

嵌入式体系结构基于ZYNQ

第二讲



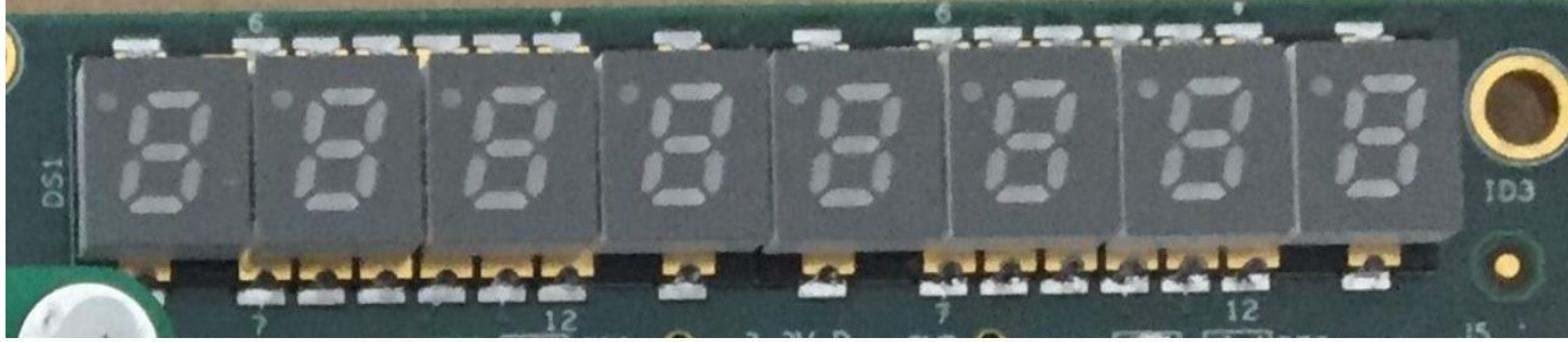
ZYNQ-SoC

FPGA+ARM

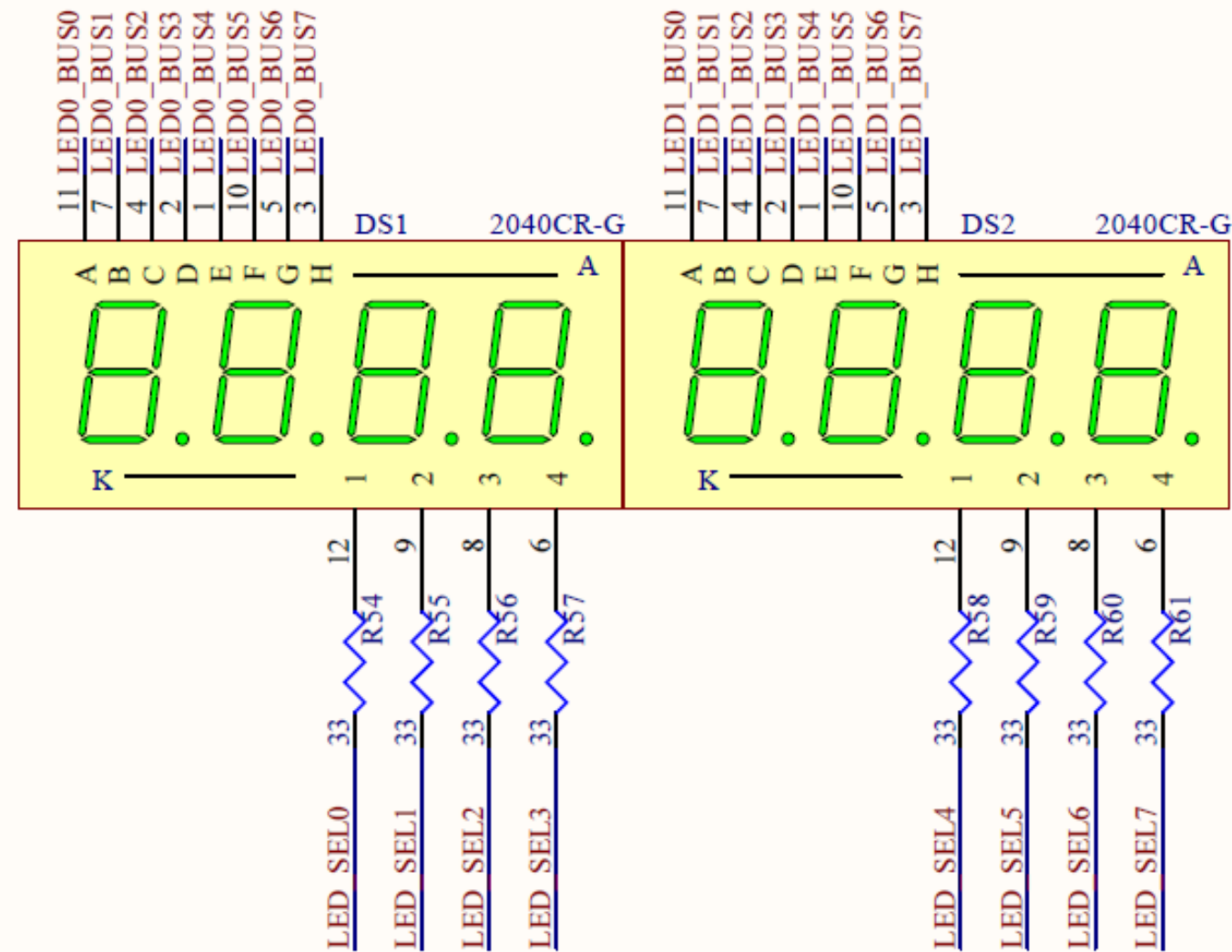
- 原理图
- 硬件决定软件
- 软件生成的时序

ZYNQ-SoC

原理图



7 Segment LED



ZYNQ-SoC

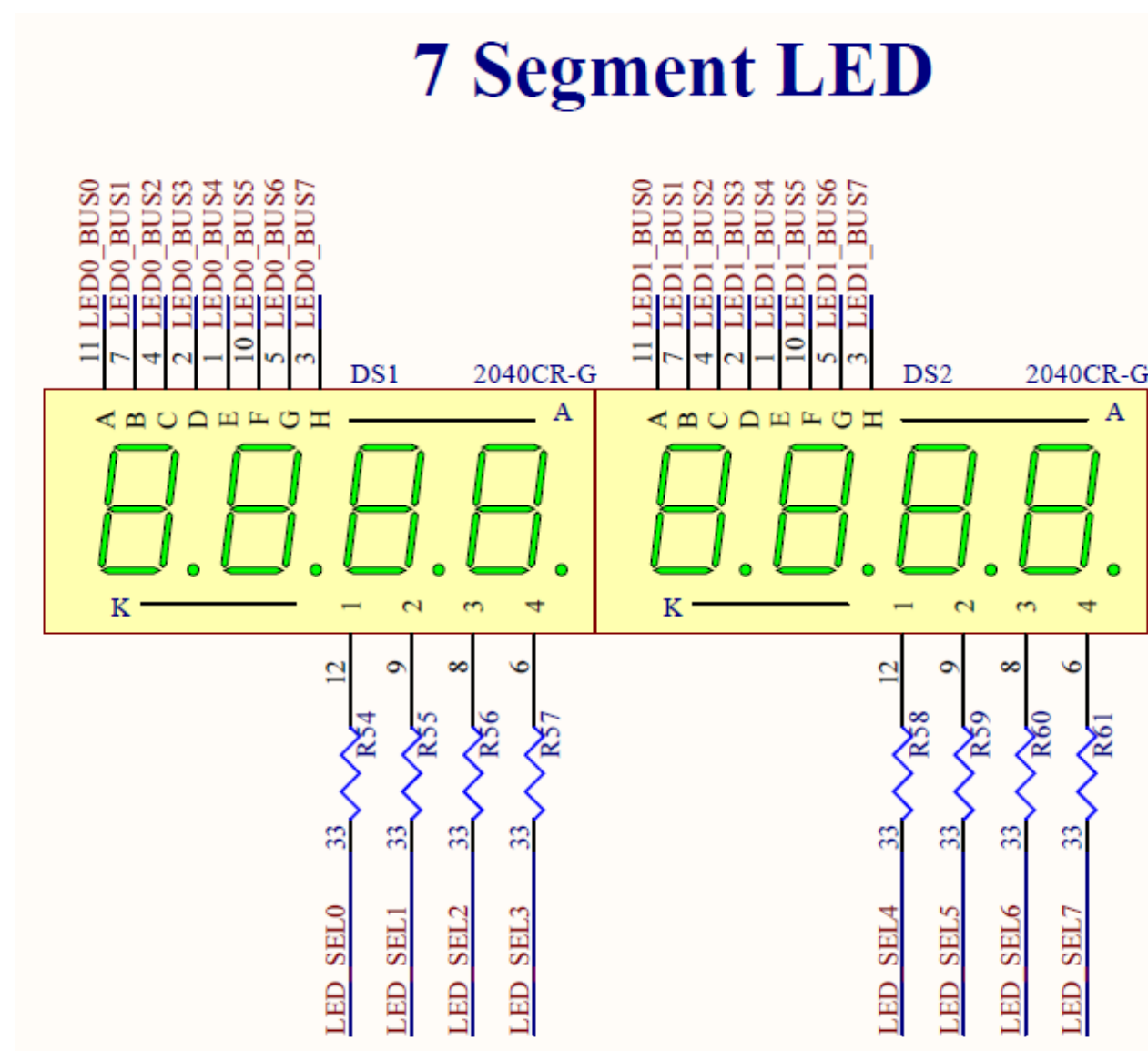
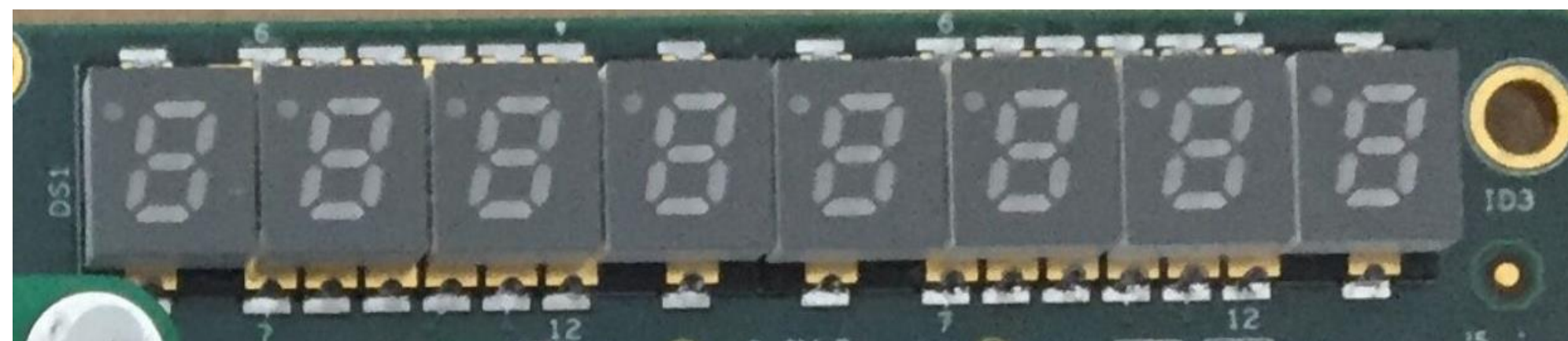
原理图

