CKM0001 COKOINO Ultrasonic Module

1、Overview

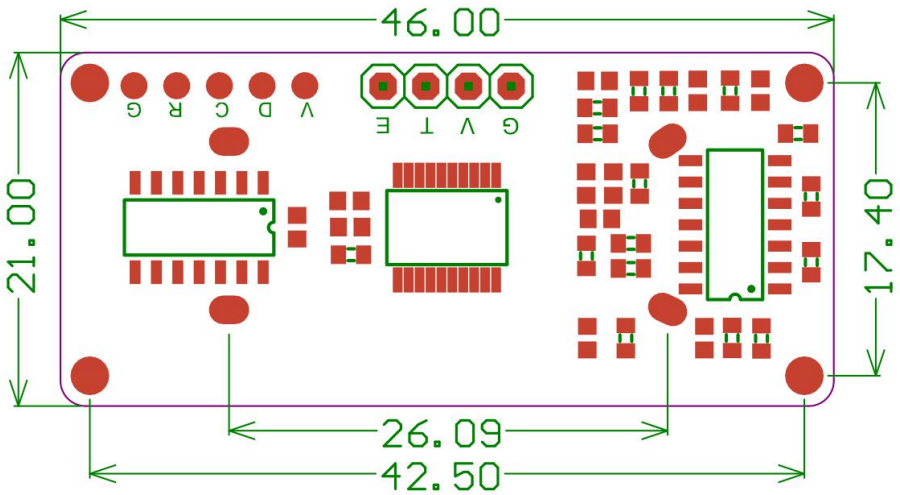
The COKOINO ultrasonic module is compatible with the Arduino platform. It is mainly used for measuring distance and obstacle avoidance. It has the characteristics of high precision, super near blind zone (2cm) and stable performance. The module comes with 4 positioning holes for easy attachment to other devices.

It can combine an arduino motherboard with other sensor and actuator modules to DIY into a variety of interesting products such as ultrasonic trolleys and ultrasonic robots.

2、Specification

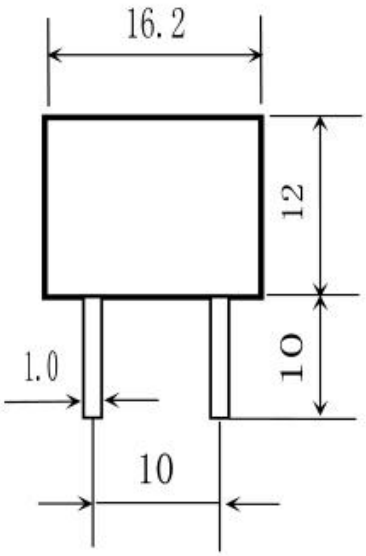
(1) Typical working voltage: 5V
(2) Ultra-small static working current: less than 5mA
(3) Induction angle: no more than 15 degrees
(4) Detection distance: 2cm-350cm
(5) High precision: up to 0.2cm
(6) Ultrasonic center frequency: 40KHz
(7) Blind area (2cm) is very close
(8)XH2.54-4P

3、Size（mm）



模块

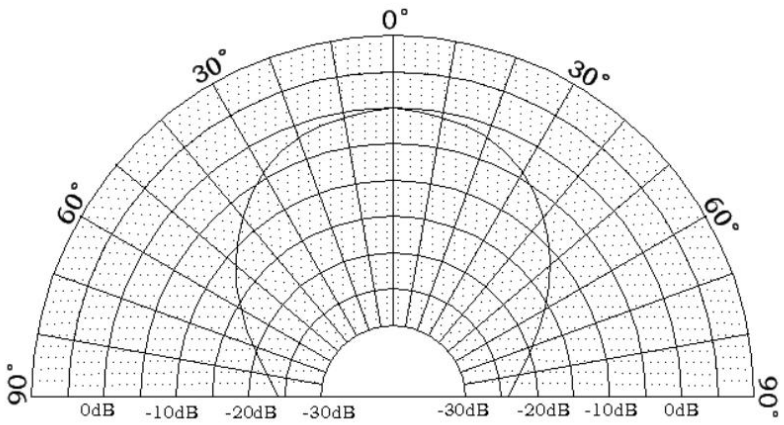
4、Parameters of TCT40-16T/R1Piezoelectric ceramic ultrasonic probe



size（mm）

Performance	Emission	Receive
Nominal frequency(KHz)	40	40
Sound pressure(0dB=0.02mPa)	117min	-
Receiving sensitivity at40KHZ(0dB=V/Pa)	-	-65min
Electrostatic capacity at1Khz,<1V(PF)	2000+-30%	2000+-30%
-dB Pointing angle	80	80
Weight（g）		

