

无线技术联盟

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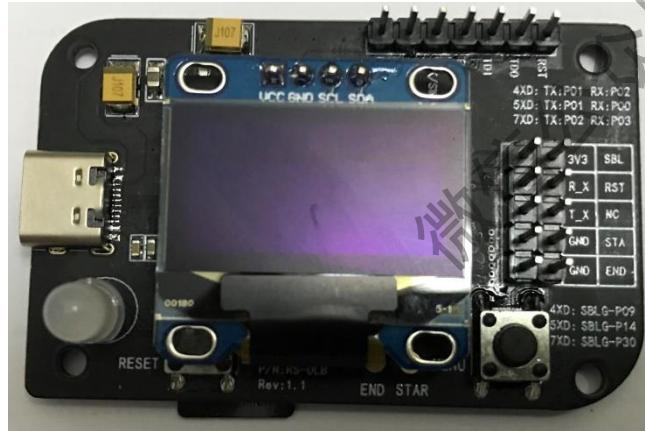
微信公众号：无线技术联盟

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TI SimpleLink MCU产线烧录器说明

该工具可以作为TI Simplelink MCU CC26xx系列，CC13xx系列MCU离线固件烧录使用，该设备可独立使用或配合专用烧录机烧录程序使用。

1拖1烧录



1拖8烧录



调试项目必备的两个工具



- IDE软件编译调试工具

- TI 原厂工具: XDS110 (\$99 USD)

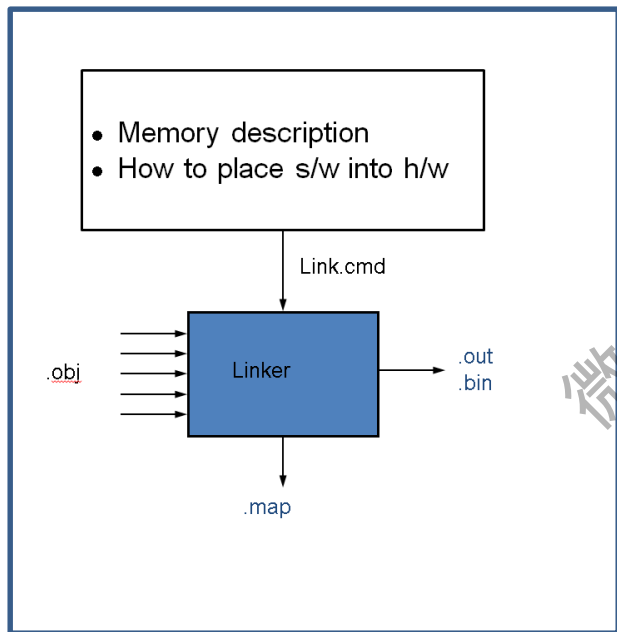
- 调试/烧录接口:

- JTAG

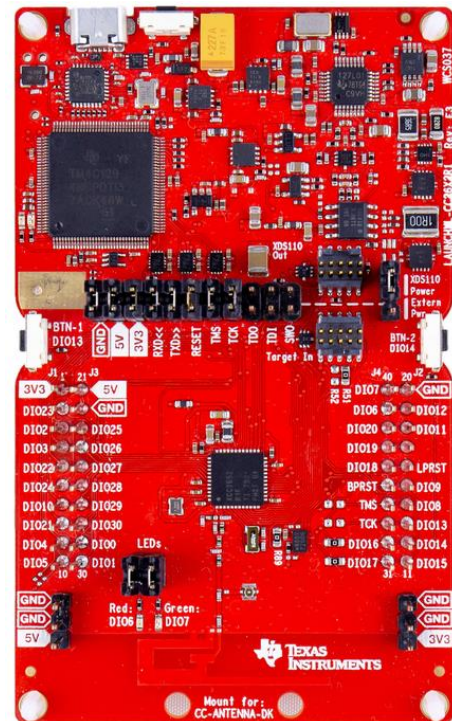
- cJTAG

- 缺点

- 贵, 必须配合上位机烧录



JTAG
cJTAG



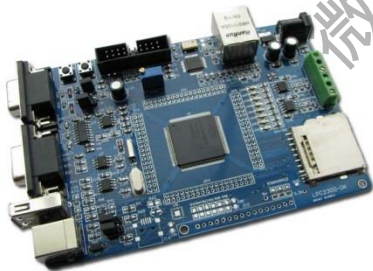
调试项目必备的两个工具

Firmware.bin

```
0101010101010101001010101010  
1010010101010101010101010101  
01011011010110110101010010...
```



