Sheet: Espressif Developer Platform – Interfaces

File: ESP_S3-CP-24_Platform_Ifce.sch

Sheet: Espressif Developer Platform – USB-Converter

File: ESP_S3-CP-24_Platform_USBConverter.sch

Soft Reset ESP32 after Flashing via DTR/RTS signals from UART

– UART Interface –

R_RXD0
R_TXD0
R_CTS
R_RTS
R_DSR
R_RI
R_DCD
R_DTR

CP_IO0 — R2 0R — R_IO0
CP_EN — R3 0R — R_EN

USB-D+#1
USB-D-#1

ESP32 does not use HW handshake on its UART0

Sheet: Espressif Developer Platform – Power

File: ESP_S3-CP-24_Platform_Power.sch

USB-D+#1
USB-D-#1
R_USB-D+#1 — R4 1M (DNP) — GND
R_USB-D-#1 — R5 1M (DNP) — GND
R_USB-D+#2
R_USB-D-#2

Sheet: Espressif Developer PLatform – uSDCard

File: ESP_S3-CP-24_Platform_uSDCard.sch

– uSDCard –

SD_HOST_D0 — R_IO2
SD_HOST_D1 — R_IO4
SD_HOST_D2 — R_IO12
SD_HOST_D3 — R_IO13
SD_HOST_CLK — R_IO14
SD_HOST_CMD — R_IO17
SD_DET — R_IO21

Sheet: Espressif Developer Platform – Modules

File: ESP_S3-CP-24_Platform_Modules.sch

– uSDCard – – UART Rx/Tx – – Boot Ctrl –

R_IO1
R_IO3
R_EN
R_IO0
R_RXD0
R_TXD0
R_IO2
R_IO4
R_IO12
R_IO13
R_IO14
R_IO17
R_IO21
R_USB-D+#2
R_USB-D-#2
R_IO5
R_IO9
R_IO10
R_IO11
R_IO15
R_IO16
R_IO35
R_IO36
R_IO37
R_IO38
R_IO39
R_IO40
R_IO41
R_IO42
R_IO47
R_IO48
R_IO6
R_IO7
R_IO45
R_IO46

IO32 and IO33 used for 32kHz crystal.
To use them as GPIOs remove resistors to crystal.

TP1 T_IO46
TP2 T_IO45
TP3 T_IO7
TP4 T_IO6

J1 Conn_02x05_Odd_Even

R_IO6 1 — 2
R_IO7 3 — 4
R_IO45 5 — 6
R_IO46 7 — 8
9 — 10

Future Use, external buttons

GND GND

OR R6 VDD

VDD VDD

R_IO18 — R7 0R — I2C_SCL
R_IO8 — R8 0R — I2C_SDA

R9 1k
R10 1k

– I2C –

I2C signals SCL and SDA can be routed to any GPIO pins of ESP32-S3 (as long they are of bidirectional type)

GPIO Pinning same as ESP32-S3-DevKitC
Power Pinning different

TP6 ESP-Power
PWR_FLAG

VDD
(CHIP_PU)

J2 Conn_01x22 (DNP)

1 —
2 —
R_EN 3
R_IO4 4
R_IO5 5
R_IO6 6
R_IO7 7
R_IO15 8
R_IO16 9
R_IO17 10
I2C_SCL 11
I2C_SDA 12
R_IO3 13
R_IO46 14
R_IO9 15
R_IO10 16
R_IO11 17
R_IO12 18
R_IO13 19
R_IO14 20
21
22

J3 Conn_01x22 (DNP)

1 — GND
2 R_RXD0
3 R_TXD0
4 R_IO1
5 R_IO2
6 R_IO42
7 R_IO41
8 R_IO40
9 R_IO39
10 R_IO38
11 R_IO37
12 R_IO36
13 R_IO35
14 R_IO0
15 R_IO45
16 R_IO48
17 R_IO47
18 R_IO21
19 R_USB-D+#2 (GPIO20)
20 R_USB-D-#2 (GPIO19)
21 — Spare
22 — +12V

