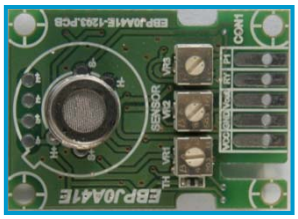
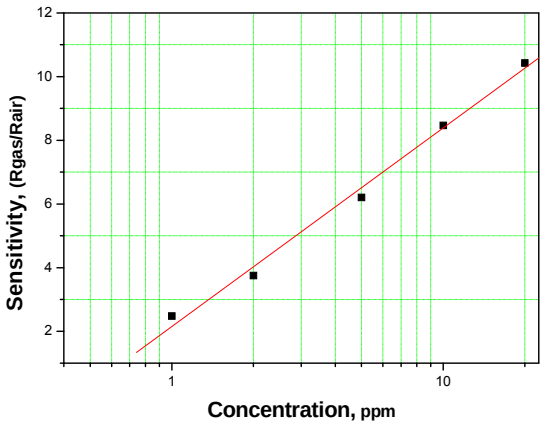
NOx Sensor – for the detection of NO_2 gas

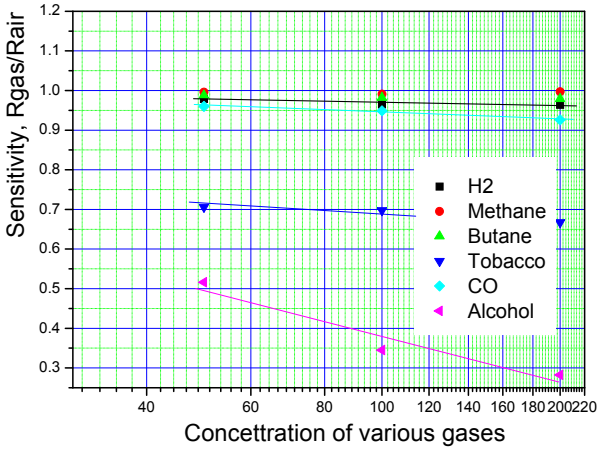
< GSNT11>



< GSNT11-P111>

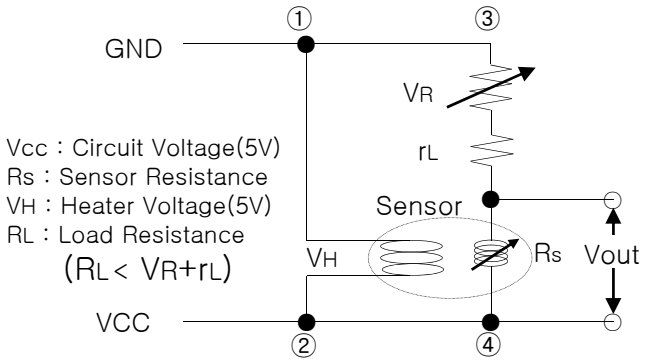
1. Sensitivity characteristic slope

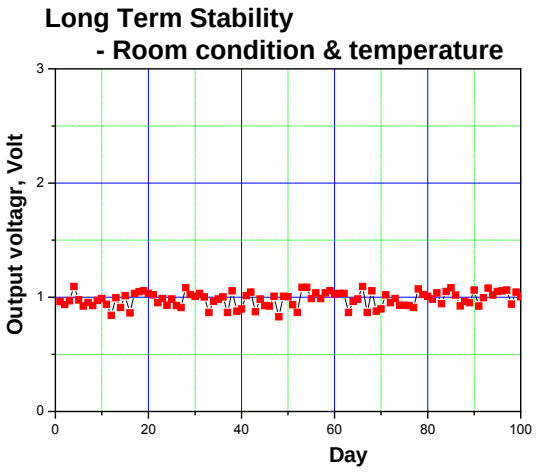




Caution 1. Smaller than gas dependency by the actual concentration(NO_2) will be able to respond because of influence of NO gas.
2. Please the sensor placed as far as possible from emission sources.
3. It seems reducing dependency as reduction gases etc. Alcohol, VOCs gas, CO,