拷贝至烧录器



- IDE软件编译调试工具

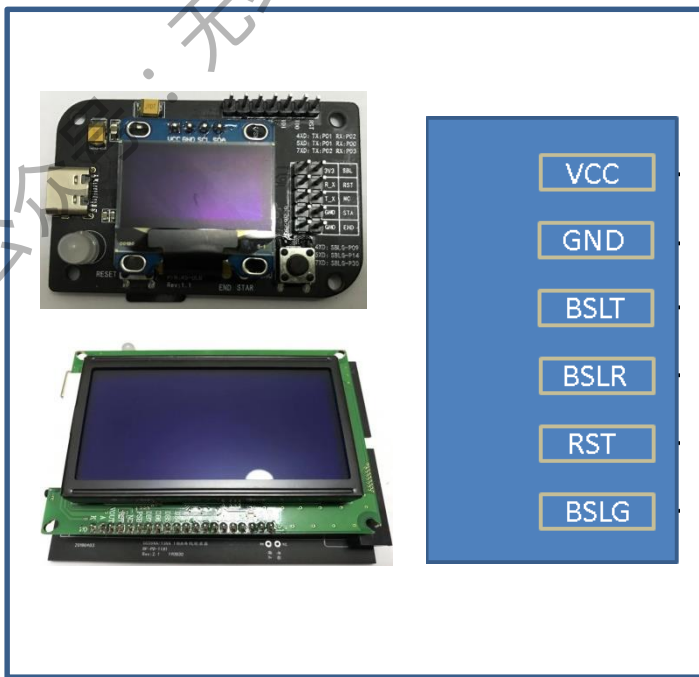
- TI 原厂工具: XDS110 (\$99 USD)

- 烧录接口:

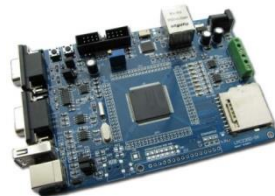
- TI Simplelink MCU Bootloader

- 优点

- 便宜, 离线烧录, 支持与烧录机架配合



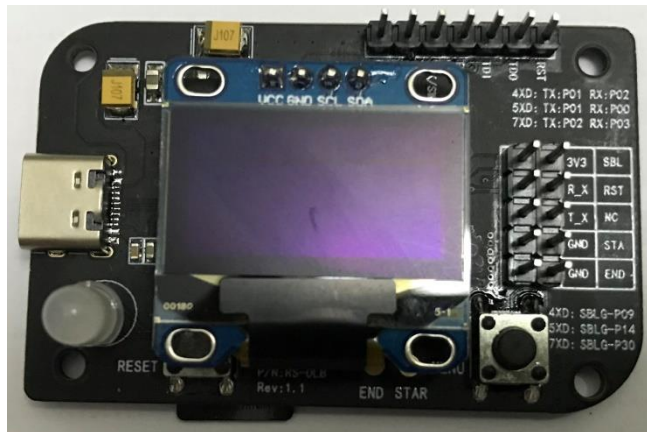
Bootloader



功能特点

- 采用屏幕显示人机交互模式，设置简单，操作方便。
- 程序加密拷贝在烧录器片上Flash中，可有效防止固件外流。
- 可配置为TI Simplelink MCU 352K flash，128k，64k，32k flash烧录模式。
- 可与烧录机架配合烧录。

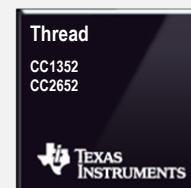
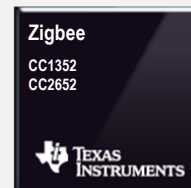
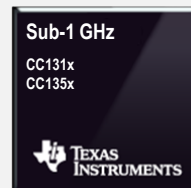
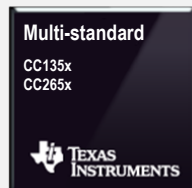
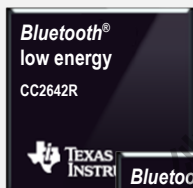
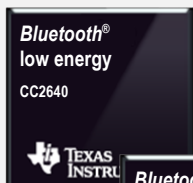
TI SimpleLink MCU产线烧录器说明



