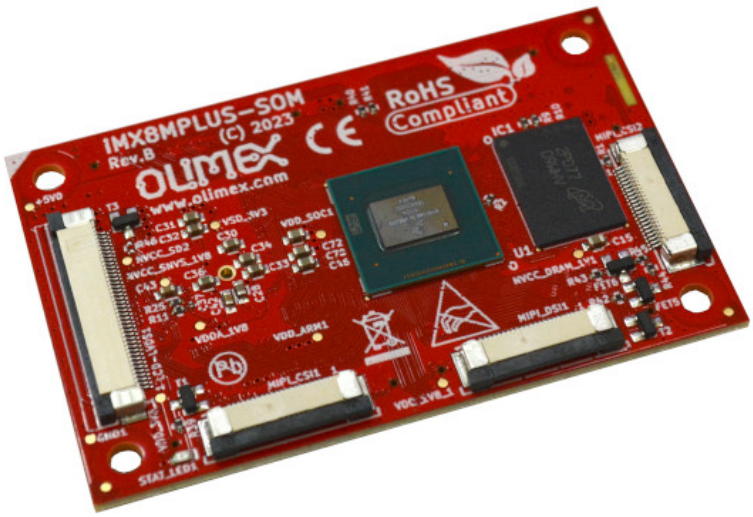


IMX8MP-SOM-xGB-IND

User Manual

Document revision 2.0 **www.olimex.com**

Table of Contents

iMX8MP-SOM-4GB-IND board features

iMX8MP-SOM-4GB-IND exposes all MIMX8ML8CVNKZAB GPIOs and features in a very compact format. It takes care for power supply and high speed memory signals complexities.

- MIMX8ML8CVNKZAB Quad core Cortex-A53 @1600Mhz + Arm Cortex-M7 @800 Mhz
- 4GB LPDDR4 RAM
- PMIC PCA9450
- 24 Mhz crystal
- 32.768 kHz crystal
- EEPROM memory (for Linux configuration or settings)
- Power LED
- User LED
- 5 x 40 pin + 1 x 20 pin total 220 pin connectors with 1.27 mm/0.05" step
- LVDS, 2 x MIPI CSI, MIPI DSI ribbon connectors on top
- Extended operating temperature – from -20°C to +85°C
- Dimensions: (70 x 43)mm
- 4 holes for mounting
- Open source hardware design, all KiCAD design files available for download

Compatible with iMX8MP-SOM-EVB-IND – iMX8MP-SOM-4GB-IND can be placed on top of expansion board for easier R&D and prototyping.

MIMX8ML8CVNKZAB chip features

The main chip has the following features:

- MIMX8ML8CVNKZAB Quad core Cortex-A53 @1600Mhz + Arm Cortex-M7 @800 Mhz
- 512KB Cache
- Vivante GC520L, Vivante GC7000UL
- HDMI HD1080p60 H.264, HD1080p60 H.265, VP8 video codec, VP9 video codec
- MIPI-DSI
- LVDS 4/8 lanes
- NPU 2.3 TOPS
- 2 x Gigabit Ethernet (1 x TSN)
- 2 x MIPI-CSI camera
- 1 x ISP camera
- 2 x USB3 with OTG
- 1 x PCIe 3.0
- 2 x CAN FD
- 3 x SPI
- 5 x I2C
- 3 x SDIO eMMC 5.1
- 4 x UART 5Mbit
- 4 x PWM
- Audio: ASRC, HiFi 4 DSP, SAI/I2S, eARC

iMX8MP-SOM-EVB-IND board of peripherals features

iMX8MP-SOM-EVB-IND can be placed on top of expansion board for easier R&D and prototyping. It has the following features:

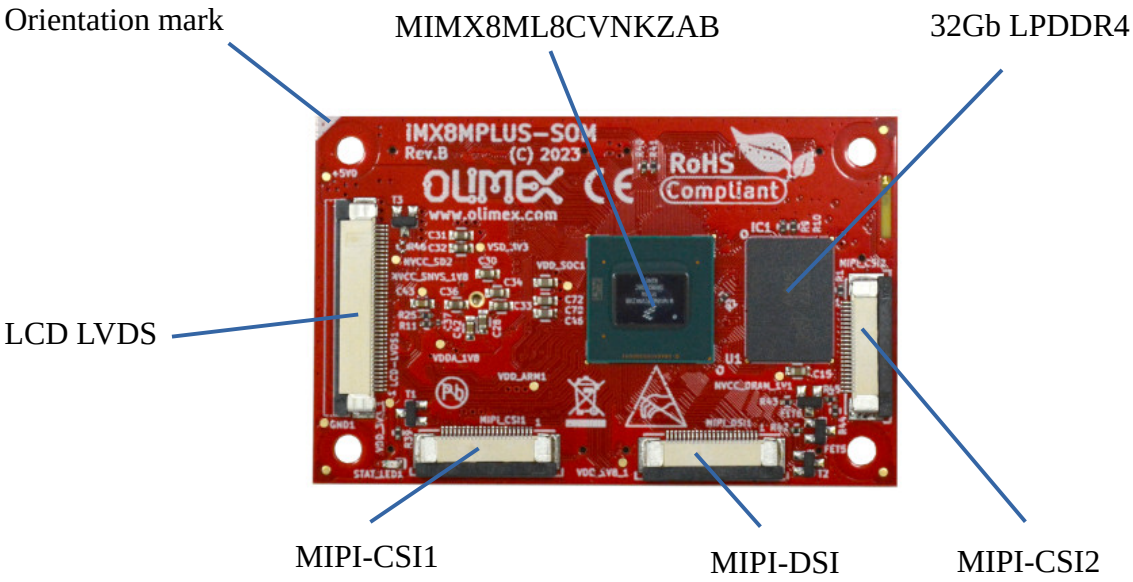
- iMX8MP-SOM matching connectors
- Two Gigabit Ethernet connectors
- Two CAN transceivers
- HDMI
- Power jack 5V
- UEXT connector
- Two GPIO connectors
- Two serial debug UARTs (for A53 and M7)
- Optional ARM JTAG connector
- Micro SD-card connector
- Flash module connector
- USB 3 hosts
- Headphone 3.5mm connector
- Microphone 3.5 mm connector
- Reset button
- PWR button
- Boot slide switch
- Industrial grade temeprature range: (-45+85)C
- Dimensions: (155 x 102)mm