2. Basic Measuring Circuit & Stability





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3. Specifications

3.1 Package (sensor)

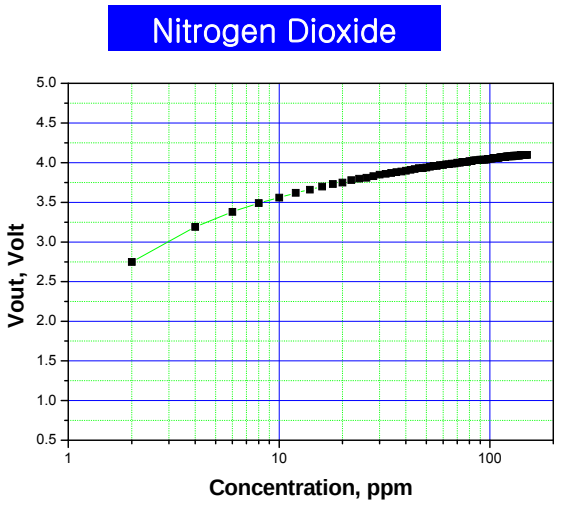
a. Characteristics

Index		Spec. & Test condition		
Circuit Voltage	Vc	Sensor input Voltage :1~12Volt, Sensor Resistance : refer to Rank table		
	VH	Heater input voltage : 5volt±1%, Heater Resistance : 33.0Ω±2.0Ω		
	PH	Power consumption : Less than 450㎽, Inrush current : Less than 200mA		
Characteristics of sensitivity (β) (Rs,gas / Rs,air)		NO_2 : 50ppm	1.80≤β≤1.83 Accuracy : ±15%	Accuracy : ±15%
Guarantee		- 3years - Calibration interval 1years recommended		
Operating environment		- Temp. : -10 ~ 50℃, Humidity : 5 ~ 90%RH, Non-condensing - Storage → Temp. : -10 ~70℃, Humidity : 0 ~90%RH		
Reaction time(T_{90})		- Reaction Time(T_{90}) : Less then 10sec - Recovering Time(T_{90}) : Less then 30sec		

*T_{90} : 90% of saturation point
*Sensitivity (β) = Rs,gas / Rs,air
- Rs,gas : output resistance after gas inlet, - Rs,air : output resistance in special air

b. Out

Ref. → RL : 16㏀, Sensor resistance : 4㏀
Vout,air : 4.0volt (센서 인가전압 5volt)



$$(ppm) = 10^{1.62 - 1.63*(Volt) + 0.41*(Volt)^2}$$

Con. (ppm)	Vout (Volt)	Con. (ppm)	Vout (Volt)	Con. (ppm)	Vout (Volt)	Con. (ppm)	Vout (Volt)
0	1.00	24	3.80	48	3.93	72	4.00
2	2.75	26	3.81	50	3.94	74	4.01
4	3.19	28	3.83	52	3.95	76	4.01
6	3.38	30	3.85	54	3.96	78	4.01
8	3.49	32	3.86	56	3.96	80	4.02
10	3.56	34	3.87	58	3.97	82	4.02
12	3.62	36	3.88	60	3.97	84	4.03
14	3.66	38	3.89	62	3.98	86	4.03
16	3.70	40	3.90	64	3.98	88	4.03
18	3.73	42	3.91	66	3.99	90	4.04
20	3.75	44	3.92	68	3.99	92	4.04
22	3.78	46	3.93	70	4.00	94	4.04

131127-NO2센서농도출력

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3.2 OP Module (GSNT11-P1xx), MOQ : none

Index		Spec. & Test condition
Circuit Voltage	Vc	Module input Voltage : 5±0.1Volt
	PH	Power consumption : 460㎽ 이하, Inrush current : Less than 140mA
Guarantee		- 2years over - Calibration interval 1years recommended
Worm up Time (T90)		- Less then 300sec
Reaction time(T90)		- Reaction Time(T90) : Less then 5sec - Recovering Time(T90) : Less then 30sec

b. Data sheet of gas concentration Error : ±10% (Compensation of temperatute)

- Max. Range :100ppm
(GSNT11-P11X)

- Max. Range : 1,000ppm
(GSNT11-P12X)

$$(ppm) = 10^{8.68 - 8.53*(Volt) + 2.08*(Volt)^2}$$

1311271-NOxOP Module Vout

Con. (ppm)	Vout (Volt)	Con. (ppm)	Vout (Volt)	Con. (ppm)	Vout (Volt)	Con. (ppm)	Vout (Volt)
0	1.05	20	2.86	110	3.00	160	3.02
1	1.87	25	2.88	120	3.01	180	3.03
2	2.33	30	2.90	130	3.01	200	3.04
3	2.49	35	2.92	140	3.02	220	3.04
4	2.58	40	2.93	150	3.02	240	3.05
5	2.63	45	2.94	160	3.02		
6	2.67	50	2.95	170	3.03		
7	2.70	60	2.96	80	2.98		
8	2.73	70	2.97	90	2.99		
9	2.75	80	2.98	100	3.00		
10	2.77	90	2.99	120	3.01		
15	2.83	100	3.00	140	3.02		