Performance



Probe pointing diagram

(1) Temperature characteristics
In the temperature range of -30 ° C to +85 ° C, the emitted sound pressure and sensitivity (at the center frequency) are not more than 6 dB compared with the initial value.
(2) Moisture test
It was placed in an environment of temperature: 60 ± 2 ° C and humidity: RH 90 to 95% for 36 hours. After the test, it was taken out under normal atmospheric conditions for 2 hours, and its sound pressure and sensitivity (at the center frequency) were changed by no more than 6 dB compared with the initial value.
(3) Vibration test
The amplitude is 0.75mm, the frequency is 10~70Hz, the sweep period is 5 minutes, and each of the three directions is tested for 10 cycles.
After the test, the change of the sound pressure and sensitivity (at the center frequency) are not more than 3 dB compared with the initial value.
(4) High temperature test
After being placed at a high temperature of +85 ° C for 36 hours, the ultrasonic module was taken out under normal atmospheric conditions for 2 hours, and the sound pressure and sensitivity (at the center frequency) were changed by no more than 3 dB compared with the initial value.
Low temperature test
(5)After being placed at a low temperature of -40 ° C for 36 hours, the ultrasonic module was taken out and recovered under normal atmospheric conditions for 2 hours, and the sound pressure and sensitivity (at the center frequency) were changed by no more than 3 dB from the initial value.
(6) Temperature cycle
The ultrasonic module was placed in an environment of +85 ± 3 ° C for 1 hour; then it was taken out and placed in an environment of -40 ± 3 ° C for 1 hour; the number of cycles was changed: 10 times. After the test, the ultrasonic wave was taken out under normal atmospheric conditions for 2 hours, and the change of sound pressure and sensitivity (at the center frequency) compared with the initial value was not more than 6 dB.
(7) Drop test
Ultrasonic placed at a height of 1 m above the ground, free to fall to the concrete floor, the number of drop times: 10 times. After the test, the change of sound pressure and sensitivity (at the center frequency) are not more than 6 dB compared with the initial value.

5、Pins

VCC: Connect to DC5V
Trig: Trigger end
Echo: Receiving end
GND: Ground

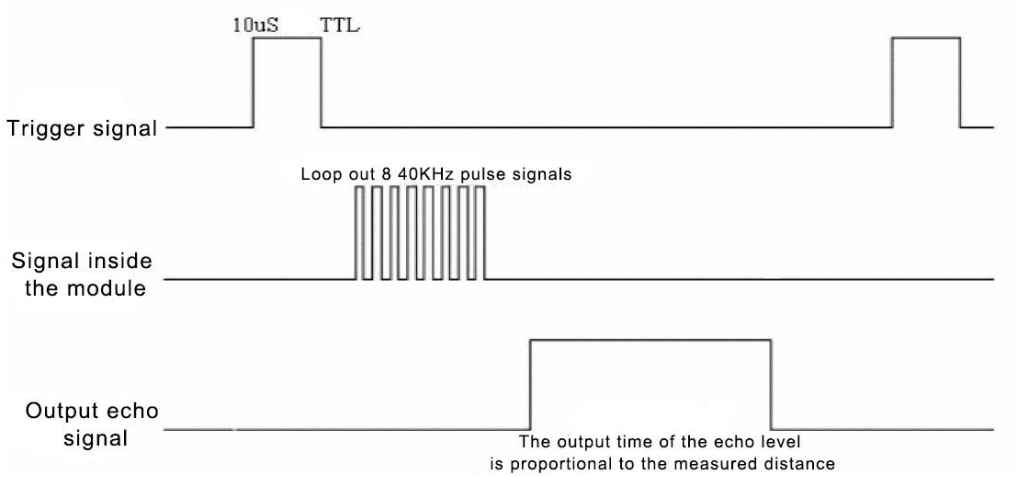
The method of using this product: the trigger terminal sends a high level above 10US, and the receiving end will wait for the high level output. When the output is detected, the timer will be started.
When the level of the receiving port changes to a low level, the ultrasonic wave can read the

value of the timer. This value is the time used for the calculating the distance. Such a continuous cycle test can calculate the value of the movement.