1拖1烧录

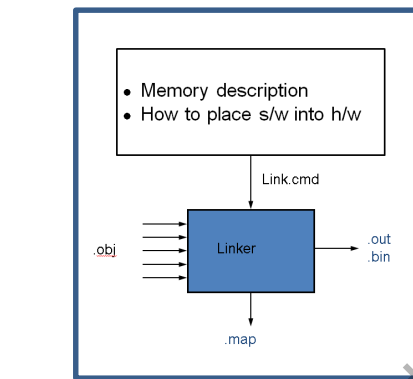
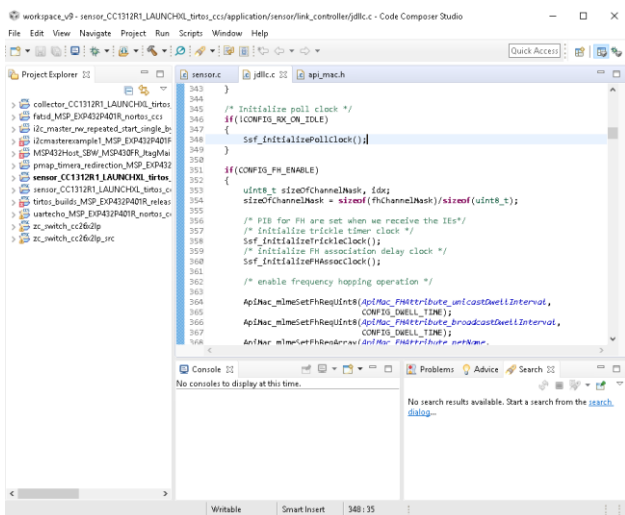


1拖8烧录



TI SimpleLink MCU Platform

制作烧录固件过程



1.编译生成Bin文件

Firmware.bin

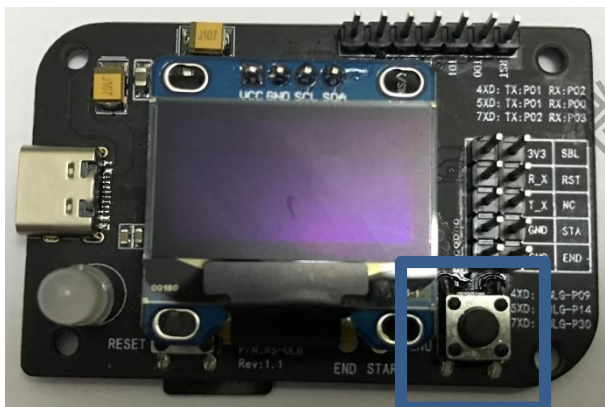
```
010101010101010100101010101010
10100101010101010101010101010101
0101101110101110111010101001000
01010101010101010100101010101010
10100101010101010101010101010101
0101101110101110111010101001010
01010101010101010100101010101010
10100101010101010101010101010101
0101101110101110111010101001010
10100101010101010101010101010101
01011011101011101110101010010...
```

2.Bin文件改名为Firmware.bin

3.制作个性化烧录文件

Bin文件个性化配置

4.拷贝程序至SD卡



5.开机长按右键，进入固件更新程序

可选：BIN文件配置(使能BootLoader)

利用第三方攻击SEGGER J-flash打开固件，查看bin文件内容，查看下图红色圈标识位数据是否为0xC5，若不为，手动改为0xC5，保存固件，若希望多次烧录，蓝色箭头指向的数值也需改为0xC5。

SEGGER J-Flash V5.12f - [new project *]

File Edit View Target Options Window Help

Project: new... C:\Users\Administrator\Desktop\RF_SM.bin

Address: 0x0 x1 x2 x4

Address	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	ASCII
1FEE0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FEF0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF10	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF20	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF30	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF50	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF60	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF80	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF90	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FFA0	00	00	00	00	00	00	00	00	00	00	80	01	10	00	88	FF	.....
1FFB0	FD	FF	58	00	3A	FF	BF	F3	FF	FF	FF	FF	FF	FF	FF	FF	..X:.....
1FFC0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	.....
1FFD0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	C5	FF	FF	FF	FF	.....
1FFE0	00	FF	FF	FF	C5	00	C5	FF	00	00	00	FF	00	00	00	00	.....
1FFF0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	.....

