2 : Gain Calibration

b. Product code

GSLS61-P

1 2 3

- (1) Division Circuit → 1:standard circuit
2:Precision grade
3:Micro-processor
- (2) Sensing range → **1:** **2:LPG 3:NG**
- (3) Connector → 0:None 1:Straight
2:Angle 3:Opposite angle

c. Relay Output

- LPG : Hi(4.0~4.1volt) output at 1,750ppm,
or 4,500ppm(Butane,C8H10)
- NG : Hi(4.0~4.1volt) output at 11,000ppm
or 12,500ppm(Methane,CH4)

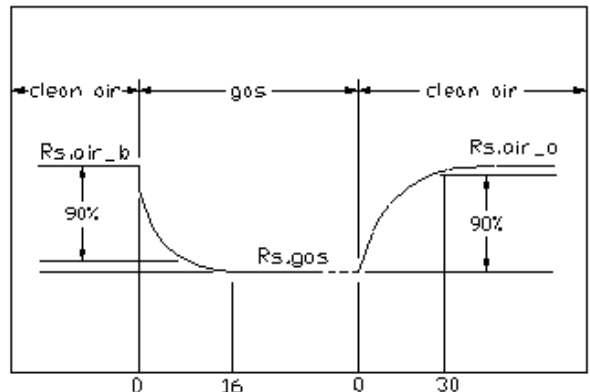
5. Reaction time(T90)

Reaction Time(T90) : Less then 10sec
[Between Rs,air_b & Rs,gas]

Recovering Time(T90) : Less then 30sec
[between Rs,gas & Rs,air_a]

Beginning stability time(T90) : Less then 10 min

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



6. Application

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

*

summary