- 有用信息

- 位号

- 网络标号

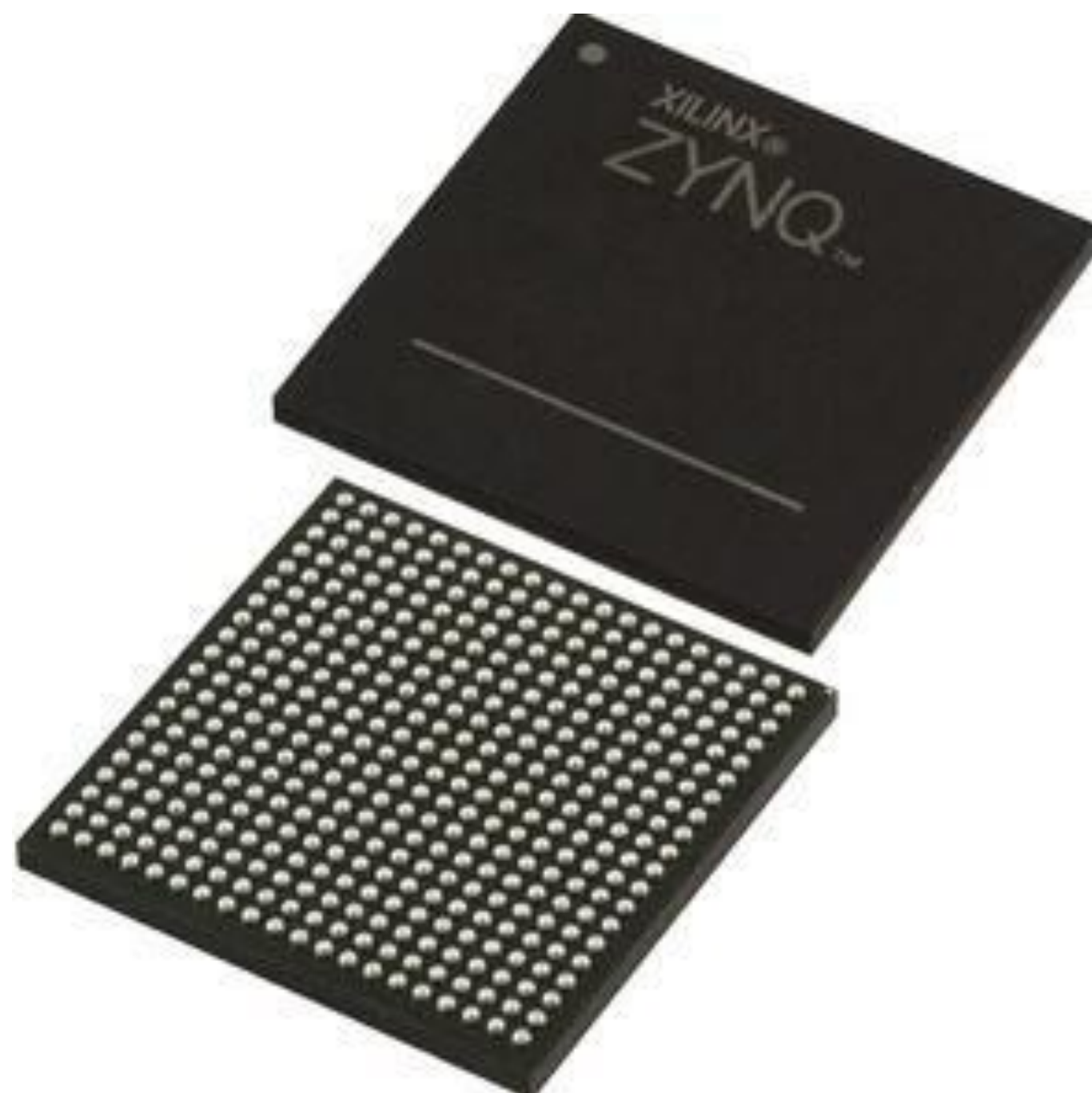
- 封装



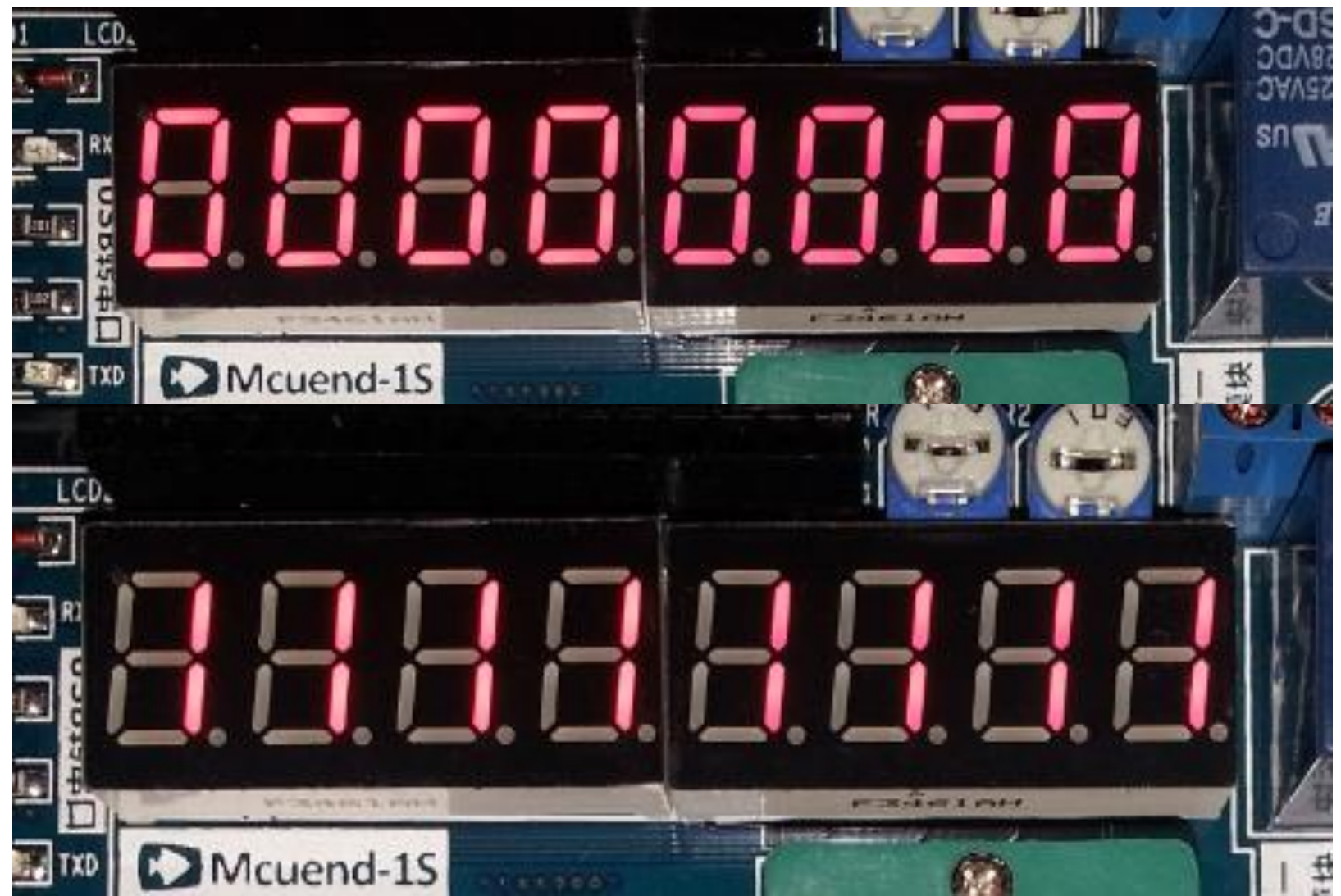
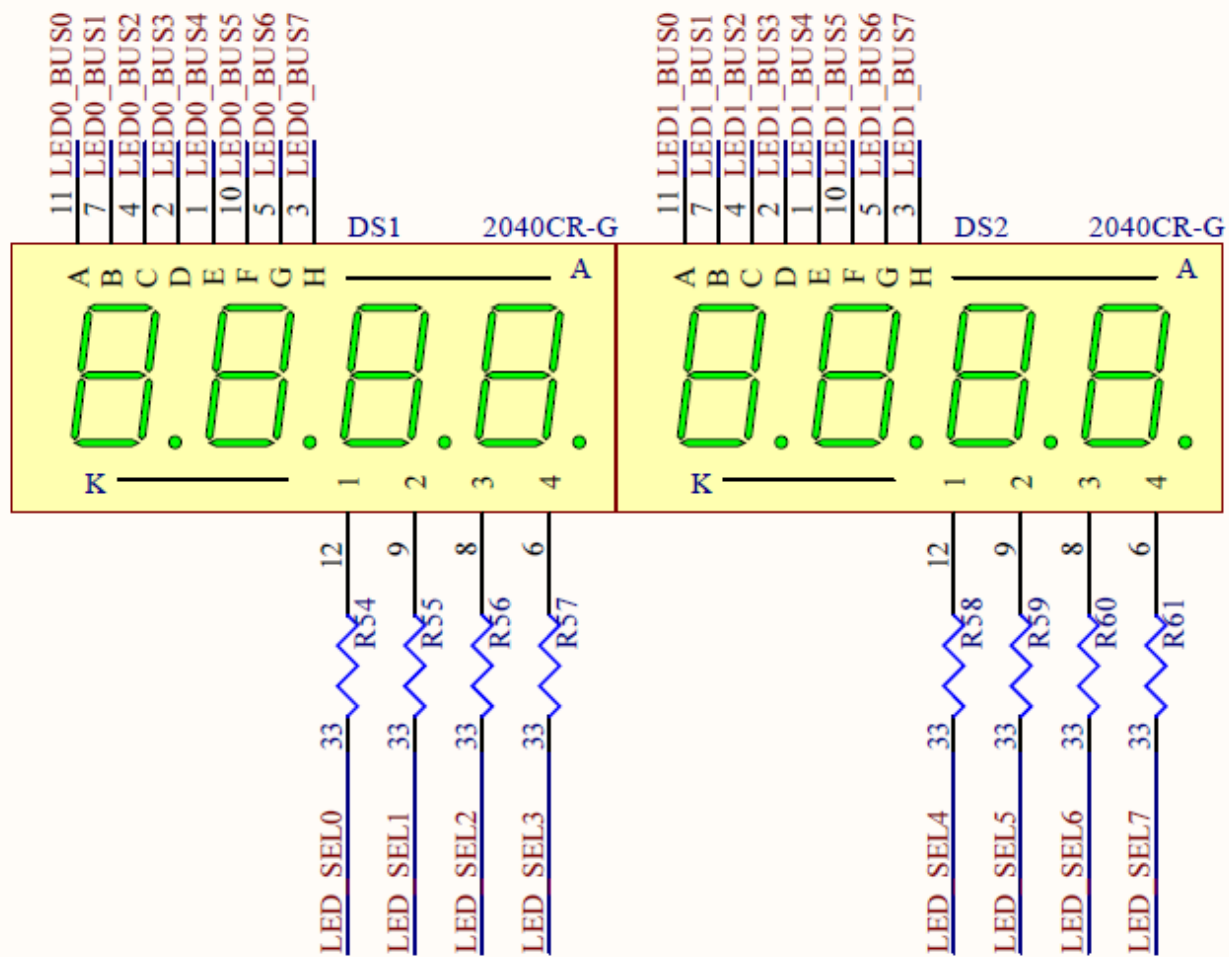
LED0_BUS4	A48	V14
LED_SEL3	A50	U11
LED0_BUS0	A52	V10
LED0_BUS3	A54	U12
LED0_BUS5	A56	W11
LED0_BUS7	A58	AA8
LED_SEL2	A60	W10
LED0_BUS2	A62	AA7
LED_SEL1	A64	V7
LED0_BUS6	A66	V9
LED0_BUS1	A68	Y10
LED_SEL0	A70	Y9
LED_SEL7	A72	W8
LED1_BUS4	A74	W7
LED1_BUS0	A76	Y6
LED1_BUS3	A78	W6
LED1_BUS5	A80	W5
LED1_BUS7	A82	V5
LED_SEL6	A84	AB6
LED1_BUS2	A86	AA6
LED_SEL5	A88	AB5
LED1_BUS6	A90	Y5
LED1_BUS1	A92	AB4
LED_SEL4	A94	AA4
PLIO_98	A96	Y4
PLIO_99	A98	AB2
PLIO_100	A100	AB1

