CM5 socket

File: cm5_socket.kicad_sch

System MCU, Watchdog, EEPROM

File: system_mcu.kicad_sch

USB3 Hub, Front USB-C

File: usb3_hub.kicad_sch

DIB 2.0, TFT DSI

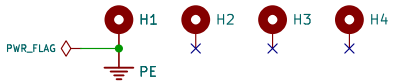
File: dib.kicad_sch

Miscelaneous

File: misc.kicad_sch

Ext video, Ethernet, Rear USB

File: ext_video.kicad_sch



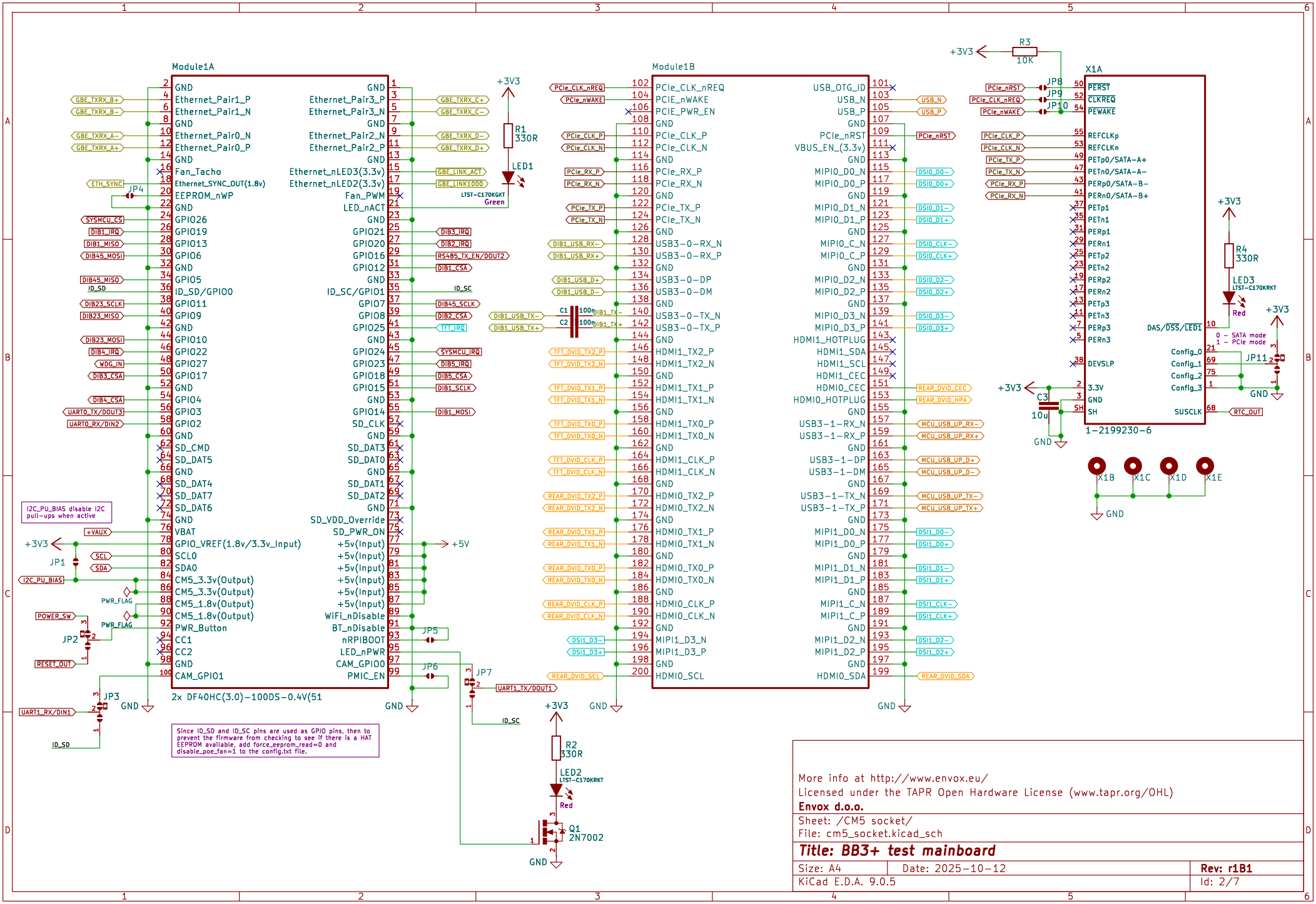
https://github.com/eez-open/eez-bb5-mcu-module
More info at http://www.envox.eu/

Envox d.o.o.

