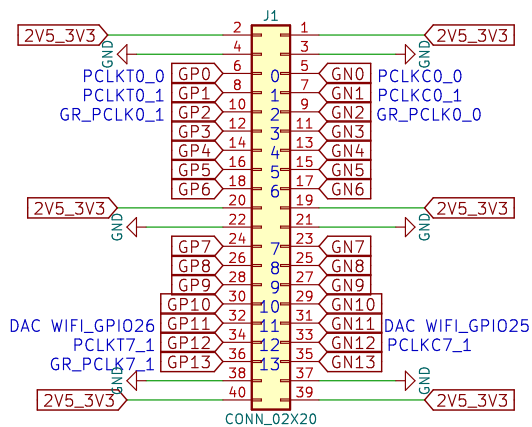


NC v1.7

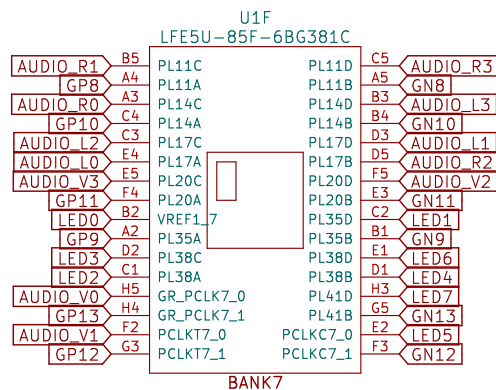
NC <v3.1.2

NC v1.7

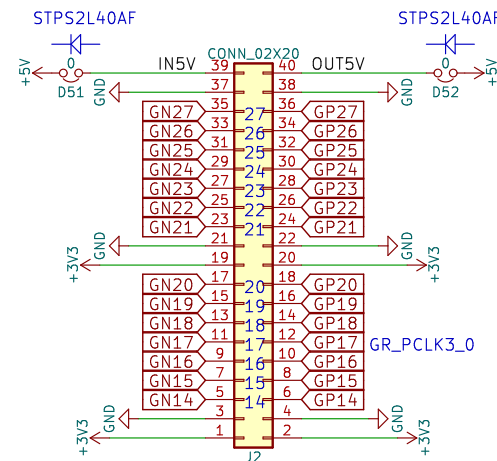
J1 J2 PIN numbering 1-40 is for FEMALE 90° ANGLED header.
For MALE VERTICAL header, SWAP EVEN and ODD pin numbers.



GP,GN 0-7 single-ended connected to BANK0
GP,GN 8-13 differential bidirectional connected to BANK7



J1 J2 PIN numbering 1-40 is for FEMALE 90° ANGLED header.
For MALE VERTICAL header, SWAP EVEN and ODD pin numbers.



GP,GN 14-21 differential bidirectional connected to BANK2,3 on "ram" sheet
GP,GN 22-27 single-ended connected to BANK1 on "gpi" sheet

GPIO route only A/B pairs as those are differential bidirectional
don't route C/D pairs to GPIO as those can be differential input only
BANK0,1 are single-ended (non-differential)

GPIO 2.54 mm connectors

EMARD

Sheet: /gpio/

File: gpio.kicad_sch

Title: ULX3S

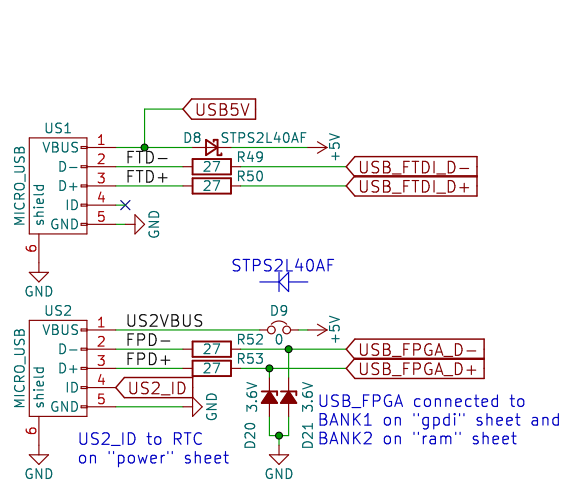
Size: A4

Date:

KiCad E.D.A. kicad 7.0.2

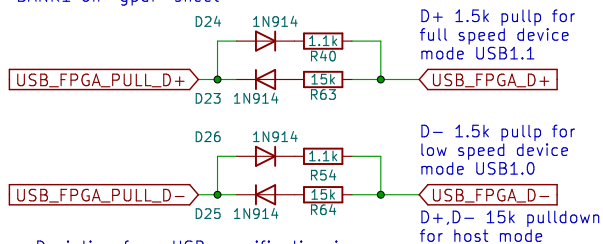
Rev: 1.0.2

Id: 3/11

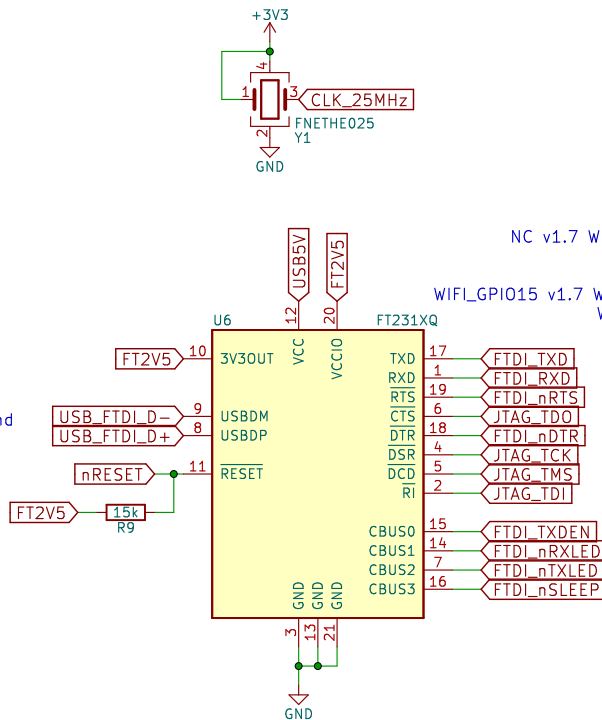


D8,D9: Schottky 2A/30V
Low drop $V_{fmax}=0.375V$
Parts reduction: Only D8 is required.
D9 D51 D52 can be 1206
1A polyfuses or 0-ohm/2A jumpers

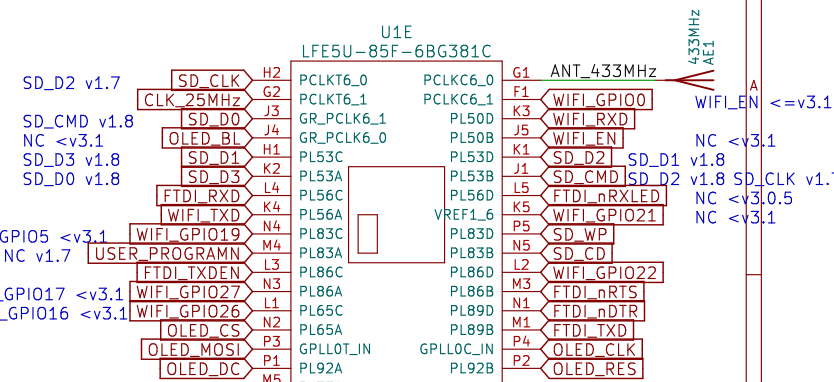
USB pull lines connected to
BANK1 on "gpdi" sheet



Deviation from USB specification in
pulldowns for BOM simplification.
With series diode, correct value R63 R64
should be 12k but 15k is used.



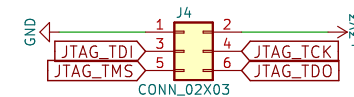
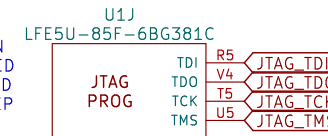
warning:
ULX3S has different pinout
for simpler PCB routing and
because FT230X has weak CTS
drive capability. (Undocumented,
FLEApga mail from 13-Nov-2015)
ULX2S pinout was:
TCK = DSR
TMS = RI
TDI = CTS
TDO = DCD



WiFi programming pins:
TXD RXD RTS DTR

VNC2 programming pins:
TXD RXD TXDEN

FTDI default
CBUS0=TXDEN
CBUS1=nRXLED
CBUS2=nTXLED
CBUS3=nSLEEP



USB serial and JTAG

EMARD

Sheet: /usb/

File: usb.kicad_sch

Title: ULX3S

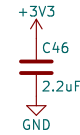
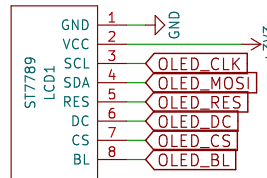
Size: A4
KiCad E.D.A. kicad 7.0.2

Date:

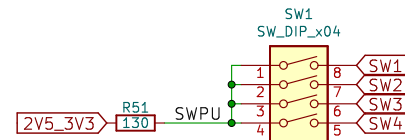
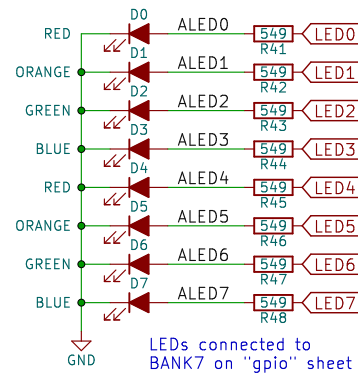
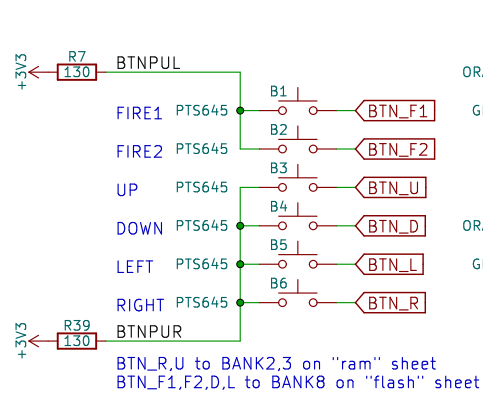
Rev: 1.0.10

Id: 4/11

ST7789/SSD1331/SSD1351/SSD1306
compatible LCD/OLED 0.96/1.3/1.54" PCB
14x14 units
1 unit = 2.54 mm

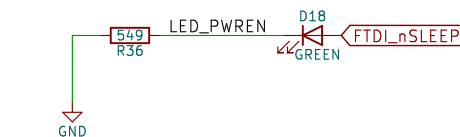


OLED connected to
BANK6 on "usb" sheet



DIP switch connected to
BANK0 on 'gpio' sheet

To fix issues with FT231XS rev A,B,C
Short-circuit D18 LED, but then
board cannot keep awake by USB.
chip rev D works properly
See TN140_FT231X Errata



Buttons, LEDs, OLED display

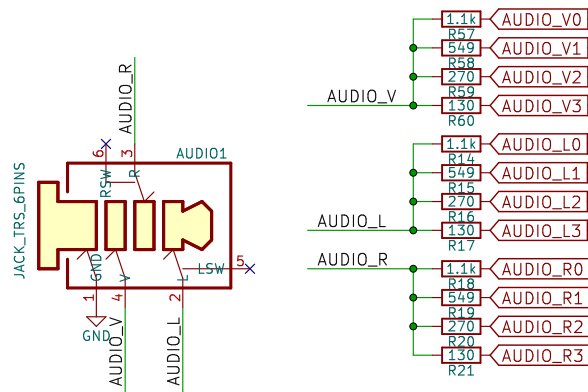
EMARD

Sheet: /blinky/
File: blinky.kicad_sch

Title: ULX3S

Size: A4 Date:
KiCad E.D.A. kicad 7.0.2

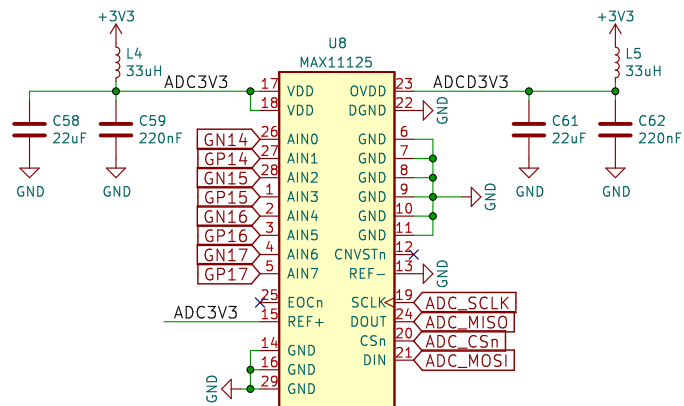
Rev: 1.0.3
Id: 6/11



JACK pinout for SJ-43516-SMT-TR
<http://www.cui.com/product/resource/sj-4351x-smt-series.pdf>
 pin 1 - sleeve (GND)
 pin 2 - tip (left channel)
 pin 3 - ring1 (right channel)
 pin 4 - ring2 (video)
 pin 5 - tip switch
 pin 6 - ring1 switch

Audio connected to
 BANK7 on "gpio" sheet

Output resistance: 75 ohm
 Internal resistance of FPGA pin: 10 ohm
 $1/(1/(130+10)+1/(270+10)+1/(549+10)+1/(1100+10))=74.6$