ZYNQ-SoC

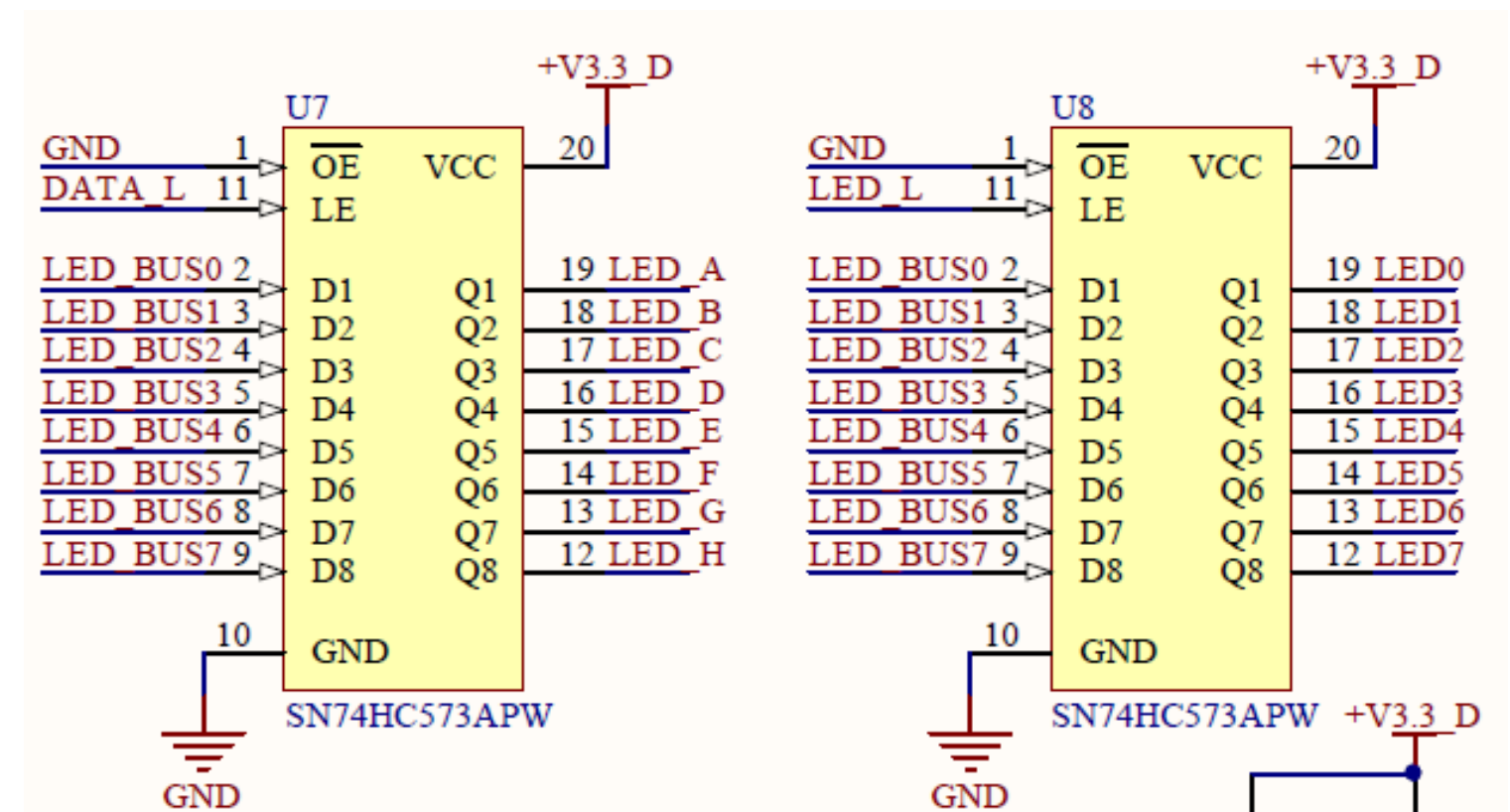
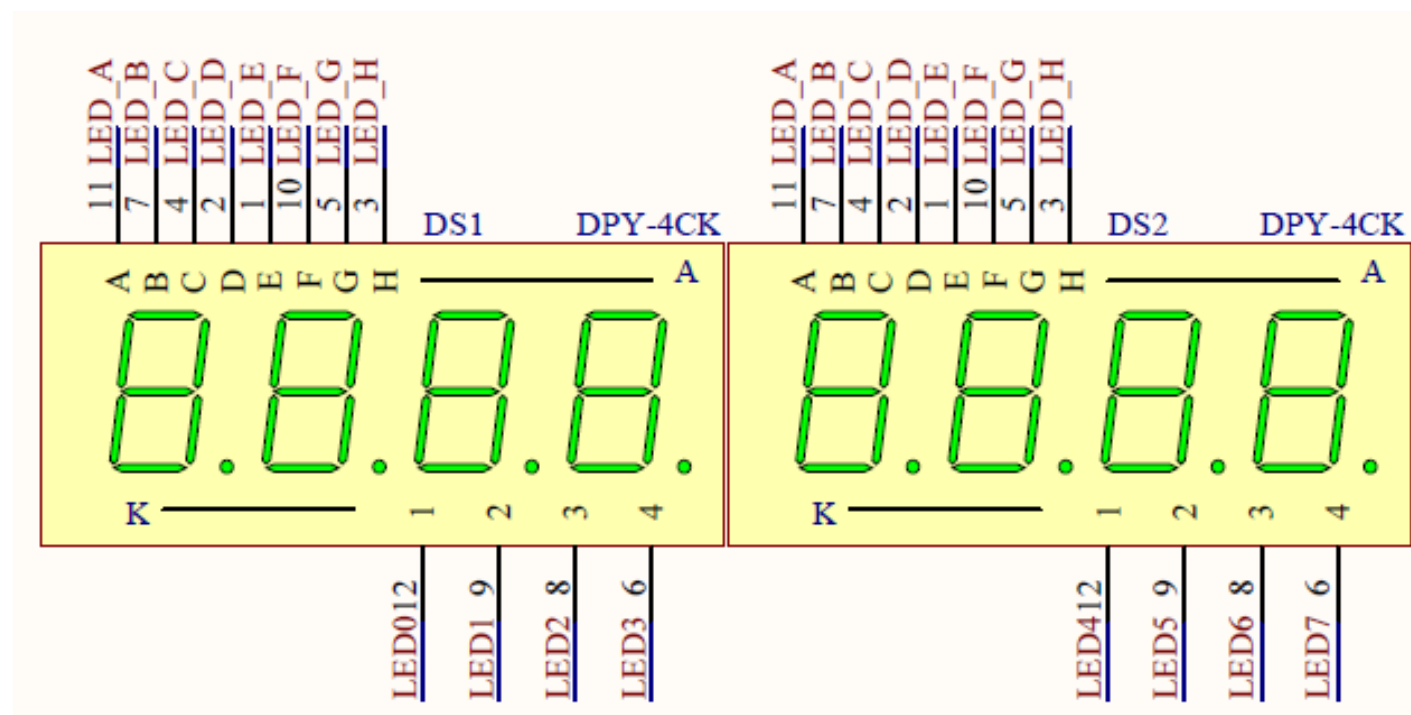
原理图