I2C Signals are derived from IO8 and IO18
(R_IO18)
(R_IO8)

USB Voltage +5VD
GND

+5VD TP5
+12V TP7

C1 0.1uF, 50V (DNP) — R_IO0
SW1 SKRTLAE010 — Boot
Cap on IO_0 may affect Booting

C2 0.1uF, 50V — R_EN
SW2 SKRTLAE010 — Reset

VDD
D1 LTST-C191KRKT (Red)
R1 1k8 — R_IO5

H1 M3-L5-3.5
H2 M3-L5-3.5
H3 M3-L5-3.5
H4 M3-L5-3.5
GND GND GND GND

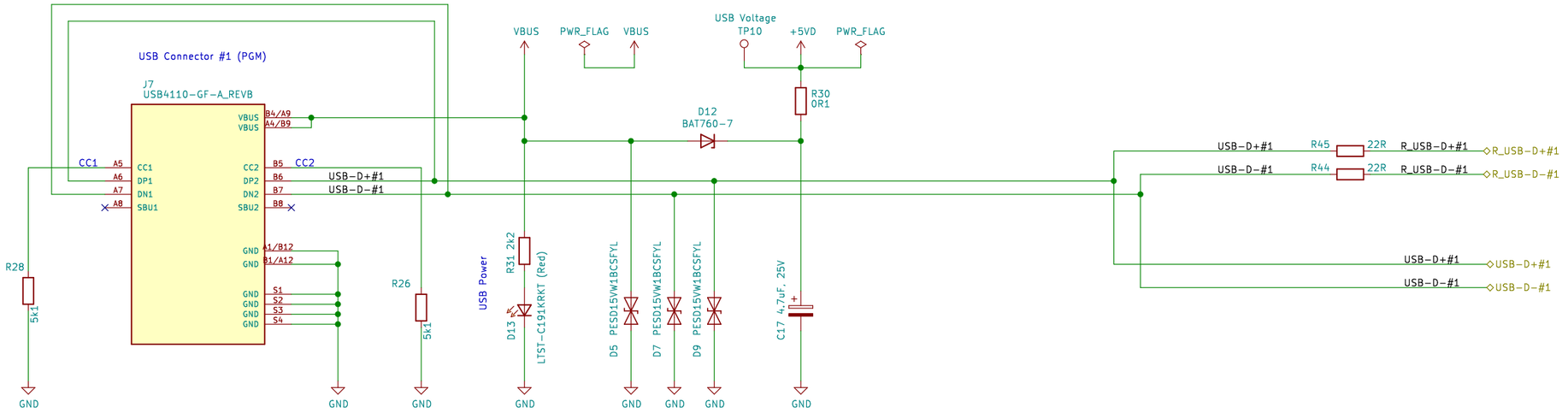
