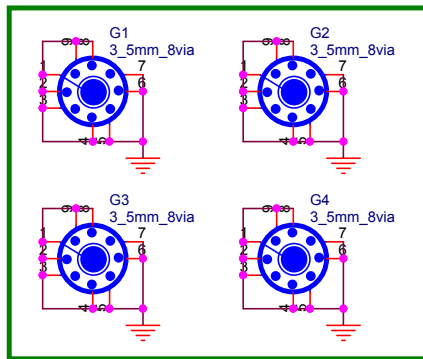
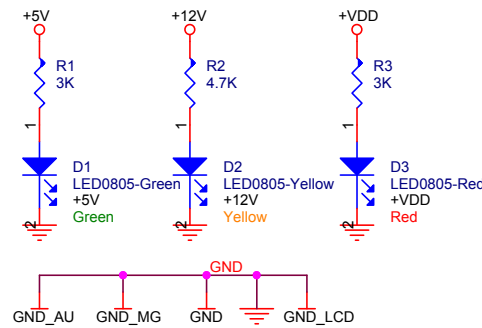


MG04-04A

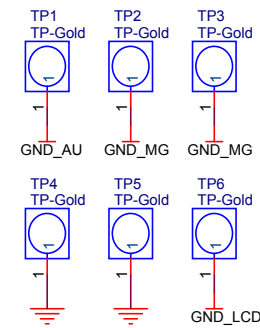
2021.05 GR08-2105B
MG32F02U USB+LCD DMB



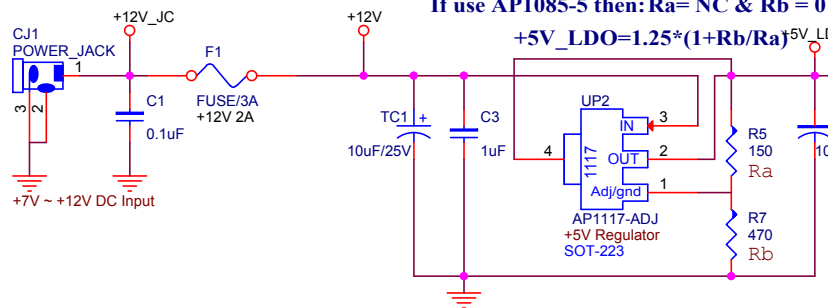
PCB Screw Position



*Short these ground planes on PCB



Power Jack DC 7~12V In



If use AP1085-5 then: Ra= NC & Rb = 0

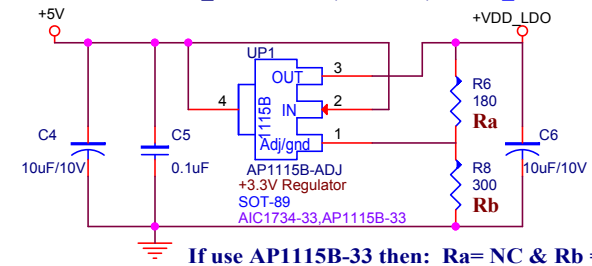
System Power (5V)

+5V about 5.17 volt

$$+5V_LDO = 1.25 * (1 + Rb/Ra)$$

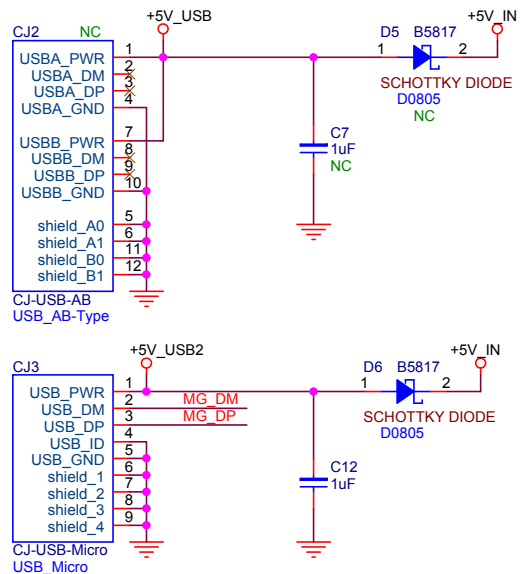
Chip IO Power (3.3V)