ADC SPI connected to
 BANK3 of "ram" sheet

Analog audio and video
EMARD

Sheet: /analog/
 File: analog.kicad_sch

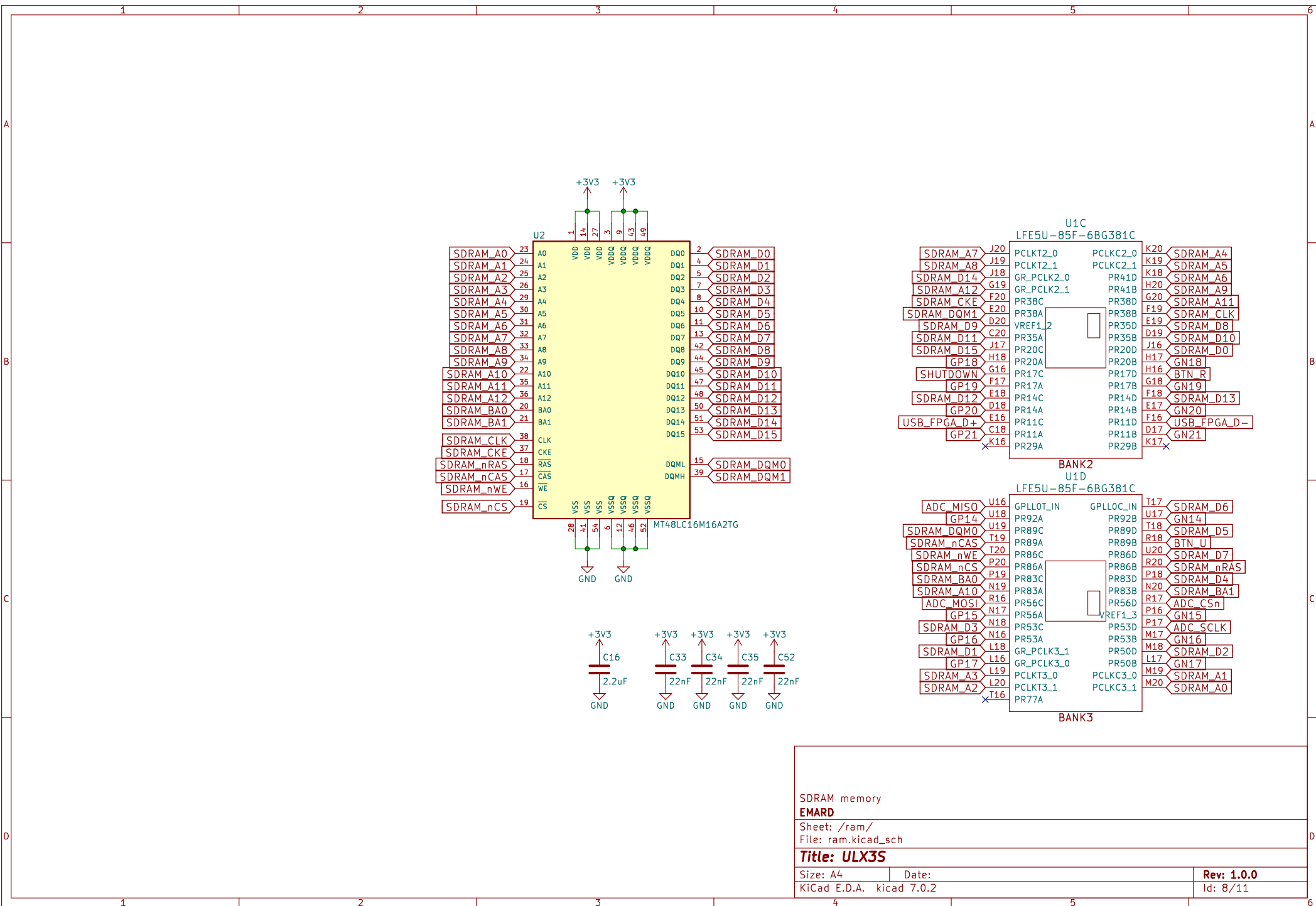
Title: ULX3S

Size: A4
 KiCad E.D.A. kicad 7.0.2

Date:

Rev: 1.0.4

Id: 7/11



SDRAM memory

EMARD

Sheet: /ram/

File: ram.kicad_sch

Title: ULX3S

Size: A4

Date:

KiCad E.D.A. kicad 7.0.2

Rev: 1.0.0

Id: 8/11

