Lesson 1 Timer

1. Project Purpose

Learn the principle of microcontroller timer to write the function to realize the timing function of 100 us.

2. Project Principle

Timer is a hardware device used to calculate time on microcontroller. It can be used to allow the microcontroller to execute the specified operation at the specified interval or calculate the exact interval between events.

Timer on microcontroller generally consists of a time-base generator and a counter. Time base is the basic unit of time.

The time base generator generates a signal with the time base as the period, and the counter counts the number of signals generated by the time-base generator. For example, if the time base is 1 second, the time base generator generates a signal per second, and the counter value is added by 1 per second. When the counter value is equal to the value we set, the microcontroller performs the operation we set.

3. Program analyst

The timer used in Arduino generally uses the packaged library functions, but here register is used to set the timer according to the data manual. TCCR2A is all set to 0 , which is normal port operation. When TCCR2B is set to CS22: CS21: CS20 = 1: 1: 0, it means 256 frequency division. TIMSK2 is set to output compare A match to interrupt enable. TCNT2 sets the initialization time, and finally Sei( ) open the total interrupt.

```
19  }
20  void InitTimer2(void)       //100us@12.000MHz
21  {
22      TCCR2A=0;
23      TCCR2B=_BV(CS21)|_BV(CS20);
24      TIMSK2=_BV(TOIE2);
25      TCNT2=206;//the interrupt time=(256-206)/500000=100us
26      sei();
```