WhirlingBits

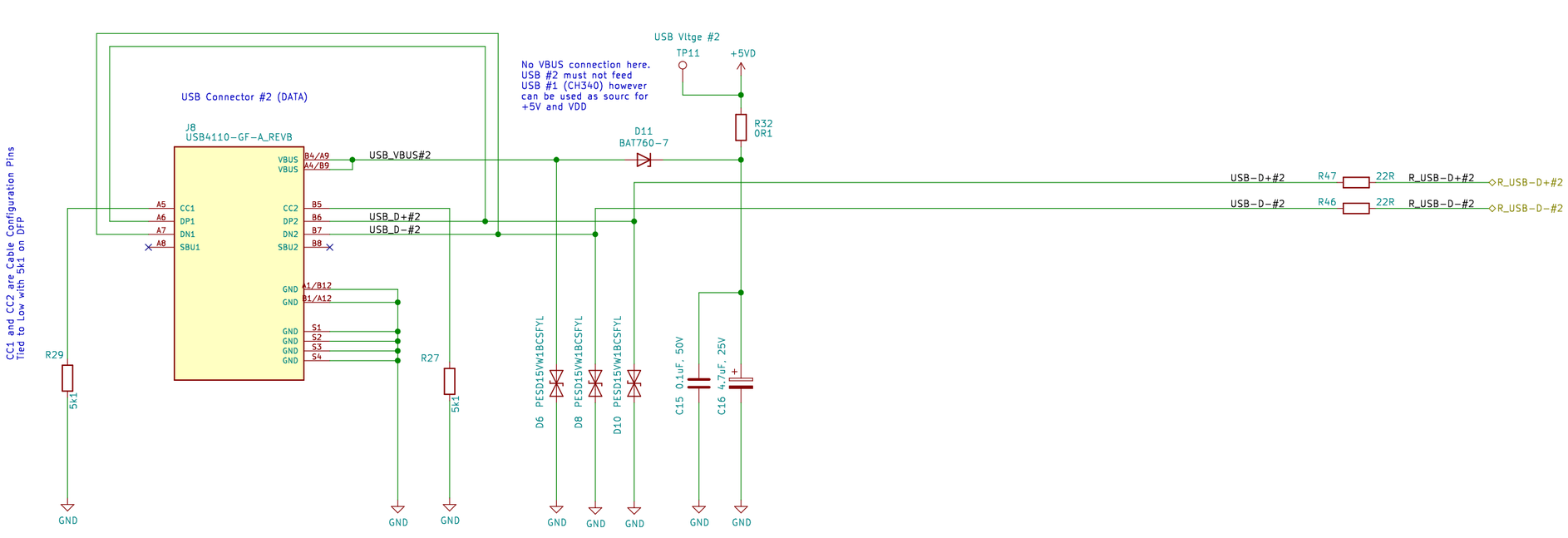
Matthias Ahrens & Stefan Tauschek

Sheet: /
File: ESP_S3-CP-24_Platform.sch

Title: Espressif ESP32_S3-CP-24 Developer Platform – Overview

Size: A3	Date: 2022-03-04	**Rev: R0.8**
KiCad E.D.A. kicad (5.1.12)-1		Id: 1/6





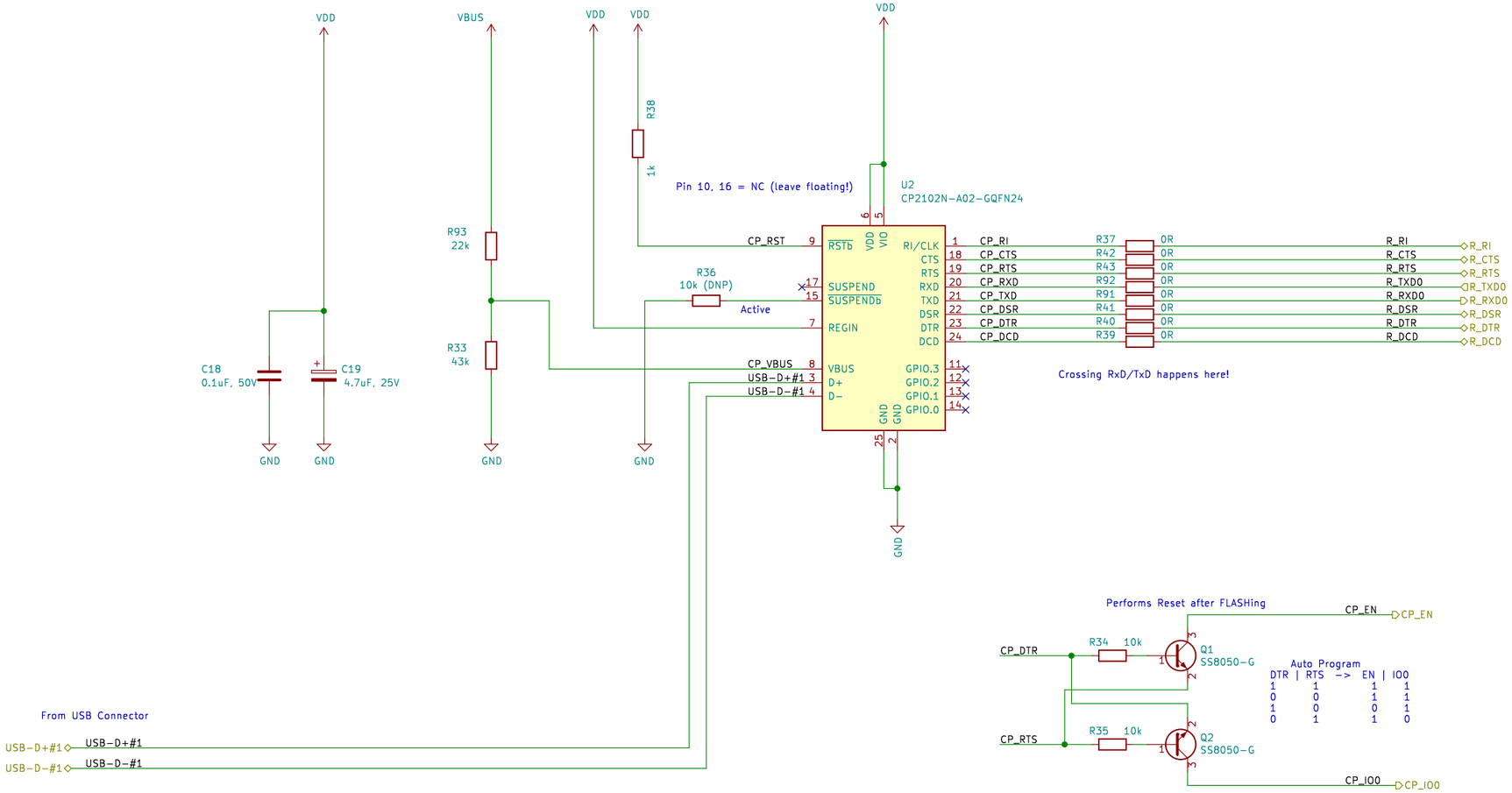
WhirlingBits

Matthias Ahrens & Stefan Tauschek

Sheet: /Espressif Developer Platform – Interfaces/
File: ESP_S3-CP-24_Platform_Ifce.sch

Title: Espressif ESP32_S3-CP-24 Developer Platform – Overview

Size: A3	Date: 2022-03-04	**Rev: R0.8**
KiCad E.D.A. kicad (5.1.12)-1		Id: 2/6



WhirlingBits

Matthias Ahrens & Stefan Tauschek

Sheet: /Espressif Developer Platform – USB-Converter/
File: ESP_S3-CP-24_Platform_USBConverter.sch

Title: Espressif ESP32_S3-CP-24 Developer Platform – Overview

Size: A3	Date: 2022-03-04	**Rev: R0.8**
KiCad E.D.A. kicad (5.1.12)-1		Id: 3/6

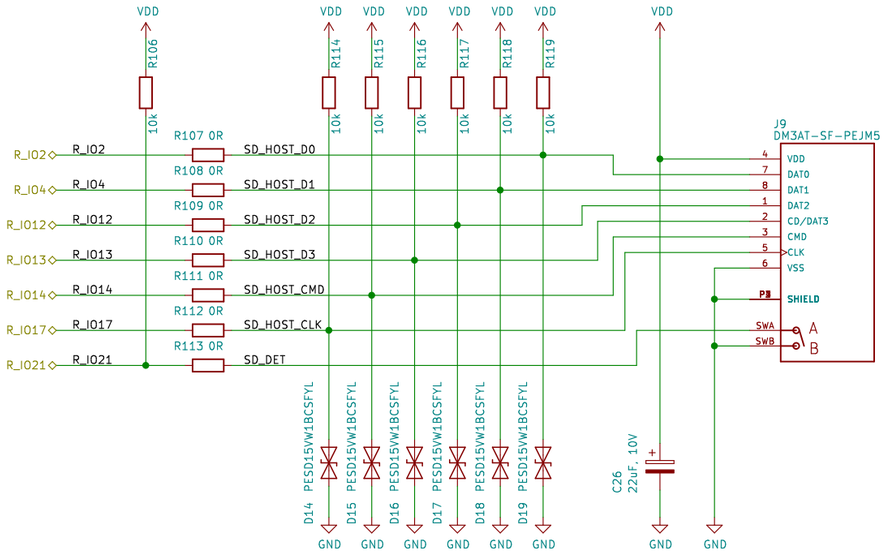
OUTPUT VOLTAGE PROGRAMMING
The output voltage is set via the external resistor divider
comprised of resistors Ra and Rb as show in Figures 1.
The resistor divider values determine the output regulation
voltage according to:
VOUT = 0.8V • (1+Ra/Rb)
In addition to setting the output voltage, the value of Ra is
instrumental in controlling the dynamics of the compensation network.
When changing the value of this resistor,
care must be taken to understand the impact this will have
on the compensation network.
In addition, the Thevenin equivalent resistance of the resistor divider controls
the gain of the input current limit. To
maintain sufficient gain in this loop, it is recommended
that the Thevenin resistance be greater than 100kΩ.

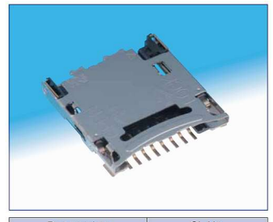
For 3V3 output use :
Ra = 845k
Rb = 261k

Rb was reduced from 270k to 261k after prototype board showed
3.18V instead of 3.3V.
Calculating the above formula this gives a voltage of
3.39V but should adjust output voltage in real circuitry to about 3.3V

C9
22p
R17
41,2k
C11
1500p
L1
10uH – SLF7032T-100M1R4-2PF
Footprint 7 x 7 mm
U1
LTC3111EMSEPBF
LT_COMP
LT_FB
LT_RUN
LT_VIN
COMP
FB
SNSGND
RUN
VIN
SW1
BST1
PGND_2
PGND
SGND
PWM/SYNC
VCC
NC
VOUT
SW2
BST2
PGND_3
LT_PWM
LT_VCC
C5 0.1uF, 50V
C8 0.1uF, 50V
GND
R18
0R (DNP)
R19
0R
PWR_FLAG
C10
1uF, 16V
Output 3V3 @ 1.5A
C12
47p
R21
49R9
R20
11,5k
Ra
R22
845k
Rb
R23
261k
C13
100uF, 6,3V
C14
1uF, 16V
TP9
3V3
VDD
PWR_FLAG
R25
0R1
R24
1k5
D4
LTST-C191KRKT (Red)
3V3 System Voltage (VDD)
J6
Conn_02x02_Top_Bottom (DNP)
Connector to use 3V3
!! Do not feed in 3V3 here !!
LT_VIN may be between 2V5 and 15V
C3
0.1uF, 50V
C4
47uF, 22V
R15
1M
R16
1M (DNP)
C7
1uF, 16V
Ext Voltage 12V
TP8
+12V
PWR_FLAG
External Power Supply, 2.5V ... 24V
J4
PJ-002AH-SMT-TR (Barrel Jack)
!! Check if Power on inner Pin !!
!! is ok for application !!
R13
0R1
D2
BAT760-7
R14
5k1
D3
LTST-C191KRKT (Red)
External Power
C6
47uF, 22V
USB Power (VBUS) and external 12V are
decoupled by Schottky and 0R1 so they can be
connected here.
Higher Voltage on either rail will feed the system
+12V
+5VD
R11
0R1
R12
0R1
J5
Conn_02x02_Top_Bottom
J5_12V
J5_5V
Connector to loop in external battery controller
In normal mode connect J5.1 with J5.3
and J5.2 with J5.4 (2 Jumpers)
When using an external battery controller such as Sparkfun's babysitter,
open the Jumpers, connect J5.4 to the input of the controller and J5.2
to the output of the controller (=battery + terminal)