$$+VDD_LDO = 1.25 * (1 + Rb/Ra) + VDD_LDO \text{ about } 3.33 \text{ volt}$$

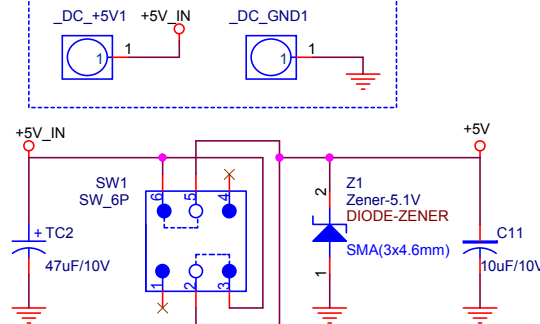


If use AP1115B-33 then: Ra= NC & Rb = 0

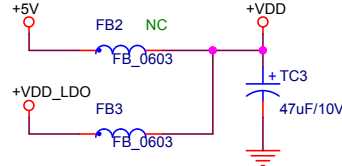
USB Connector



Extra DC Power Con

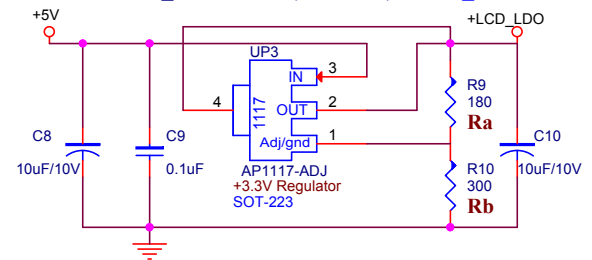


VDD Power

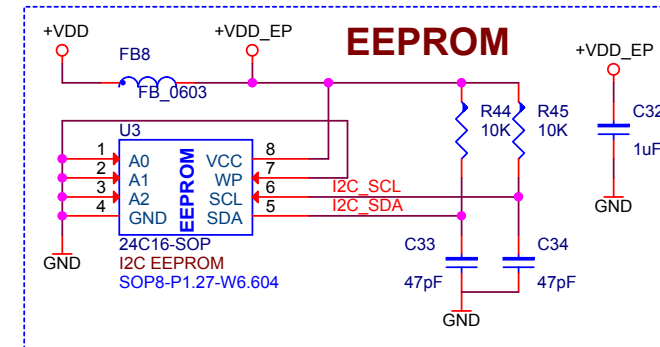
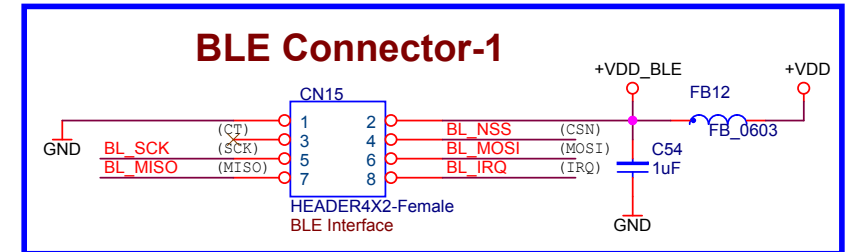
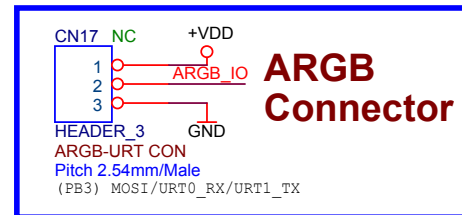
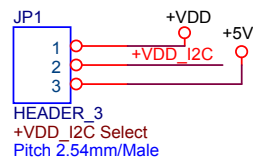
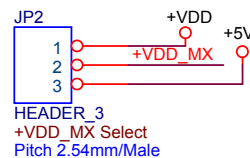
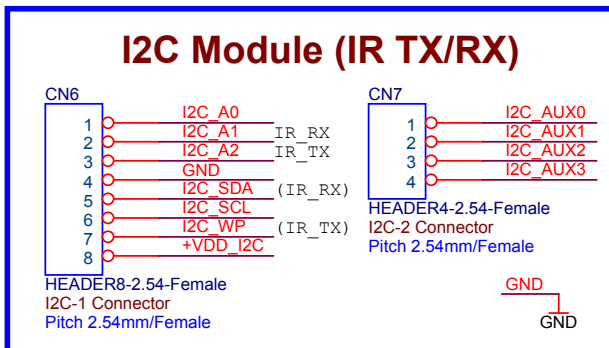
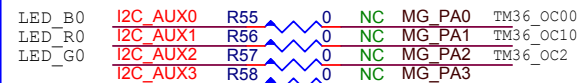
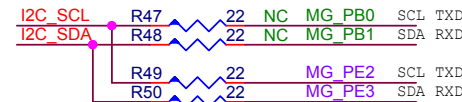
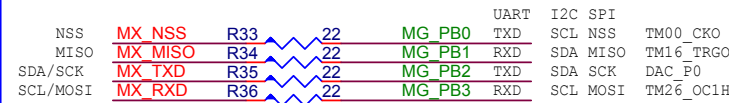
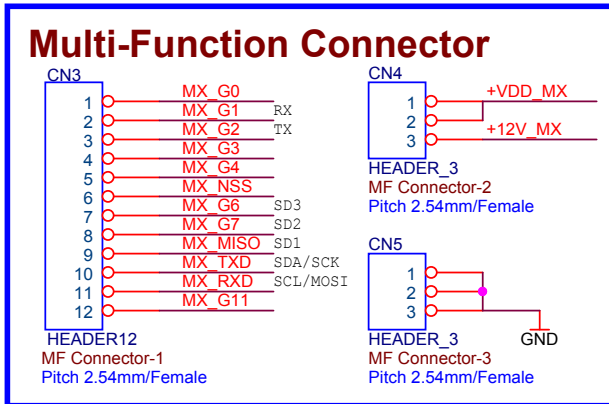
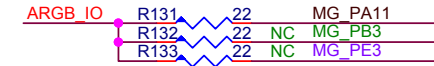
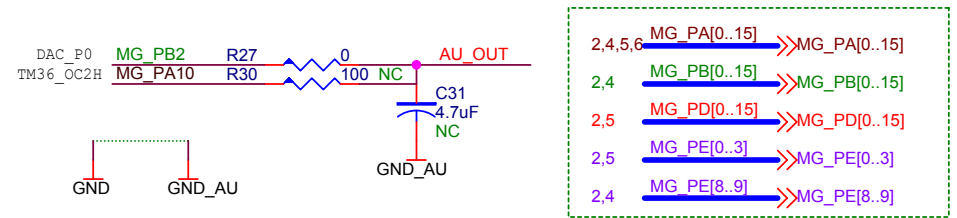
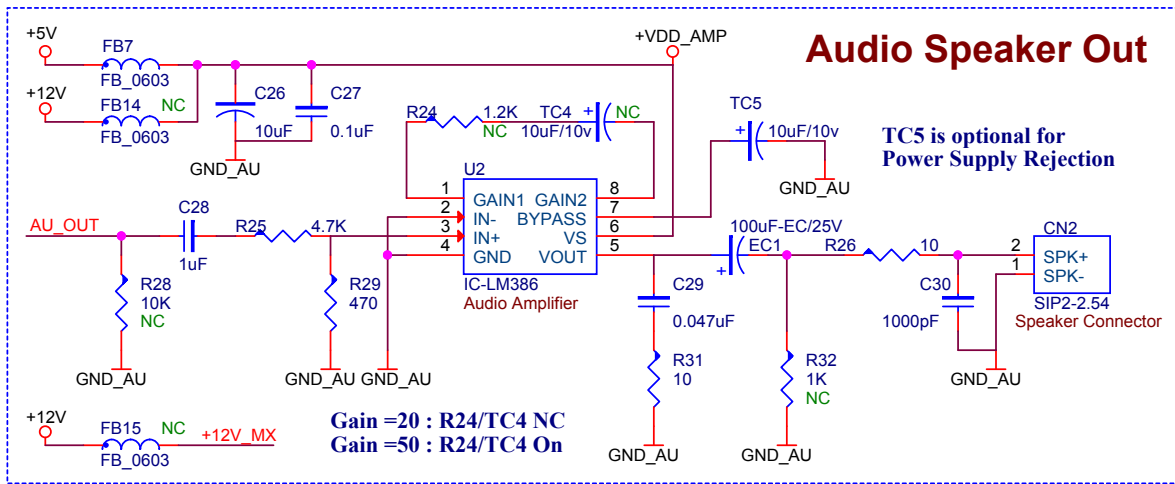