LOG

Application log started

- J-Flash V5.12f (J-Flash compiled May 17 2016 16:03:49)
- JLinkARM.dll V5.12f (DLL compiled May 17 2016 16:03:35)
- Reading flash device list [C:\Program Files\SEGGER\JLink_V512f\ETC\JFlash\Flash.csv] ...
- List of flash devices read successfully (3179 Devices)
- Reading MCU device list [C:\Program Files\SEGGER\JLink_V512f\ETC\JFlash\MCU.csv] ...
- List of MCU devices read successfully (5195 Devices)
- Creating new project ...
- New project created successfully
- Opening data file [C:\Users\Administrator\Desktop\RF_SM.bin] ...
- Data file opened successfully (131072 bytes, 1 range, CRC = 0x00000000)

Ready

地址0x1ffdb

使能多次烧录有效必须写入0xC5

可选：BIN文件配置(使能BootLoader)

1FFB0	FD	FF	58	00	3A	FF	BF	F3	FF	FF	FF	FF	FF	FF	FF	..X.:....
1FFC0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	.....
1FFD0	FF	FF	FF	FF	FF	FF	FF	C5	FF	FF	C5	FF	FF	FF	FF	.....
1FFE0	00	FF	FF	FF	C5	00	C5	FF	00	00	00	FF	00	00	00	.....
1FFF0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	.....

```
tor\Desktop\RF_SM.bin] ...  
72 bytes, 1 range, CRC = 0x00000000)  
or\Desktop\RF_SM.bin] ...  
2 bytes, 1 range)  
or\Desktop\RF_SM.bin] ...  
or\Desktop\RF_SM.bin] ...
```

Bootloader使能指定IO
默认为芯片的最后一个IO

Bootloader使能IO状态
默认低电平有效

Figure 11-13. BL_CONFIG Register

28	27	26	25	24
BOOTLOADER_ENABLE				
R-C5h				
20	19	18	17	16
RESERVED				BL_LEVEL
R-0h				R-1h
12	11	10	9	8
BL_PIN_NUMBER				
R-FFh				
7	6	5	4	3
BL_ENABLE				
R-FFh				

Table 11-15. BL_CONFIG Register Field Descriptions

Bit	Field	Type	Reset	Description
31-24	BOOTLOADER_ENABLE	R	C5h	Bootloader enable. Boot loader can be accessed if IMAGE_VALID_CONF.IMAGE_VALID is non-zero or BL_ENABLE is enabled (and conditions for boot loader backdoor are met). 0xC5: Boot loader is enabled. Any other value: Boot loader is disabled.
23-17	RESERVED	R	0h	Reserved
16	BL_LEVEL	R	1h	Sets the active level of the selected DIO number BL_PIN_NUMBER if boot loader backdoor is enabled by the BL_ENABLE field. 0: Active low. 1: Active high.
15-8	BL_PIN_NUMBER	R	FFh	DIO number that is level checked if the boot loader backdoor is enabled by the BL_ENABLE field.
7-0	BL_ENABLE	R	FFh	Enables the boot loader backdoor. 0xC5: Boot loader backdoor is enabled. Any other value: Boot loader backdoor is disabled. NOTE! Boot loader must be enabled (see BOOTLOADER_ENABLE) if boot loader backdoor is enabled.

如若要使能多次烧录功能，需
要把BL_CONFIG 7-0位改为0xC5，
芯片即可多次烧录，否则，芯
片只有在空片模式下才能使用
bootloader，烧录一次固件之后
无法再通过bootloader烧录第二
次！

可选：BIN文件配置(禁用JTAG)

SEGGER J-Flash V5.12f - [new project *]

File Edit View Target Options Window Help

Project - new...