Sheet: /
File: BB3plus test mainboard.kicad_sch

Title: BB3+ test mainboard

Size: A4	Date: 2025-10-12	**Rev: r1B1**
KiCad E.D.A. 9.0.5		Id: 1/7


Module1A
Module1B
X1A
2x DF40HC(3.0)-100DS-0.4V(51
1-2199230-6
I2C_PU_BIAS disable I2C pull-ups when active
Since ID_SD and ID_SC pins are used as GPIO pins, then to prevent the firmware from checking to see if there is a HAT EEPROM available, add force_eeprom_read=0 and disable_poe_fan=1 to the config.txt file.
More info at http://www.envox.eu/
Licensed under the TAPR Open Hardware License (www.tapr.org/OHL)
Envox d.o.o.
Sheet: /CM5 socket/
File: cm5_socket.kicad_sch
Title: BB3+ test mainboard
Size: A4
Date: 2025-10-12
Rev: r1B1
KiCad E.D.A. 9.0.5
Id: 2/7

System 32-bit MCU

The System MCU is programmed so that the Master MCU first simultaneously activates DIB4_CSA and DIB5_CSA and then simultaneously activates DIB2_CSA and DIB3_CSA which will reset the System MCU and put it into bootloader mode.
Simultaneous activation of two CSA (Chip Select) signals on the same SPI channel should never occur in normal operation.
100K pullup resistors ensure that RESET and BOOT0 are inactive if the Master MCU is not installed.

5V monitoring

Supercap for RTC

Supercap alternatives:
1) KR-5R5H105-R
2) SCMDVLT3R6105ZVH190004E
3) SCMDVLT5R5105ZVH190004E

EEPROM

Watchdog/supervisor

The watchdog signal is daisy chained in such a way that the master MCU/CPU sends a "heartbeat" signal WDG_IN to the system MCU (G071) which forwards it as WDG_OUT. The start of monitoring the "heartbeat" signal is controlled with WDG_SET.

Audio out

Audio out (AB-class amp)

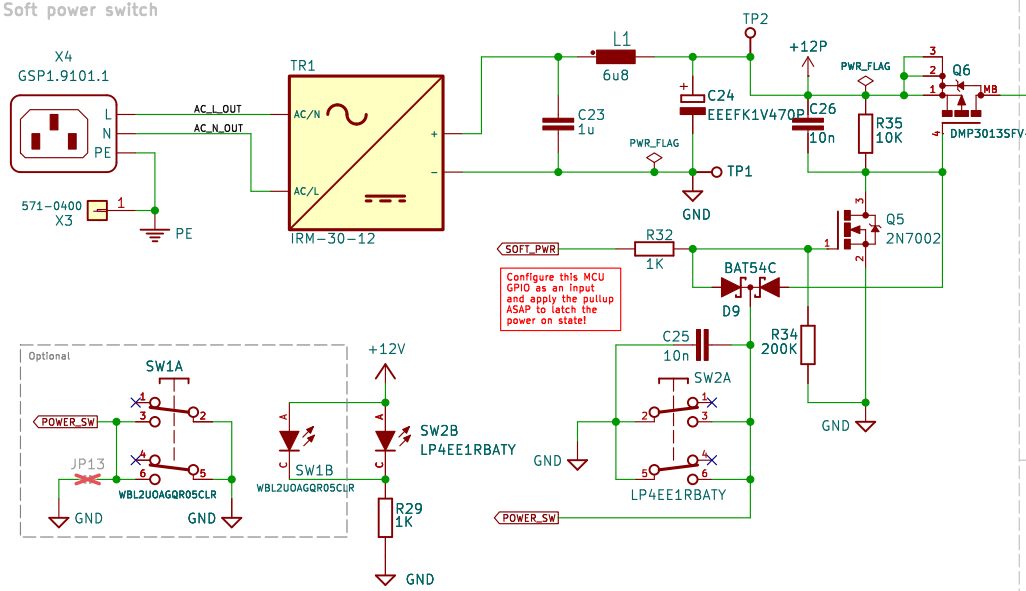
Envox d.o.o.

Sheet: /System MCU, Watchdog, EEPROM/
File: system_mcu.kicad_sch

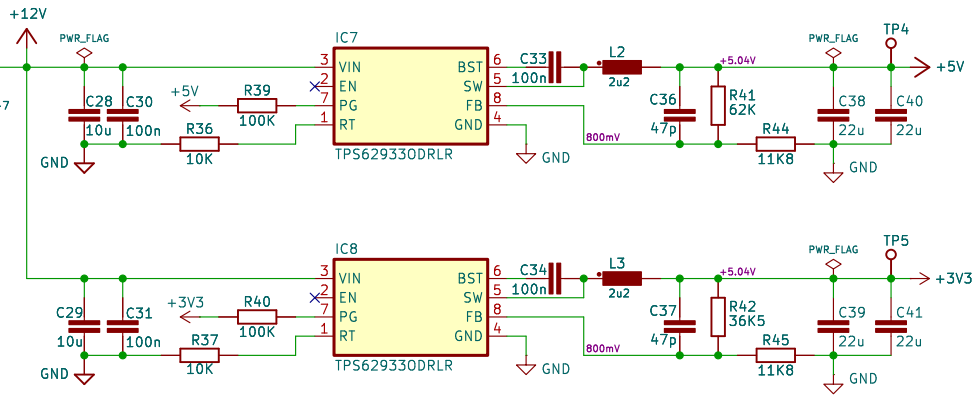
Title: BB3+ test mainboard

Size: A4	Date: 2025-10-12	**Rev: r1B1**
KiCad E.D.A. 9.0.5		Id: 3/7

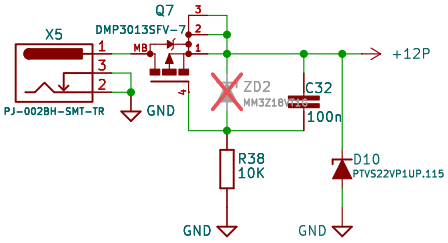
Soft power switch



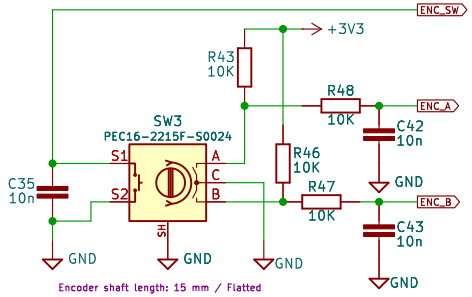
DC–DC stepdown converters (+5V, +3V3)



