

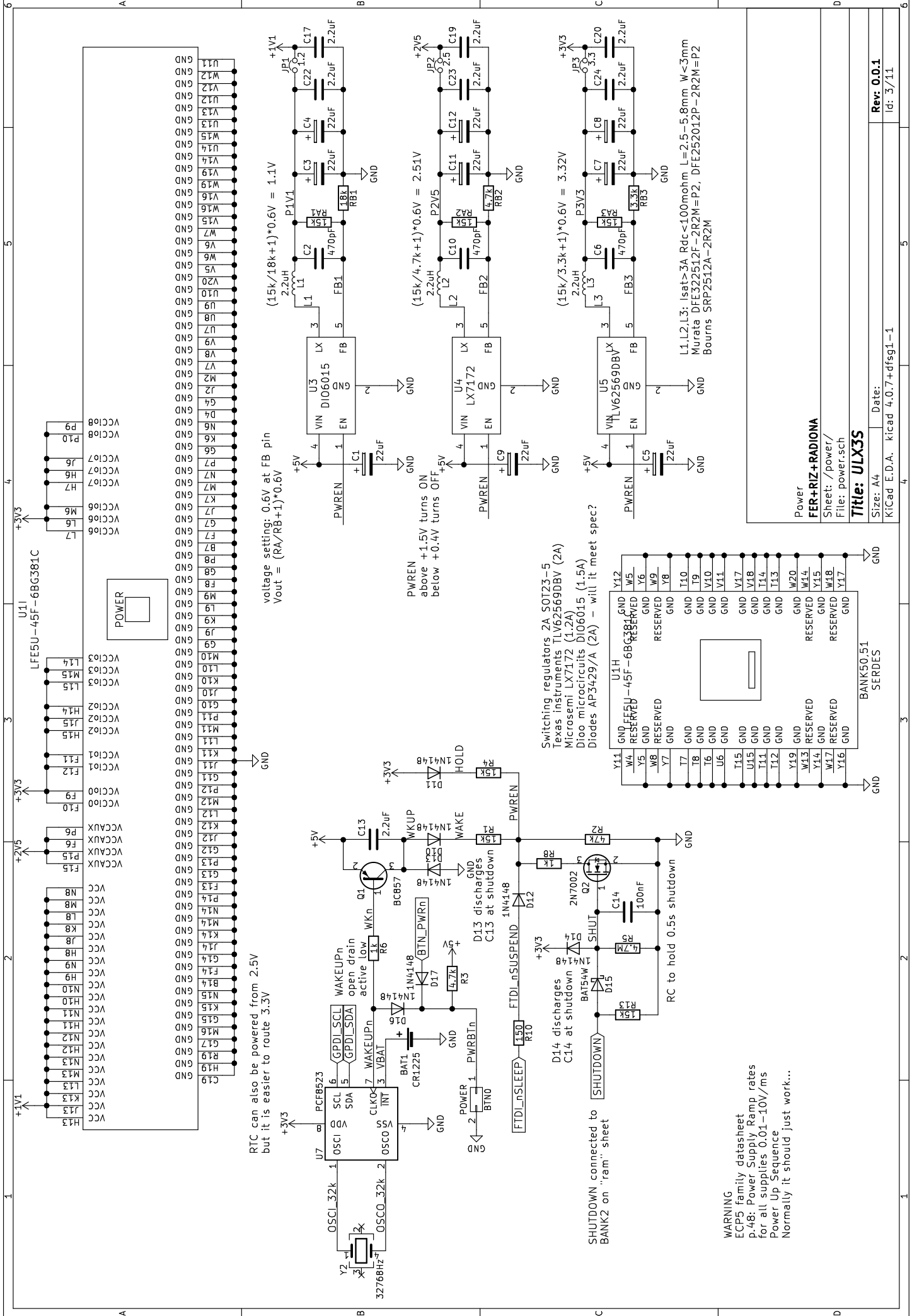
2.54 mm connectors
FER+RIZ+RADIONA
 Sheet: /gpio/
 File: gpio.sch