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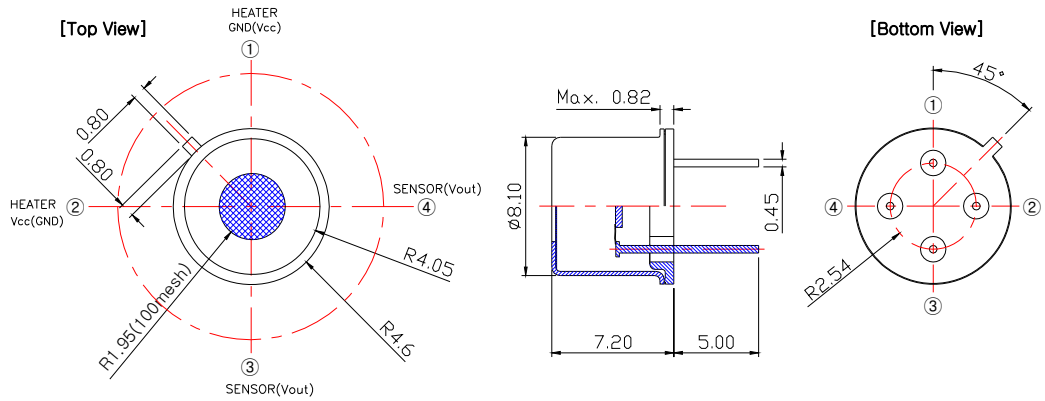
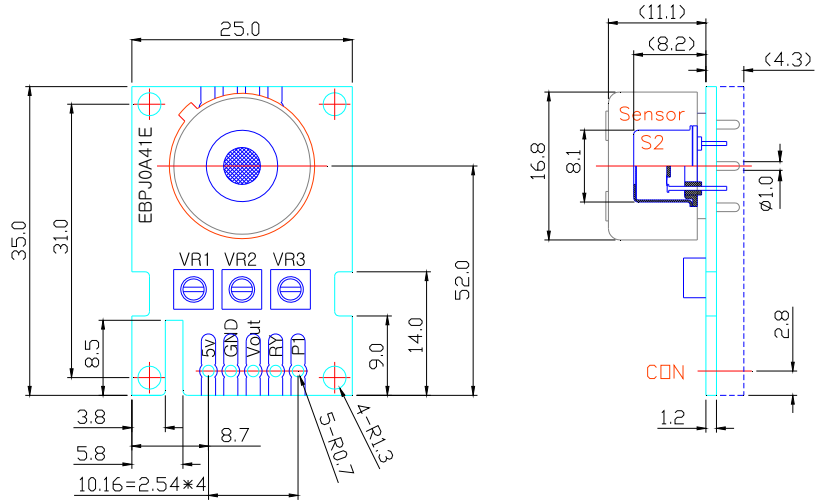
4. Structure and Dimensions

4.1 Package



4.2 Pack module



a. Data output

□ □ □ □
① ② ③ ④

① Vcc : 5.0volt
② GND
③ Data(Vout, analogue signal)
④ Relay

b. Product code

GSNT11-P■ ■ ■
1 2 3

(1) Division Circuit → 1:standard circuit
2:Precision grade
3:Micro-processor

(2) Gas sensing range → **1:100 2:200ppm**

(3) Connector → 0:None 1:Straight
2:Angle 3:Opposite angle

c. Relay Output

Max. Output range 200ppm
: Hi(3.7volt) output at 0.6ppm(NO)

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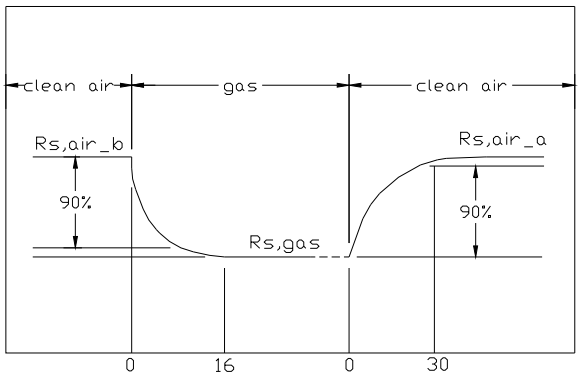
5. Reaction time(T90)



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 5 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 (β=Rgas/Rair)

	Smoke (HC)	Alcohol (C_2H_5OH)	Hydrogen (H_2)	Carbon Oxide (CO)	
Concentration	2,000ppm	50ppm	200ppm	100ppm	
Sensitivity	0.8	0.8	0.8	0.8	±0.1

* Sensitivity(β) = Rgas/Rair
* Rgas : Out resistance in gas, Rair : Out resistance in clean air

7. Rank Code

Rank	Resistance	Rank	Resistance	Rank	Resistance
40A	1.0 ~1.5kΩ	**40D**	3.5~5.0kΩ		
40B	1.5 ~2.2kΩ	**40E**			
40C	2.2 ~3.5kΩ	**40F**			

8. Application

* AQS for Vehicle
* Air Purifier
* Damper

*** This specification is subject to change for product upgrade without notice.**

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