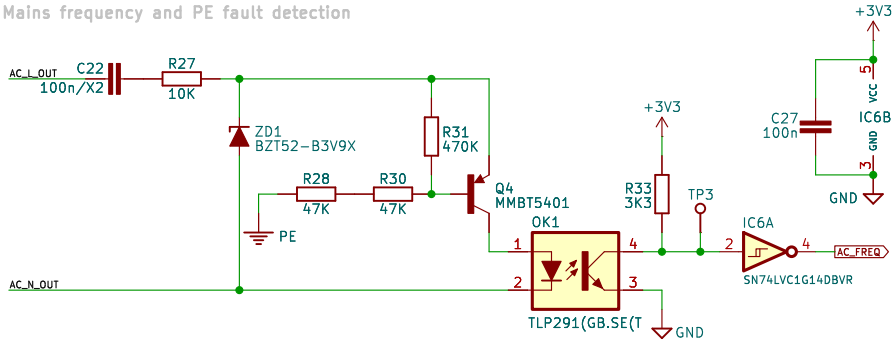
12Vdc aux



Encoder with switch



AC Mains frequency and PE fault detection

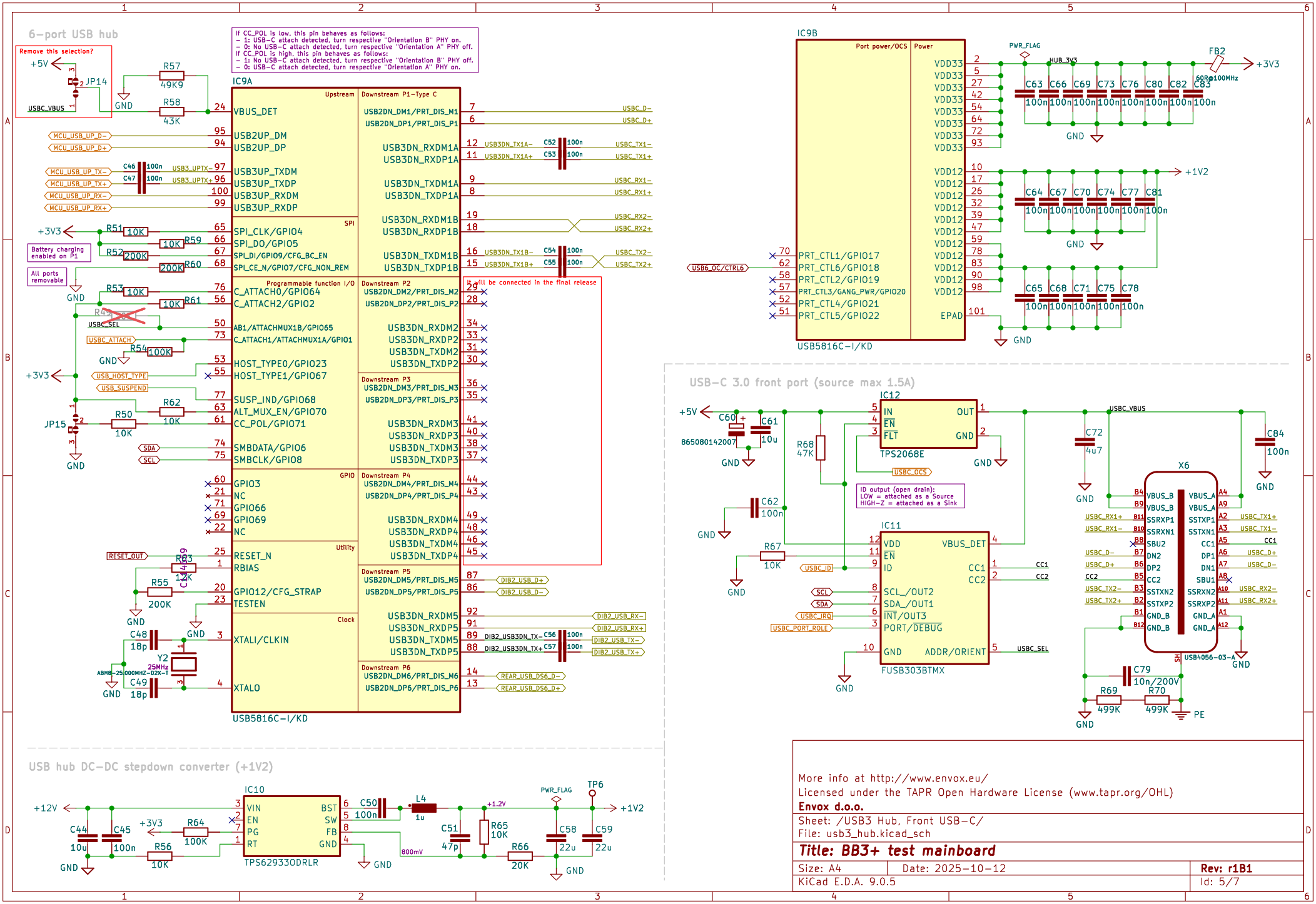


Envox d.o.o.

Sheet: /Miscelaneous/
File: misc.kicad_sch

Title: BB3+ test mainboard

Size: A4	Date: 2025-10-12	**Rev: r1B1**
KiCad E.D.A. 9.0.5		Id: 4/7


6-port USB hub
Remove this selection?
+5V
JP14
USBC_VBUS
R57
49K9
R58
43K
GND
IC9A
If CC_POL is low, this pin behaves as follows:
– 1: USB-C attach detected, turn respective "Orientation B" PHY on.
– 0: No USB-C attach detected, turn respective "Orientation A" PHY off.
If CC_POL is high, this pin behaves as follows:
– 1: No USB-C attach detected, turn respective "Orientation B" PHY off.
– 0: USB-C attach detected, turn respective "Orientation A" PHY on.
Upstream
VBUS_DET
USB2UP_DM
USB2UP_DP
USB3UP_TXDM
USB3UP_TXDP
USB3UP_RXDM
USB3UP_RXDP
SPI
SPI_CLK/GPIO4
SPI_DO/GPIO5
SPI_DI/GPIO9/CFG_BC_EN
SPI_CE_N/GPIO7/CFG_NON_REM
Programmable function I/O
C_ATTACH0/GPIO64
C_ATTACH2/GPIO2
AB1/ATTACHMUX1B/GPIO65
C_ATTACH1/ATTACHMUX1A/GPIO1
HOST_TYPE0/GPIO23
HOST_TYPE1/GPIO67
SUSP_IND/GPIO68
ALT_MUX_EN/GPIO70
CC_POL/GPIO71
SMBDATA/GPIO6
SMBCLK/GPIO8
GPIO
GPIO3
NC
GPIO66
GPIO69
NC
Utility
RESET_N
RBIAS
GPIO12/CFG_STRAP
TESTEN
Clock
XTALI/CLKIN
XTALO
Downstream P1–Type C
USB2DN_DM1/PRT_DIS_M1
USB2DN_DP1/PRT_DIS_P1
USB3DN_RXDM1A
USB3DN_RXDP1A
USB3DN_TXDM1A
USB3DN_TXDP1A
USB3DN_RXDM1B
USB3DN_RXDP1B
USB3DN_TXDM1B
USB3DN_TXDP1B
Downstream P2
USB2DN_DM2/PRT_DIS_M2
USB2DN_DP2/PRT_DIS_P2
USB3DN_RXDM2
USB3DN_RXDP2