Title: ULX3S

Size: A4
 Date:
 KiCad E.D.A. kicad 4.0.7+dfsg1-1

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

J2_5-J2_23 connected to BANK2,3 on "ram" sheet
 J2_25-J2_35 connected to BANK1 on "gpd1" sheet



RTC can also be powered from 2.5V but it is easier to route 3.3V

voltage setting: $0.6V$ at FB pin
 $V_{out} = (RA/RB+1) \cdot 0.6V$

PWRREN above +1.5V turns ON below +0.4V turns OFF

Switching regulators 2A_SOT23-5
 Texas Instruments LV62569DBV (2A)
 Microsemi LX7172 (1.2A)
 Diodo microcircuits D106015 (1.5A)
 Diodes AP3429/A (2A) - will it meet spec?

WARNING
 ECP5 family datasheet p.48: Power Supply Ramp rates for all supplies 0.01-10V/ms Power Up Sequence. Normally it should just work...

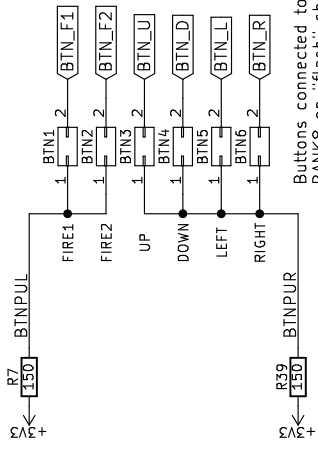
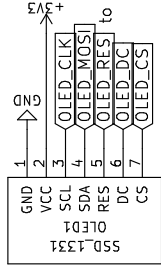
Power
FER+RIZ+RADIONA
 Sheet: /power/
 File: power.sch

Title: ULX3S

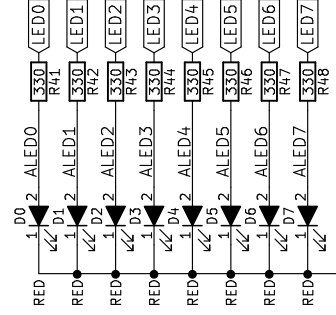
Size: A4 Date:
 KiCad E.D.A. kicad 4.0.7+dfsg1-1

Rev: 0.0.1
 Id: 3/11

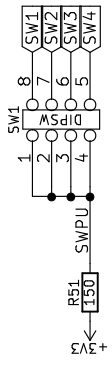
SSD1306 B/W or SSD1331 COLOR
 compatible OLED 0.96" or 1.3" PCB
 1.4x1.4 units
 1 unit = 2.54 mm



Buttons connected to BANK8 on "flash" sheet

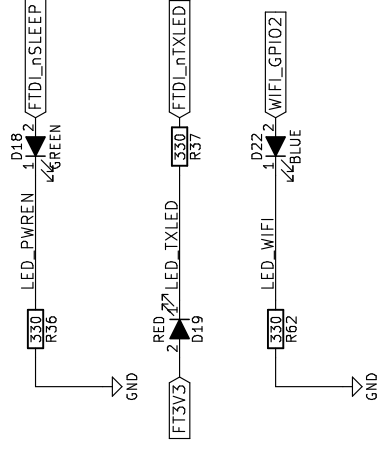


LEDs connected to BANK7 on "gpio" sheet



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



TXLED blinks when FPGA sends data to FTDI

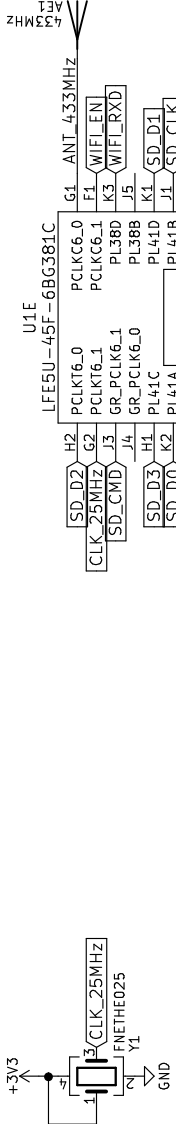
Buttons, LEDs, OLED display
FER+RIZ+RADIONA

