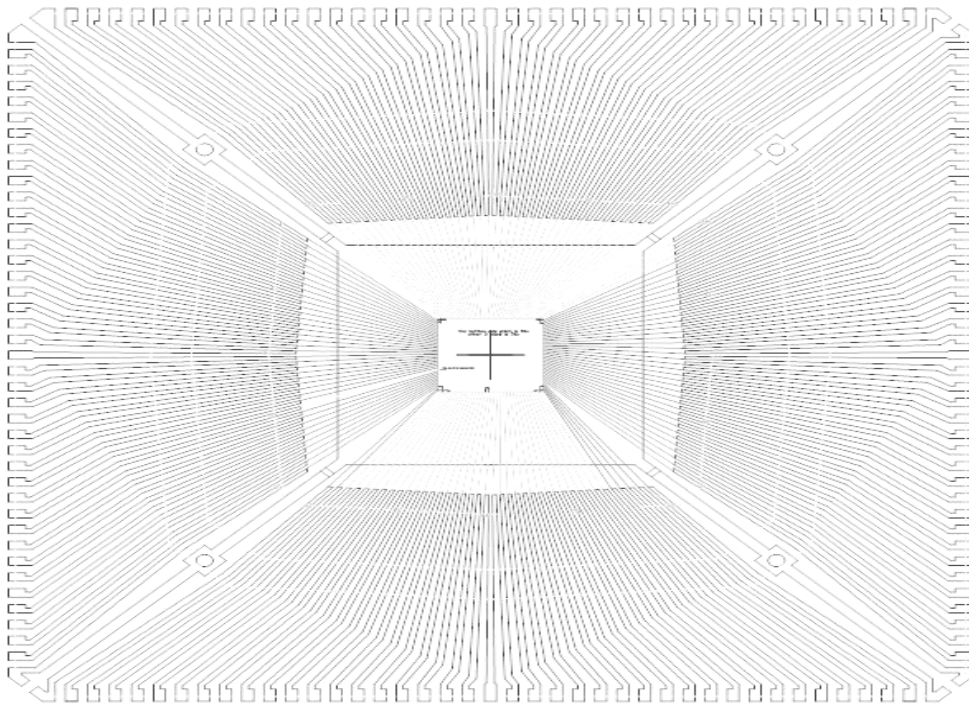


LONTIUM SEMICONDUCTOR CORPORATION
ClearedEdge™ Technology

LT9211 Demo User Guide



Reversion History

Date	Author	Version	Descriptions
2019-06-08		1.0	

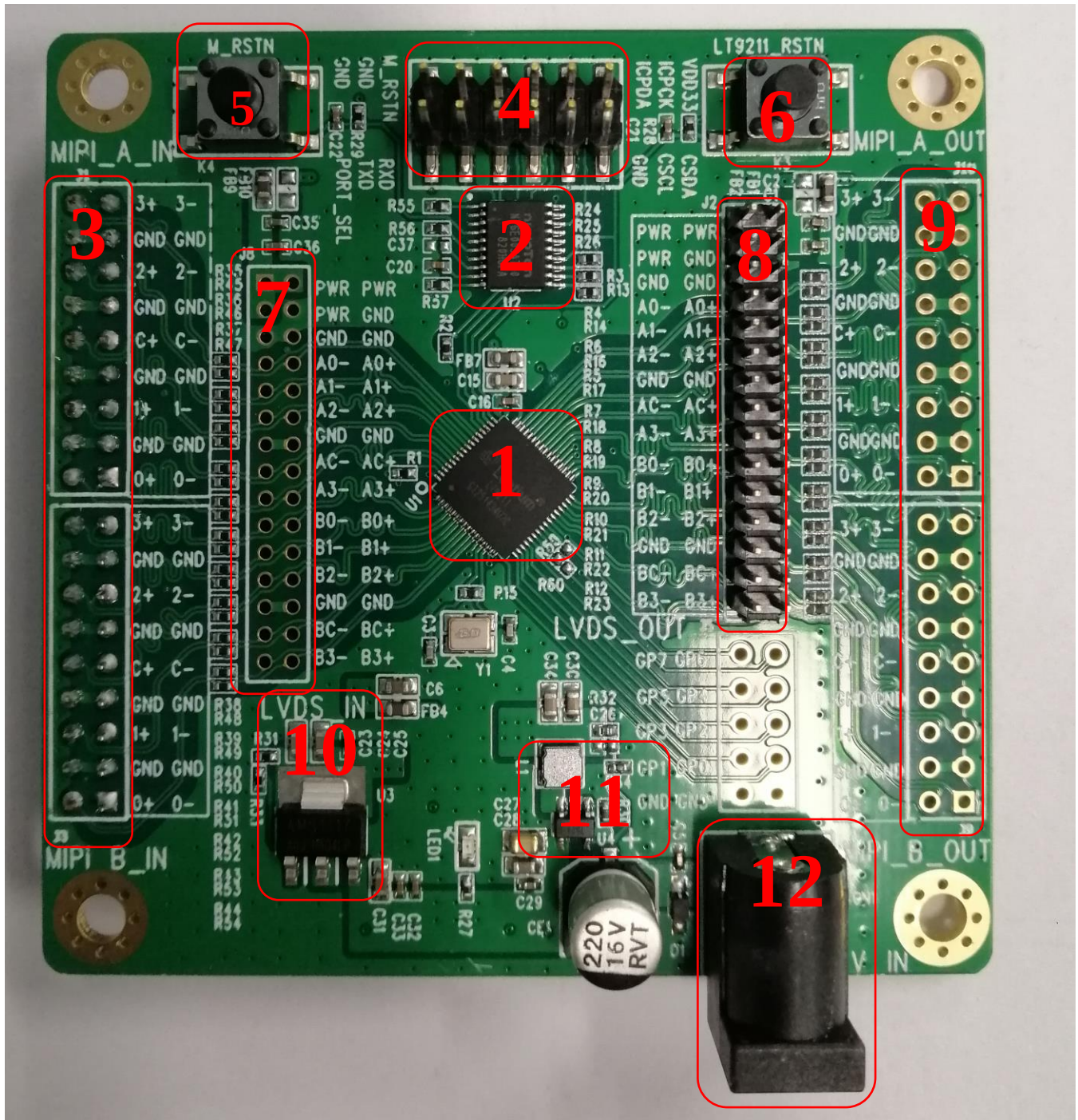
CONFIDENTIAL

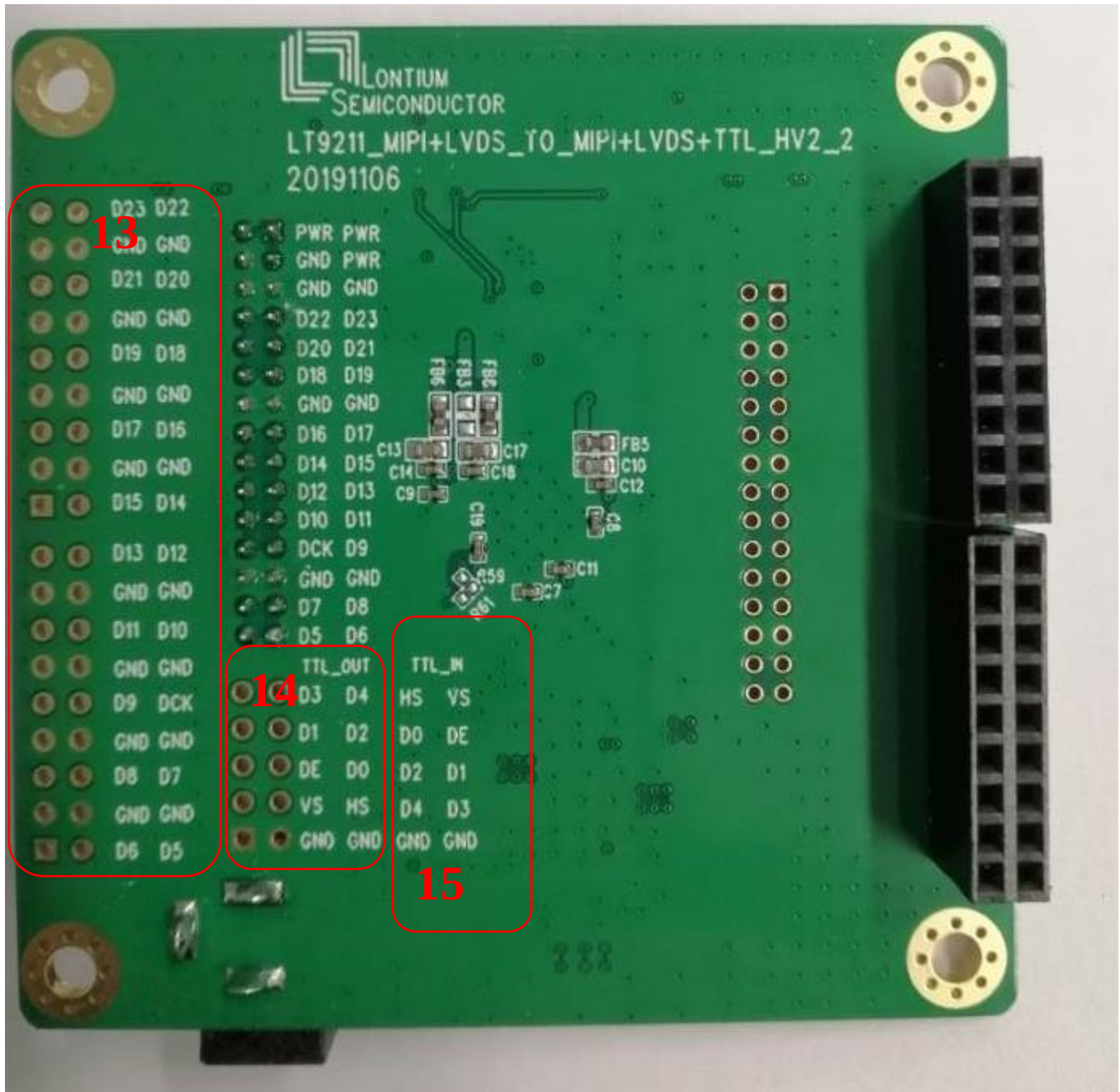
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1. LT9211 Demo Board





**1. LT9211; 2. N76E003; 3. MIPI Input/TTL Input D5~D23/CLK;
4. MCU Upgrade Interface & MCU UART; 5. MCU RESET; 6. LT9211
RESET; 7. LVDS Input; 8. LVDS Output; 9. MIPI Output; 10. 1.2V;
11. 3.3V; 12.5V IN; 13. TTL OUT D5~D23/CLK; 14. TTL OUT
D0~D4/HS/VS/DE; 15. TTL IN D0~D4/HS/VS/DE;**

2. Board Power Consumption