USB3DN_TXDM2
USB3DN_TXDP2
Downstream P3
USB2DN_DM3/PRT_DIS_M3
USB2DN_DP3/PRT_DIS_P3
USB3DN_RXDM3
USB3DN_RXDP3
USB3DN_TXDM3
USB3DN_TXDP3
Downstream P4
USB2DN_DM4/PRT_DIS_M4
USB2DN_DP4/PRT_DIS_P4
USB3DN_RXDM4
USB3DN_RXDP4
USB3DN_TXDM4
USB3DN_TXDP4
Downstream P5
USB2DN_DM5/PRT_DIS_M5
USB2DN_DP5/PRT_DIS_P5
USB3DN_RXDM5
USB3DN_RXDP5
USB3DN_TXDM5
USB3DN_TXDP5
Downstream P6
USB2DN_DM6/PRT_DIS_M6
USB2DN_DP6/PRT_DIS_P6
USB5816C-I/KD
It will be connected in the final release
MCU_USB_UP_D–
MCU_USB_UP_D+
MCU_USB_UP_TX–
MCU_USB_UP_TX+
MCU_USB_UP_RX–
MCU_USB_UP_RX+
USB3_UPTX–
USB3_UPTX+
C46 100n
C47 100n
+3V3
R51 10K
R59 10K
R52 200K
R60 200K
Battery charging enabled on P1
All ports removable
R53 10K
R61 10K
R54 100K
USBC_SEL
USBC_ATTACH
USB_HOST_TYPE
USB_SUSPEND
JP15
R62
R50 10K
SDA
SCL
RESET_OUT
R63 12K
R55 200K
C48 18p
C49 18p
Y2
25MHz
ABM8-25.000MHZ-D2X-T
USB3DN_TX1A–
USB3DN_TX1A+
USB3DN_TX1B–
USB3DN_TX1B+
C52 100n
C53 100n
C54 100n
C55 100n
USBC_D–
USBC_D+
USBC_TX1–
USBC_TX1+
USBC_RX1–
USBC_RX1+
USBC_RX2–
USBC_RX2+
USBC_TX2–
USBC_TX2+
DIB2_USB_D+
DIB2_USB_D–
DIB2_USB_RX–
DIB2_USB_RX+
DIB2_USB3DN_TX–
DIB2_USB3DN_TX+
C56 100n
C57 100n
DIB2_USB_TX–
DIB2_USB_TX+
REAR_USB_DS6_D–
REAR_USB_DS6_D+
IC9B
Port power/OCS
Power
VDD33
VDD12
EPAD
PRT_CTL1/GPIO17
PRT_CTL6/GPIO18
PRT_CTL2/GPIO19
PRT_CTL3/GANG_PWR/GPIO20
PRT_CTL4/GPIO21
PRT_CTL5/GPIO22
