

STM8S207CB Unique ID 测试

ST 芯片的唯一识别码 (Unique ID) 是 ST 芯片非常实用的功能之一，由于该识别码永远不会重复，那么一个识别码就唯一对应了一台设备，可以非常好的管理用户的设备信息库。那么我们看看 datasheet 如何描述这个识别码：

Unique ID

The devices feature a 96-bit unique device identifier which provides a reference number that is unique for any device and in any context. The 96 bits of the identifier can never be altered by the user.

The unique device identifier can be read in single bytes and may then be concatenated using a custom algorithm.

The unique device identifier is ideally suited:

- For use as serial numbers
- For use as security keys to increase the code security in the program memory while using and combining this unique ID with software cryptographic primitives and protocols before programming the internal memory.
- To activate secure boot processes

可以看出，UniqueID 可以单字节读出来，一共 12 个字节，虽然可以读出这些数据，但是这些数据不能被用户改变。下图是这 12 个字节数据的结构：

Table 14. Unique ID registers (96 bits)

Address	Content description	Unique ID bits							
		7	6	5	4	3	2	1	0
0x48CD	X co-ordinate on the wafer	U_ID[7:0]							
0x48CE		U_ID[15:8]							
0x48CF	Y co-ordinate on the wafer	U_ID[23:16]							
0x48D0		U_ID[31:24]							
0x48D1	Wafer number	U_ID[39:32]							
0x48D2	Lot number	U_ID[47:40]							
0x48D3		U_ID[55:48]							
0x48D4		U_ID[63:56]							
0x48D5		U_ID[71:64]							
0x48D6		U_ID[79:72]							
0x48D7		U_ID[87:80]							
0x48D8		U_ID[95:88]							

X co-ordinate on the wafer 是指该芯片的晶圆在主晶圆上面的 X 坐标；
Y co-ordinate on the wafer 是指该芯片的晶圆在主晶圆上面的 Y 坐标；
Wafer number 是指该芯片的晶圆所在的主晶圆的编号；
Lot number 是指该芯片的批量编号。

软件代码如图所示，唯一的问题是在利用 ST-Link 跟踪过程中，设置断点总是出现异常，不得已采用在 Debug 过程中，将断点设置在程序末尾，当程序停止在此处时，打开 memory 窗口，输入 0x48CD，观察此后的 12 个字节数值，即是 UniqueID 的值。

```
void main(void)
{
    u8 UID_data[20];
    u8 i;

    ErrorStatus status = ERROR;

    for(i=0; i<20; i++)
    {
        UID_data[i] = 0;
    }

    UID_data[0] = *(unsigned char*) (0x48cd);
    UID_data[1] = *(unsigned char*) (0x48ce);
    UID_data[2] = *(unsigned char*) (0x48cf);
    UID_data[3] = *(unsigned char*) (0x48d0);
    UID_data[4] = *(unsigned char*) (0x48d1);
    UID_data[5] = *(unsigned char*) (0x48d2);
    UID_data[6] = *(unsigned char*) (0x48d3);
    UID_data[7] = *(unsigned char*) (0x48d4);
    UID_data[8] = *(unsigned char*) (0x48d5);
    UID_data[9] = *(unsigned char*) (0x48d6);
    UID_data[10] = *(unsigned char*) (0x48d7);
    UID_data[11] = *(unsigned char*) (0x48d8);

    while(1);
}
```

在试验中我曾经读出的两颗芯片的 UniqueID 为：

(1) 0x00 0x02 0x00 0x05 0x19 0x47 0x30 0x31 0x35 0x36 0x36 0x34

(2) 0x00 0x03 0x00 0x06 0x19 0x47 0x30 0x31 0x35 0x36 0x36 0x34

可见这两颗芯片是同一颗晶圆上面切下来的，只是 X、Y 位置不同而已。用户也可以根据这样的方法来比较不同芯片的 UniqueID。