MIPI to 2-Port LVDS @1080P 60Hz: IVCC18 205mA; VCCIO 1mA;
MIPI to 24bit TTL @1080P 60Hz: IVCC18 142mA; IVCCIO@3.3V 15mA; IVCCIO@1.8V 6mA;
MIPI Splitter @ 1080P 60Hz: IVCC18 238mA; VCCIO 1mA;
LVDS Splitter @ 1080P 60Hz: IVCC18 266mA; VCCIO 1mA;

3. Compile&Build LT9211 Software

If the MCU is N76E003:

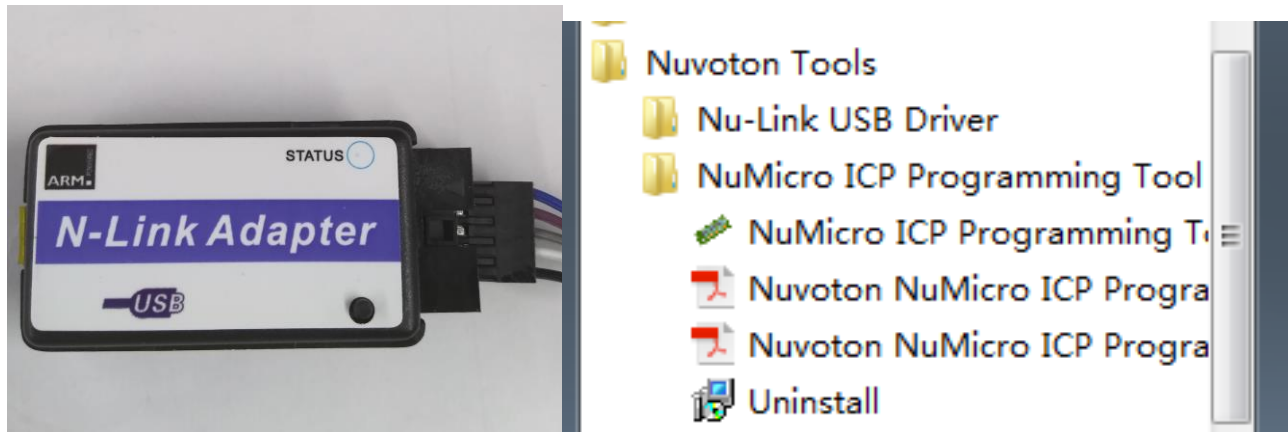
Open the KEIL C51 IDE software, and open the LT9211_EVB_CODE project from [Project] Menu.

Rebuild all target files or Build target, it would create hex file under folder "..\Objects\"...

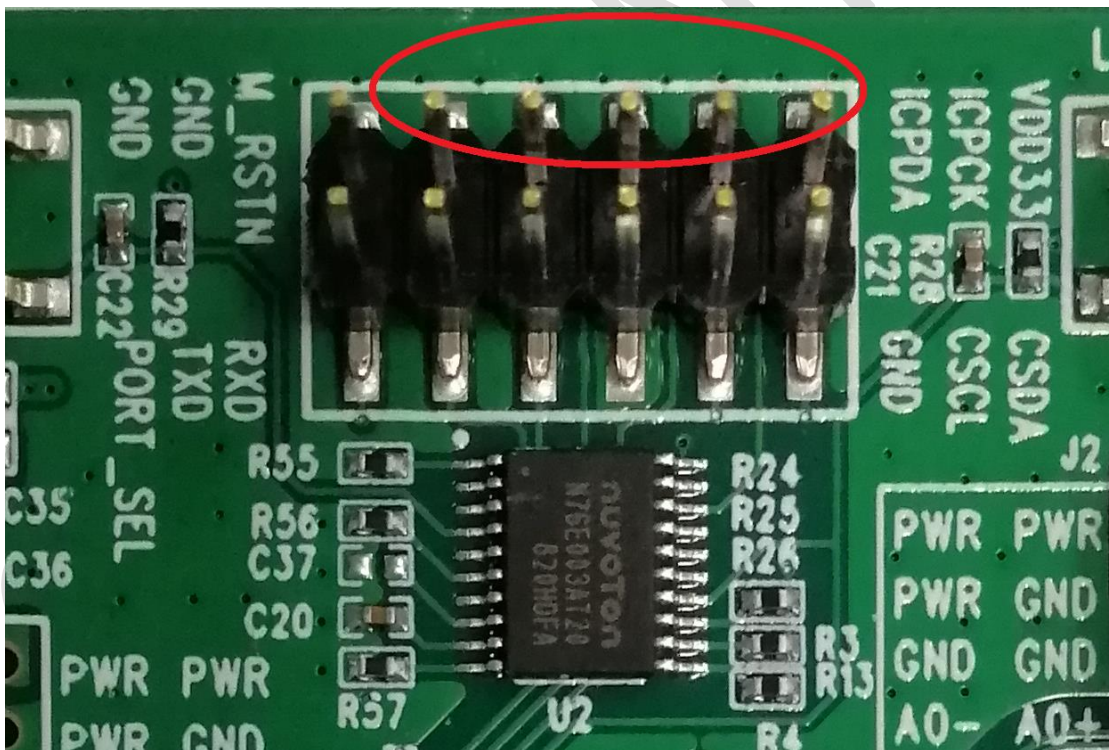
4. Upgrade firmware for LT9211 demo

If the MCU is N76E003:

You need to use “N-LINK”, and also install the “NuMicro ICP Programming Tool”.