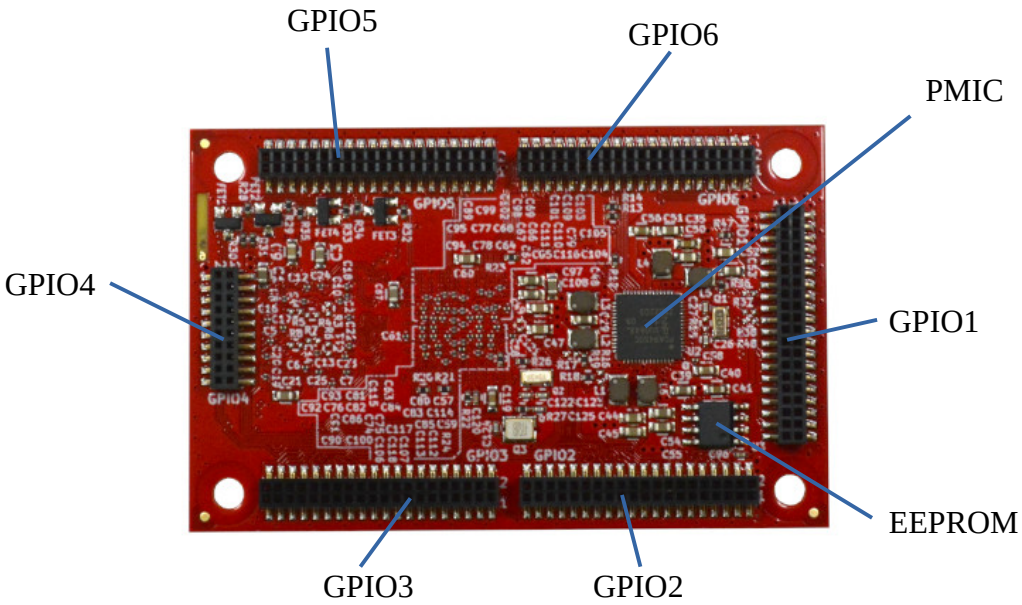
Order codes for iMX8MP-SOM and accessories

iMX8MP-SOM-4GB-IND	Main module with iMX8MPLUS, 4GB LPDDR4, EEPROM, PMIC
iMX8MP-SOM-EVB	Evaluation board with peripherals that can be used as a reference design, compatible with iMX8MP-SOM-4GB-IND
MICRO-SD-16GB-CLASS10	Blank 16GB microSD card
SY1005E	Power adapter 5V 2A
USB-SERIAL-F	Serial debug cable for console log
CABLE-HDMI-50CM	HDMI cable
BATTERY-LIPO1400mAh	Li-Po battery for standalone operation
LCD/LCD-OLinuXino-5CTS	5 inch LCD 800x480 pixels with capacities touch panel
LCD-OLinuXino-7CTS	7 inch LCD 1024x600 pixels with capacitive touch panel
LCD-OLinuXino-10CTS	10 inch LCD 1024x600 pixels with capacitive touch panel
UEXT modules	Expansion modules temperature, humidity, pressure, magnetic field, light sensors. Modules with LCDs, LED matrix, Relays, Bluetooth, Zigbee, WiFi, GSM, GPS, RFID, RTC, EKG, sensors and etc.

HARDWARE

iMX8MP-SOM layout





iMX8MP-SOM schematics

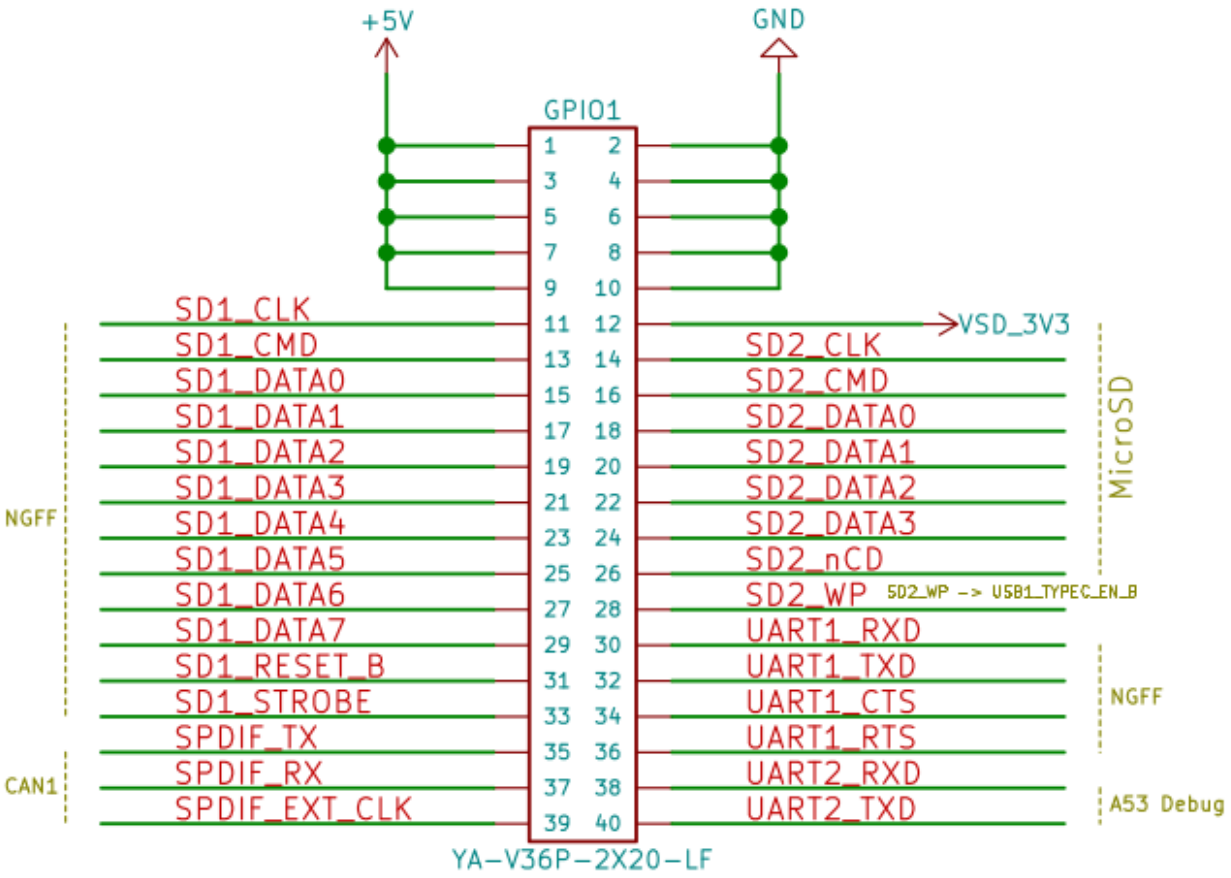
iMX8MP-SOM-4GB-IND latest schematic is at our GitHub.

Hardware sources and more can also be found here:

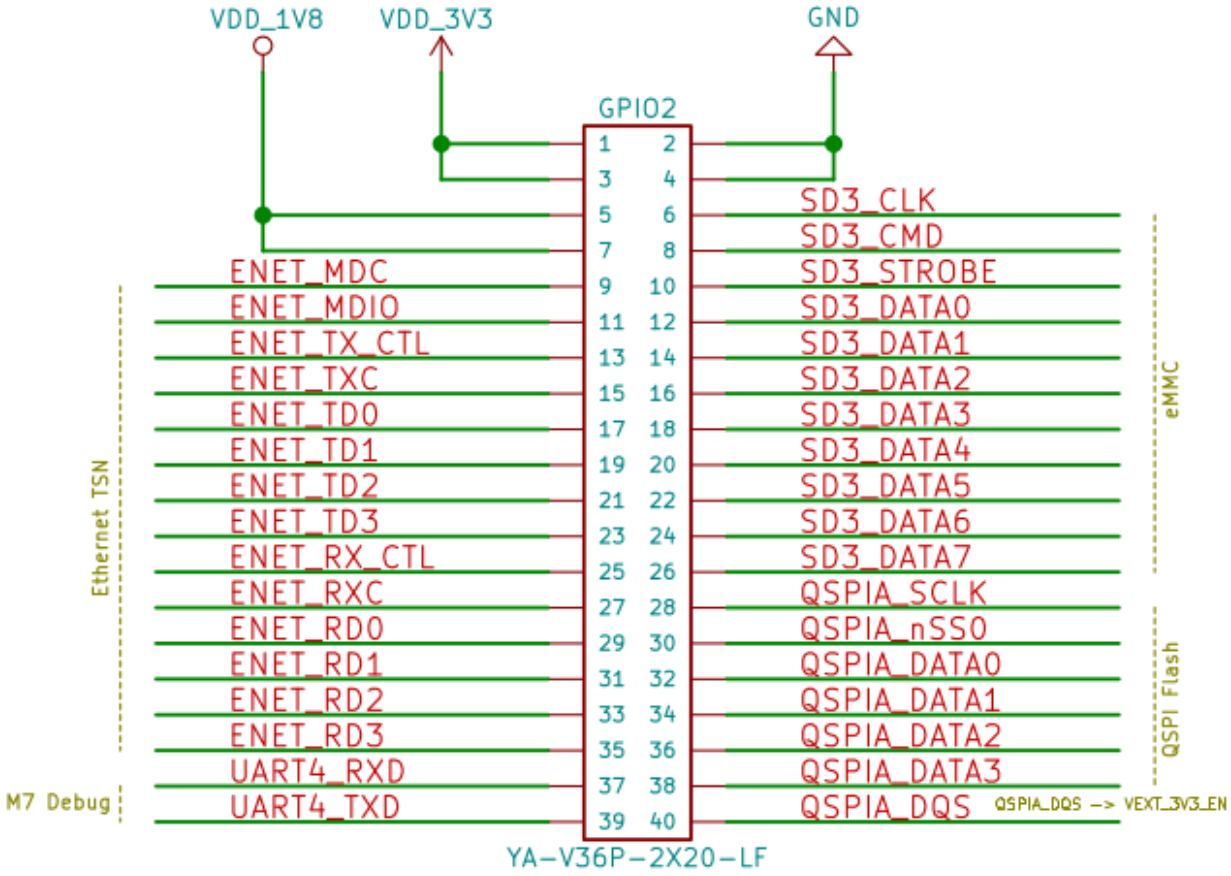
https://github.com/OLIMEX/iMX8MP-SOM/tree/main/HARDWARE

iMX8MP-SOM connectors

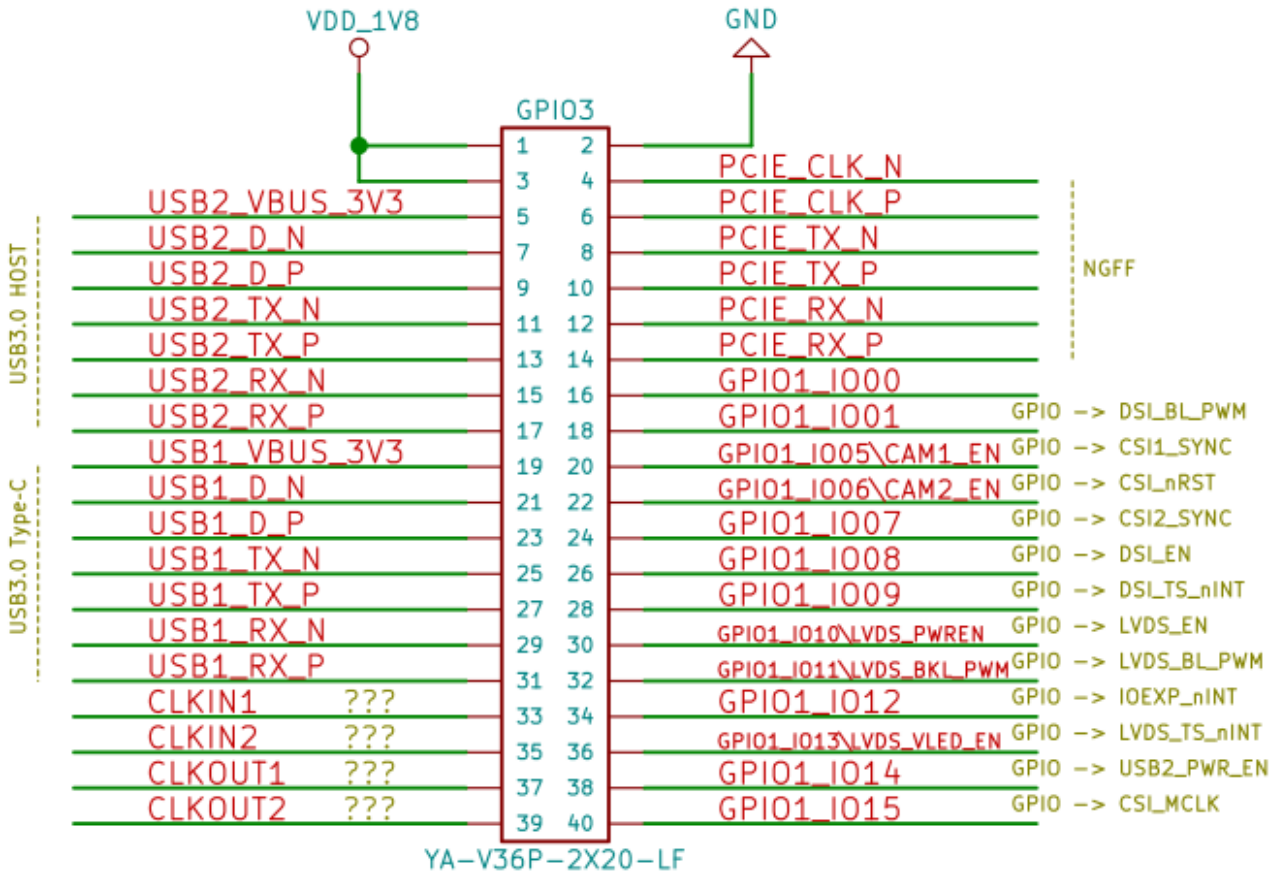
GPIO1



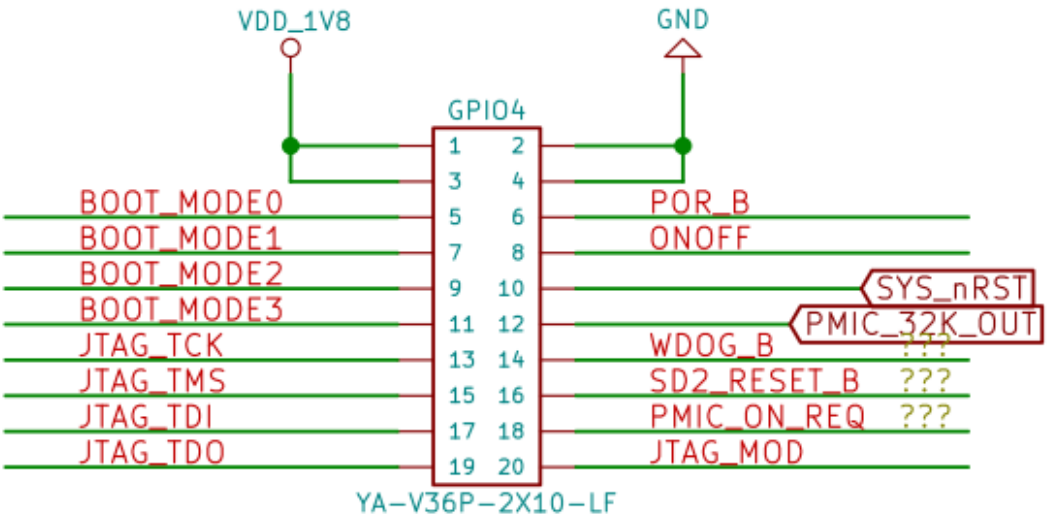
GPIO2


VDD_1V8
VDD_3V3
GND
GPIO2
1 2
3 4
5 6
7 8
9 10
11 12
13 14
15 16
17 18
19 20
21 22
23 24
25 26
27 28
29 30
31 32
33 34
35 36
37 38
39 40
SD3_CLK
SD3_CMD
SD3_STROBE
SD3_DATA0
SD3_DATA1
SD3_DATA2
SD3_DATA3
SD3_DATA4
SD3_DATA5
SD3_DATA6
SD3_DATA7
QSPIA_SCLK
QSPIA_nSS0
QSPIA_DATA0
QSPIA_DATA1
QSPIA_DATA2
QSPIA_DATA3
QSPIA_DQS
QSPIA_DQS -> VEXT_3V3_EN
ENET_MDC
ENET_MDIO
ENET_TX_CTL
ENET_TXC
ENET_TD0
ENET_TD1
ENET_TD2
ENET_TD3
ENET_RX_CTL
ENET_RXC
ENET_RD0
ENET_RD1
ENET_RD2
ENET_RD3
UART4_RXD
UART4_TXD
Ethernet TSN
M7 Debug
eMMC
QSPI Flash
YA-V36P-2X20-LF