USB6_OC/CTRL6
USB5816C-I/KD
PWR_FLAG
HUB_3V3
FB2
60R@100MHz
+3V3
+1V2
C63 C66 C69 C73 C76 C80 C82 C83 100n
C64 C67 C70 C74 C77 C81 100n
C65 C68 C71 C75 C78 100n
USB-C 3.0 front port (source max 1.5A)
IC12
TPS2068E
IN
EN
FLT
OUT
GND
+5V
C60
B65080142007
C61 10u
R68 47K
USBC_OCS
ID output (open drain):
LOW = attached as a Source
HIGH-Z = attached as a Sink
C62 100n
IC11
FUSB303BTMX
VDD
VBUS_DET
EN
ID
CC1
CC2
SCL_/OUT2
SDA_/OUT1
INT/OUT3
PORT/DEBUG
ADDR/ORIENT
USBC_ID
USBC_IRQ
USBC_PORT_ROLE
R67 10K
CC1
CC2
USBC_SEL
C72 4u7
C84 100n
USBC_VBUS
X6
USB4056-03-A
VBUS_B
VBUS_A
SSRXP1
SSRXN1
SSTXP1
SSTXN1
SBU2
DN2
DP2
CC2
SSTXN2
SSRXN2
SSRXP2
GND_B
SBU1
DP1
DN1
CC1
SSTXP1
SSTXN1
SSRXP1
SSRXN2
SSTXN2
GND_A
SH
C79 10n/200V
R69 499K
R70 499K
PE
USB hub DC-DC stepdown converter (+1V2)
IC10
TPS62933ODRLR
VIN
EN
PG
RT
BST
SW
FB
GND
+12V
C44 10u
C45 100n
R64 100K
R56 10K
C50 100n
L4 1u
C51 47p
R65 10K
R66 20K
800mV
+1.2V
PWR_FLAG
TP6
C58 22u
C59 22u
More info at http://www.envox.eu/
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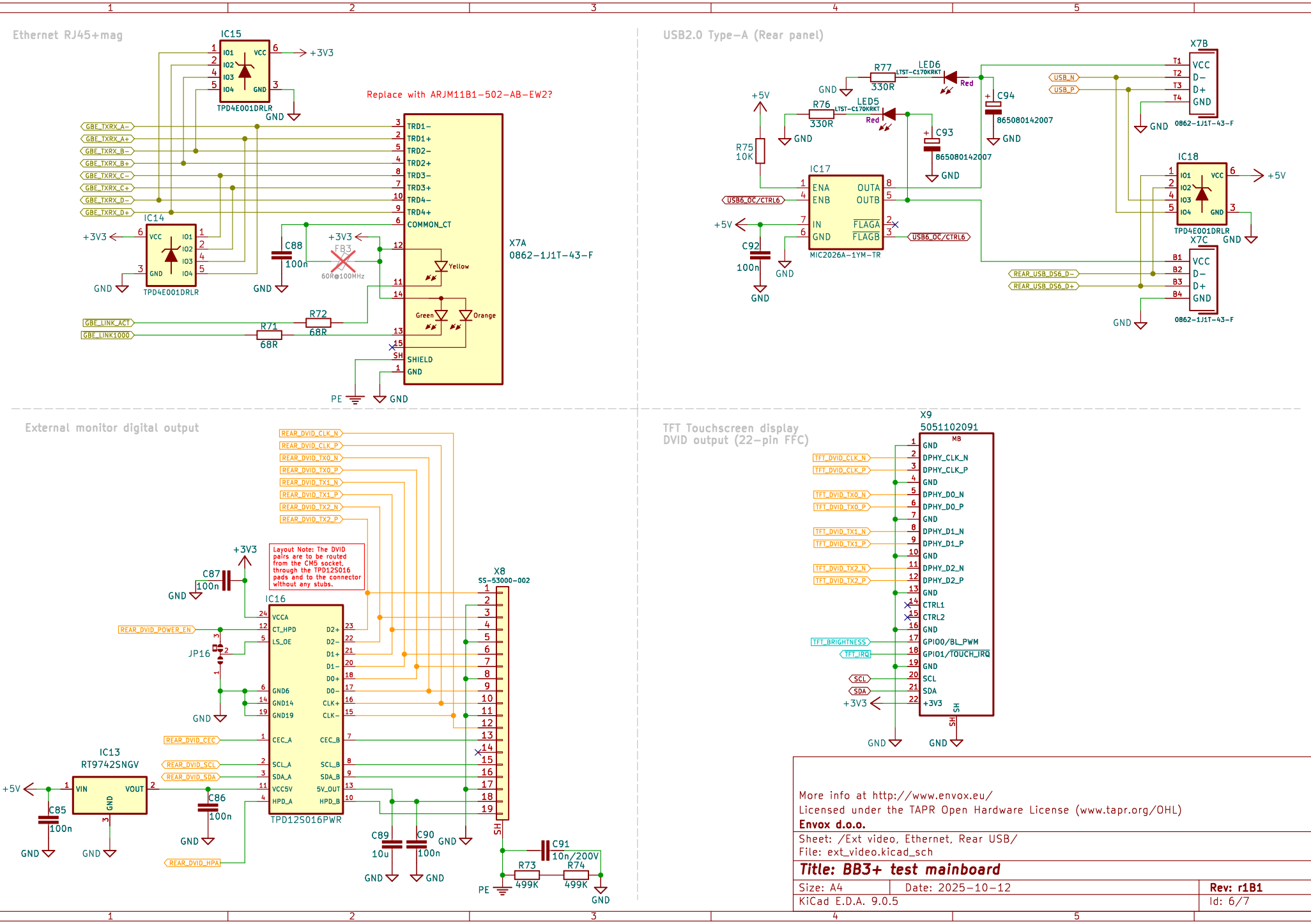
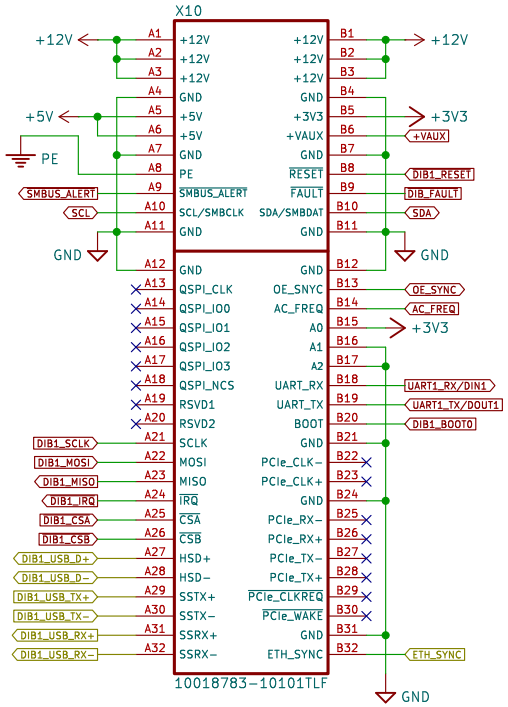
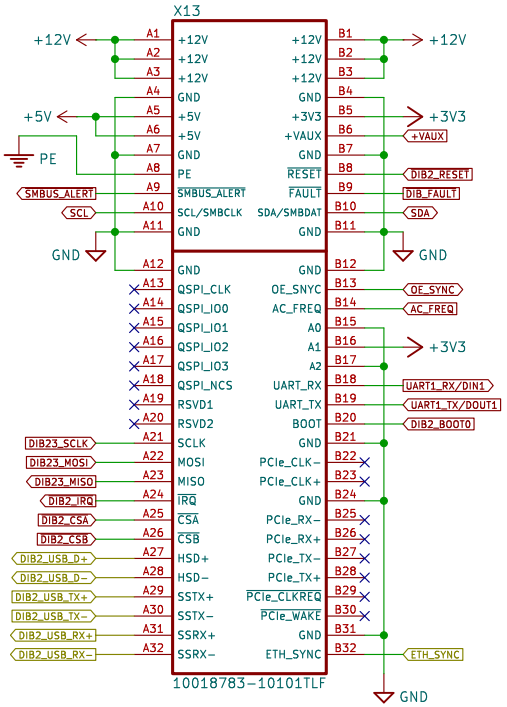
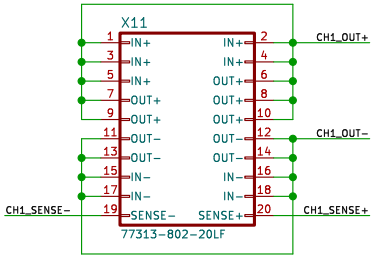
Envox d.o.o.
Sheet: /USB3 Hub, Front USB-C/
File: usb3_hub.kicad_sch
Title: BB3+ test mainboard
Size: A4
Date: 2025-10-12
Rev: r1B1
KiCad E.D.A. 9.0.5
Id: 5/7

