

LT768x Schematic Check Flow

1. LT768x clock input can use the MCU's PWM output (Figure 1), the active crystal, or the quartz crystal (Figure 2, typically 10MHz). Because MCU usually have multiple channels of PWM outputs, it is recommended to provide one channel for LT768x, which can save the cost, too. The shorter the clock signal line, the better, and try to avoid other signal lines. If you want to use a quartz crystal, it is recommended to use a four-pin 3225 package 10M crystal, and the 15pF capacitor on the crystal 2 end does not need to be soldered.

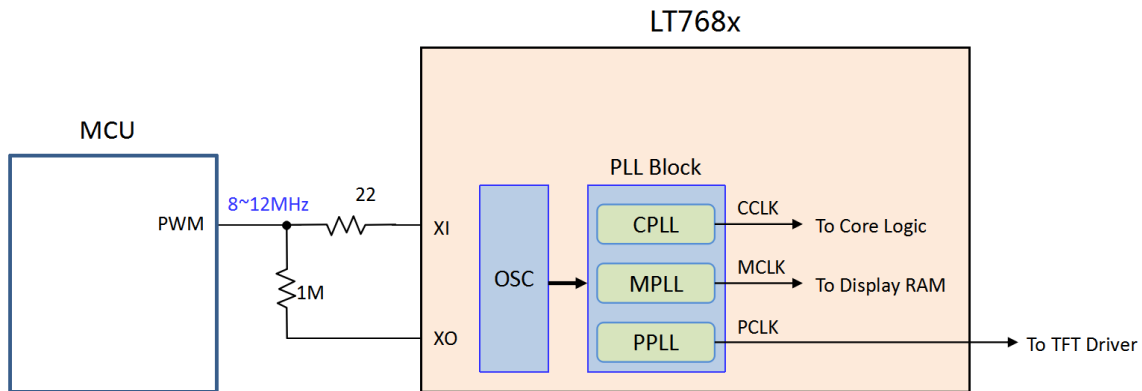


Figure 1: LT768x Clock Circuit - 1

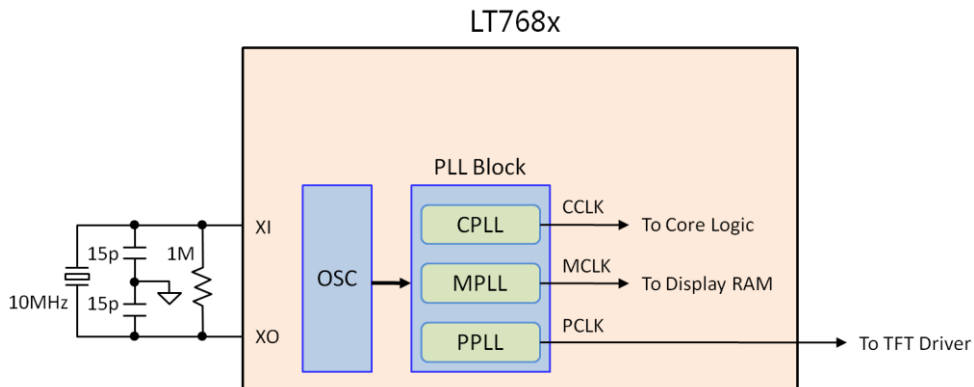


Figure 2: LT768x Clock Circuit - 2

2. Check whether any error in correspondent schematic.
3. RGB interface: check if PCLK, PDE, HSYNC, VHYNC corresponds to panel interface; series resistor reserve a test point; data line must be aligned high; If panel require SPI initialize, SPI should reserve a test port.
4. Check whether IC power supply is correct?
5. VDD_3.3V: whether the filter capacitor 0.1uF is connected.
6. VDDC_1.8V: whether filter capacitor 1uF and 0.1uF is connected.
7. PWM[0] : whether reserved 10K pull-up resistor is added? (display initialize picture)
8. MCU interface setting : check if PSM[2:0] corresponds to MCU interface.

Pin #	Pin Name	I/O	Pin Description												
9~11	PSM[2:0]	I	Host Interface Selection <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>PSM[2:0]</th> <th>Host I/F Mode</th> </tr> </thead> <tbody> <tr> <td>0 0 X</td> <td>8bits or 16bits 8080 Parallel Interface Mode</td> </tr> <tr> <td>0 1 X</td> <td>8bits or 16bits 6800 Parallel Interface Mode</td> </tr> <tr> <td>1 0 0</td> <td>3-Wire SPI Mode</td> </tr> <tr> <td>1 0 1</td> <td>4-Wire SPI Mode</td> </tr> <tr> <td>1 1 X</td> <td>I2C Mode</td> </tr> </tbody> </table> <p>If Host interface set as parallel mode, then PSM[0] pin is external interrupt input pin.</p>	PSM[2:0]	Host I/F Mode	0 0 X	8bits or 16bits 8080 Parallel Interface Mode	0 1 X	8bits or 16bits 6800 Parallel Interface Mode	1 0 0	3-Wire SPI Mode	1 0 1	4-Wire SPI Mode	1 1 X	I2C Mode
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Figure 3: LT768xMCU Interface Setting