Name	Value
Connection	USB [Device 0]
Target interface	JTAG
Init JTAG speed	4000 kHz
JTAG speed	4000 kHz
TAP number	<not used>
IRPre	<not used>
CPU	ARM7
Endian	Little
Check core Id	No
Core Id	0x0
Use target RAM	No
RAM address	0x0
RAM size	4 KB
Flash memory	Auto detection
Base address	0x0
Organization	16 bits x 1 chip

C:\Users\Administrator\Desktop\ccbinfile(TRY).bin

Address: 0x0 x1 x2 x4

Address	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	ASCII
1FEE0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FEF0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF10	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF20	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF30	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF50	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF60	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF80	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FF90	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
1FFA0	00	00	00	00	00	00	00	00	00	00	80	01	10	00	88	FF	..X.:.....
1FFB0	FD	FF	58	00	3A	FF	BF	F3	FF	FF	FF	FF	FF	FF	FF	FF	.....
1FFC0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	.....
1FFD0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FE	FF	C5	FF	FF	FF	FF	.....
1FFE0	C5	FF	FF	FF	00	00	00	FF	00	00	00	FF	FF	FF	FF	FF	.....
1FF00	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	.....

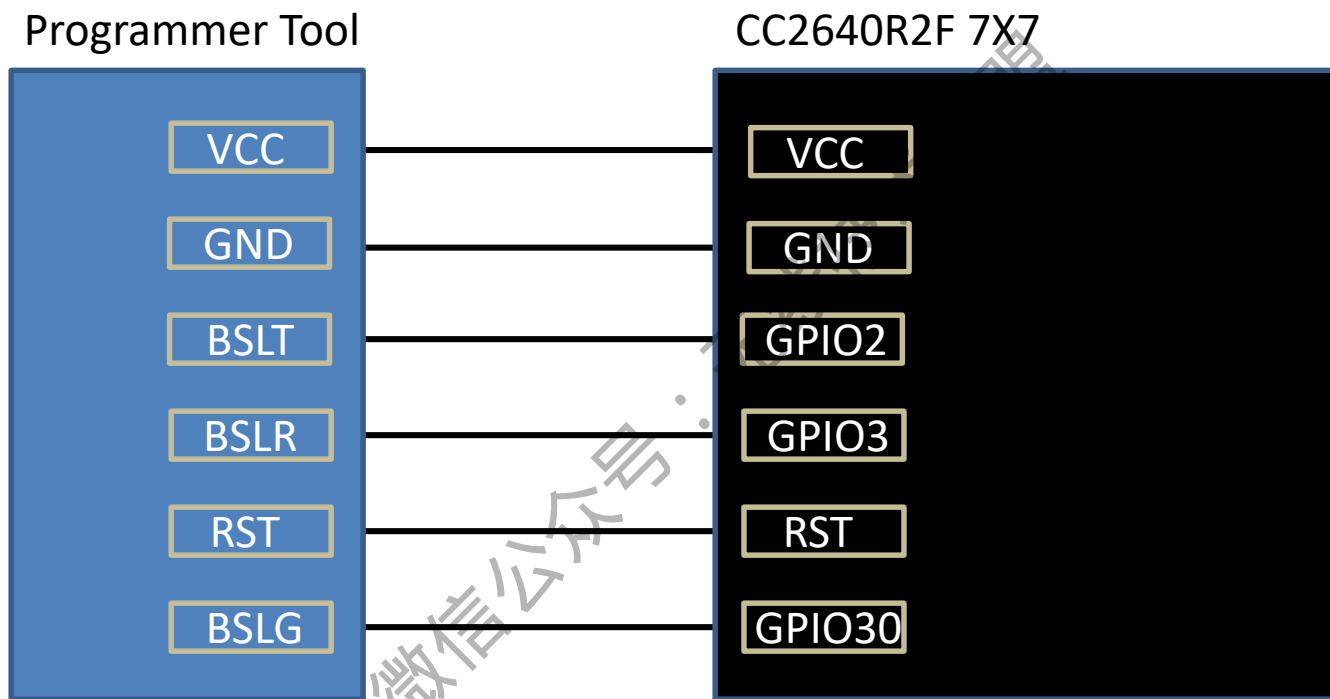
LOG

- Data file opened successfully (131072 bytes, 1 range, CRC = 0x00000000)
- Opening data file [C:\Users\Administrator\Desktop\ccbinfile(13).bin] ...
- Data file opened successfully (131072 bytes, 1 range, CRC = 0x00000000)
- Saving data file [C:\Users\Administrator\Desktop\ccbinfile(TRY).bin] ...
- Data file saved successfully (131072 bytes, 1 range)
- Saving data file [C:\Users\Administrator\Desktop\ccbinfile(TRY).bin] ...
- Data file saved successfully (131072 bytes, 1 range)
- Opening data file [C:\Users\Administrator\Desktop\ccbinfile(13).bin] ...
- Data file opened successfully (131072 bytes, 1 range, CRC = 0x00000000)
- Saving data file [C:\Users\Administrator\Desktop\ccbinfile(TRY).bin] ...
- Data file saved successfully (131072 bytes, 1 range)