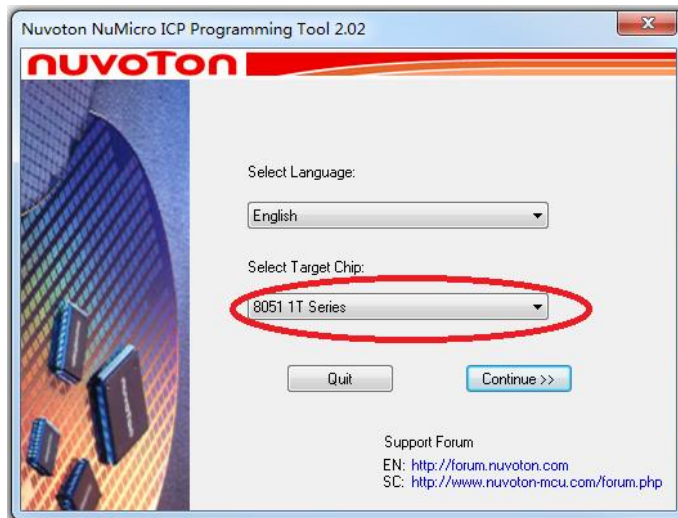


You should use N-LINK to connect these ports as shown below:

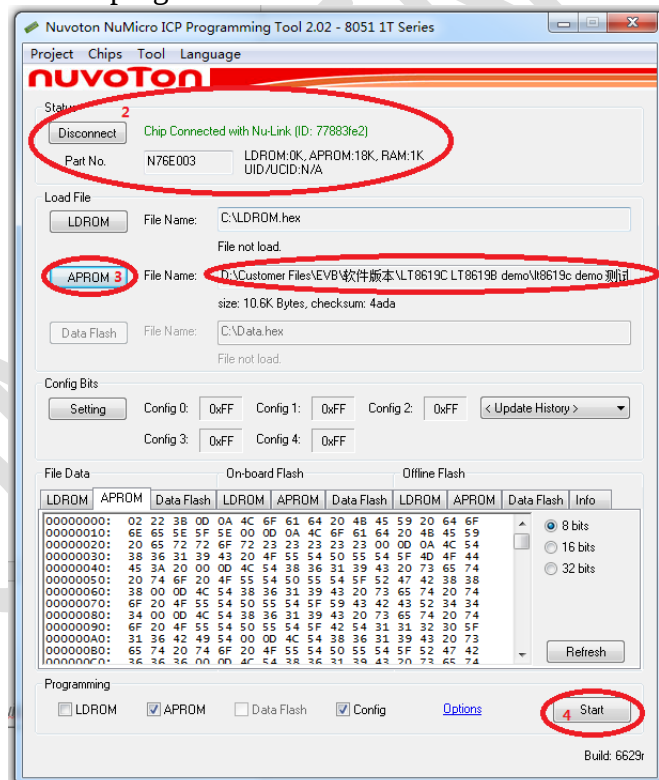


Programming steps:

1. Open "NuMicro ICP Programming Tool", and select "8051 1T series".



2. Click the “Connect” button to check the programming interface is ok.
3. Click the “APROM” button to load the hex file.
4. Click the “Start” button to program.



5. FAQ

无法下载程序

Unable to program:

(1)检查3.3V和1.8V输出。

Check 3.3V and 1.8V power output.

(2)检查线顺。

Check the line order.

不出图

No image:

(1) 如果是LVDS屏幕，请根据屏幕供电要求，修改demo上LVDS接口输出电源。如果焊接磁珠FB1，则输出电源是5V,如果焊接磁珠FB2,则输出电源是 3.3V。

If it is an LVDS screen, please modify the output power supply of the LVDS interface on the demo according to the power supply requirements of the screen. If the bead FB1 are soldered, the output power supply is 5V. If the bead FB2 are soldered, the output power supply is 3.3V.



(2)检查晶振是否起振，频率是25MHz.

Whether the crystal oscillator oscillates at a frequency of 25MHz.

(3)使用示波器查看输入端有没有MIPI/TTL/LVDS信号，信号是否正常。

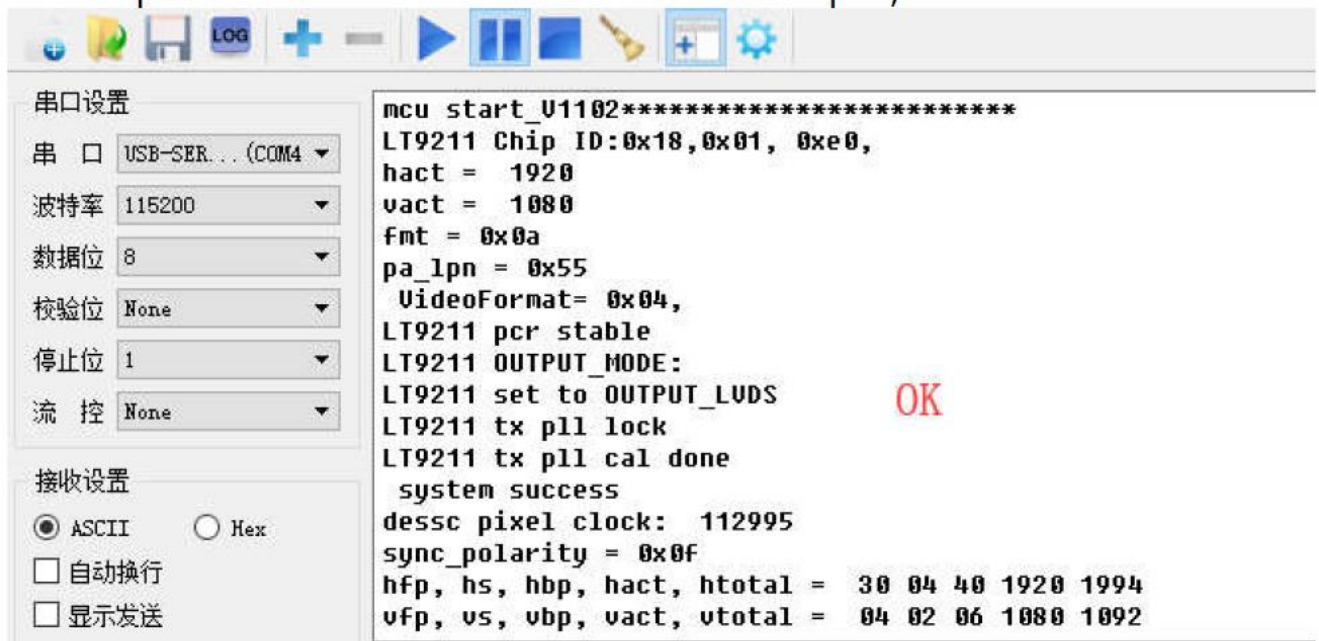
Use the oscilloscope to check if there is any MIPI/TTL/LVDS signals at the input and whether the signal is normal.

(4)使用示波器查看输出端有没有MIPI/TTL/LVDS信号，信号是否正常。

Use the oscilloscope to check if there is any MIPI/TTL/LVDS signals at the input and whether the signal is normal.

(5)连接到N76E003的串口，波特率是115200，打印LOG，将LOG发给FAE。

Connect to the serial port of the N76E003, the baud rate is 115200, print the LOG, and send the LOG to FAE.



(6)检查LT9211 的PCR 是否不稳定?

Is the PCR of the LT9211 unstable?

串口设置

串 口: USB-SER... (COM4)

波特率: 115200

数据位: 8

校验位: None

停止位: 1

流 控: None

接收设置

☒ ASCII ☐ Hex

☐ 自动换行

☐ 显示发送

☐ 显示时间

发送设置

☒ ASCII ☐ Hex

☐ 重复发送: 1000 ms

```

mcu start*****
LT9211 Chip ID:0x18,0x01, 0xe0,
hact = 1920
vact = 1080
fmt = 0x0a
pa_lpn = 0x55
PCR M = 0x17
PCR M overflow limit setting = 0x19
PCR M underflow limit setting = 0x10
LT9211 pcr unstable!!!!
LT9211 pcr unstable!!!!
LT9211 pcr unstable!!!!
LT9211 pcr unstable!!!!
LT9211 pcr unstable!!!!
LT9211 OUTPUT_MODE.
LT9211 set to OUTPUT_LVDS
LT9211 tx pll lock
LT9211 tx pll cal done
system success
dessc pixel clock: 148755
sync_polarity = 0x0f
hfp, hs, hbp, hact, httotal = 4094 44 4053 00 65535
vfp, vs, vbp, vact, vttotal = 77 05 250 00 1100
          
```

如果不稳定，修改LT9211_MipiRxPll()中的0x8235寄存器值，根据video_timing中的pclk_khz
 If it is unstable, modify the 0x8235 register value in LT9211_MipiRxPll(), according to pclk_khz in video_timing

```

//[1:0]PIXCK_DIVSEL
0x82 --44M~88M ; 0x83 --22M~44M
0x80 --176M~352M ; 0x81 --88M~176M
  
```

```

//if (MIPI_Timing[pclk_10khz] < 8800, 则写入0x8235 寄存器为0x82。
//if (MIPI_Timing[pclk_10khz] < 8800, write 0x8235 register to 0x82.
  
```

```

HDMI_WriteI2C_Byte(0x35, 0x82*PIXCLK_88M_176M*);
  
```

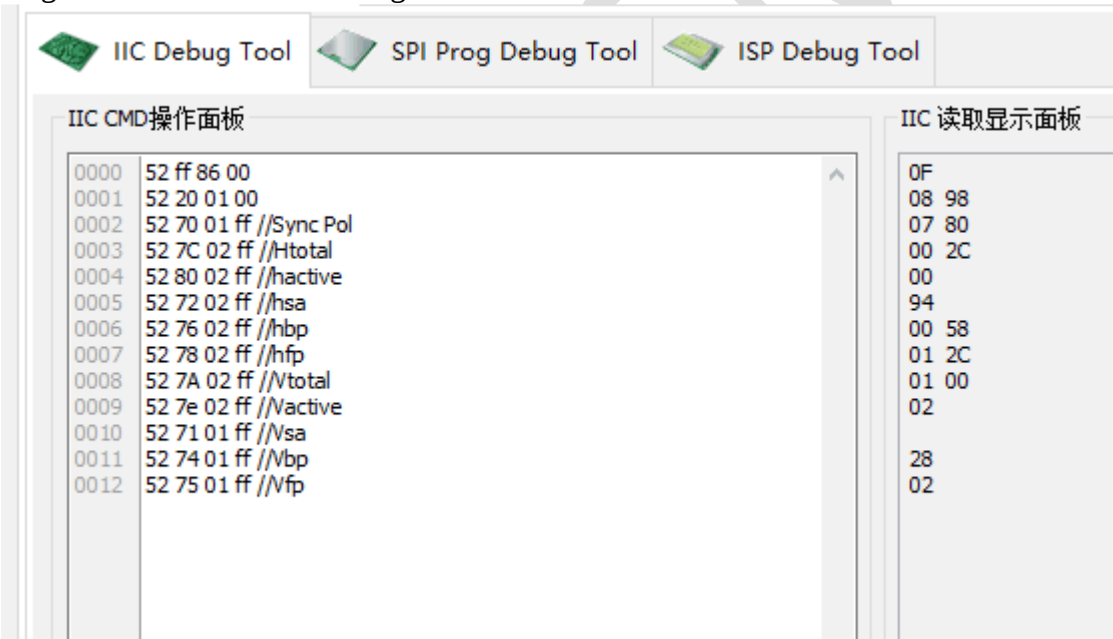
```

124
125 static void lt9211_mipi_rx_pll(void) {
126     int ret;
127     /* deassert pll */
128     ret = lt9211_i2c_write_byte(0xff,0x82);
129     PRINT_ERROR_LINE(lt9211_struct, ret)
130     ret = lt9211_i2c_write_byte(0x2d,0x48);
131     PRINT_ERROR_LINE(lt9211_struct, ret)
132     ret = lt9211_i2c_write_byte(0x35,0x82);
133     PRINT_ERROR_LINE(lt9211_struct, ret)
134 }
135
136 static void lt9211_mipi_pcr(void)
137 {
138     int ret;

```

(7)使用USB转I2C工具，连接I2C接口，用"IICDebugToolsV2"工具读取寄存器的值，并反馈给FAE。

Use the USB to I2C tool to connect to the I2C interface, and use the "IICDebugToolsV2" tool to read the register value and send the log to FAE.



(8)可读取的寄存器请联系FAE，索取寄存器手册。

For readable registers, please contact FAE for the register manual.

(9) 确认是否接收了正确的视频信号，通过读Video check 寄存器。

Confirm that the correct video signal has been received by reading the Video check register.

(10) 确认是否稳定的恢复了时钟信号，通过读Pixel Clock 寄存器。

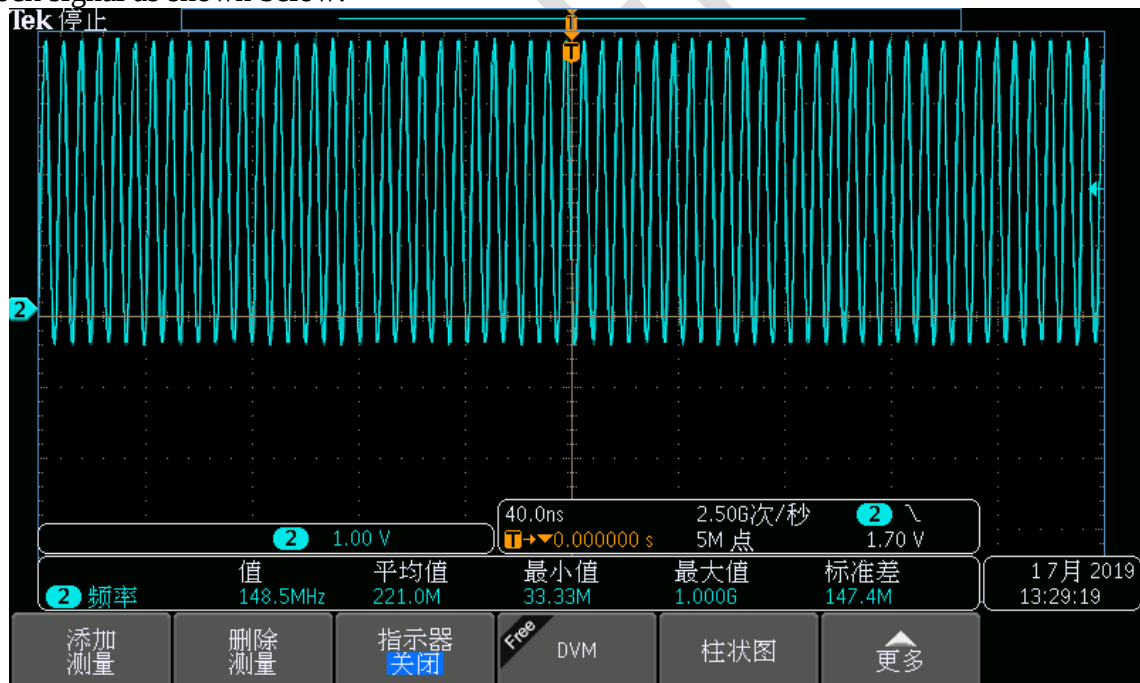
Confirm that the clock signal is recovered steadily by reading the Pixel Clock register.

(11)确认输入信号和输出信号的分辨率和图像格式是否正确。

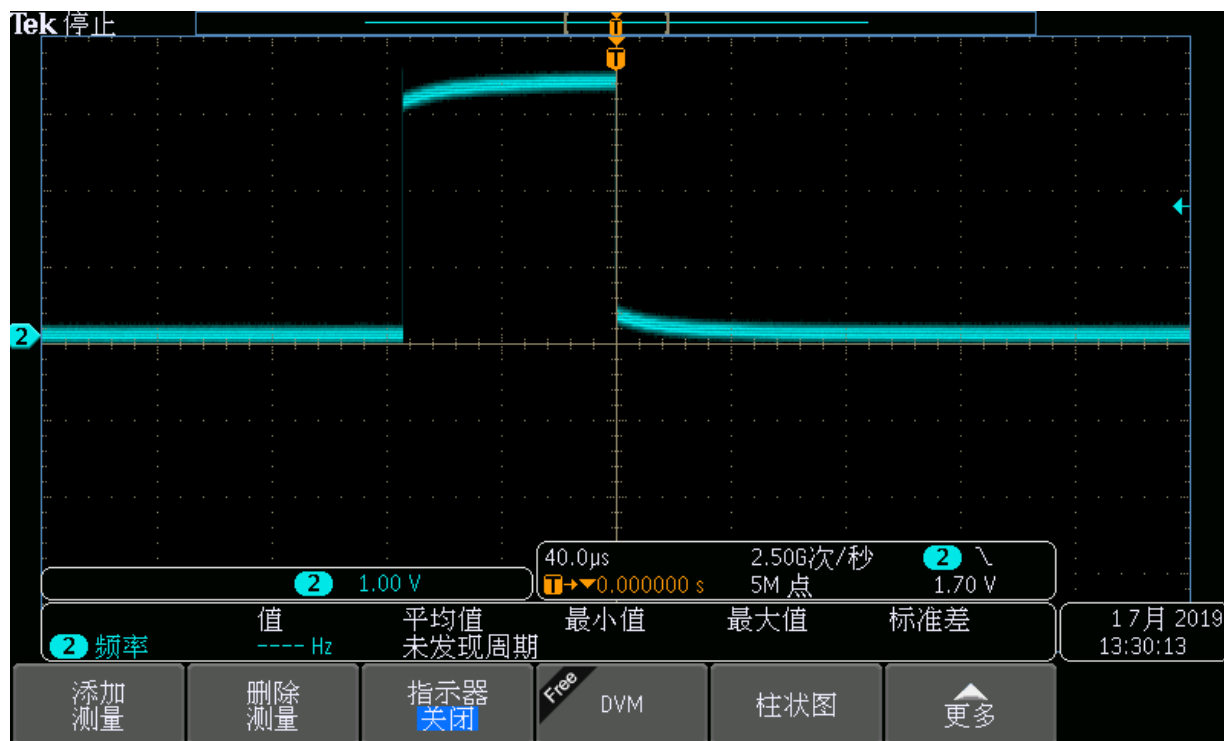
Confirm that the resolution and color format of the input signal and output signal are correct.
(12)检查输入输出线顺。

Check the input and output line order.

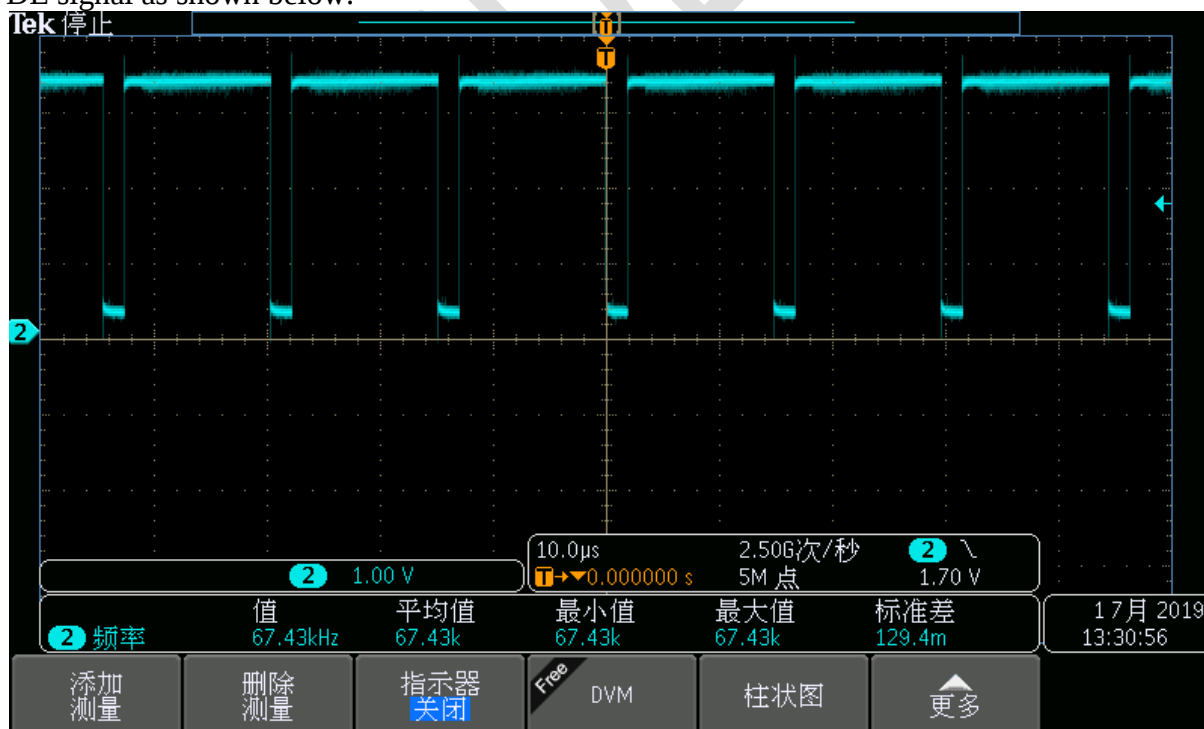
TTL clock signal as shown below:



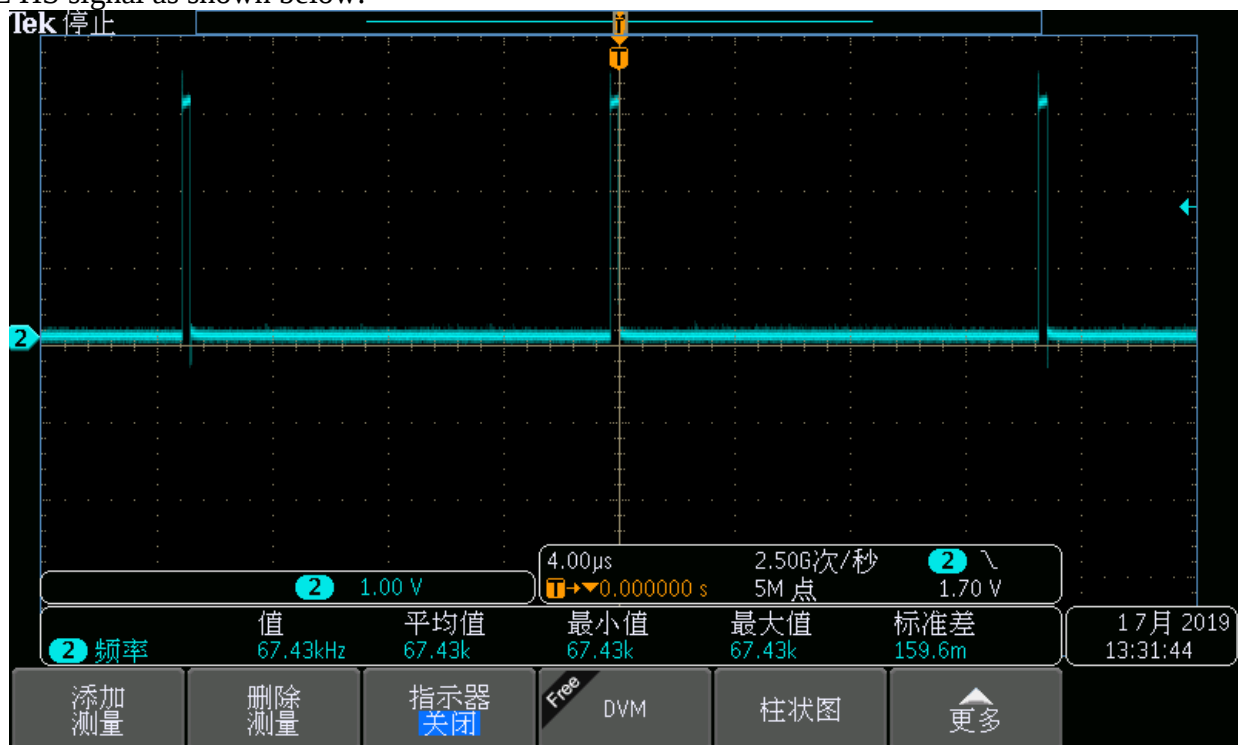
TTL VS signal as shown below:



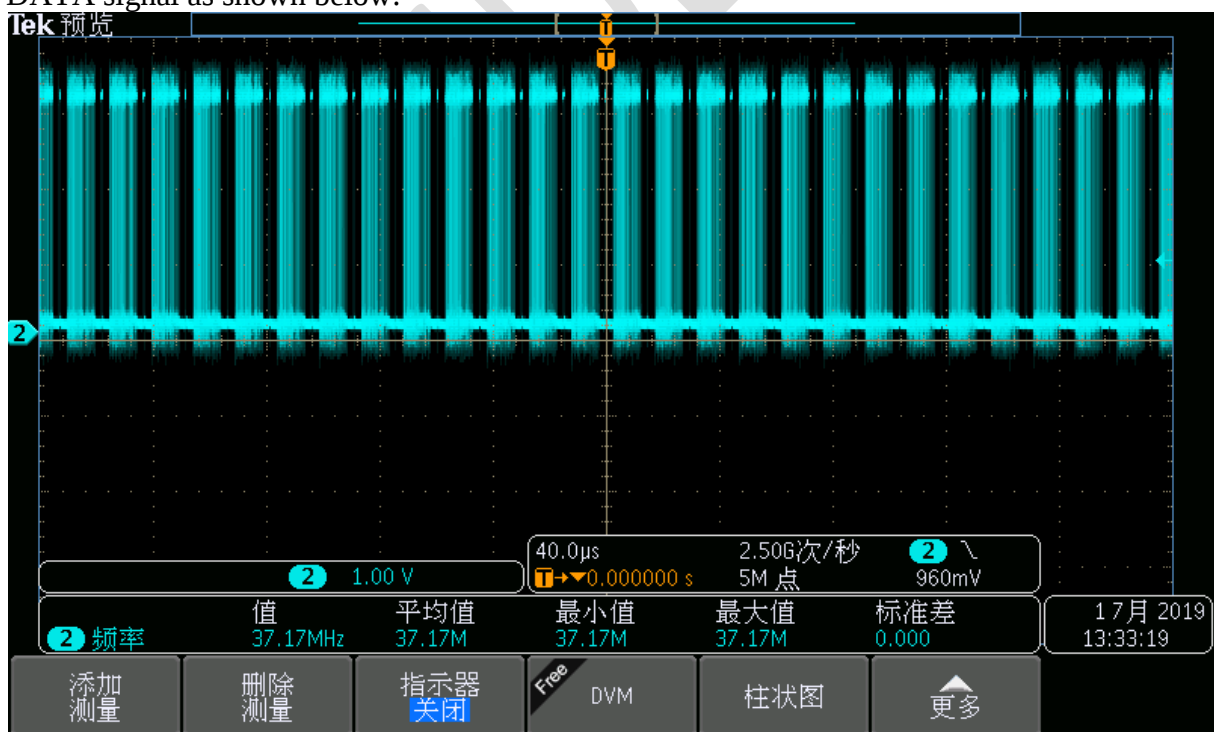
TTL DE signal as shown below:

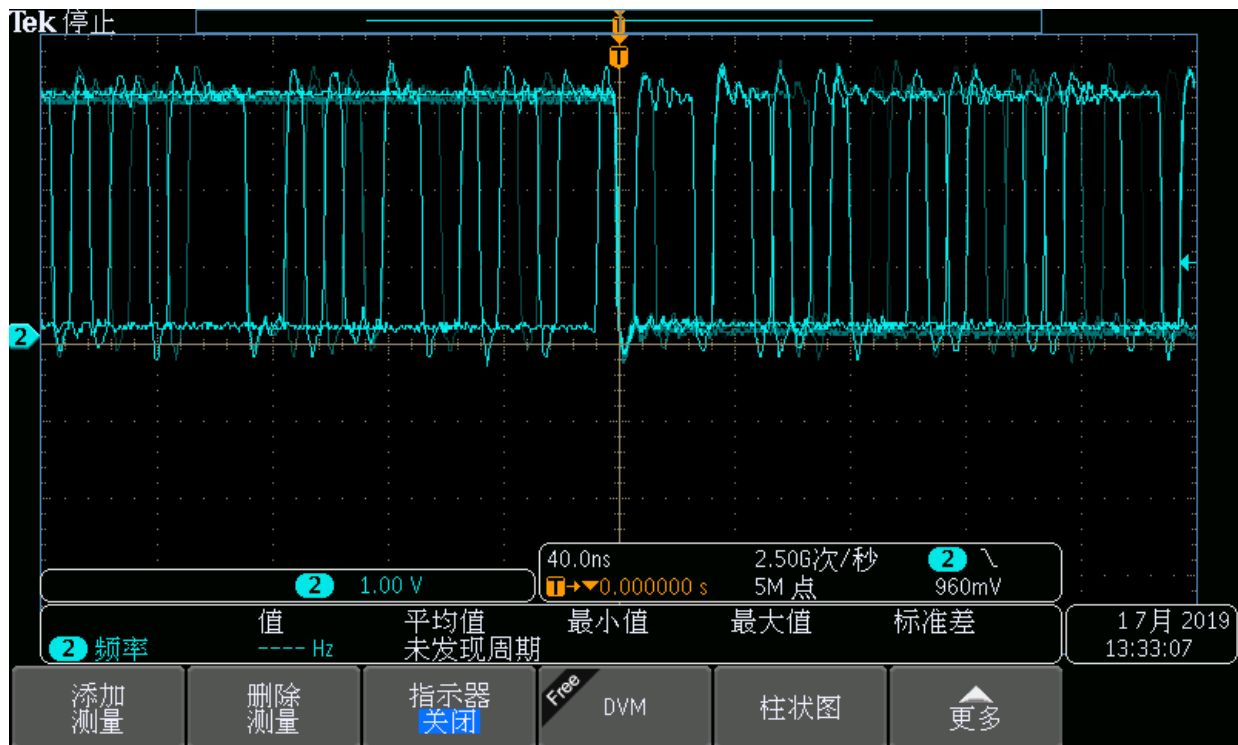


TTL HS signal as shown below:

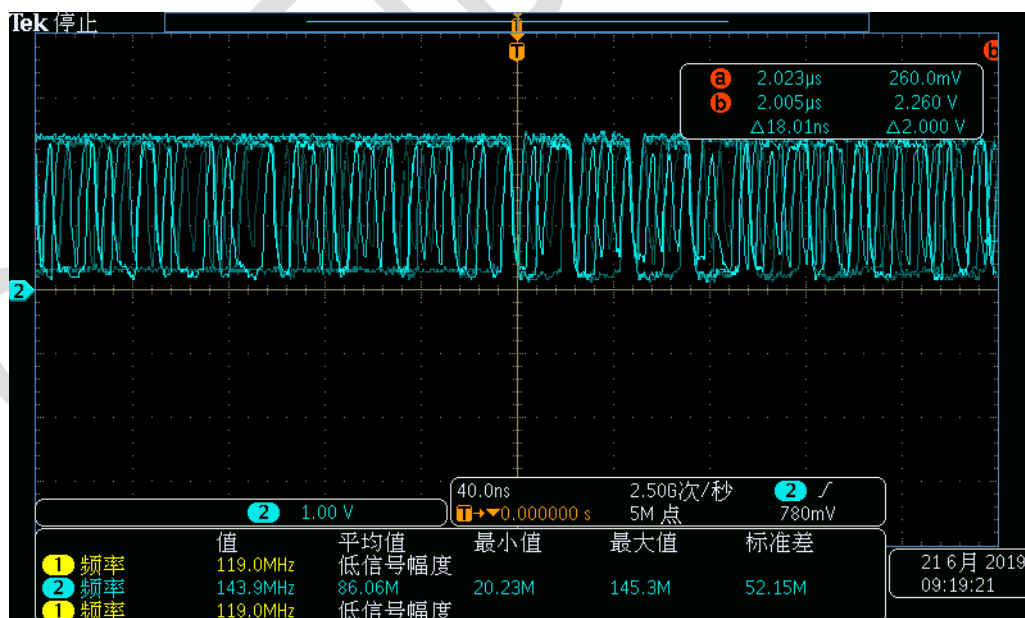


TTL DATA signal as shown below:

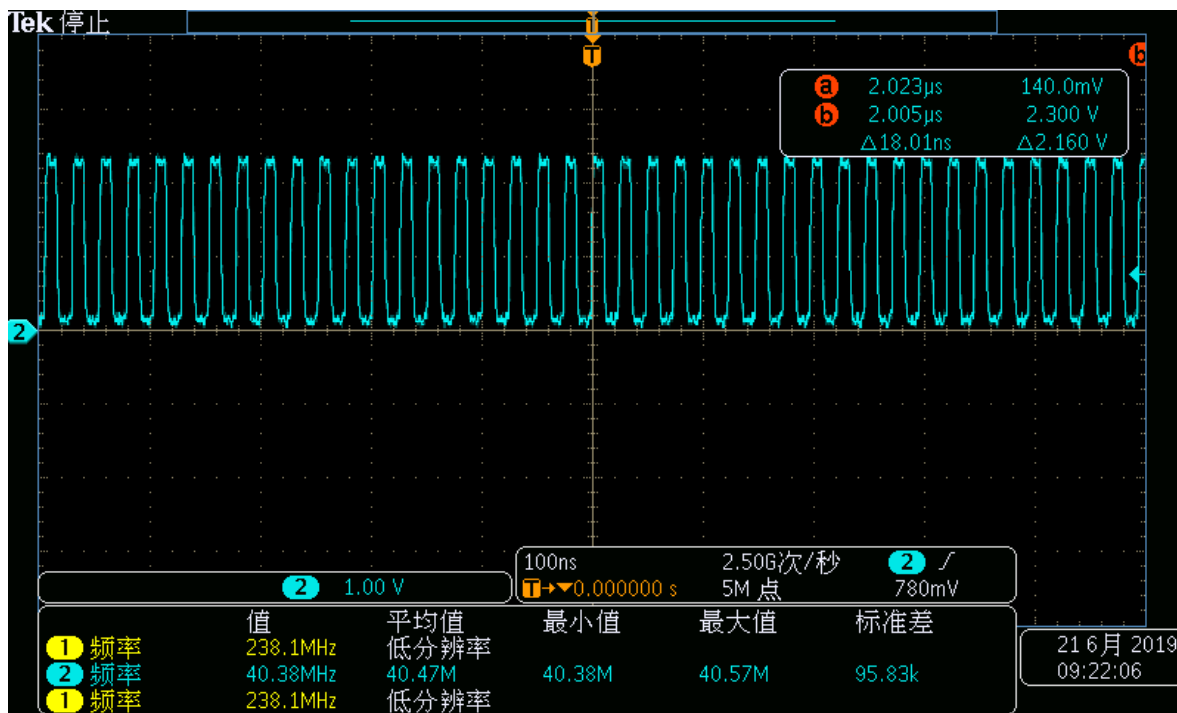




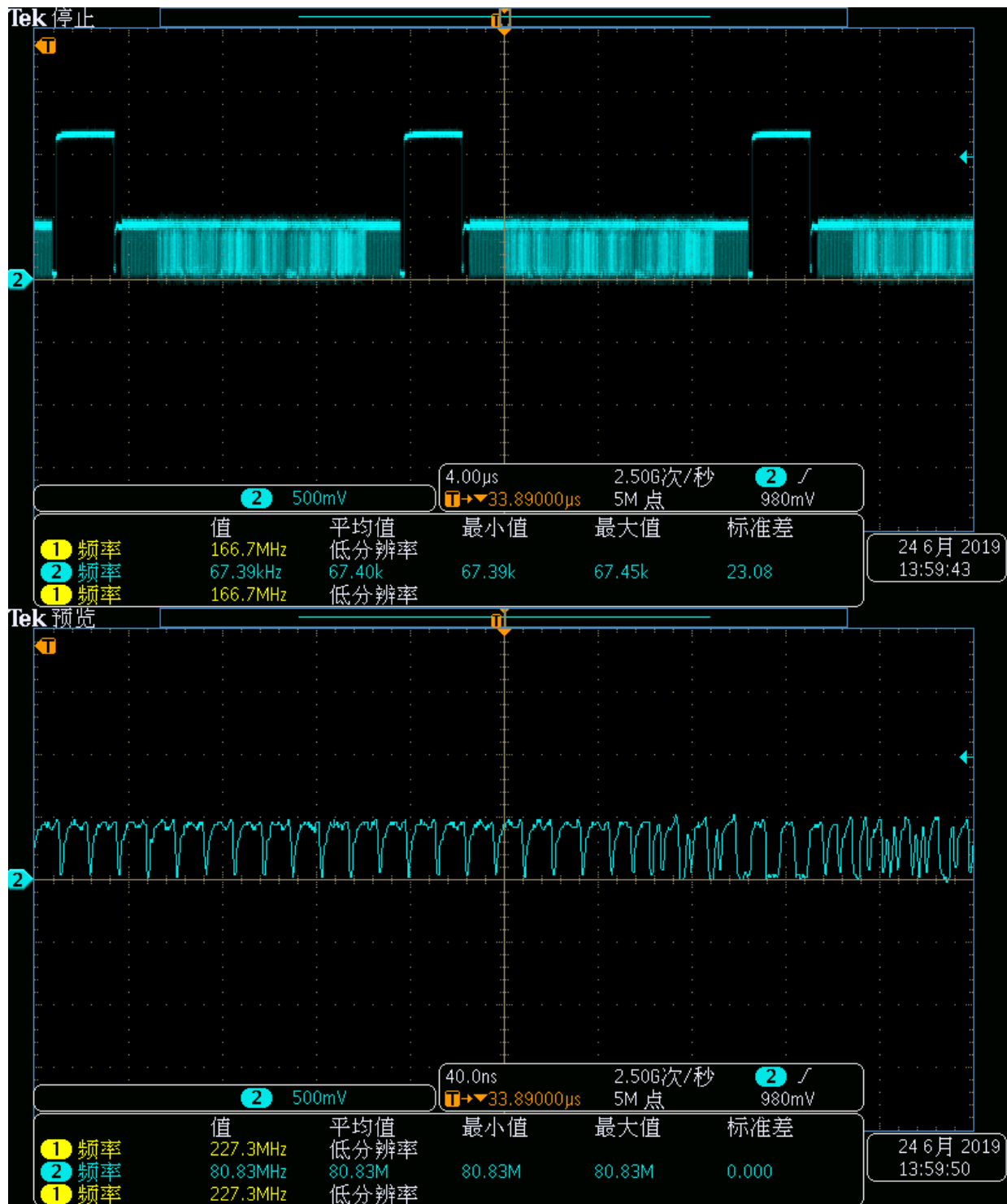
LVDS data signal as shown below :