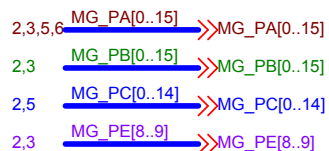
LCD Power (3.3V)

$$+LCD_LDO = 1.25 * (1 + Rb/Ra) + LCD_LCD \text{ about } 3.33 \text{ volt}$$

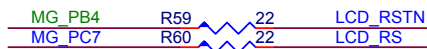


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| | megawin | | |
| | Title | | |
| | System Power | | |
| | Size E | Document Number | Rev 1.1 |
| Date: Thursday, May 27, 2021 | | Sheet 1 | of 9 |

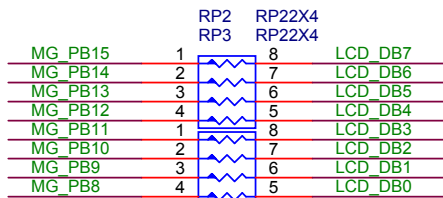
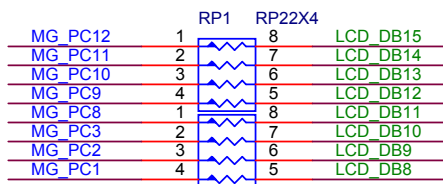
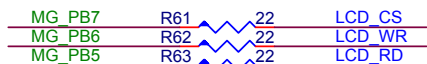




LCD Common IF



8080 LCD IF

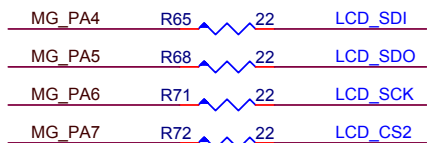


RP4 RP22X4

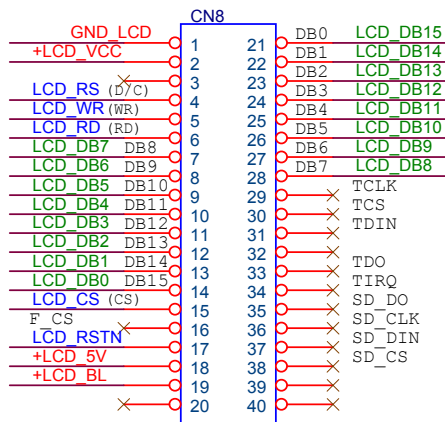
Place RP9~12 on Bottom Side

Swap MG_xx and LCD_DBxx Lsb/Msb nets
 if place on Top Side

SPI LCD IF



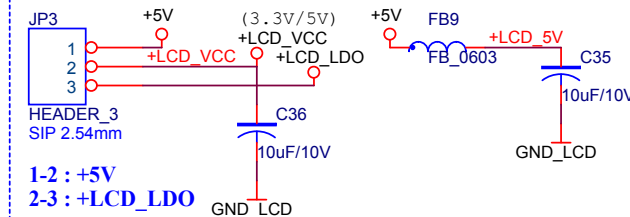
8080 LCD Module-1



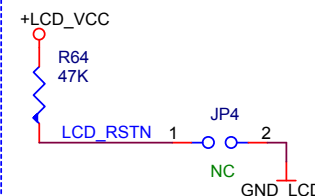
HEADER20X2-2.54-Female
 LCD Module IF

3.2TFT-ILI9341 (240x320)(TFT-320QVT-9341)
 2.4TFT-ILI9325 (240x320)