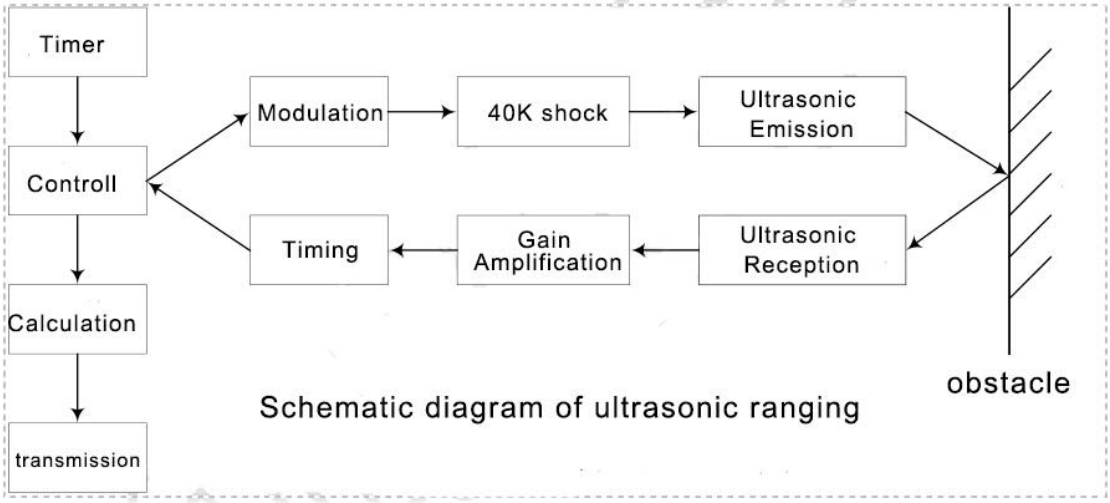
6、Working Principle

The trigger sends a high level signal of at least 10us, and the module cyclically transmits eight 40khz square waves to automatically detect whether there is a signal return; if a signal is detected, a high level is output through Echo. The duration time of the high level is the time from the transmission to the return of the ultrasonic wave. Test distance = (time of high level duration * sound speed (340M/S))/2.

Timing diagram：



System work frame：



7、Precautions

1) This module should not be wired when there is power. If the power supply is connected to UNO, let the Gnd terminal of the module first connect to UNO. Otherwise it will affect the operation of the ultrasonic module.

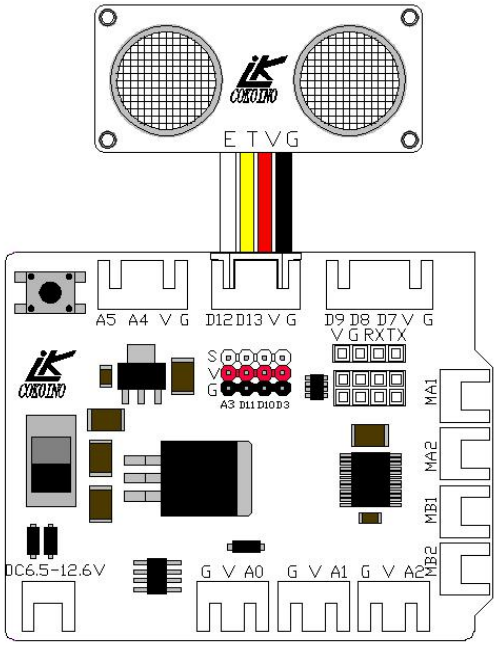
(2) When measuring distance, the area of the object to be measured is not less than 0.5 square

meters and should be as flat as possible. Otherwise it will affect the test results.

(3) It is recommended that the test period be above 60MS to prevent the transmitted signal from affecting the recall signal

8、Wiring

UNO R3 controller	Ultrasonic sensor
GND	G
5V	V
4	T
3	E



9、arduino code

```
#define Echo 3      //The macro defines the pin 3 of the motherboard as Echo, which is used to receive the pulse width foo
#define Trig 4      //Macro defines the pin 4 of the motherboard as the Trig, the signal trigger pin
unsigned long rxTime;    //Define an unsigned long integer variable
float distance;          //Define a floating point variable
void setup()             //Set the parameter function, only run once after the program starts.
  {
  Serial.begin(9600);    //Set the baud rate of the serial port to 9600.
  pinMode(Trig, OUTPUT); //Set the Trig pin to output
  pinMode(Echo, INPUT);  //Set the Echo pin to input
  }
void loop()          //The main loop function, the program will continue to run in this function after executing this function
```

```
  {
  digitalWrite(Trig, LOW);    //Echo pin is output high
  delayMicroseconds(2);       //Delay 2 microseconds
  digitalWrite(Trig, HIGH);   //Trig pin is output high
  delayMicroseconds(10);      //Delay 10 microseconds
  digitalWrite(Trig, LOW);    //Echo pin is output high

  rxTime = pulseIn(Echo, HIGH); //The time to read the Echo pin high, in
milliseconds
  distance = (float)rxTime * 34 / 2000.0;  //Calculate the measured distance
using the formula
  Serial.print(distance);         //Serial output test distance
  Serial.print("cm");             //Serial output cm typeface
  delay(80);                      //Delay 80 milliseconds
  }
```

10、Test result

Wiring according to the above picture, upload the code to the uno, after power-on, open the serial port monitor of the IDE, you can see the distance between the ultrasonic module and the obstacle in front, the unit is cm, as shown below: