LT768x Show up TFT Panel Process and Precaution

A. Power Supply

1、Before power on, make sure no short circuit and abnormal.

2、Check if LT768x VDD voltage is stable at 3.3V.

3、Check if LT768x VDD_C voltage is stable at 1.8V.

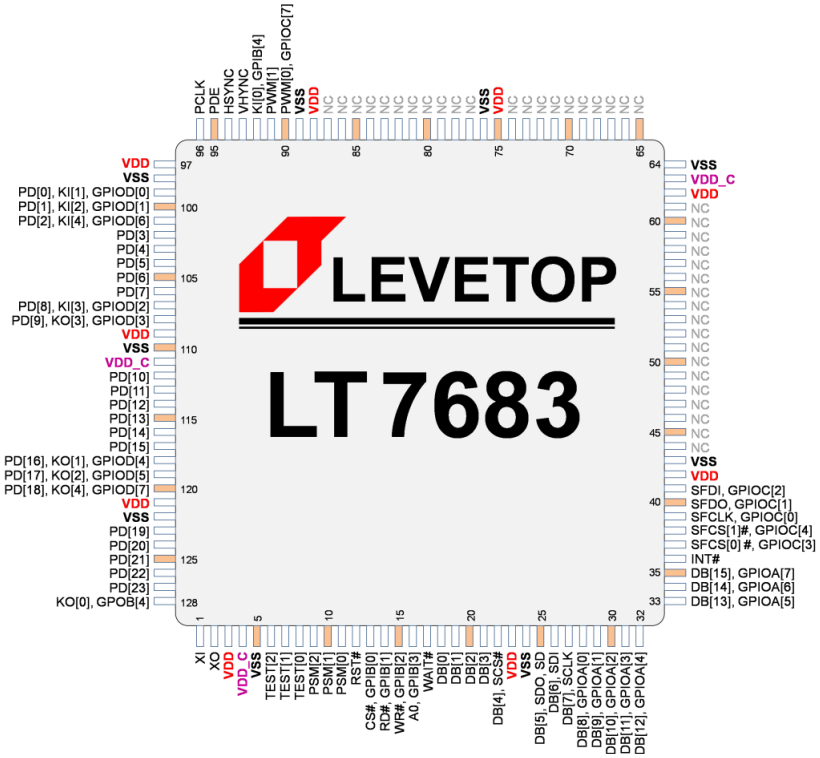

Figure 1：LT7681/LT7683/LT7686 Pin Assignment（LQFP-128Pin）

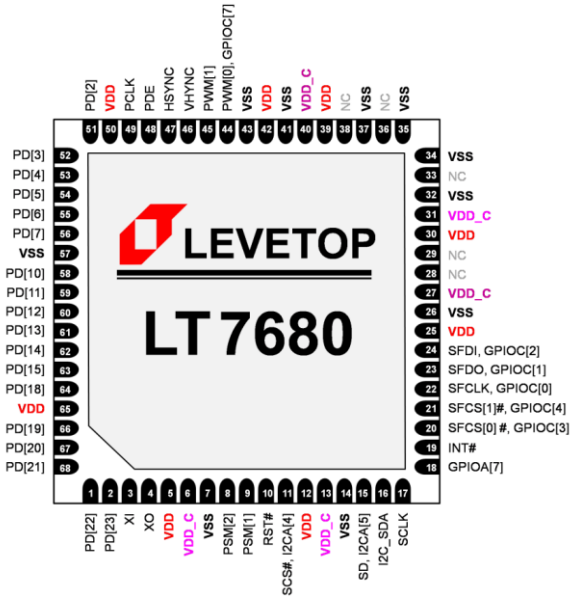

Figure 2：LT7680 Pin Assignment（QFN-68Pin）

B. Crystal

Make sure the clock input or the crystal oscillator (usually 10MHz) start oscillation (measured with an oscilloscope). If there is no oscillation, check the clock source or the RC circuit of the crystal oscillator used the correct resistor value, or replace the crystal oscillator.