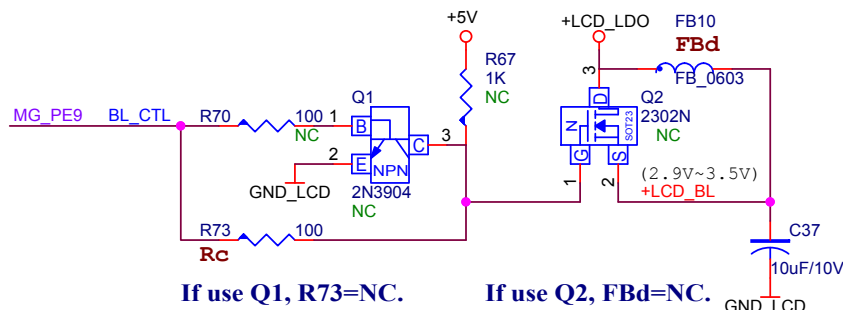
LCD Power



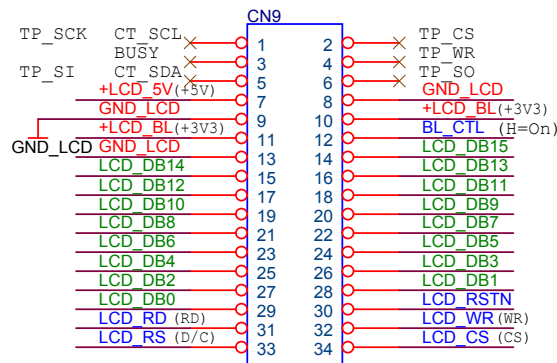
LCD Reset



8080 LCD Backlight Control

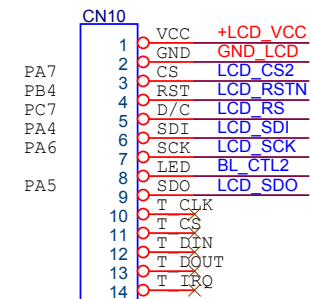


8080 LCD Module-2



4.3TFTLCD (480x800)(ALIENTEK-NT35510)

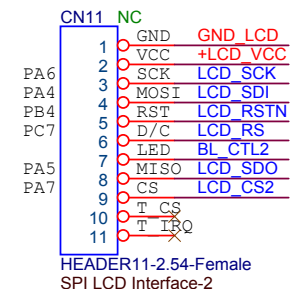
SPI LCD Module-1



HEADER14-2.54-Female
 SPI LCD Interface-1

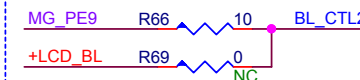
SPI 2.2TFT-ILI9341 (240x320)

SPI LCD Module-2



HEADER11-2.54-Female
 SPI LCD Interface-2

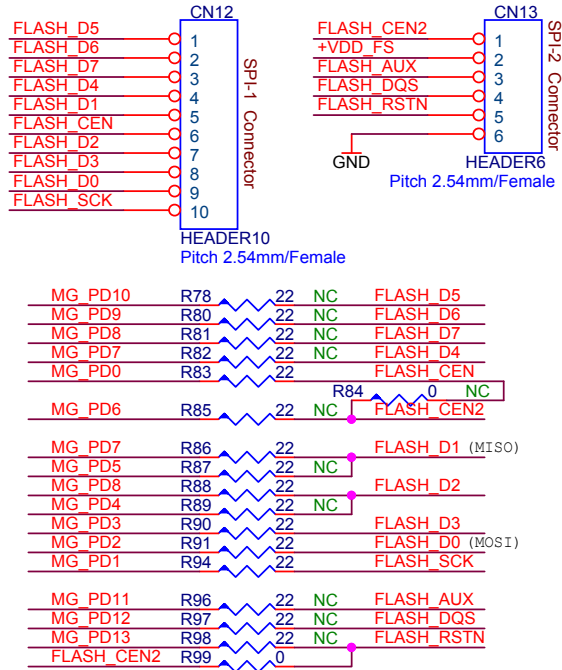
SPI LCD Backlight Control



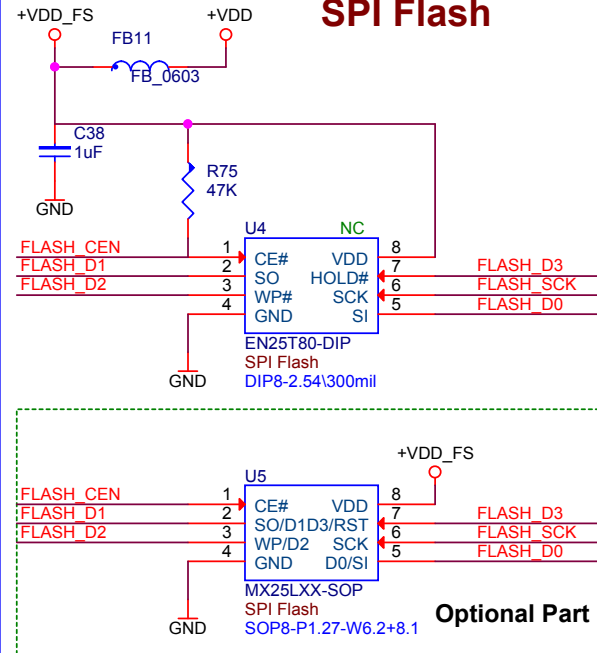
megawin

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|---------------|------------------------|--------------|
| Title | | |
| LCD Interface | | |
| Size C | Document Number | Rev |
| | MG04-04 | 1.0 |
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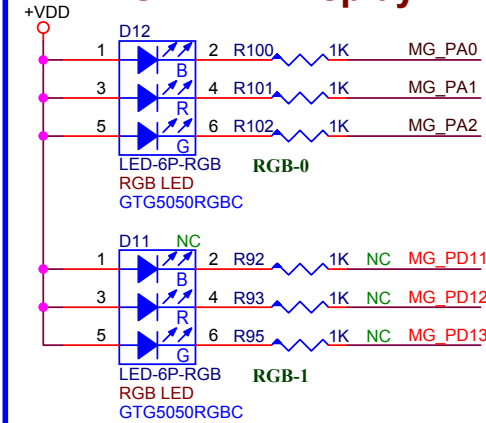
SPI Connector



