

MPGs Sensor – for the detection of CNG, LPG

가 LPG/NG sensor
Bead/Thick film type

(bead type)	(가)	(2) 가
(Thick film type)	(4) 가	(가)

GSLS61 가 ,



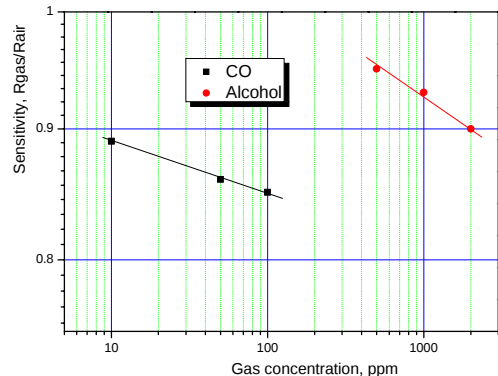
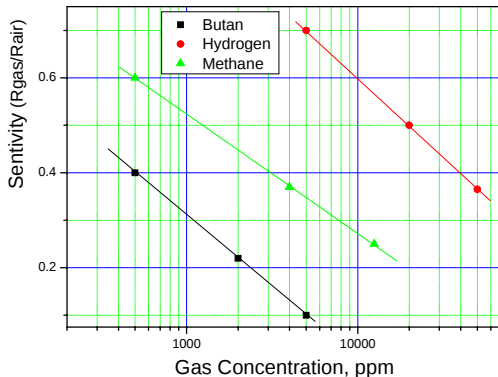
< Package >



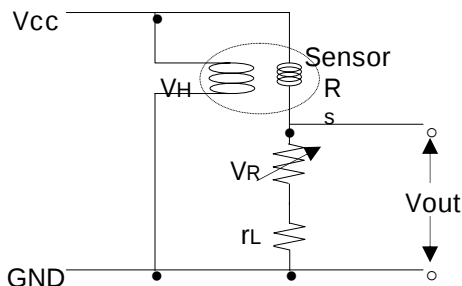
< Module (- P1XX) >

- * LPG (Liquid Petroleum Gas) : 가 → Butane(, C_4H_{10}), Propane (, C_3H_8).
- * CNG or LNG (Compressible Natural Gas, Liquid Natural Gas) : 가 → , Methane (, CH_4)

1. Sensitivity characteristic slope

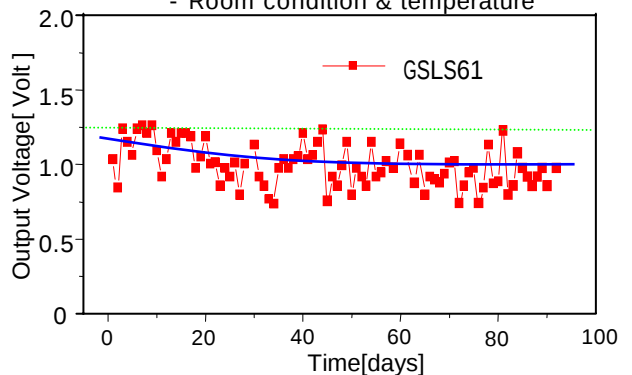


2. Basic Measuring Circuit



Vcc : Circuit Voltage(5V) VH : Heater Voltage(5V)
RL : Load Resistance Rs : Sensor Resistance
($RL=VR+rL$)

Long Term Stability
- Room condition & temperature



3. Specifications

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

a.

- Heater input voltage : 5volt $\pm$ 1%
Resistance : 16.0 Ω $\pm$ 0.2 Ω

- Power consumption : 680mV
- Sensor input Voltage : 1 ~ 12Volt

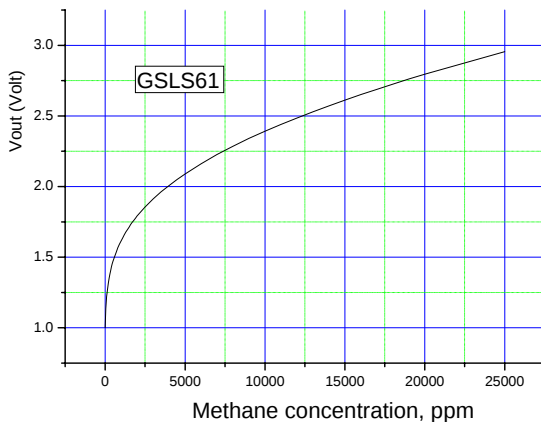
b.

