S509   IR   GAS   SENSOR   DATASHEET
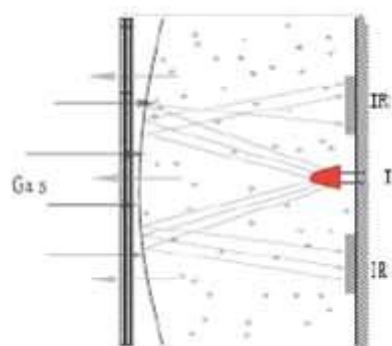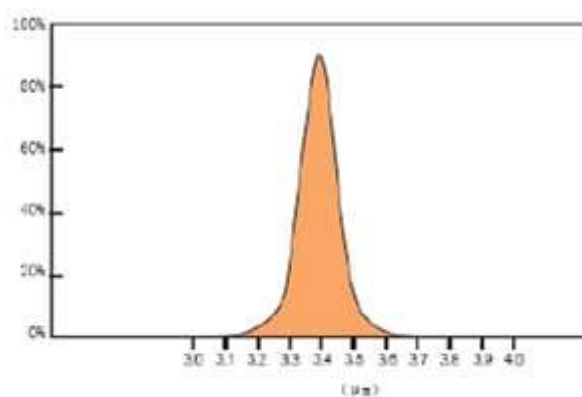
Characteristics:

◆ -40℃~+70℃ wide working temperature range high precision measurement
◆ Sensor automatic revision, zero drift an automatic adjustment
◆ Immune to poisonous and harmful material, have fight poisoning efficacy
◆ Work without oxygen to participate in
◆ Using the infrared principle scattered, and long service life
◆ Sensor work, can output the digital quantity and analog
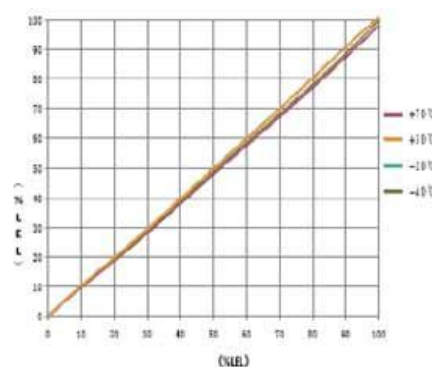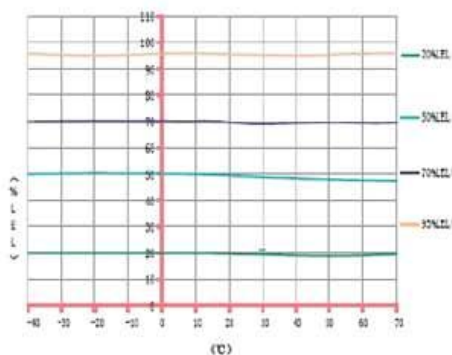◆ Has the standard output interface, peripheral use circuit is simple

Infrared gas sensor is based on bill-LangBo law and ir theory developed, we can accurately detect methane, carbon dioxide, hydrocarbons, etc.

Sensor interior has intelligent processing chip, the gas absorption of light signal conversion into gas concentration information, and digital signal and linear output voltage signal and through the software algorithm in complex linearization and precise processing temperature and humidity compensation of gas density per second, and a time interval according to certain packet format automatically send output.

S509 in different temperature changes   S509 output and actual concentration in different temperature

When offered 3.0VDC~ 6.0VDC range voltage, S509 infrared sensor can be in -40℃~+70℃ Wide temperature range normal work. The sensor to provide analog and digital output interface. The user can through the interface auto receiving gas concentration data and execution, use the function such as calibration is very simple.

parameters	Technical specification		Unit
Working voltage	Minimum Typical Maximum		
	3.0 5.0 6.0		V
Working current	Standard working current	≤60	mA
Output voltage（Vout）	Output rang 0~2.3V	0V~0.3V,means sensor fault	
		0.4V~2V,Corresponding 0%FS.~100%FS.	
		＞2, means Super range	
Detection range	CO2	0-5%	
Preheating	≤20 (Preheat the concentration of the output data is invalid)		S
resolution	1‰FS.		
response timeT90	≤30		S
Measurement accuracy	±3%FS		
Zero repeatability	≤±1%FS		
Long-term zero drift	≤±1%FS/year		
working temperature	-40℃~+70℃		
working environment humidity	0~95%RH No condensation		
Work pressure	700~1300		mBar
Storage temperature	-40℃~+70℃		
warranty	Within a year of spontaneous goods		
Service life	＞5year		
weight	25		g

description of pins：

pins	name	Function	detailed description		
1	VCC	power	Minimum value Typical value Maximum value 3.0 5.0 6.0		
2	RXD	Digital input and feet	UART,TTL level, the voltage signal is 0~2.5V. Method of use please see reference circuit		
3	TXD	Digital output feet	UART,TTL level, the voltage signal is 0~2.5V. Method of use please see reference circuit		
4	Vout	Analog output,the output voltage dc feet	Output rang 0~2.3V	0V~0.3V,means sensor fault	
				0.4V~2V,Corresponding 0%FS.~100%FS.	
				＞2, means Super range	
5	GND	GND	connect GND		