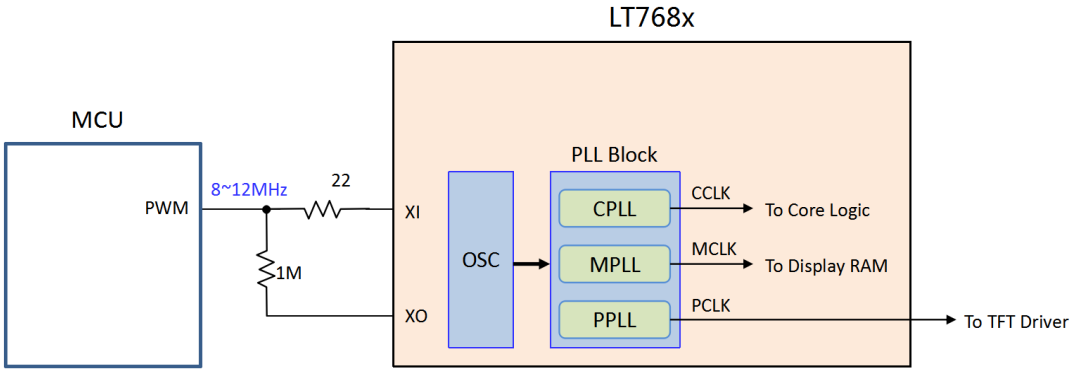

Figure 3：LT768x Clock Circuit - 1

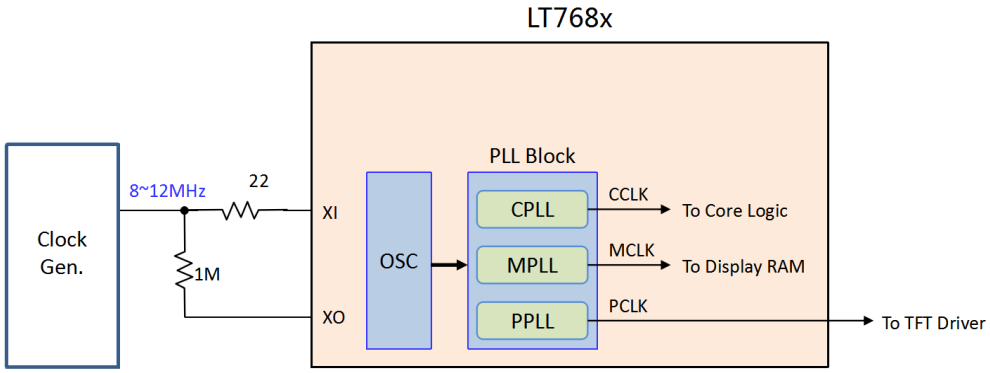

Figure 4：LT768x Clock Circuit - 2

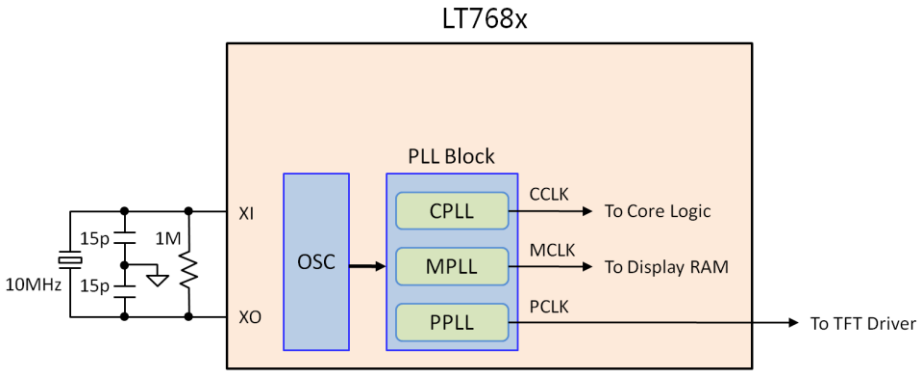

Figure 5：LT768x Clock - 3

C. Reset

Confirm that the RST# reset pin can be properly controlled by the MCU. This pin should be high potential after reset.