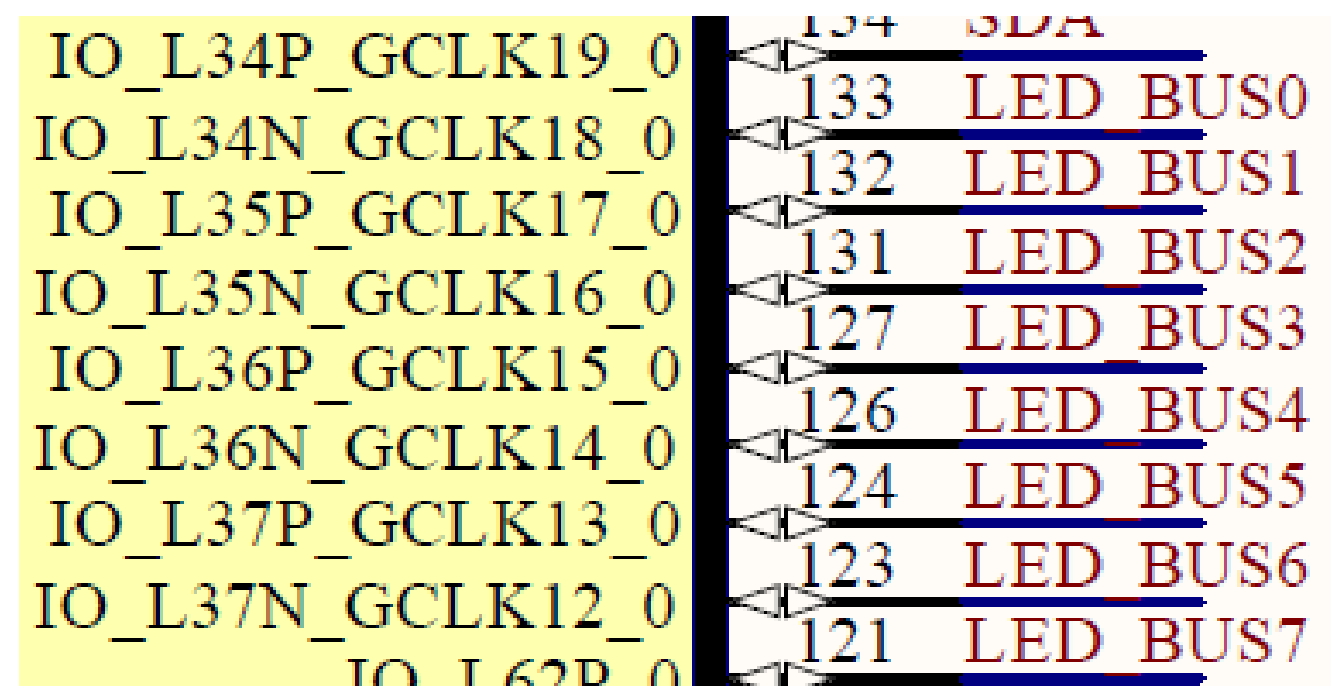
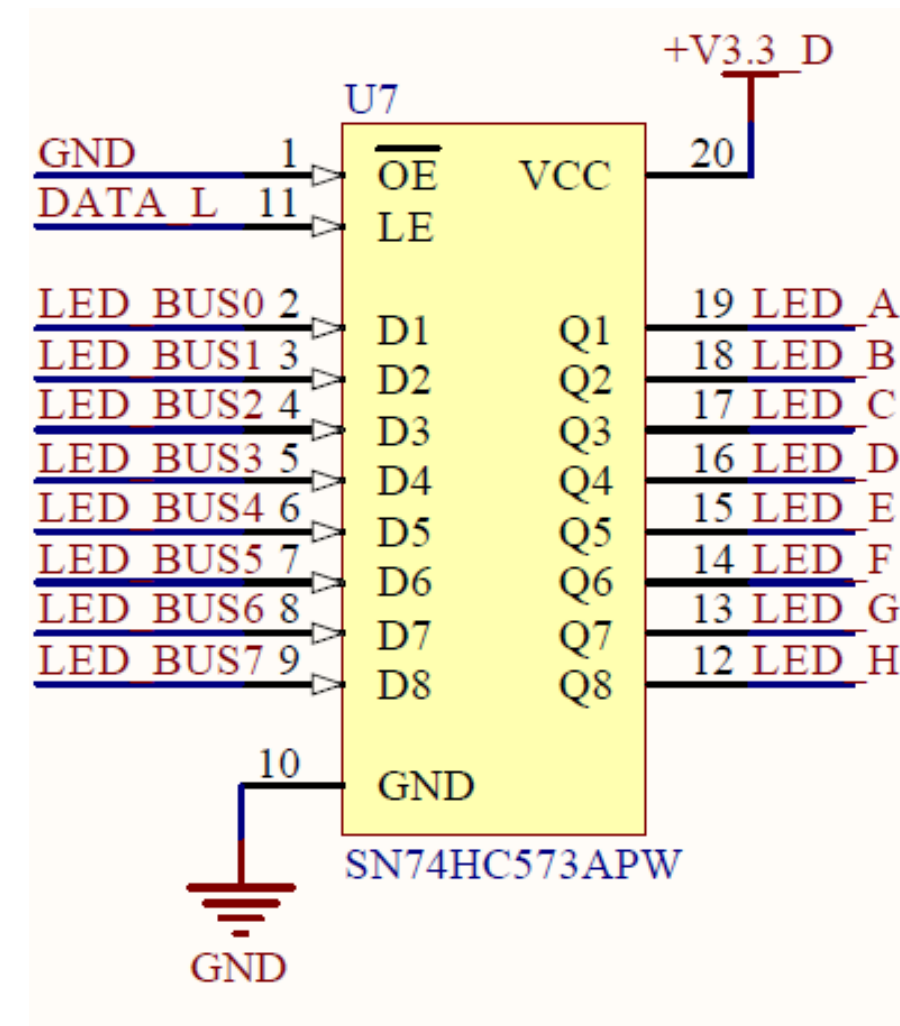
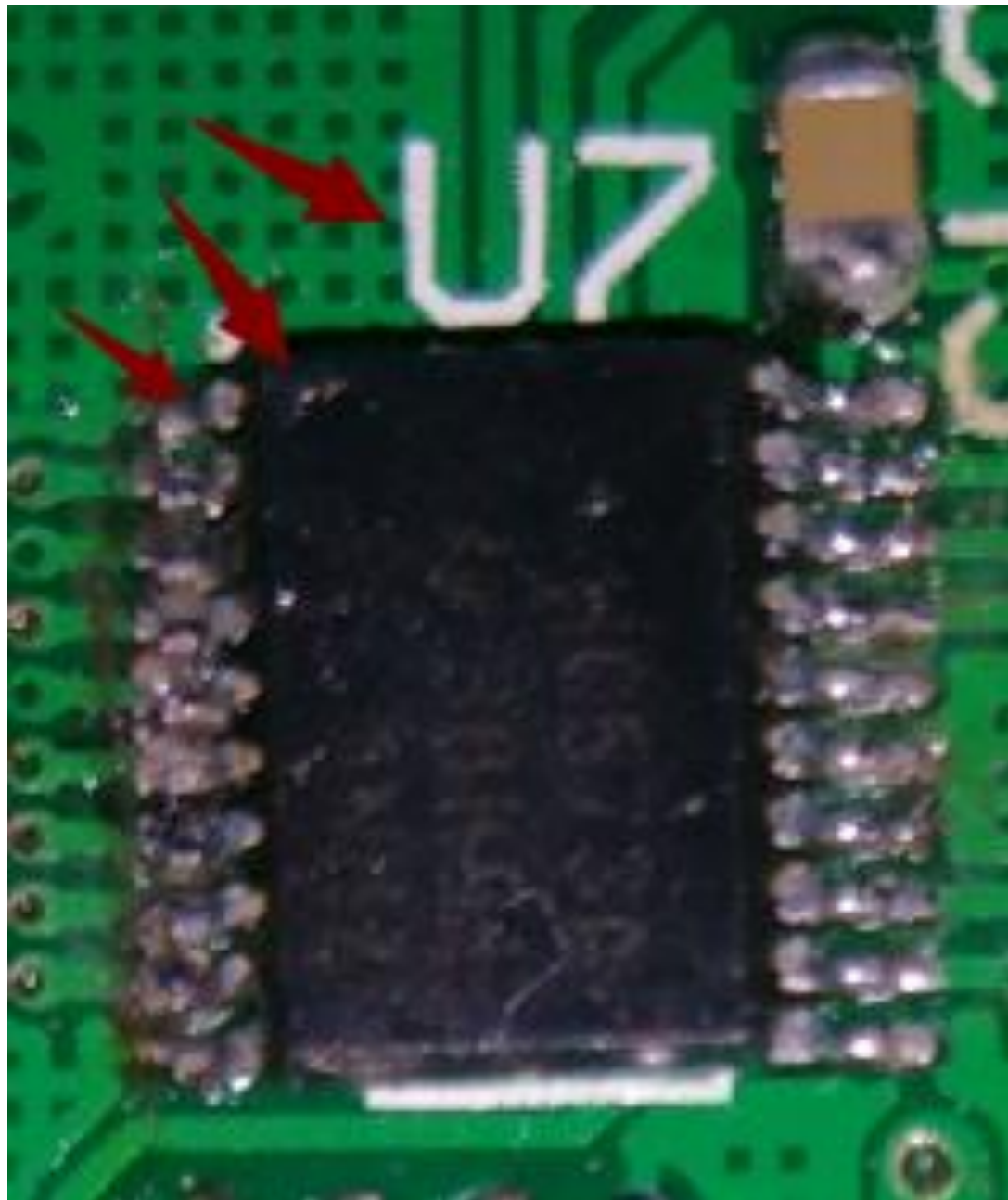