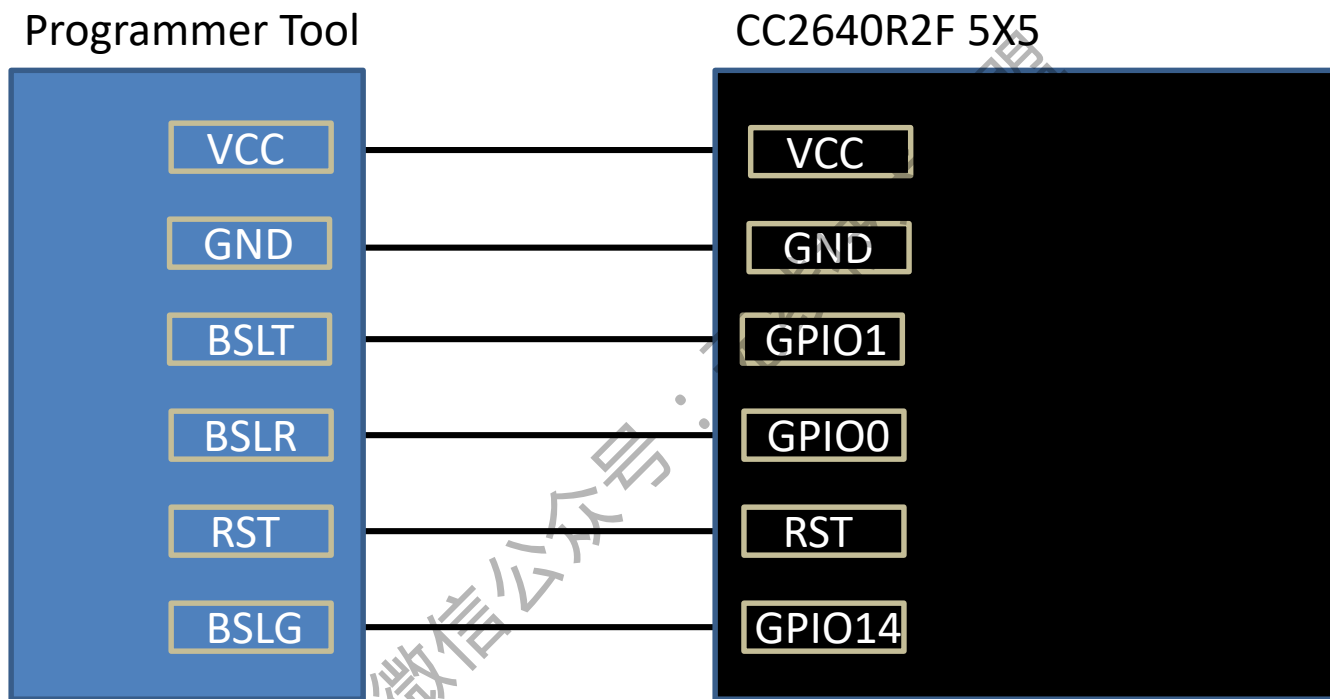
Ready

设置1FFE4 1FFE5 1FFE6 1FFE8 1FFE9 1FFEA地址值为0

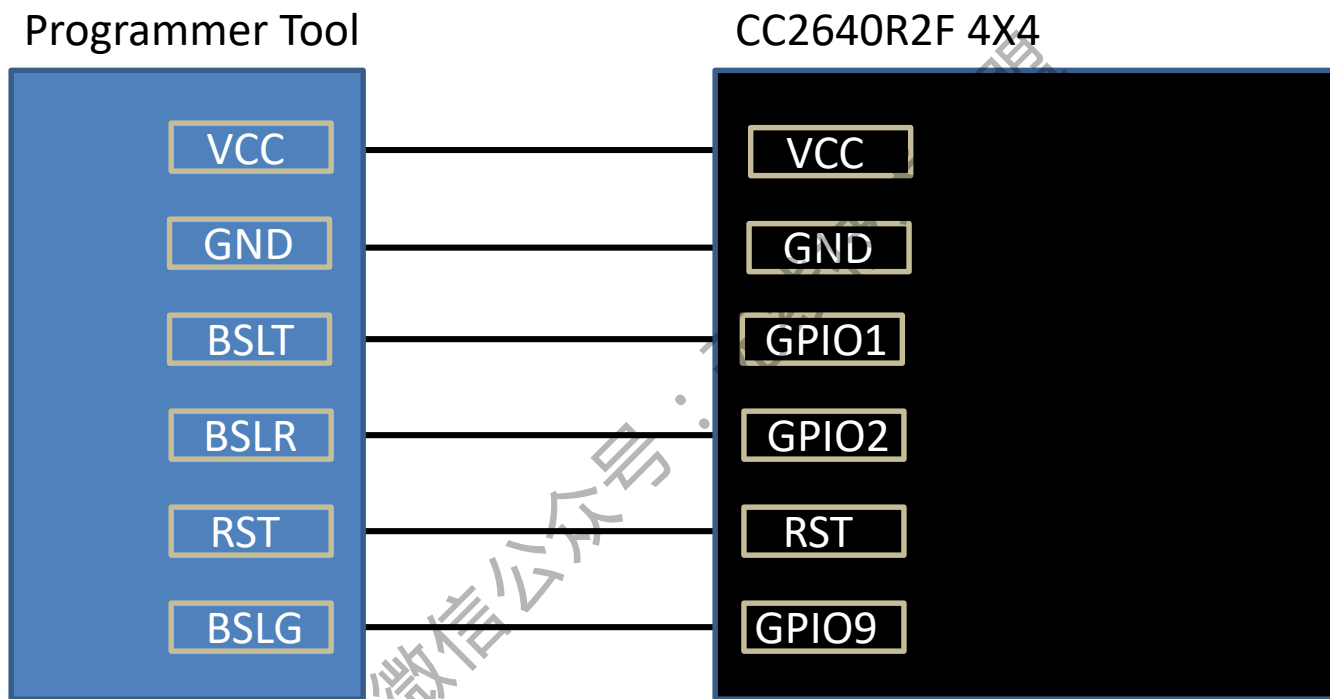
烧录器与7X7芯片接线图



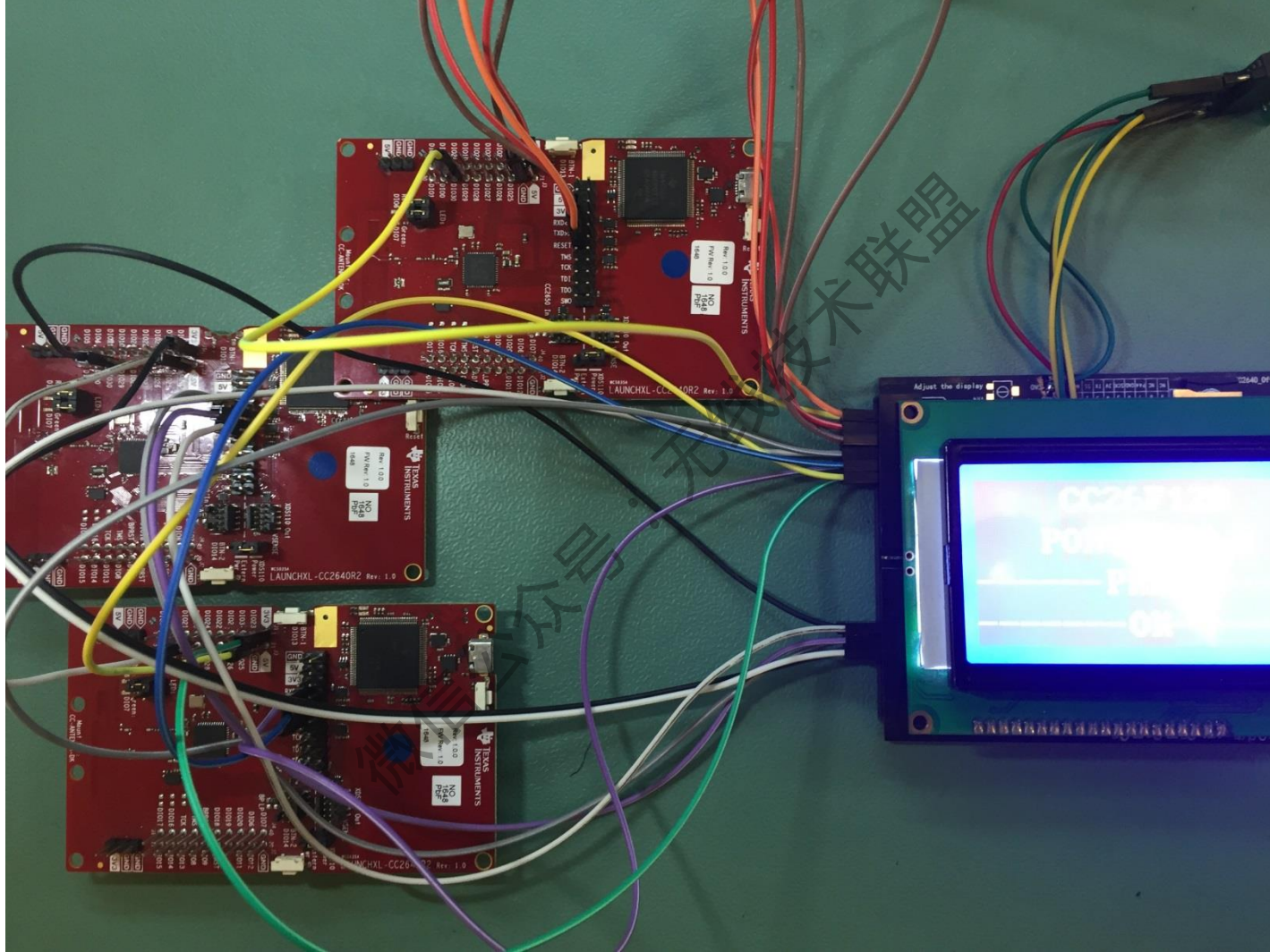
烧录器与5X5芯片封装接线图



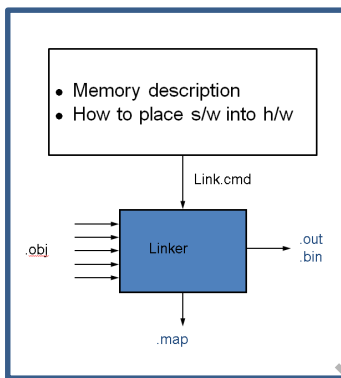
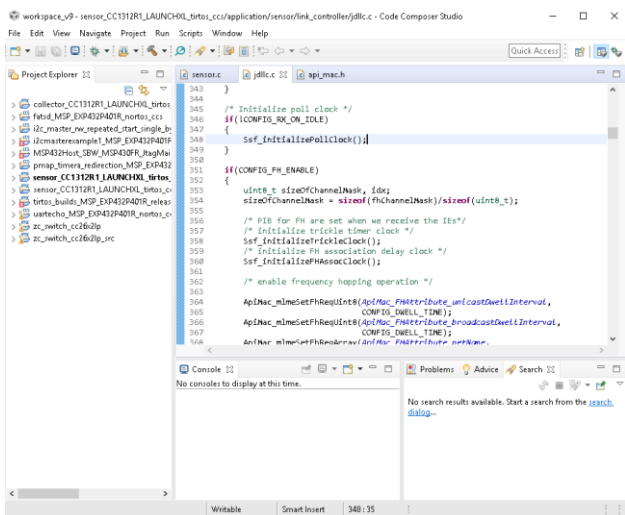
烧录器与4X4芯片封装接线图



实例



制作烧录固件过程



1.编译生成Bin文件

Firmware.bin

```
010101010101010100101010101010
10100101010101010101010101010101
0101101110101110111010101001000
01010101010101010100101010101010
10100101010101010101010101010101
0101101110101110111010101001010
01010101010101010100101010101010
10100101010101010101010101010101
0101101110101110111010101001010
10100101010101010101010101010101
01011011101011101110101010010...
```

2.Bin文件改名为Firmware.bin



3.制作个性化烧录文件

Bin文件个性化配置

4.拷贝程序至SD卡



5.开机长按中间按键，直至显示配置界面



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