9. Check if SPI Flash download interface is connected:

flash 外接下载接口

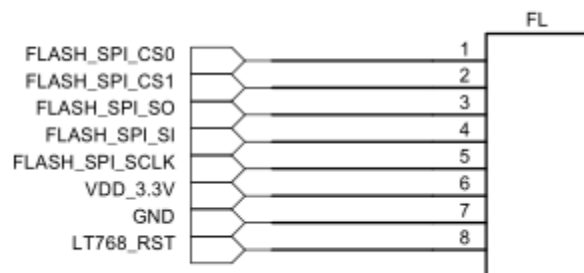


Figure 4: SPI Flash Download Interface

10. 768 RESET pin should be pull out, it will be used when burn FLASH
11. Does the component's parameter value / voltage value reasonable? Does it meet the circuit requirements?
12. Does the schematic need to be reviewed with second party engineers?
13. Use MCU GPIO or PWM output to control the Enable of backlight, and add the pull-down and capacitor to avoid the panel flash when power on.

14. EMC Interference and anti-interference :

- Use high quality components(filter capacitor) in power supply filter circuit
- 3.3V DC to DC power input and output, add Choke (magnetic beads) in addition to filter capacitor. (Figure 5, 6)
- TFT panel back light DC to DC power input and output, add Choke (magnetic beads) in addition to filter capacitor. (Figure 7, 8)

- Add RC circuit on MCU to LT7680 SPI CLK. (Figure 9).
- Add RC circuit on LT7680 to SPI Flash CLK. (Figure 10).
- Coat the TFT FPC. (Figure 11).
- Add series resistor on LT768 RGB output
- Add series resistor and GND capacitor on PCLK, PDE, HSYNC, VHYNC. (Figure 12).
- Add ESD components.
- Add grounded metal shield on LT768 and MCU.

