

Ultrasonic ranging module HC - SR04 provides 2cm - 400cm non-contact measurement function, the ranging accuracy can reach to 3mm. The module includes ultrasonic transmitters, receiver and control circuit. The basic principle of work: (1) Using IO trigger for at least 10us high level signal, (2) The Module automatically sends eight 40 kHz and detect whether there is a pulse signal back. (3) IF the signal back, through high level, time of high output IO duration is the time from sending ultrasonic to returning. Test distance = (high level time × velocity of sound (340M/S) / 2, λ Wire connecting direct as following: ① 5V Supply ② Trigger Pulse Input ③ Echo Pulse Output ④ 0V Ground Electric Parameter Working Voltage DC 5 V Working Current 15mA Working Frequency 40Hz Max Range 4m Min Range 2cm Measuring Angle 15 degree Trigger Input Signal 10uS TTL pulse Echo Output Signal Input TTL level signal and the range in proportion Dimension 45\*20\*15mm Timing diagram The Timing diagram is shown below. You only need to supply a short 10uS pulse to the trigger input to start the ranging, and then the module will send out an 8 cycle burst of ultrasound at 40 kHz and raise its echo. The Echo is a distance object that is pulse width and the range in proportion. You can calculate the range through the time interval between sending trigger signal and receiving echo signal. Formula:  $\mu\text{S} / 58 = \text{centimeters}$  or  $\mu\text{S} / 148 = \text{inch}$ ; or: the range = high level time \* velocity (340M/S) / 2; we suggest to use over 60ms measurement cycle, in order to prevent trigger signal to the echo signal.

Attention: ① The module is not suggested to connect directly to electric, if connected electric, the GND terminal should be connected the module first, otherwise, it will affect the normal work of the module. ② When tested objects, the range of area is not less than 0.5 square meters and the plane requests as smooth as possible, otherwise, it will affect the results of measuring.