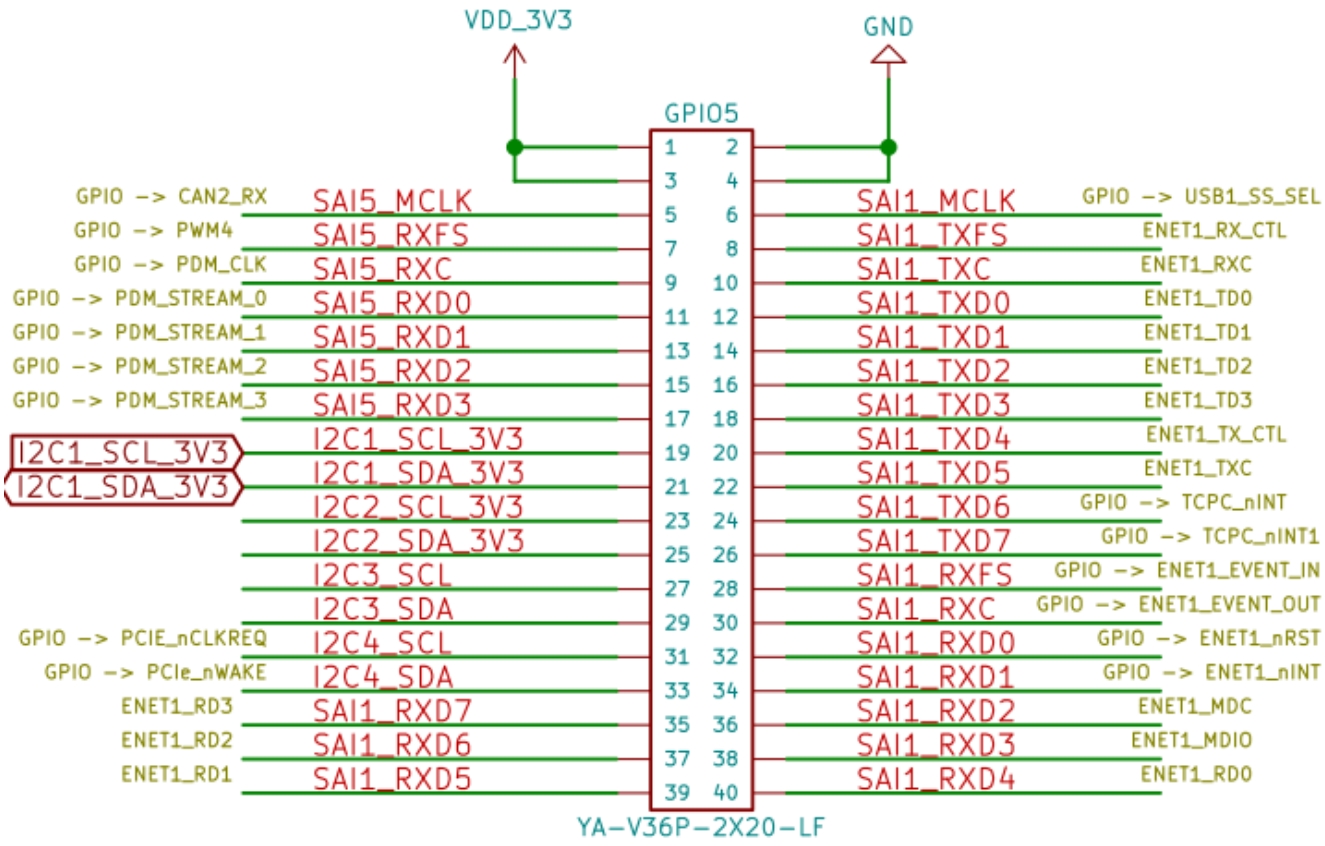
GPIO3


VDD_1V8
GND
GPIO3
1 2
3 4
5 6
7 8
9 10
11 12
13 14
15 16
17 18
19 20
21 22
23 24
25 26
27 28
29 30
31 32
33 34
35 36
37 38
39 40
USB3.0 HOST
USB3.0 Type-C
USB2_VBUS_3V3
USB2_D_N
USB2_D_P
USB2_TX_N
USB2_TX_P
USB2_RX_N
USB2_RX_P
USB1_VBUS_3V3
USB1_D_N
USB1_D_P
USB1_TX_N
USB1_TX_P
USB1_RX_N
USB1_RX_P
CLKIN1 ???
CLKIN2 ???
CLKOUT1 ???
CLKOUT2 ???
PCIE_CLK_N
PCIE_CLK_P
PCIE_TX_N
PCIE_TX_P
PCIE_RX_N
PCIE_RX_P
NGFF
GPIO1_IO00
GPIO1_IO01
GPIO1_IO05\CAM1_EN
GPIO1_IO06\CAM2_EN
GPIO1_IO07
GPIO1_IO08
GPIO1_IO09
GPIO1_IO10\LVDS_PWREN
GPIO1_IO11\LVDS_BKL_PWM
GPIO1_IO12
GPIO1_IO13\LVDS_VLED_EN
GPIO1_IO14
GPIO1_IO15
GPIO -> DSI_BL_PWM
GPIO -> CSI1_SYNC
GPIO -> CSI_nRST
GPIO -> CSI2_SYNC
GPIO -> DSI_EN
GPIO -> DSI_TS_nINT
GPIO -> LVDS_EN
GPIO -> LVDS_BL_PWM
GPIO -> IOEXP_nINT
GPIO -> LVDS_TS_nINT
GPIO -> USB2_PWR_EN
GPIO -> CSI_MCLK
YA-V36P-2X20-LF