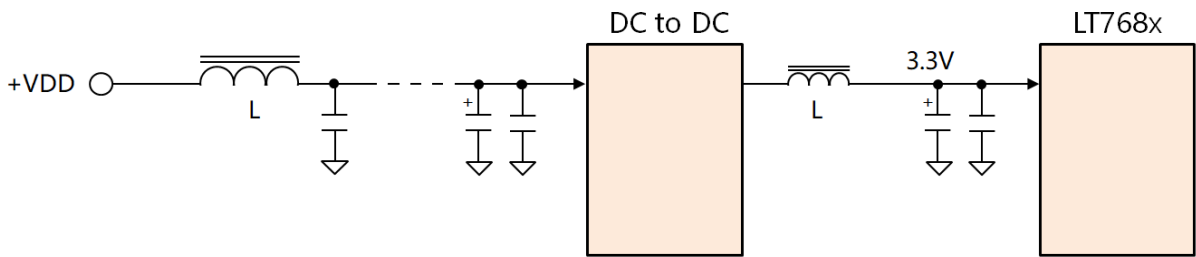


Figure 5: 3.3V DC to DC Adding LC

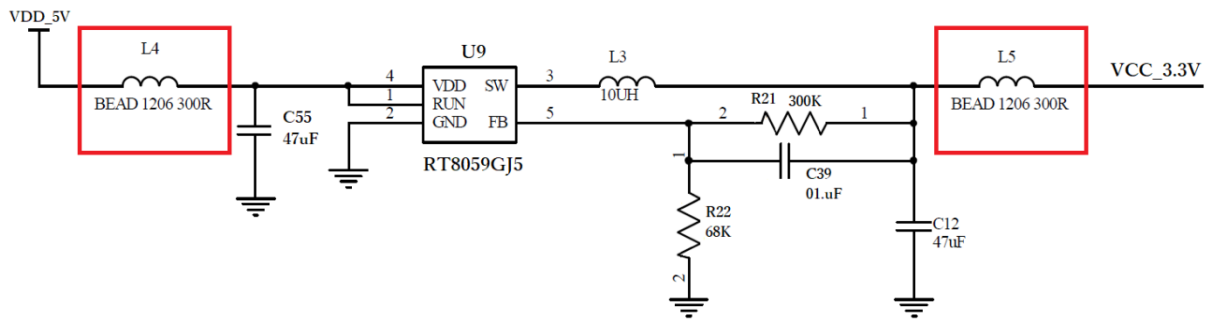


Figure 6: 3.3V DC to DC Example

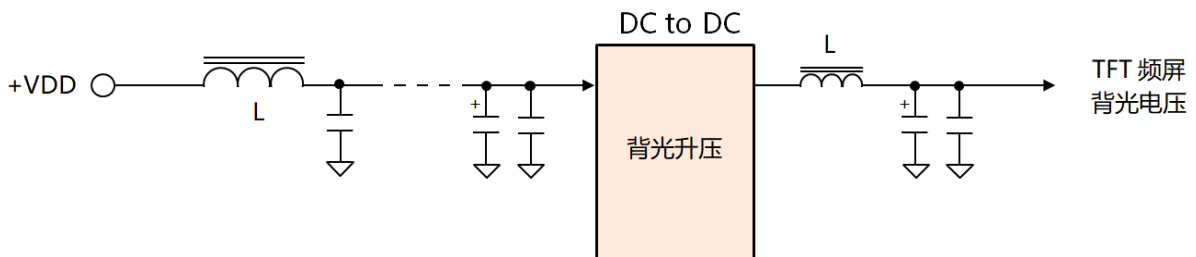


Figure 7: TFT Backlight DC to DC Output/Input Adding LC

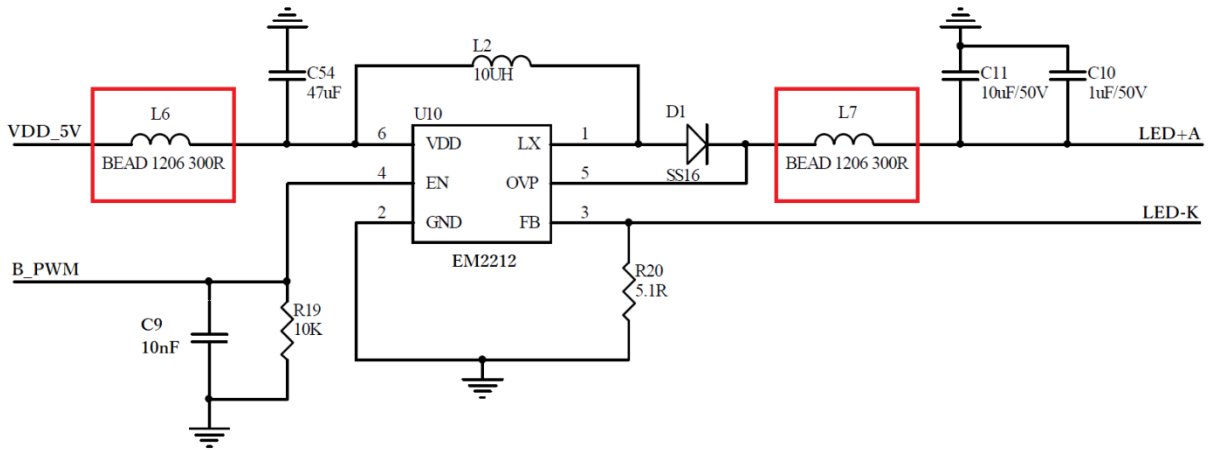


Figure 8: TFT Backlight DC to DC Example

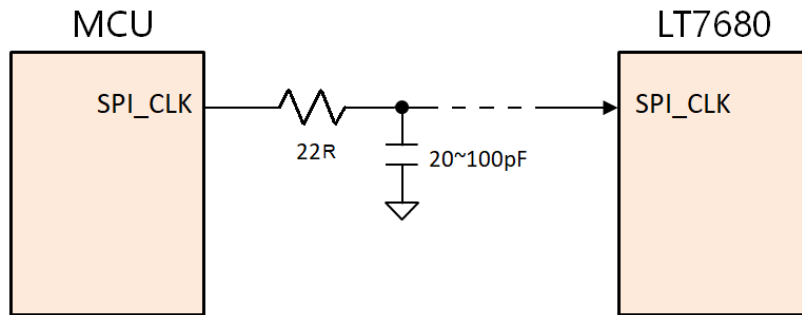


Figure 9: MCU to LT7680 SPI CLK Adding RC

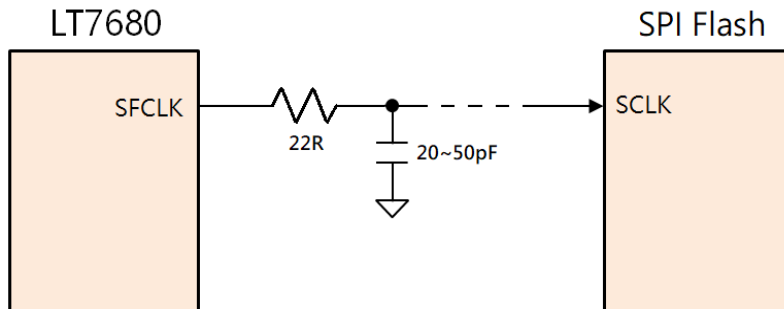


Figure 10: LT768 to SPI Flash CLK Adding RC

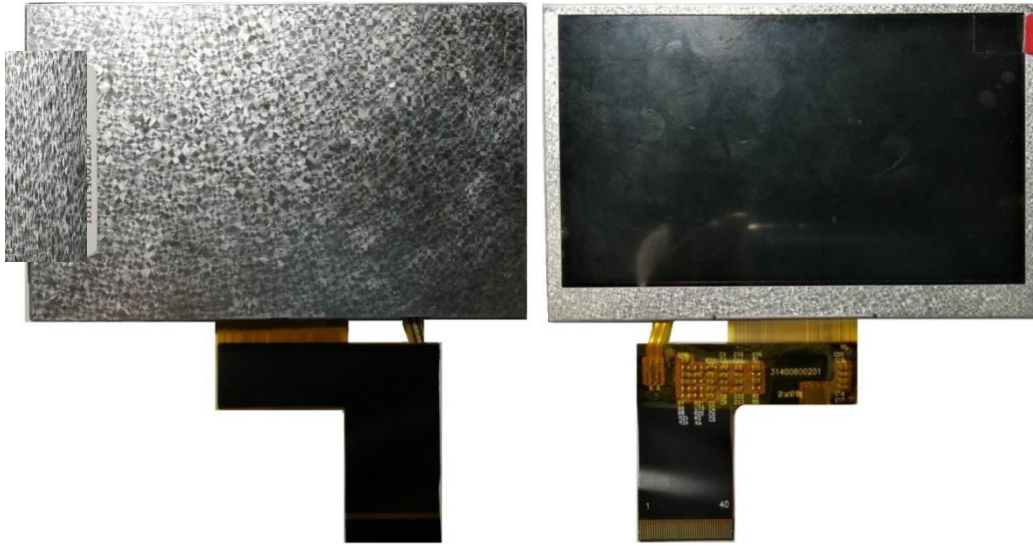


Figure 11: TFT Panel FPC Coating

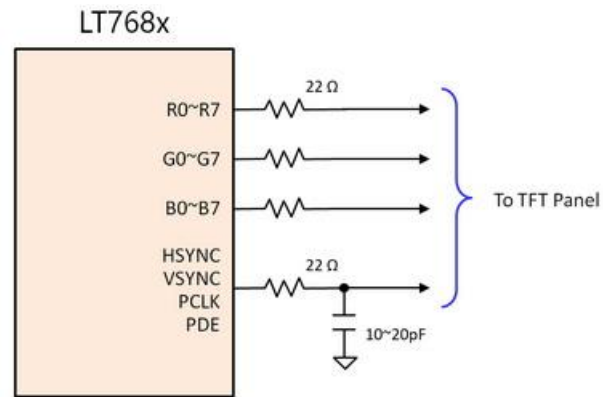


Figure 12: RGB output adding series resistor and GND capacitor

LT768x PCB Layout Check flow

1. There is no error in the PCB schematic.
 2. The spacing between the power supply and the GND should be sufficient to avoid short circuit in the board or soldering.
 3. Under sufficient condition, the line of high current should be expanded and thickened as much as possible and the number of PCB holes should be increased.
 4. The clock or crystal oscillator should be close to LT768. Make sure there no wire under the crystal oscillator and the back of the PCB. . It is recommended to surround the circuit with ground wire.
 5. The area of the ground wire is as large as possible, and adds PCB holes number as much as possible.
 6. The filter capacitor for the LT768 power supply should be close to the IC's power supply pin.
 7. The SPI Flash circuit should be close to the LT768.
 8. Layout inspection, label inspection, connector inspection, positive and negative inspection.
 9. Increase process test points, such as key signals, power supply voltage signals, etc.
 10. Increase the program test point.
 11. Debug test points, such as important signals that are difficult to measure, it is best to lead out test points.
 12. Reserve screw holes or fixing holes for the PCB.
2. Size check and inspection.
 3. Check the structure to avoid the component being too high
 4. Whether the PCB board name and version are clearly marked.
 5. The main core circuit of the LT768+MCU chip is recommended (or reserved) to be covered with a metal cover to increase the anti-interference ability.
 6. The anti-jamming choke should be close to the power input.
 7. The PCB should retain contact or solder joints with the metal frame of the TFT.