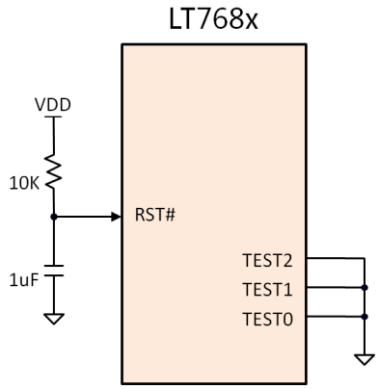

Figure 6：External Reset Method - 1

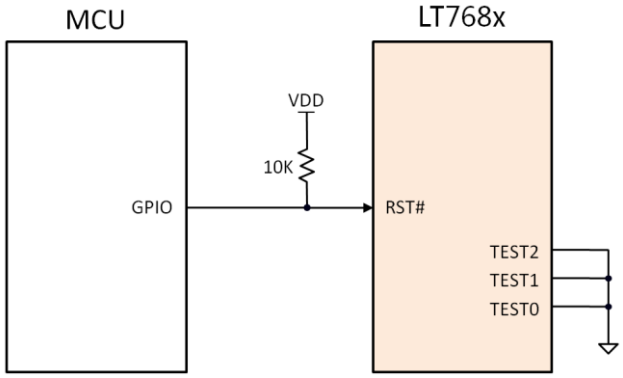

Figure 7：External Reset Method - 2

D. Test Pin

Confirm that the TEST[2:0] pins are grounded (Figure 6, Figure 7). If you are using the LT7680A/B model, ignore this step.

E. MCU Interface

1、 As per different MCU interface, check if it match LT768x PSM[2:0] pin setting

Figure 1：LT7681/3/6 MCU interface mode

PSM[2:0]	MCU interface mode
0 0 X	8bits or 16bits 8080 parallel interface mode
0 1 X	8bits or 16bits 6800 parallel interface mode
1 0 0	Serial 3 wire SPI mode
1 0 1	Serial 4 wire SPI mode
1 1 X	Serial I2C mode

2、The LT7680A/B only supports serial 3-wire SPI and I2C modes. The PSM[0] pin is already connected to ground inside the IC, while PSM[2] must be connected to high potential. PSM[1] = 0, select serial 3-wire SPI mode; PSM[1] = 1, select serial I2C mode.

Figure 2：LT7680 MCU interface mode

PSM[2:1]	MCU interface mode
1 0	Serial 3 wire SPI mode
1 1	Serial I2C mode
0 X	Not allowed

3、The wire from MCU interface to LT768x should be less than 15cm as possible as you can. If the wire is too long, it needs to add a pull resistor or reduce the transmission speed.

F. Initialize

1、Check if the MCU is running program, and check if the system initialization passes after power-on. If not, check if the peripheral circuit of the MCU is normal.

2、Make sure the MCU successfully resets the LT768x, that is, if the "System_Check_Temp" function passes after reset. If not, check the interface and reset pin of the MCU and LT768x are properly connected.

3、Make sure the MCU successfully initializes the LT768x. If there is any function does not pass such as the “LT768_SDRAM_initail” function, try to reduce the communication speed of the interface between the MCU and LT768x.

4、Check whether the MCU and the LT768 communicate normally through the Initialization Function provided by the Levetop.

5、Use the Display-ON Function which provided by Levetop to enable the LCD output a normal signal.

G. Display

1、If the above steps are normal, and the MCU program has controlled the LT768x output , such as red, green, and blue, and if there is no picture is displayed, then first check whether the LT768x LCD output signals PCLK, DE, HSYNC, and VSYNC have Waveform output. Make sure the waveforms are correct (measured with an oscilloscope), and there signals are sent to the FPC of the TFT panel. If there is no waveform, check if the chip has solder joints or replace the chip.