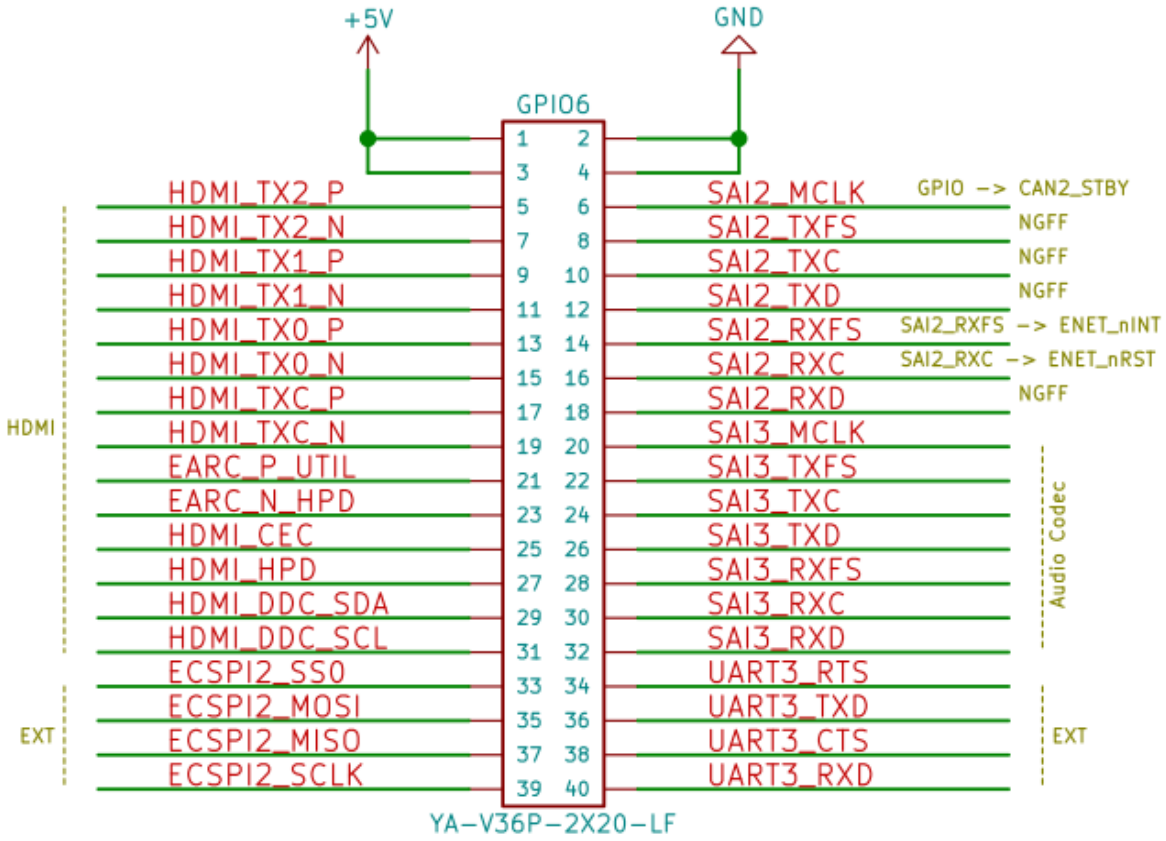
GPIO4


VDD_1V8
GND
GPIO4
1 2
3 4
5 6
7 8
9 10
11 12
13 14
15 16
17 18
19 20
BOOT_MODE0
BOOT_MODE1
BOOT_MODE2
BOOT_MODE3
JTAG_TCK
JTAG_TMS
JTAG_TDI
JTAG_TDO
POR_B
ONOFF
SYS_nRST
PMIC_32K_OUT
WDOG_B
SD2_RESET_B
PMIC_ON_REQ
JTAG_MOD
???
???
???
YA-V36P-2X10-LF