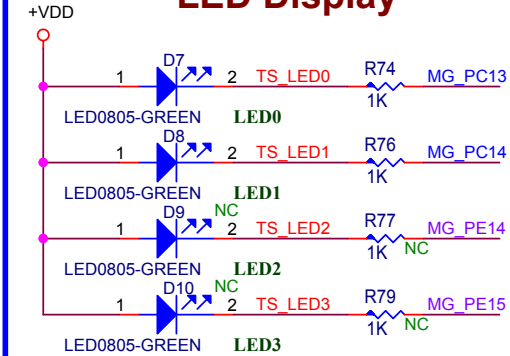
SPI Flash



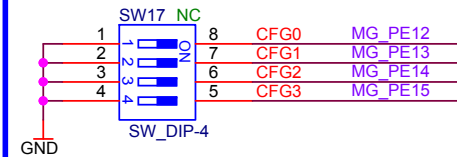
RGB LED Display



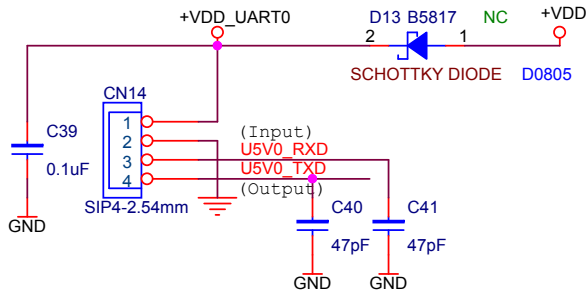
LED Display



CFG Setting

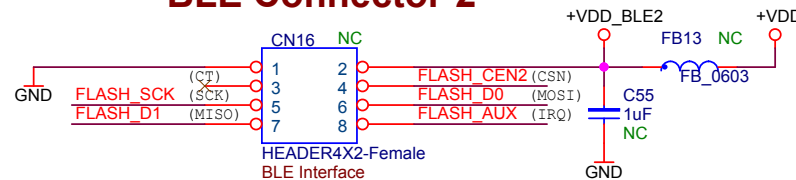


UART Connector-0



These parts close to CN14

BLE Connector-2



megawin

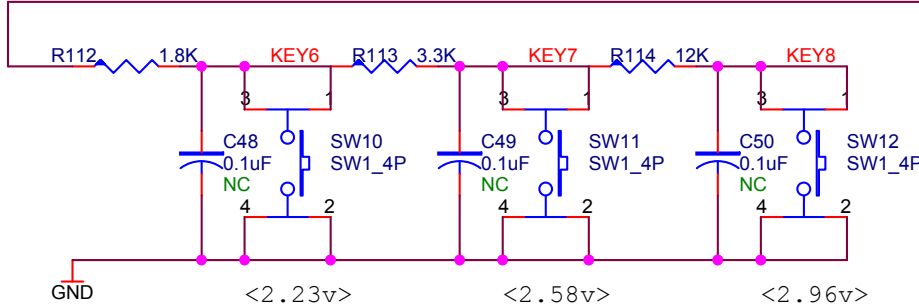
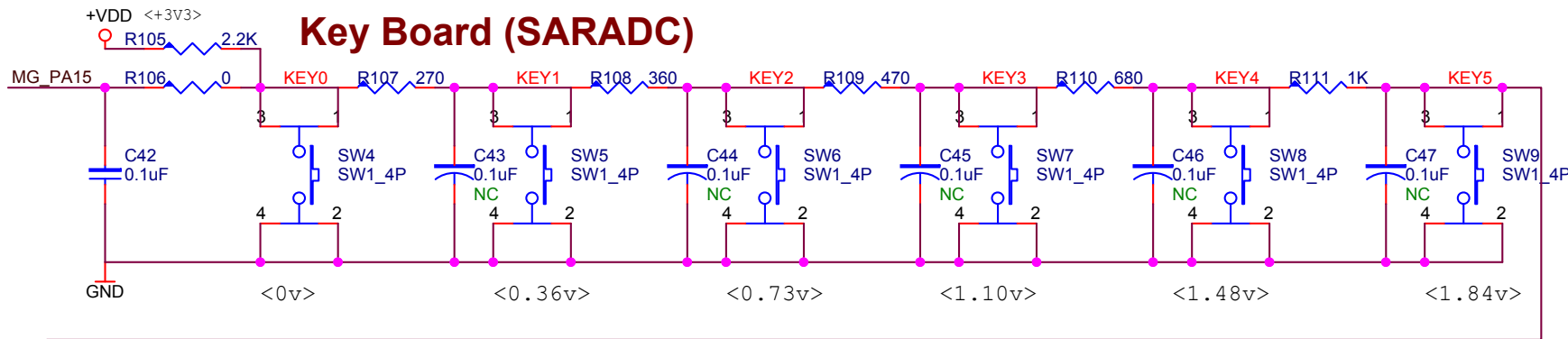
SPI Flash and LED