7 Segment LED

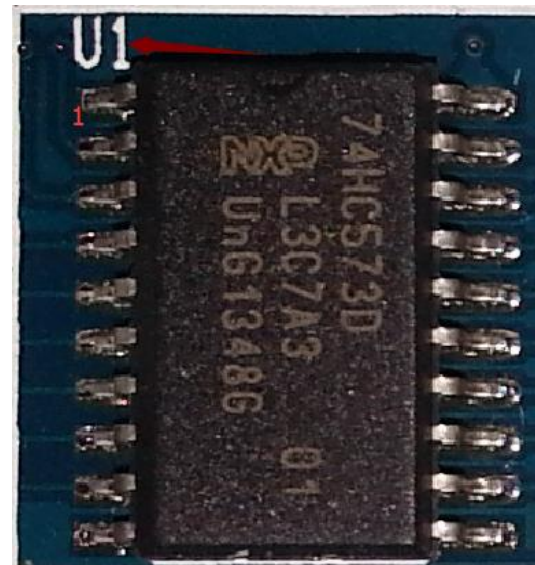
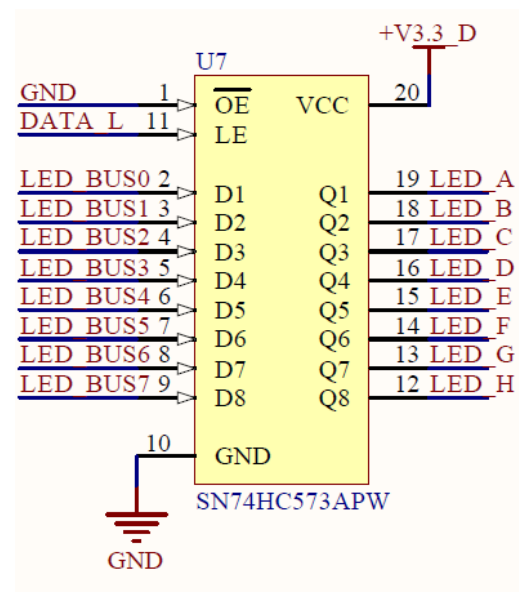


```
char LED_BUS0,LED_BUS1,LED_SEL;
void main()
{LED_BUS0 = 0;
 LED_BUS1 = 0;
 LED_SEL=0xFF;
    while(1)
    {
        LED_BUS0 = 0x3f;
        LED_BUS1 = 0x3f;
        LED_SEL=0x00;
        delay(1000);
        LED_BUS0 = 0x06;
        LED_BUS1 = 0x06;
        LED_SEL=0x00;
        delay(1000);    }}
//关闭数码管的显示
//程序主循环
//数字“0”的代码
//数字“1”的代码
```