Sheet: /blinky/
 File: blinky.sch

Title: ULX3S

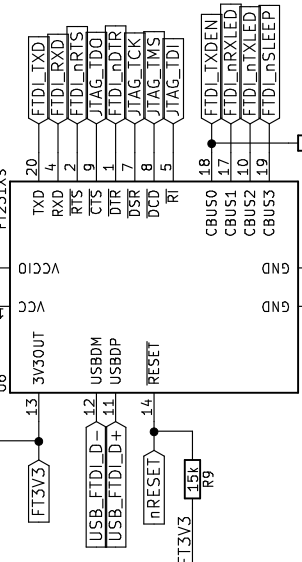
Size: A4 Date:
 KiCad E.D.A. kicad 4.0.7+dfsg1-1

Rev: 0.0.1
 Id: 4/11



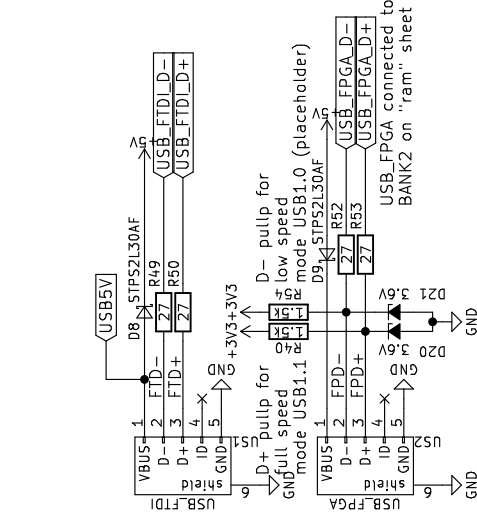
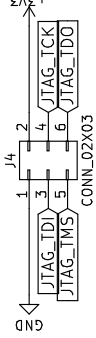
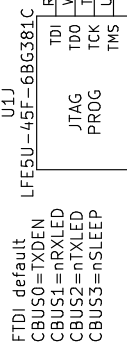
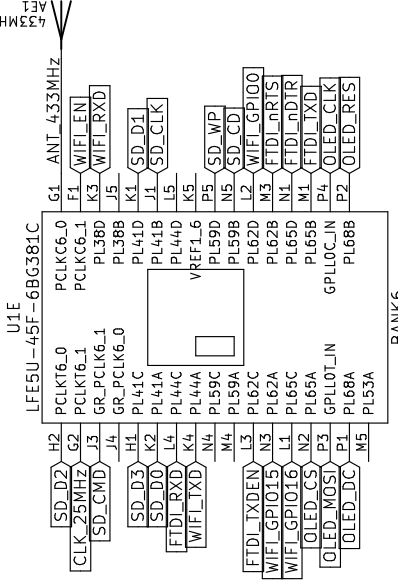
WiFi programming pins:
TXD RXD RTS DIR

VNC2 programming pins:
TXD RXD TXDEN



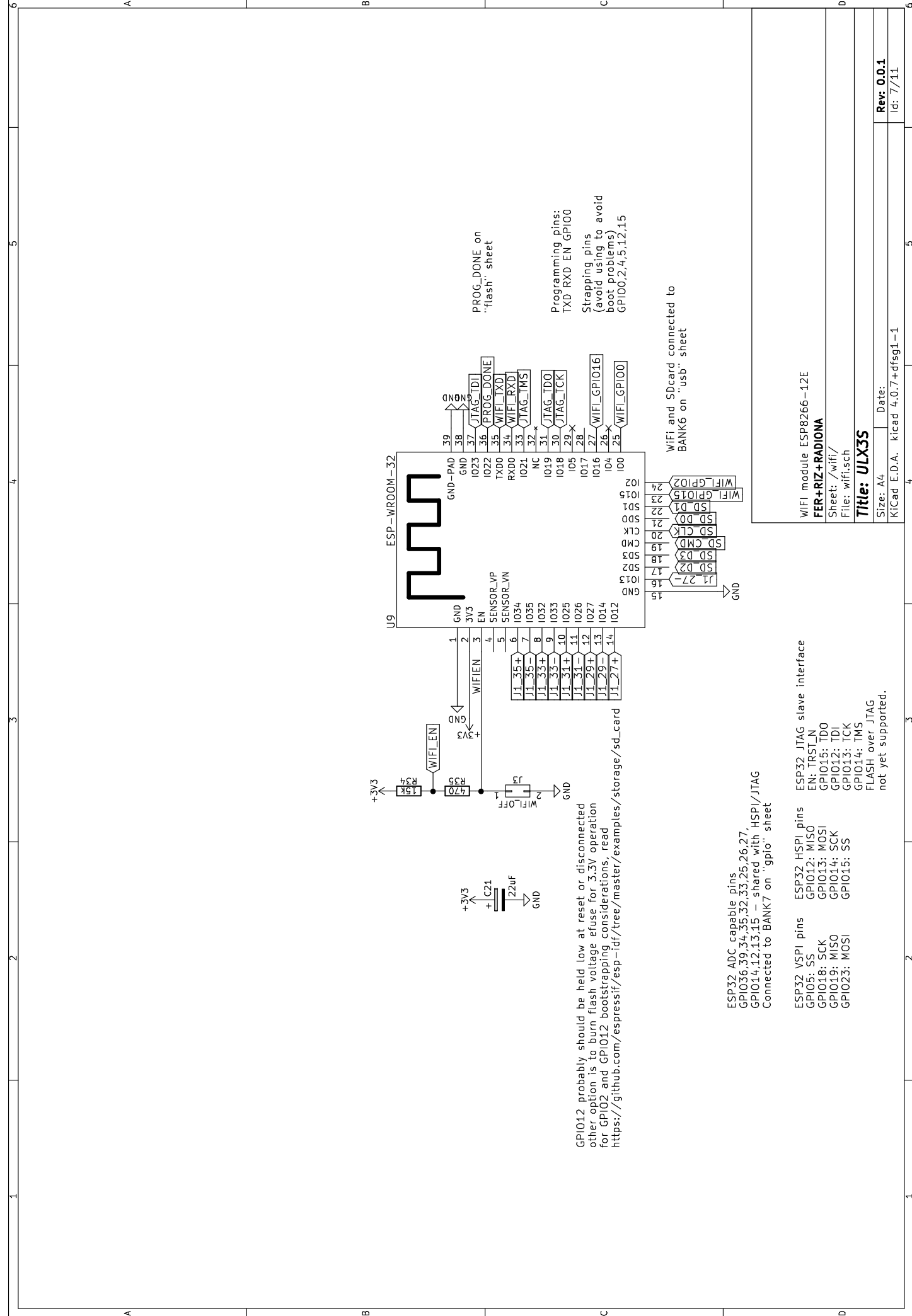
warning:
ULX3S has different pinout for simpler PCB routing and because FT230X has weak CTS drive capability. (Undocumented, FLEAPga mail from 13-Nov-2015)
TCK = DSR
TMS = RI
TDO = DCD

Short circuit R56 for chip rev A,B,C workaround in TN140_FT231X Errata



D8,D9: Schottky 2A/30V
Low drop V_{fmax}=0.375V

Root sheet
FER+RIZ+RADIONA
Sheet: /usb/
File: usb.sch
Title: ULX3S
Size: A4 Date:
KiCad E.D.A. kicad 4.0.7+dfsg1-1
Rev: 0.0.1
Id: 6/11



PROG_DONE on "flash" sheet

Programming pins:
TXD RXD EN GPIO0

Strapping pins
(avoid using to avoid boot problems)
GPIO0,2,4,5,12,15

WiFi and SDcard connected to BANK6 on "usb" sheet

ESP32 ADC capable pins
GPIO36,39,34,35,32,35,25,26,27,
GPIO14,12,13,15 - shared with HSPi/JTAG
Connected to BANK7 on "gpio" sheet