MG04-04

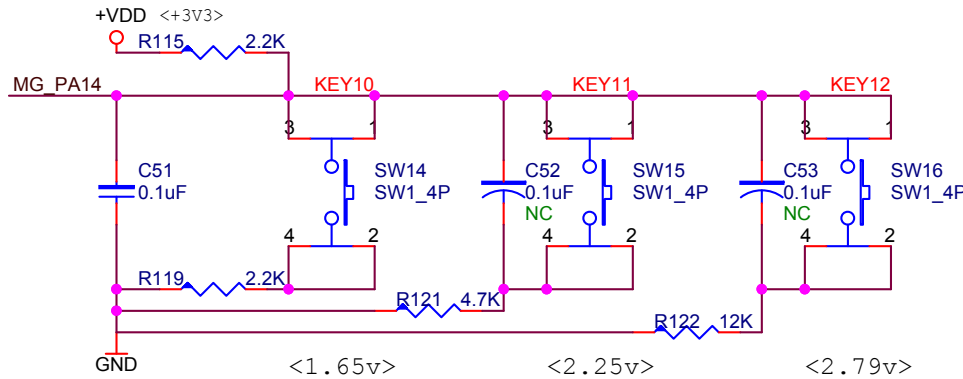
Rev 1.0

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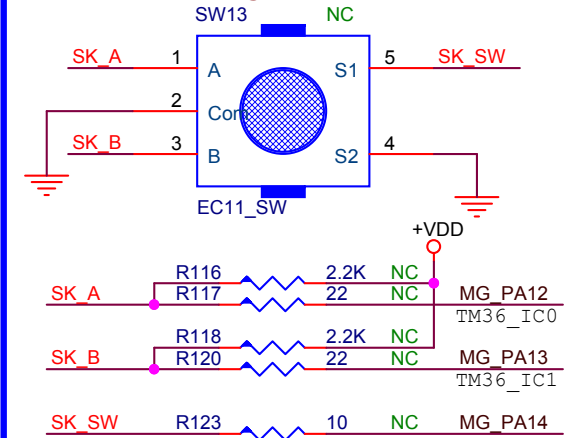
Key Board (SARADC)



KEY2 KEY1 KEY0
KEY5 KEY4 KEY3
KEY8 KEY7 KEY6
KEY12 KEY11 KEY10
PCB Position



Shuttle Key



[Composited Key]
Key10+Key11 : 1.34v
Key10+Key12 : 1.51v
Key11+Key12 : 2.00v

[Shuttle Key]
SW : 0v

2,3,4,5 MG_PA[0..15] >> MG_PA[0..15]

Board Features :

- * MG32F02U Demo Board
- * USB Device Interface
- * 8/16-bit 8080 LCD Interface
- * SPI LCD Interface
- * Multi-Function Module Interface
- * I2C Module Interface
- * SPI Flash Module Interface
- * BLE Module Interface
- * RGB LED
- * SARADC/Shuttle Key Input
- * Mono Audio Out

Power ~

- * 12V DC Jack , 5V DC SIP2-2.54 , USB-A/B/Micro Connector
- * Built-in 12V-to-5V LDO Circuit
- * Built-in 5V-to-3.3V(VDD) LDO Circuit
- * Built-in 5V-to-3.3V(LCD) LDO Circuit

Debug Interface ~

- * SWD IF Connector SIP6-2.54 *1
- * UART Connector SIP4-2.54 * 2

Module IF

- * 8080 LCD Module Connector 20x2 *1, 17x2 *1
- * SPI LCD Module Connector 14x1 *1, 11x1 *1
- * Multi-Function Module Connector
- * I2C Module Connector
- * SPI Flash Module Connector
- * BLE Module Connector
- * ARGB Connector

On Board Component Circuit

- * SPI Flash DIP + SOP
- * LM386 Circuit *1
- * EEPROM SOP *1
- * MCU XTAL Circuit *1

Others ~

- * Trap DIP Switch 2x2 *1
- * RGB LED *2
- * User LED *4
- * Push Button *1 (Reset)
- * SARADC Key Matrix 3x4
- * Shuttle Key Circuit *1

Layout Rule :

* Impedance :

1. Single-end signals ~ 12 mil/124ohm(Coated MicroStrip) for general nets
2. Single-end signals ~ 10 mil/129ohm(Coated MicroStrip) for LQFP80
3. Single-end signals with ground shield ~ 12-6/61ohm(Coated Coplanar Strips)
4. USB differential signals ~ 15-5-15/90ohm (Edge-Coupled Coated MicroStrip)

* Power/Ground :

1. Bypass cap. need close to related power/ground pin
2. Using Copper for DC input source and LDO input/output path

* Clock/XTAL :

1. Ground shielding and arc routing
2. Signal trace cross orthogonal with test point outline and do not directly pass through the central hole of test point for high speed signal

Board Note :

* Ferrite Beed Spec :


- FB : Rdc=0.2 , Z=300/100MHz , Idc=500mA ~ MCB2012S301H
FB_L : Rdc=0.015 , Z=120/100MHz , Idc=6000mA ~ MHC3216S121W
FB_S : Rdc=0.25 , Z=60/100MHz , Idc=500mA ~ MCB1608H600H
FB_0603 : Rdc=0.15 , Z=120/100MHz , Idc=500mA ~ MCB1608S121H

ECO List on Circuit:

1. Remove CJ2 MG_DP/MG_DM signals
2. Change EC1 footprint from C-EC-S-P6.0_DIP to C-EC-S-P7.2-T6.3X5.5 and fix pad no mask error
3. Add CN17 ARGB connector
4. Add FB14 and rename +5V_AMP to VDD_AMP
5. Add FB15 and change CN4 pin-3 net to +12V_MX
6. Change BL_CTL net (R70/R73) from PE8 to PE9
7. Change R127/R128/R130/R30 net from PB1/PB2/PB3/PA9 to PE8/PB1/PA10/PA10
8. Remove R131 ~ R135
9. Change CN17 net from MG_PB3 to ARGB_IO and add R131/R132/R133

