

Low Power Consumption Infrared Gas Sensor

(Model: TX4041A)

User's Manual

Version : 1.1

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TX4041A Low Power Consumption Infrared Gas Sensor

Description

TX-4041A low-power infrared gas sensor is a general-purpose intelligent infrared gas sensor (hereinafter referred to as the sensor), using non-dispersive infrared (NDIR) principle to detect hydrocarbon combustible gases in the air. It has good selectivity, ultra-low power consumption, no oxygen dependence, stable performance, long life, and built-in temperature compensation. The sensor is a compact and high performance sensor which combines the mature infrared absorption gas detection technology with micro-machining and excellent circuit design. It is easy to use, can directly replace catalytic combustion elements, so it is widely used in various occasions where combustible and explosive gases exist.



Feather

- * High sensitivity, high resolution, fast response time, ultra-low power consumption
- * Provides a variety of output modes, such as UART and analog voltage
- * Temperature compensation, excellent linear output, excellent stability, long service life
- * Anti-water vapor interference, no poisoning, can directly replace the catalytic combustion principle sensor

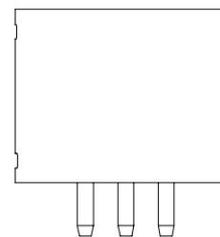
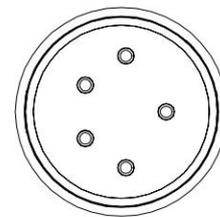
Main Application

- * HVAC Refrigeration and Indoor Air Quality monitoring
- * Industrial Process and safety protection monitoring
- * Agricultural and animal husbandry production process monitoring

Technical Parameter

sheet 1

Model No.	TX-4041A
Detection Gas	Hydrocarbon flammable gases
Working voltage	3.3V~5.5V DC(powerd by the safety grid)
Average Current	<0.8mA
Deteciton Range	0~10% Vol optional(refer to sheet 2)
Interface level	3V
Output signal	UART(3.0V or 5.0V)
Preheat Time	<10s
Reponse Time	T90<15s
Working Temperature	-20℃ ~60℃
Working Humidity	0~95%RH(non-condensing)
Dimension	Φ20mm×21.7mm
Weight	8g
Life time	>5 years
Protection Level	IP54
Power end, communication end Intrinsicsafety parameter	Ui=7.5VDC, li=200mA, Pi=375mW, Ci=4.5μF, Li=0mH

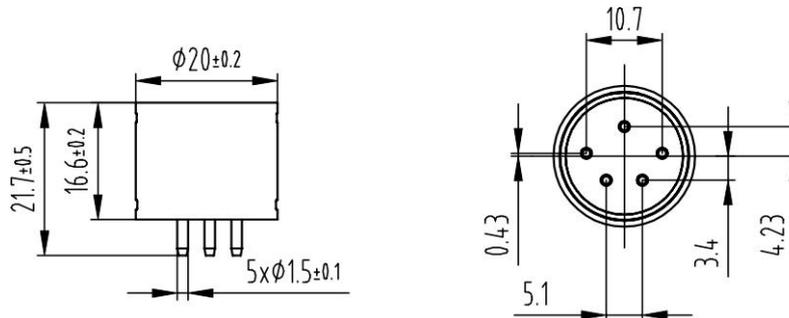


Picture1: sensor external view

Common range and accuracy (other range and detection gas can be customized)

Sheet2						
Gas	Molecular formula	Range	Resolution	Decimal place	Accuracy	Note
Methane	CH ₄	0~5.00% Vol	0.01% Vol	2 decimal	±3%FS(10℃-40℃) ±5%FS(-20℃-10℃, 40℃-60℃)	
		0~10.00% Vol		2 decimal		
Propane	C ₃ H ₈	0~100% LEL	1% LEL	None		
Isobutane	C ₄ H ₁₀	0~100% LEL	1% LEL	None		

Product size drawing (size tolerance ±0.2 mm)

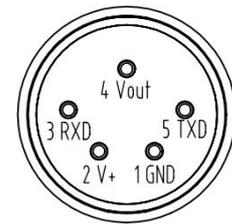


Picture 2: Sensor structure diagram

Pin definition

Sheet 3

Sheet NO.	Definition
Pin 1	GND
Pin 2	V+ input voltage
Pin 3	UART(RXD) 0V~3V data input
Pin 4	NC
Pin 5	UART(TXD) 0V~3V data output



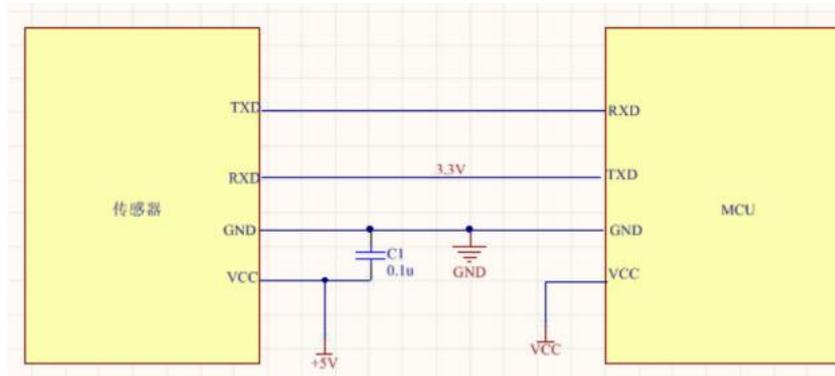
Picture 3. Pin Definition

Output Mode

UART output

Hardware connection

External devices can communicate with the sensor via the UART. The 3.3V-5V device (MCU) can be directly connected to the serial port pins RX and TX, The interface circuit is shown in the following figure, read the gas concentration and calibration.



Safety and explosion proof

The product complies with GB/T 3836.1 "Explosive environment Part 1: General requirements for equipment" and GB/T 3836.4 "Explosive Environment Part 4: Equipment protected by intrinsically safe" standards; The explosion-proof mark is Exib II B T4 Ga, which is suitable for zone 0, zone 1 and Zone 2, containing class IIA, class IIB, class IIC, class T1 ~ T4 flammable gas, vapor and air mixing explosive environment; It has passed the inspection by the National Explosion-proof Electrical Product Quality Inspection Center and obtained the explosion-proof certificate. When in use, please pay attention to the following items:

1. The intrinsic safety power supply must be used to power the sensor, otherwise the explosion-proof performance will be affected.
2. Do not replace the sensor in a dangerous place.
3. Do not disassemble or replace sensor components to avoid affecting explosion-proof performance.
4. It is not allowed to replace components or structures, so as not to affect explosion-proof performance.
5. The installation and wiring of the safety gate shall be carried out in accordance with the safety gate instruction manual, and the safety gate shall obtain the explosion-proof certificate.

Cautions for Maintenance

1. The sensor should be calibrated regularly, the recommended calibration period is 6 months.
2. Do not use the sensor in a high dust density environment for a long time.
3. The sensor should be kept away from heat sources and avoid direct sunlight or other thermal radiation.
4. Please use sensors in the sensor power supply scope.
5. Do not cut or weld the sensor pins