Description:
Module main technical parameters:
1.Working Voltage : 5V(DC)
2.Static current: Less than 2mA.
3.Output signal: Electric frequency signal, high level 5V, low level 0V.
4.Sensor angle: Not more than 15 degrees.
5.Detection distance: 2cm-450cm.
6.High precision: Up to 0.3cm
7.Input trigger signal: 10us TTL impulse
8.Echo signal : output TTL PWL signal
Mode of connection:
1.VCC
2.trig(T)
3.echo(R)
4.GND

Use method:

- Product feature

HC-SR04 ultrasonic module can offer non-contact distance sensing function, the range of which is 2cm—400cm., and the range accuracy is up to 2mm; the module includes ultrasonic transmitter, receiver and control circuit.
The basic operation principle is below:

- use IO port TRIG to trigger ranging. It needs 10 us high level signal at least
- Module can send 8 pro 40 kz square wave automatically, and will test if there is any signal returned.
- If there is signal returned, output one high level signal via IO port ECHO. The duration of the high level signal is the time from transmitter to receiving with the ultrasonic.

Testing distance =duration of high level*sound velocity(340m/s) / 2

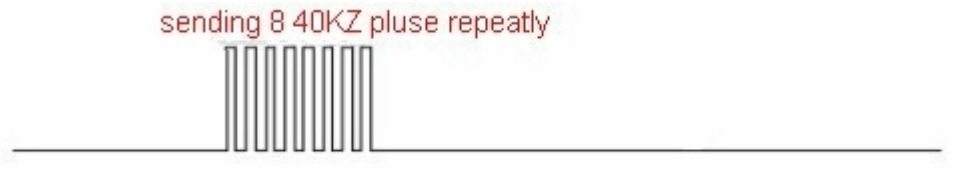
- Physical map

Refer to the wiring diagram below,
VCC supply 5V, and GND is ground wire. TRIG is trigger control signal input, ECHO is echo signal output.
electric parameter

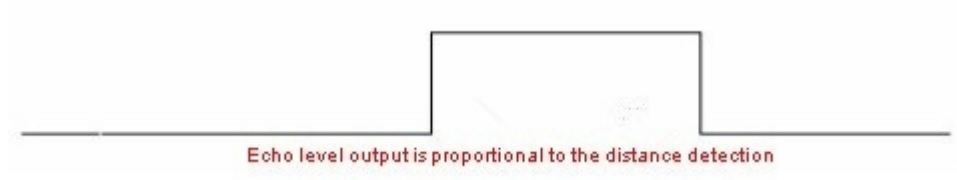
Electric parameter	HC-SR04 ultrasonic module
Operating voltage	DC 5V
Operating current	15 mA
Operating frequency	40 Hz
Utmost range	4 m
Nearest range	2cm
Measure angel	15 °
Input trigger signal	10uS TTL pluse
Output echo signal	Output TTL level signal, proportional to the range
specification	45*20*15 mm

4. Ultrasonic sequence diagram
trigger signal

Sending signal inside the module



Output echo signal



Picture 2: Ultrasonic sequence diagram

The sequence diagram above indicates that you just need to supply one 10 uS pulse or above to trigger the signal, inside the module, it will send 8 pro 40kHz round electric level with testing the returning wave. Once tested that there is returning wave signal, then it will output echo signal. The pulse width of the echo signal is in direct proportion to the testing distance. Therefore, the distance can be caculated according the duration from the sending signal to receiving signal.

Here is the formula below:

uS/ 58=cm or uS/148=inch; distance=high level time*sound velocity(340m/s) / 2

Suggestion: the measurement period is 60ms or above, which can protecting echo signal from sending signal.

Note:

(1). for this module, keep in mind not to connect with electricity. If it is connected with electricity, you need to connect up the GND port of the module firstly, otherwise it will affect the normal working of the module.

(2). When testing, the coverage of the tested object is 0.5 square meter or below, and try to make the plate smoothly., otherwise, it will affect the result of the testing.

5. Specification of the object.