ECO List on PCB only:

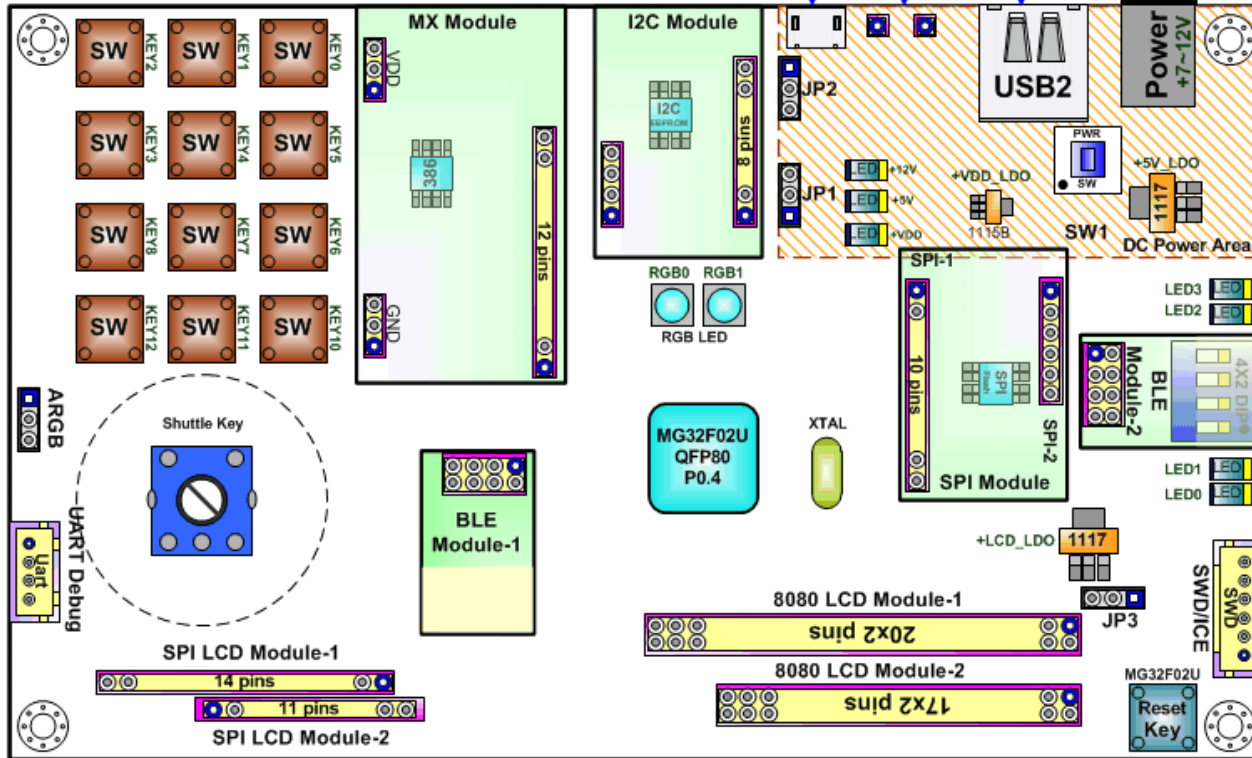
1. Correct CN12/CN13 placement on PCB
2. Swap SW7(KEY3) and SW9(KEY5) placement on PCB
3. Change SW13(shuttle Key) footprint to short the width of two ground pins
4. Add one independent Outline-Line for SW14-SW16 on PCB
5. Change CJ3 footprint from USB5A-MICRO-290X220P065 to

| | | | |
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|  | megawin | | |
| | Title | | |
| | Board Comment | | |
| | Size E | Document Number | Rev |
| | | MG04-04 | 1.0 |
| Date: Thursday, May 27, 2021 Sheet 7 of 9 | | | |