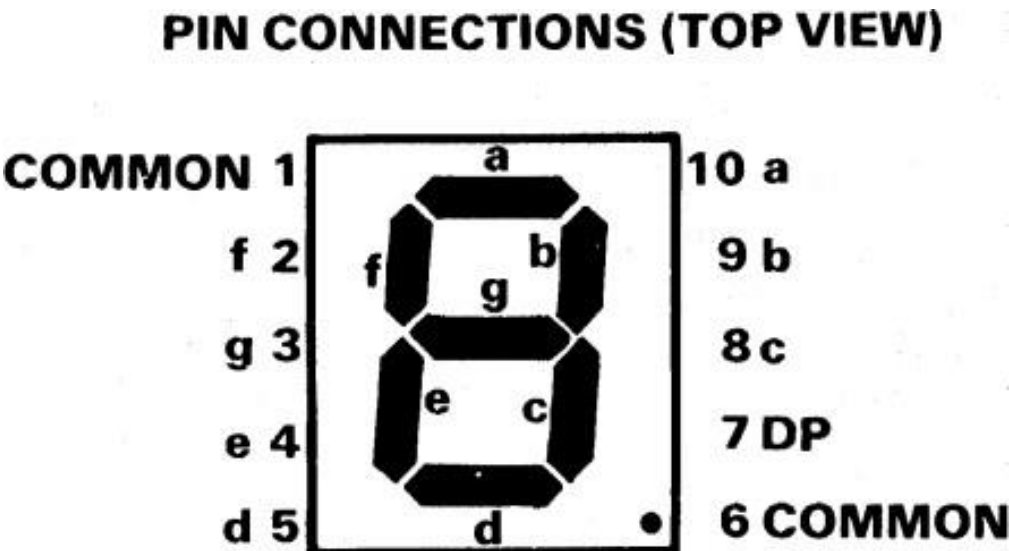
- 有用线索
- 芯片型号



HC573 引脚功能表:

PIN No 引脚号	SYMBOL 符号	NAME AND FUNCTION 名称及功能
1	OE	3 State output Enable Input (Active LOW)3 态输出使能输入 (低电平)
2, 3, 4, 5, 6, 7, 8, 9	D0 to D7	Data Inputs 数据输入
12,13,14,15,16,17,18,19	Q0 to Q7	3 State Latch Outputs 3 态锁存输出
11	LE	Latch Enable Input 锁存使能输入
10	GND	Ground 接地(0V)
20	VCC	Positive Supply Voltage 电源电压

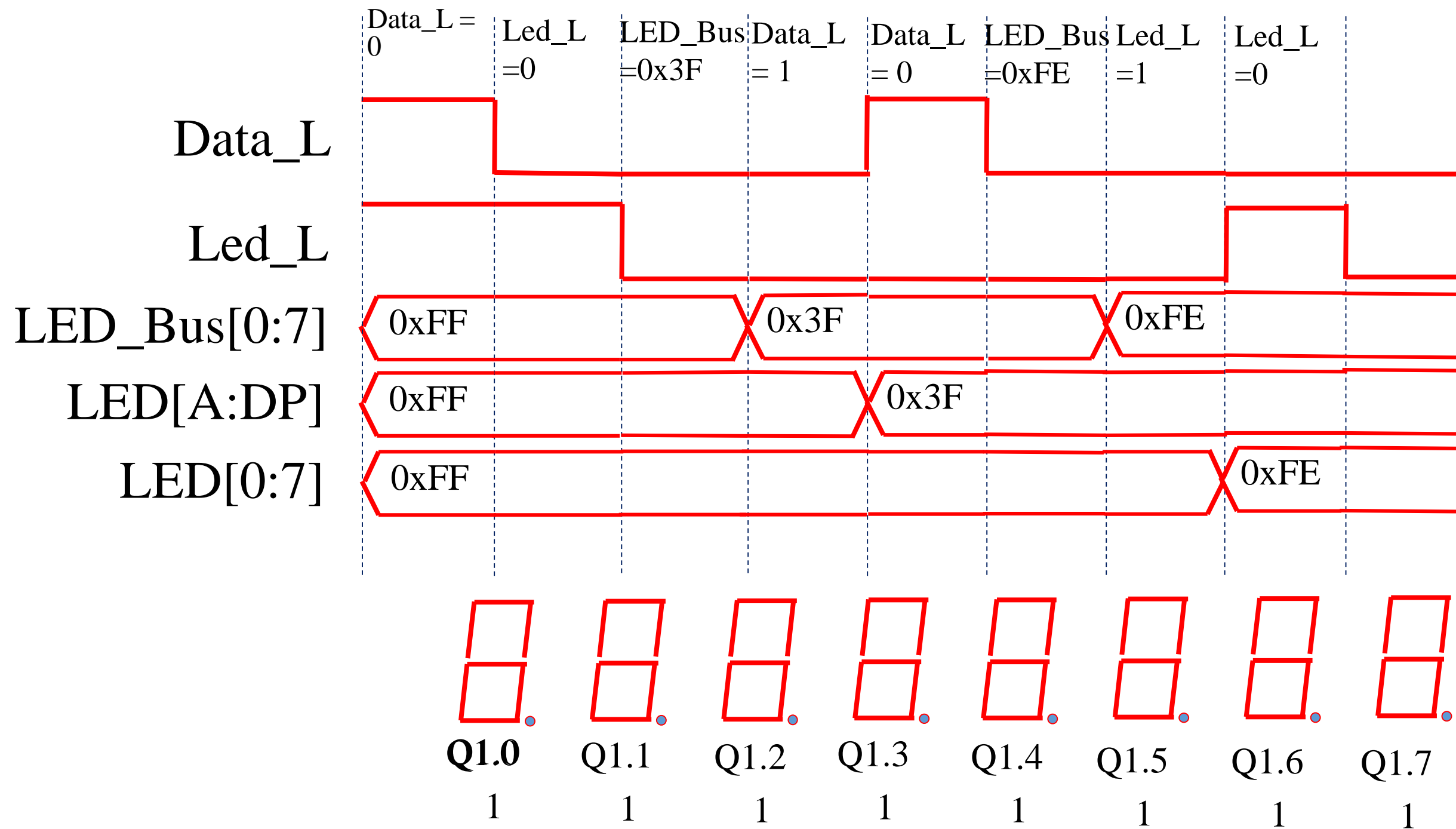
INPUTS 输入		Outputs输出		
OE	LE	D	Q (HC573)	Q (HC563)
H	X	X	Z	Z
L	L	X	NO CHANGE *	NO CHANGE *
L	H	L	L	H
L	H	H	H	L