ESP32 VSPi pins
GPIO5: SS
GPIO18: SCK
GPIO19: MISO
GPIO23: MOSI

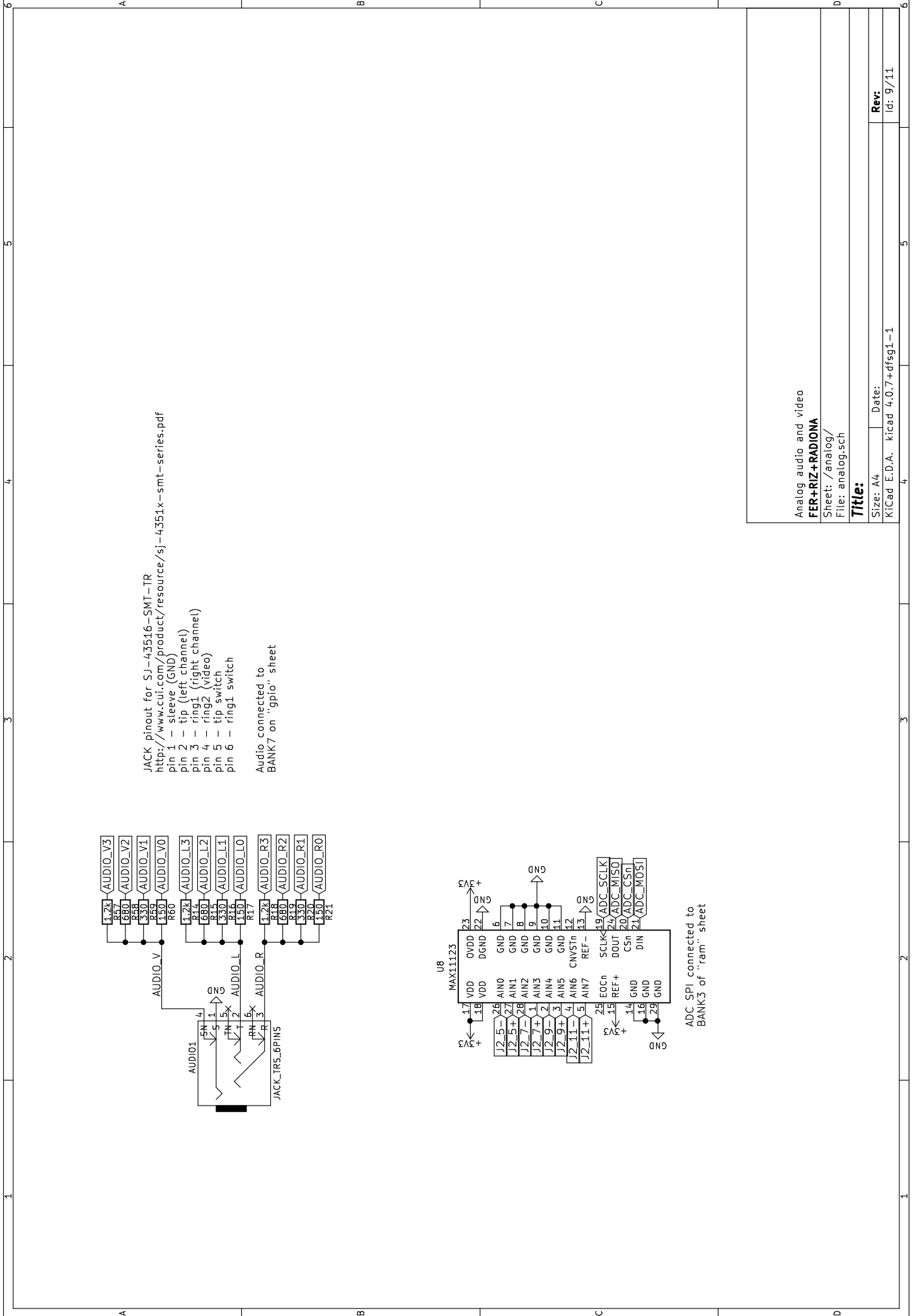
ESP32 JTAG slave interface
EN: TRST_N
GPIO15: TDO
GPIO12: TDI
GPIO13: TCK
GPIO14: TMS
FLASH over JTAG
not yet supported.