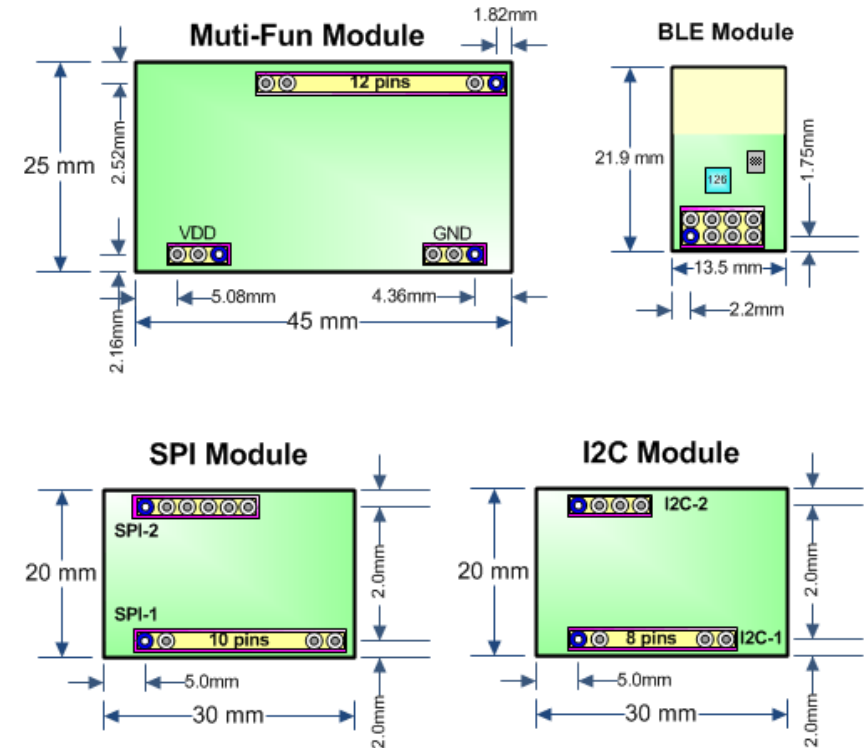
MG04-04A

LCD Demo Board PCB Placement

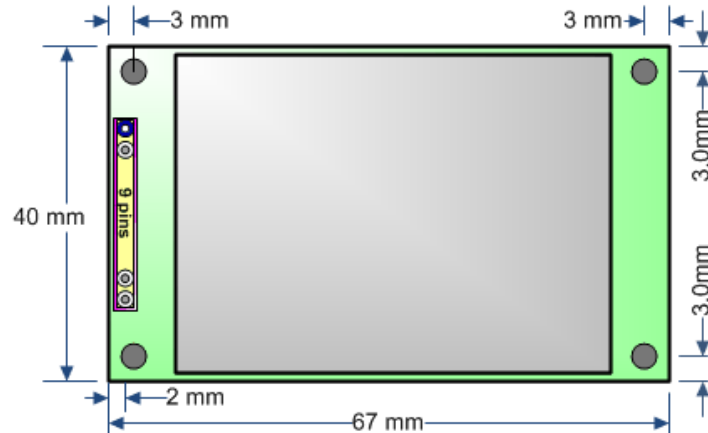
PCB Size:
150x90 mm²



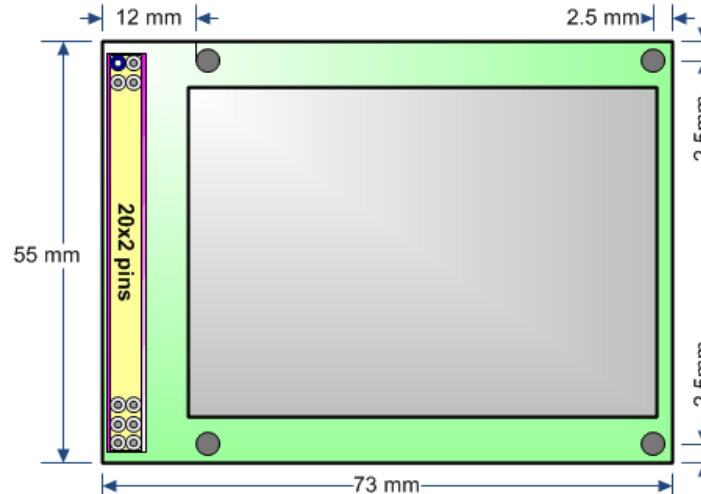
Module Board Dimension:




ILI9341 2.2" 240x320 SPI TFT LCD

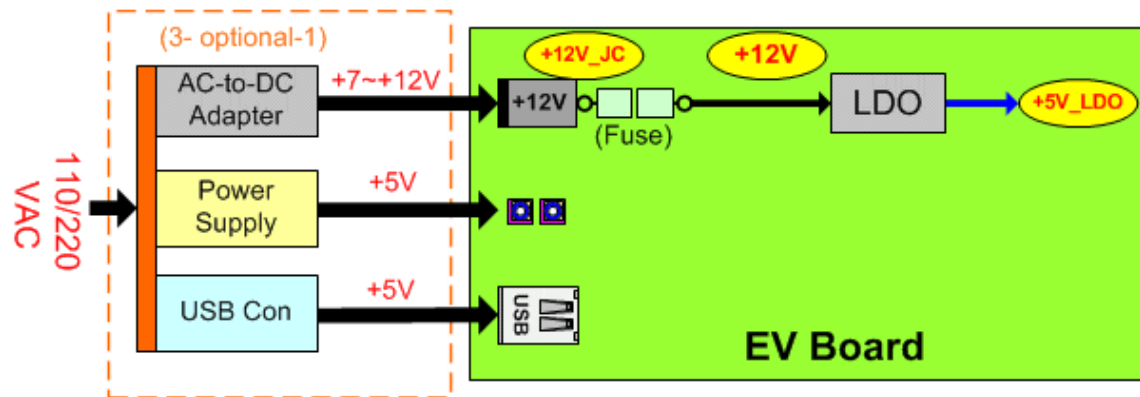


ILI9325 2.4" 240x320 TFT LCD

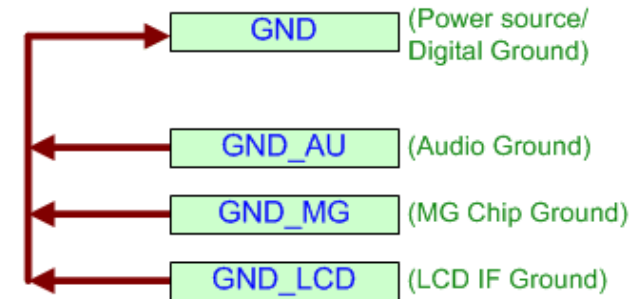


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|---|--------------------|-----------------|---------|
|  | megawin | | |
| | Title | | |
| | PCB Placement Plan | | |
| | Size E | Document Number | Rev 1.0 |
| Date: Monday, July 12, 2021 | | Sheet 8 | of 9 |

Power Supply Source Diagram



Ground Connection Diagram



Power Connection Diagram