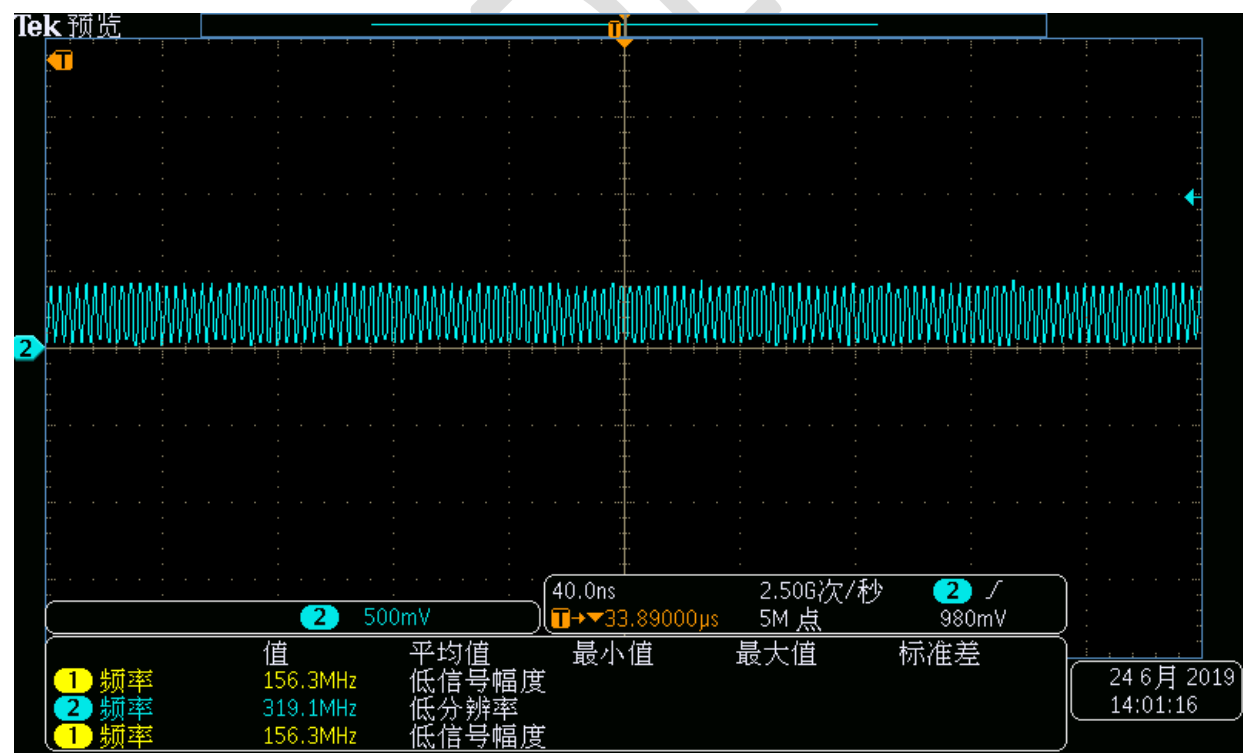
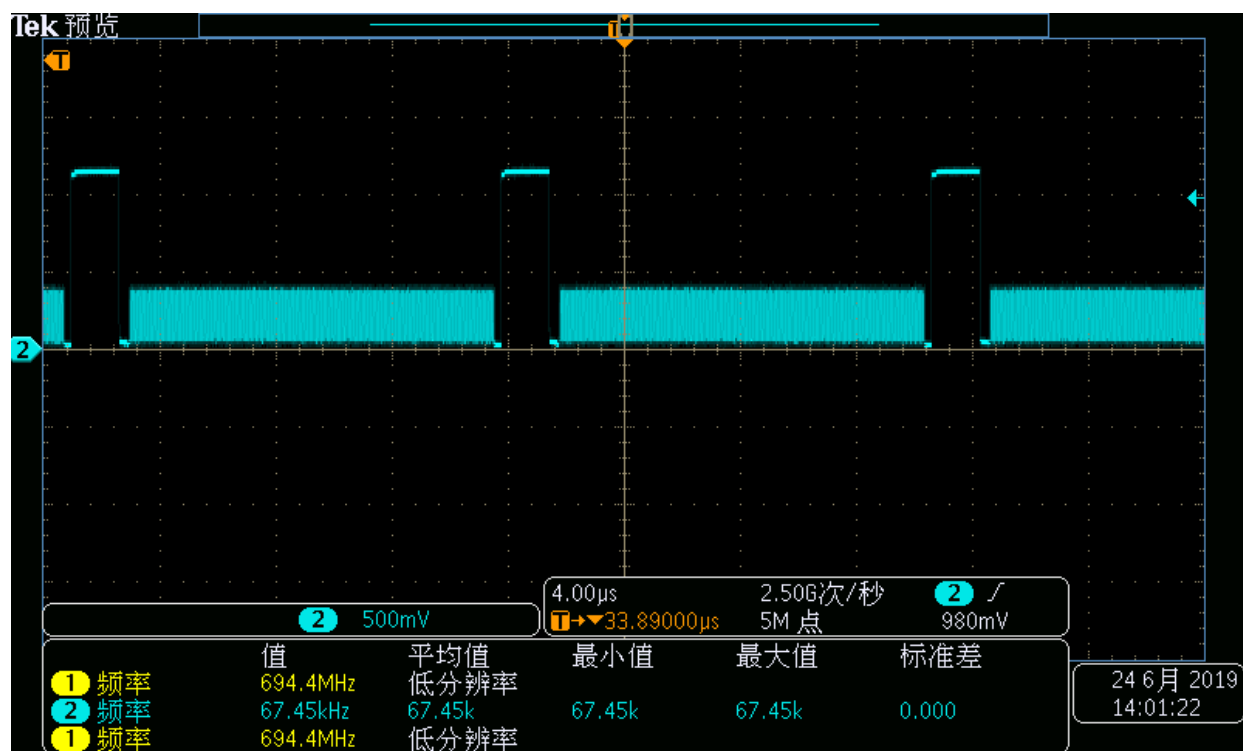
LVDS clock signal as shown below:



MIPI data signal as shown below:



MIPI clock signal as shown below:



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