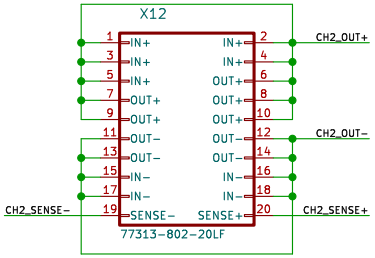

Ethernet RJ45+mag
IC15
TPD4E001DRLR
+3V3
GND
Replace with ARJM11B1-502-AB-EW2?
GBE_TXRX_A-
GBE_TXRX_A+
GBE_TXRX_B-
GBE_TXRX_B+
GBE_TXRX_C-
GBE_TXRX_C+
GBE_TXRX_D-
GBE_TXRX_D+
IC14
TPD4E001DRLR
C88
100n
FB3
60R@100MHz
TRD1-
TRD1+
TRD2-
TRD2+
TRD3-
TRD3+
TRD4-
TRD4+
COMMON_CT
SHIELD
X7A
0862-1J1T-43-F
Yellow
Green
Orange
GBE_LINK_ACT
GBE_LINK1000
R71
68R
R72
68R
PE
USB2.0 Type-A (Rear panel)
R77
330R
LED6
LTST-C170KRKT
Red
R76
330R
LED5
LTST-C170KRKT
Red
C94
865080142007
C93
865080142007
R75
10K
IC17
MIC2026A-1YM-TR
ENA
ENB
IN
GND
OUTA
OUTB
FLAGA
FLAGB
USB6_OC/CTRL6
C92
100n
X7B
X7C
0862-1J1T-43-F
USB_N
USB_P
REAR_USB_DS6_D-
REAR_USB_DS6_D+
IC18
TPD4E001DRLR
External monitor digital output
REAR_DVID_CLK_N
REAR_DVID_CLK_P
REAR_DVID_TX0_N
REAR_DVID_TX0_P
REAR_DVID_TX1_N
REAR_DVID_TX1_P
REAR_DVID_TX2_N
REAR_DVID_TX2_P
Layout Note: The DVID pairs are to be routed from the CM5 socket, through the TPD12S016 pads and to the connector without any stubs.
C87
100n
IC16
TPD12S016PWR
REAR_DVID_POWER_EN
JP16
REAR_DVID_CEC
REAR_DVID_SCL
REAR_DVID_SDA
REAR_DVID_HPA
X8
SS-53000-002
IC13
RT9742SNGV
C85
100n
C86
100n
C89
10u
C90
100n
C91
10n/200V
R73
499K
R74
499K
TFT Touchscreen display
DVID output (22-pin FFC)
X9
5051102091
TFT_DVID_CLK_N
TFT_DVID_CLK_P
DPHY_CLK_N
DPHY_CLK_P
TFT_DVID_TX0_N
TFT_DVID_TX0_P
DPHY_D0_N
DPHY_D0_P
TFT_DVID_TX1_N
TFT_DVID_TX1_P
DPHY_D1_N
DPHY_D1_P
TFT_DVID_TX2_N
TFT_DVID_TX2_P
DPHY_D2_N
DPHY_D2_P
CTRL1
CTRL2
TFT_BRIGHTNESS
GPIO0/BL_PWM
TFT_IRQ
GPIO1/TOUCH_IRQ
SCL
SDA
More info at http://www.envox.eu/
Licensed under the TAPR Open Hardware License (www.tapr.org/OHL)
Envox d.o.o.
Sheet: /Ext video, Ethernet, Rear USB/
File: ext_video.kicad_sch
Title: BB3+ test mainboard
Size: A4
Date: 2025-10-12
Rev: r1B1
KiCad E.D.A. 9.0.5
Id: 6/7

DIB 2.0 Signal connectors

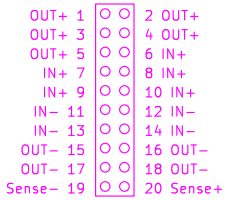




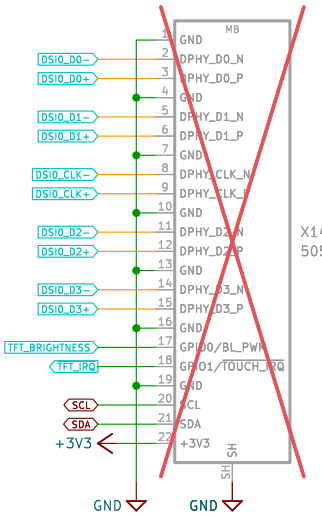




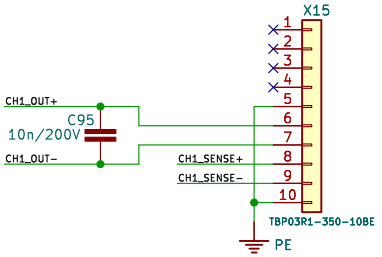
20-pin DIB v2.0 Power connector



TFT Touchscreen display DSI output (22-pin FFC)



Rear front power outputs



Rear panel power connector

More info at http://www.envox.eu/

Envox d.o.o.

Sheet: /DIB 2.0, TFT DSI/
File: dib.kicad_sch

Title: BB3+ test mainboard

Size: A4	Date: 2025-10-12	**Rev: r1B1**
KiCad E.D.A. 9.0.5		Id: 7/7