WiFi module ESP8266-12E
FER+RIZ+RADIONA
Sheet: /wifi/
File: wifi.sch

Title: ULX3S

Size: A4 Date:
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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

ADC SPI connected to
 BANK3 of "ram" sheet

Analog audio and video

FER+RIZ+RADIONA

Sheet: /analog/

File: analog.sch

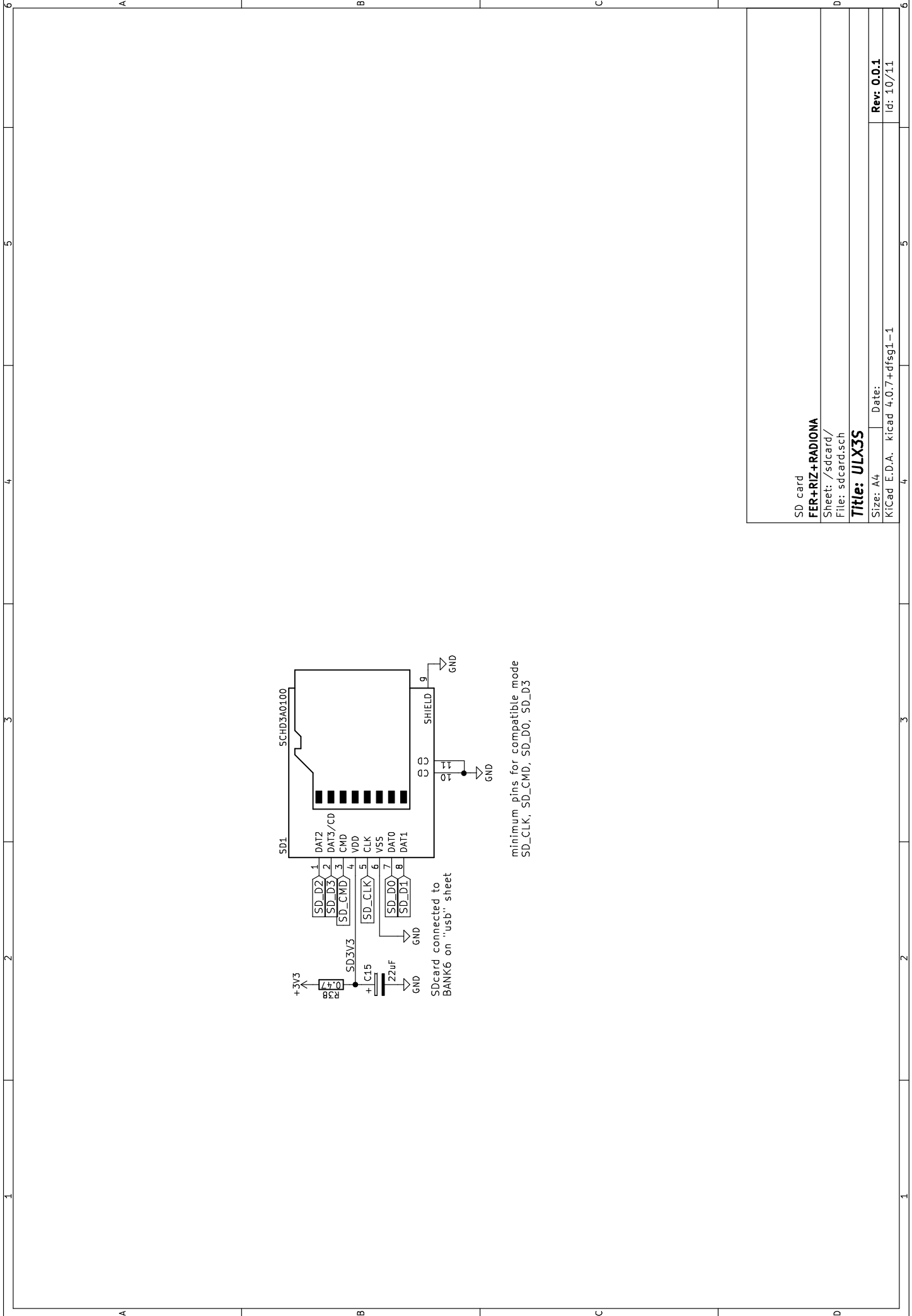
Title:

Size: A4 Date:

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Rev:

Id: 9/11



minimum pins for compatible mode
SD_CLK, SD_CMD, SD_D0, SD_D3

SD card
FER+RIZ+RADIONA

Sheet: /sdcard/
File: sdcard.sch

Title: ULX3S

Size: A4 Date:

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Rev: 0.0.1

Id: 10/11