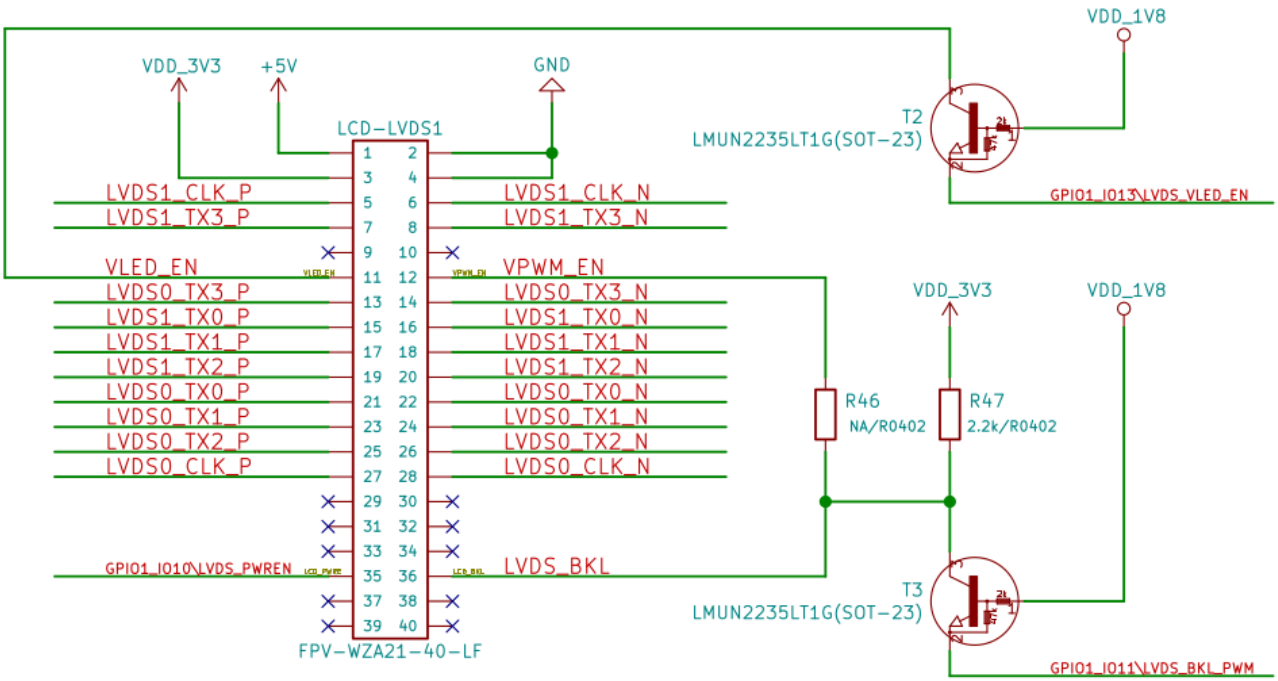
GPIO5


VDD_3V3
GND
GPIO5
1 2
3 4
5 6
7 8
9 10
11 12
13 14
15 16
17 18
19 20
21 22
23 24
25 26
27 28
29 30
31 32
33 34
35 36
37 38
39 40
YA-V36P-2X20-LF
GPIO -> CAN2_RX
GPIO -> PWM4
GPIO -> PDM_CLK
GPIO -> PDM_STREAM_0
GPIO -> PDM_STREAM_1
GPIO -> PDM_STREAM_2
GPIO -> PDM_STREAM_3
I2C1_SCL_3V3
I2C1_SDA_3V3
GPIO -> PCIE_nCLKREQ
GPIO -> PCIe_nWAKE
ENET1_RD3
ENET1_RD2
ENET1_RD1
SAI5_MCLK
SAI5_RXFS
SAI5_RXC
SAI5_RXD0
SAI5_RXD1
SAI5_RXD2
SAI5_RXD3
I2C1_SCL_3V3
I2C1_SDA_3V3
I2C2_SCL_3V3
I2C2_SDA_3V3
I2C3_SCL
I2C3_SDA
I2C4_SCL
I2C4_SDA
SAI1_RXD7
SAI1_RXD6
SAI1_RXD5
SAI1_MCLK
SAI1_TXFS
SAI1_TXC
SAI1_TXD0
SAI1_TXD1
SAI1_TXD2
SAI1_TXD3
SAI1_TXD4
SAI1_TXD5
SAI1_TXD6
SAI1_TXD7
SAI1_RXFS
SAI1_RXC
SAI1_RXD0
SAI1_RXD1
SAI1_RXD2
SAI1_RXD3
SAI1_RXD4
GPIO -> USB1_SS_SEL
ENET1_RX_CTL
ENET1_RXC
ENET1_TD0
ENET1_TD1
ENET1_TD2
ENET1_TD3
ENET1_TX_CTL
ENET1_TXC
GPIO -> TCPC_nINT
GPIO -> TCPC_nINT1
GPIO -> ENET1_EVENT_IN
GPIO -> ENET1_EVENT_OUT
GPIO -> ENET1_nRST
GPIO -> ENET1_nINT
ENET1_MDC
ENET1_MDIO
ENET1_RD0