가

- $\rightarrow$ RL : 100k Ω , Sensor resistance : 400k Ω , Vout,air : 1.0volt (가 5volt)

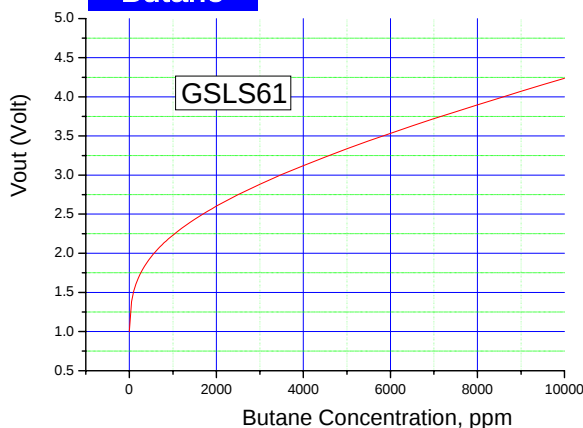
- : $\pm$ 7% (,)

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		

가

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

	Sensitivity, β (1,000ppm)	
Smoke	Less than 0.9	, Korea
Alcohol	Less than 0.8	Cooking gas
Butyl Acid	Less than 0.8	, /

3.2 Module (Methane/Butane)

a.

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

b. 가 data sheet : $\pm$ 5% (,)

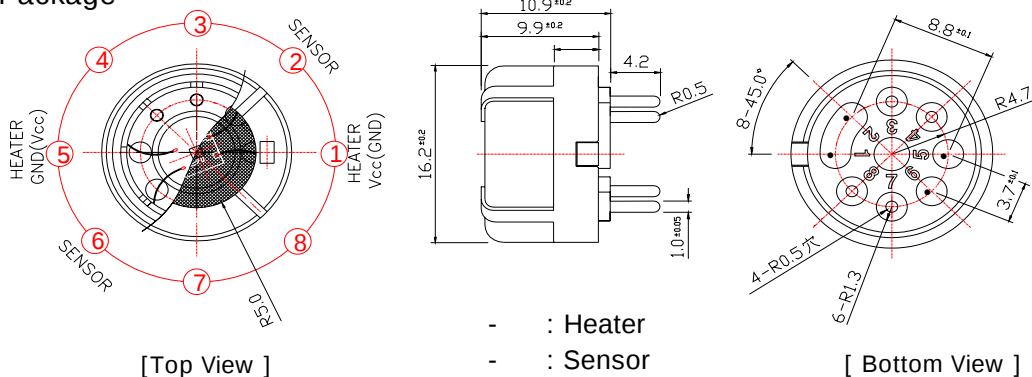
Methane GSMS61-P110

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

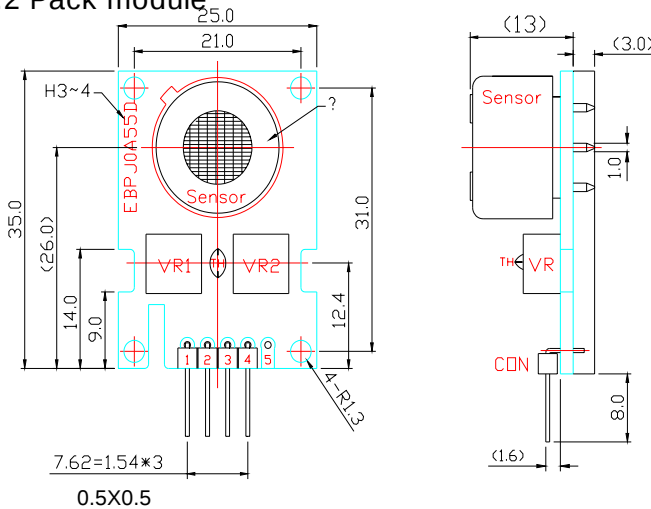
4.1 Package



Rank Table(J) - Rank

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

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]

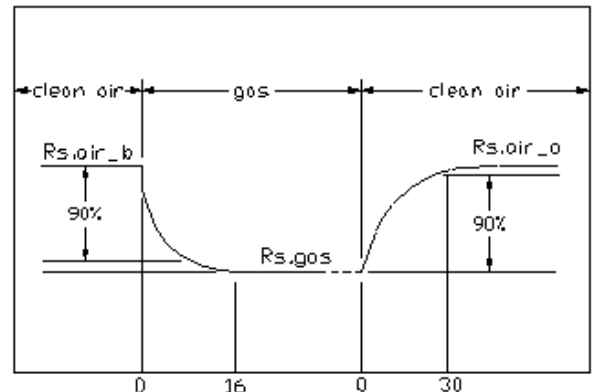
Recovering Time(T₉₀) : Less then 30sec
[between Rs,gas & Rs,air_a]

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