LED_BU S07	LED_BU S06	LED_BU S05	LED_BU S04	LED_BU S03	LED_BU S02	LED_BU S01	LED_BU S00
DP	G	F	E	D	C	B	A
0	1	1	0	1	1	0	1

0x3f,0x06,0x5b,0x4f,0x66,0x6d,0x7d,0x07,0x7f,0x6f

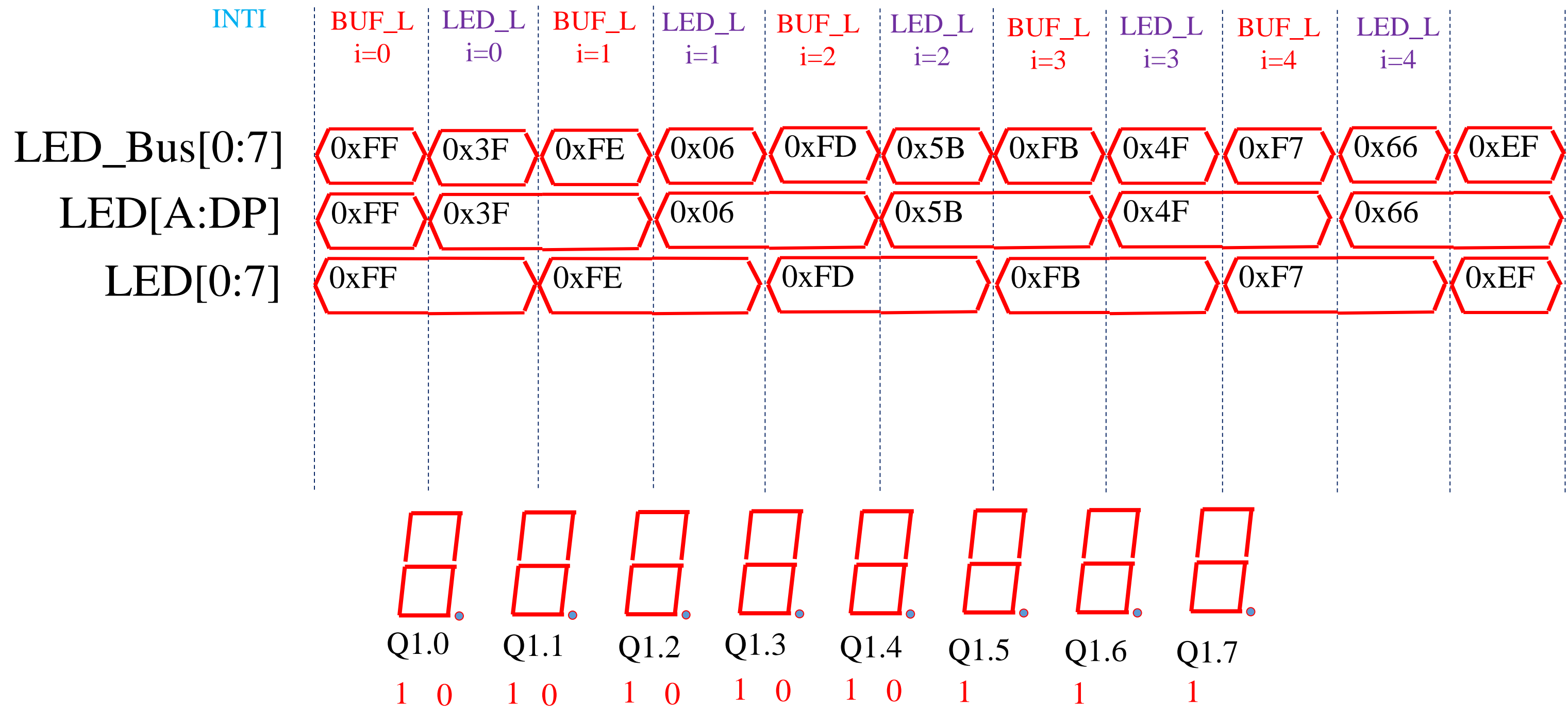
- 以时间为横坐标，单位为毫秒
- 按照输入信号，在横坐标上画出对应时间的状态
- 根据逻辑决定输出在时间刻度上的状态
- 问题：如果缩短周期会出现什么现象？



- 第一步正确，后面一定会正确吗？
- 刚才程序作者的原意是什么？
- 能得到想要的效果吗？
- 现实和程序逻辑差距有多大？


```
char LED_Bus ;
sbit Data_L,Led_L;
void main()
{
    unsigned char i;
    LED_Bus = 0xFF;
    Data_L = 1;
    Led_L = 1;
    Data_L = 0;
    Led_L = 0;                                     //INTI
    while(1)
    {
        for(i=0; i<8; i++)
        {
            LED_Bus = table[i];
            Data_L = 1;
            Data_L = 0;                             //BUF_L

            LED_Bus = 0x01 << i;
            LED_Bus = ~ LED_Bus;
            Led_L = 1;
            Led_L = 0;                               //LED_L
            delay(500);                             //延时1ms，防止拖影
        }
    }
}
```



0 2 2 9 9 6 8 0

```
char LED_Bus ;
sbit Data_L,Led_L;
void main()
{
    unsigned char i;
    LED_Bus = 0xFF;
    Data_L = 1;
    Led_L = 1;
    Data_L = 0;
    Led_L = 0;                                     //INTI
    while(1)
    {
        for(i=0; i<8; i++)
        {
            LED_Bus = 0x01 << i;
            LED_Bus = ~ LED_Bus;
            Led_L = 1;
            Led_L = 0;                               //LED_L
            LED_Bus = table[i];
            Data_L = 1;
            Data_L = 0;                               //BUF_L

            delay(500);                               //延时1ms, 防止拖影
        }
    }
}
```


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```
char LED_Bus ;
sbit Data_L,Led_L;
void main()
{
    unsigned char i;
    while(1)
    {
        for(i=0; i<8; i++)
        {
            LED_Bus = 0xFF;
            Data_L = 1;
            Led_L = 1;
            Data_L = 0;
            Led_L = 0;           //INTI
            LED_Bus = 0x01 << i;
            LED_Bus = ~ LED_Bus;
            Led_L = 1;
            Led_L = 0;           //LED_L
            LED_Bus = table[i];
            Data_L = 1;
            Data_L = 0;           //BUF_L}}}
```

0 1 2 3 4 5 6 7

- 亮度不够怎么办？
- 如何进行闪烁？
- 如何闪烁特定的某一位？
- 如何漂移？

- 区分时序中的输入和输出？
- 时序有时候会表示信息？

思考题