WhirlingBits
Matthias Ahrens & Stefan Tauschek
Sheet: /Espressif Developer Platform – Power/
File: ESP_S3-CP-24_Platform_Power.sch
Title: Espressif ESP32_S3-CP-24 Developer Platform – Overview
Size: A3 | Date: 2022-03-04 | Rev: R0.8
KiCad E.D.A. kicad (5.1.12)-1 | Id: 4/6





Part number	CL No.
DM3CS-SF	609-0032-3

DM3 AT – SF – PEJM5
❶ ❷ ❸ ❹

❶ Series name: DM3	❸ Termination type : SF Right-angle SMT(Standard)
❷ Connector type : AT Push-Push (ejection mechanism), Top board mounting (Standard)	DSF Right-angle SMT(Reverse)
BT Push-Push (ejection mechanism), Bottom board mounting (Reverse)	❹ Card ejection code : PEJM5, PEJS
CS Hinge, Push-Pull (no ejection mechanism), Top board mounting (Standard)	(Push insert/push eject)
D Push-Pull (no ejection mechanism), Top board mounting (Standard)	None : Manual card
Number of contacts : 8	insertion/ejection

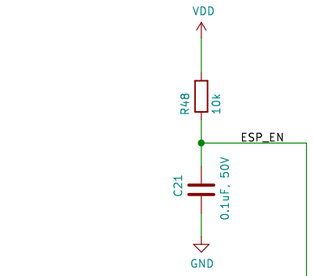
WhirlingBits

Matthias Ahrens & Stefan Tauschek

Sheet: /Espressif Developer PLatform – uSDCard/
File: ESP_S3-CP-24_Platform_uSDCard.sch

Title: Espressif ESP32_S3-CP-24 Developer Platform – Overview

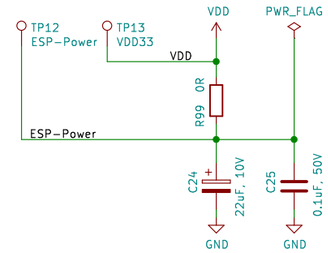
Size: A3	Date: 2022-03-04	**Rev: R0.8**
KiCad E.D.A. kicad (5.1.12)-1		Id: 5/6



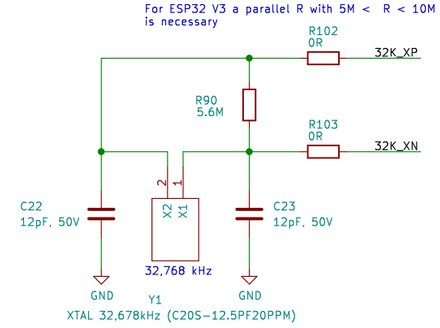
Pckg 0402 to place in grid

U3
ESP32-S3-WROOM-1

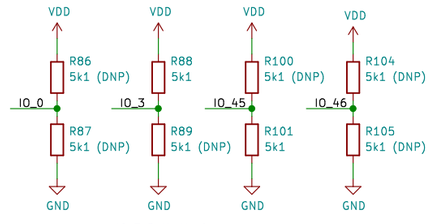
To measure current consumption of ESP32
remove R99 and connect Amperemeter between
TP12 and TP13



For ESP32 V3 a parallel R with 5M < R < 10M
is necessary



Strapping Resistors



IO_3 Pull-Up for
JTAG over USB

WhirlingBits

Matthias Ahrens & Stefan Tauschek

Sheet: /Espressif Developer Platform - Modules/
File: ESP_S3-CP-24_Platform_Modules.sch

Title: Espressif ESP32_S3-CP-24 Developer Platform - Overview

Size: A3	Date: 2022-03-04	**Rev: R0.8**
KiCad E.D.A. kicad (5.1.12)-1		Id: 6/6