1. Analog output way：
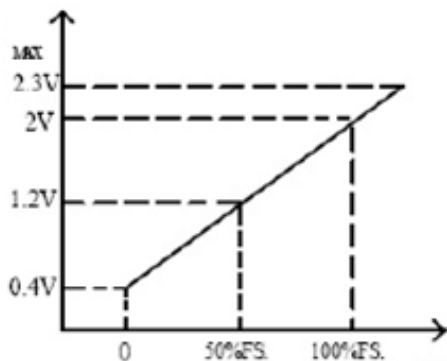   ① The Vout of the sensor output 0.4V~2VDC voltage signal, linear corresponding 0-100% FS. Range.As shown in figure1：
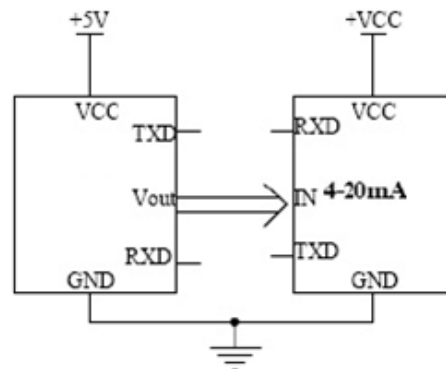

figure1

2. Digital output way：
   ① Direct link 3.3V equipment (CPU). Through a serial port directly receive gas concentration data and execution calibration function. As shown in figure 3:
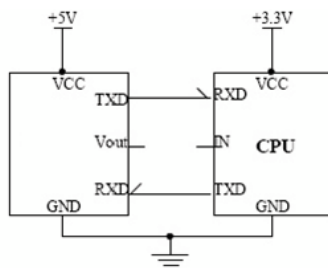

Figure3

   ② If the connection 5 V equipment (CPU), the proposal for level conversion. Through a serial port receiving gas concentration data and execution calibration function. As shown in figure 4:

③ The Vout can be connected directly 4-20 mA convert the input circuit. As shown in figure 2：

Figure2

Figure4

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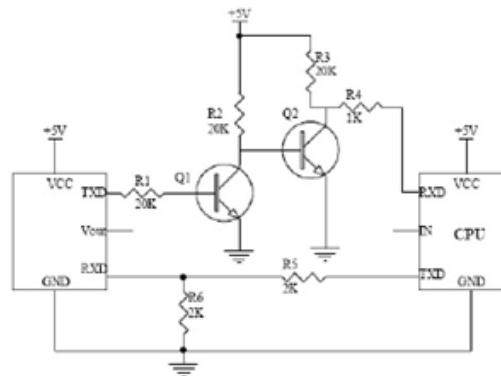Tel: + 86-755-83289036   Fax: + 86-755-83289052   E-mail: sales@isweek.com

The explaination of Communication agreement

Use communication function, the sensor to electricity should be input user identification number, identification number right this agreement may be according to realize communication function, otherwise can't use. For example the sample code for Psample, special, only enter the sample special identification number, sensor will send concentration data. Enter the sample identification special instructions for example for:

Unsigned char cmd_Sample_id=＂Psample\t2E\r\n＂;

1.Digital communication format:

Baud rate: 1200; data bit: 8; data Stop bits: 1; Parity: no

2.Packet format:

Agreement all packets format as follow:

Byte1	……	ByteN	0x09	Check	0x0d	0x0a

Explaination:

a.packet is by all the ASCII composition string

b.Calibration algorithm: data area (before beginning to TAB, not including the TAB) of all characters, assume accumulative peace for S, the calibration word for:

Checksum=(unsigned char)(-(signed char)S)

c.The calibration of the word is content: check two code, for example: check word for 0x23, is character "23", and as calibration word is 0 xab, is "AB", pay attention to the need to be sized letters ab.

3.Calibration instructions：

Users can send command through a serial port to the sensor, according to afore-mentioned regulations packet format, calibration instruction format as follow:

B	Data	0x09	Check	0x0d	0x0a

Explaination:

a.Among them, for a threshold value of 0 (zero) or other calibration of between 0 to 10000 floating point Numbers or integer

b.Instructions issued, if successful, will be in 200 ms sensor in the same respond to this packet, or no response

c.Need to make the sensor calibration before at least 30 minutes continuous work

For example:

Calibration zero instructions

unsigned char cmd_zero=＂B0\t8E\r\n＂;

Calibration 50%FS. Instructions:

unsigned char cmd_span=＂B0\t59\r\n＂;

4. Receiving concentration

Sensors will after electrify per second of a specified interval packets sent concentration data format. The user can through the check calibration word validation data is correct.

Concentration data	0x09	Check	0x0d	0x0a

Explaination:

a.The concentration of data for ASCII, the unit is the FS

For example: test 0-100%LEL of the methane receives the data for 0x31 0x35, it means the concentration of 15%LEL。