2、If the LT768x's LCD output signals PCLK, DE, HSYNC, and VSYNC have no waveform output, check if the “Display On” function was executed.

3、If the LT768x's LCD output signals PCLK, DE, HSYNC, and VSYNC has a waveform output, check if the PCLK frequency matches the panel and if the HSYNC and VSYNC timings are setting correctly (active high or active low) .

4、If the LT768x's LCD output signals are normal, check if the panel driver circuit voltage. And the backlight circuit (LEDA+, LEDK-) voltage meets the panel requirements. If the voltage is not match or no voltage, check and adjust the circuit.

5、If the panel has a Display ON/OFF control pin, double check whether the level of the secondary pin meets the requirements. If it is not meet or low, check and adjust the circuit.

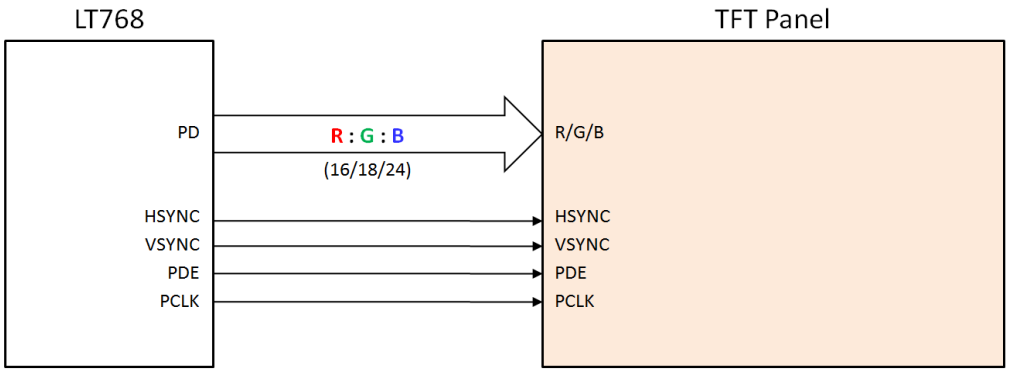

Figure 8: LT768x and TFT Driver Interface

H. SPI Flash

1、If the communication with SPI Flash is failed, first check if the circuit connection between Flash and LT768x is normal, and if there is short-circuit around the flash.

2、SPI Flash Programming: If you use STM32F103 + LT7681/3/6 platform, you can use the STM32_BinToFlash program to programming Flash (Please contact us for documents). If you use the LT7680A/B platform, you need to use an external programmer. Noted that when programming the Flash, the reset pin of LT768x should be grounded, otherwise it will not be able to burn.

3、The Flash Bin file needs to be generated by LT_IMAGE_TOOL.exe software. It has the functions of making pictures, bootloader, cursor, font, GIF and WAV bin files, and also has the integration function of bin files.

I. Others

1、Users can refer to the LT768x user manual and application note (LT768x_AP-Note_Vxx.pdf). In particular, the application note explains the hardware interface and internal functions of the LT768x, together with the demo kits, libraries, and the schematic diagram allows the TFT module factory or system-side application customers to quickly set up and develop the LT768x, making it easy to get started and shorten the time of development. In addition to hardware and software setup instructions, the manual also introduces the STM32+LT768 demo board, STC8051+LT768 demo board provided by Levetop, and the TFT module design guidance based on LT768x to the for the factory, the flash burn methods.

2、For different MCUs, different serial/parallel ports, 24bit RGB or 16bit RGB, Levetop provides a simple Demo program (STM32+LT768 Simple DEMO.rar, STC8+L768 Simple DEMO.rar), allow users to quickly show up the TFT panel. Please download the simple Demo program from our website Http://www.levetop.cn/en or contact us.