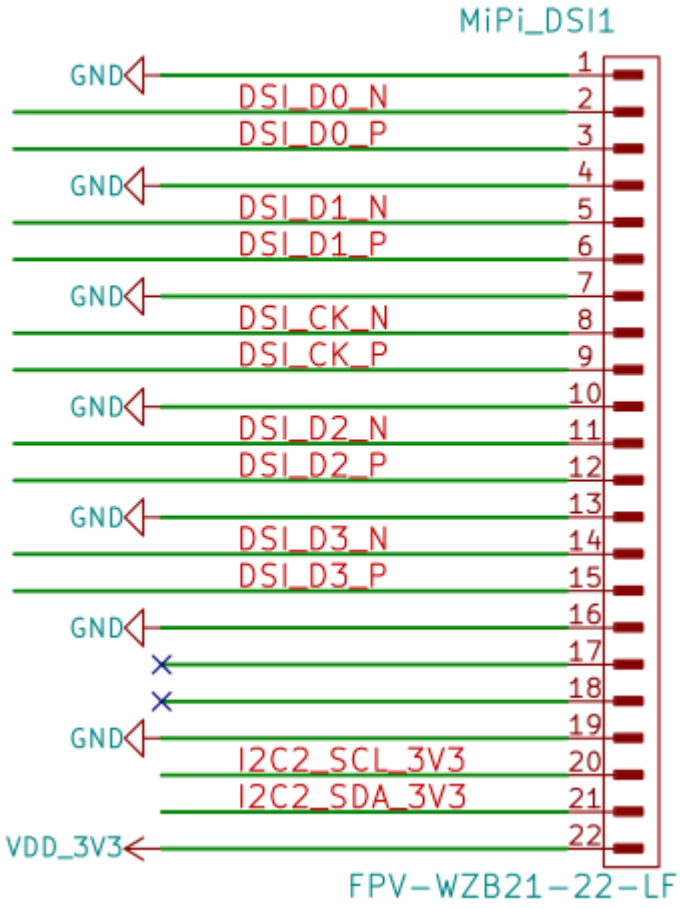
GPIO6


+5V
GND
GPIO6
HDMI_TX2_P
HDMI_TX2_N
HDMI_TX1_P
HDMI_TX1_N
HDMI_TX0_P
HDMI_TX0_N
HDMI_TXC_P
HDMI_TXC_N
EARC_P_UTIL
EARC_N_HPD
HDMI_CEC
HDMI_HPD
HDMI_DDC_SDA
HDMI_DDC_SCL
ECSPI2_SS0
ECSPI2_MOSI
ECSPI2_MISO
ECSPI2_SCLK
HDMI
EXT
SAI2_MCLK
SAI2_TXFS
SAI2_TXC
SAI2_TXD
SAI2_RXFS
SAI2_RXC
SAI2_RXD
SAI3_MCLK
SAI3_TXFS
SAI3_TXC
SAI3_TXD
SAI3_RXFS
SAI3_RXC
SAI3_RXD
UART3_RTS
UART3_TXD
UART3_CTS
UART3_RXD
GPIO -> CAN2_STBY
NGFF
NGFF
NGFF
SAI2_RXFS -> ENET_nINT
SAI2_RXC -> ENET_nRST
NGFF
Audio Codec
EXT
YA-V36P-2X20-LF

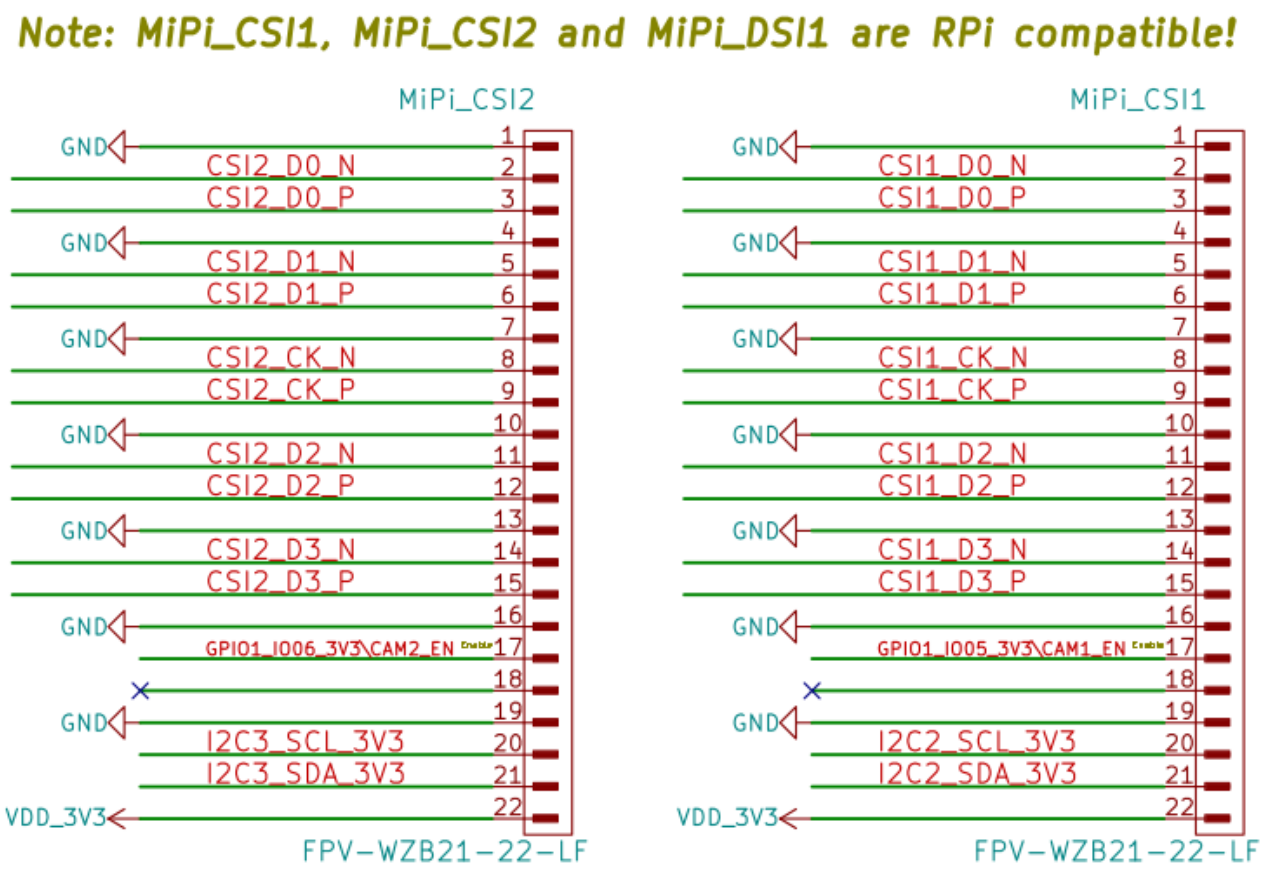
LCD


VDD_1V8
VDD_3V3
+5V
GND
LCD-LVDS1
T2
LMUN2235LT1G(SOT-23)
GPIO1_IO13\LVDS_VLED_EN
LVDS1_CLK_P
LVDS1_TX3_P
LVDS1_CLK_N
LVDS1_TX3_N
VLED_EN
VPWM_EN
LVDS0_TX3_P
LVDS1_TX0_P
LVDS1_TX1_P
LVDS1_TX2_P
LVDS0_TX0_P
LVDS0_TX1_P
LVDS0_TX2_P
LVDS0_CLK_P
LVDS0_TX3_N
LVDS1_TX0_N
LVDS1_TX1_N
LVDS1_TX2_N
LVDS0_TX0_N
LVDS0_TX1_N
LVDS0_TX2_N
LVDS0_CLK_N
GPIO1_IO10\LVDS_PWREN
LVDS_BKL
R46
NA/R0402
R47
2.2k/R0402
T3
LMUN2235LT1G(SOT-23)
GPIO1_IO11\LVDS_BKL_PWM
FPV-WZA21-40-LF

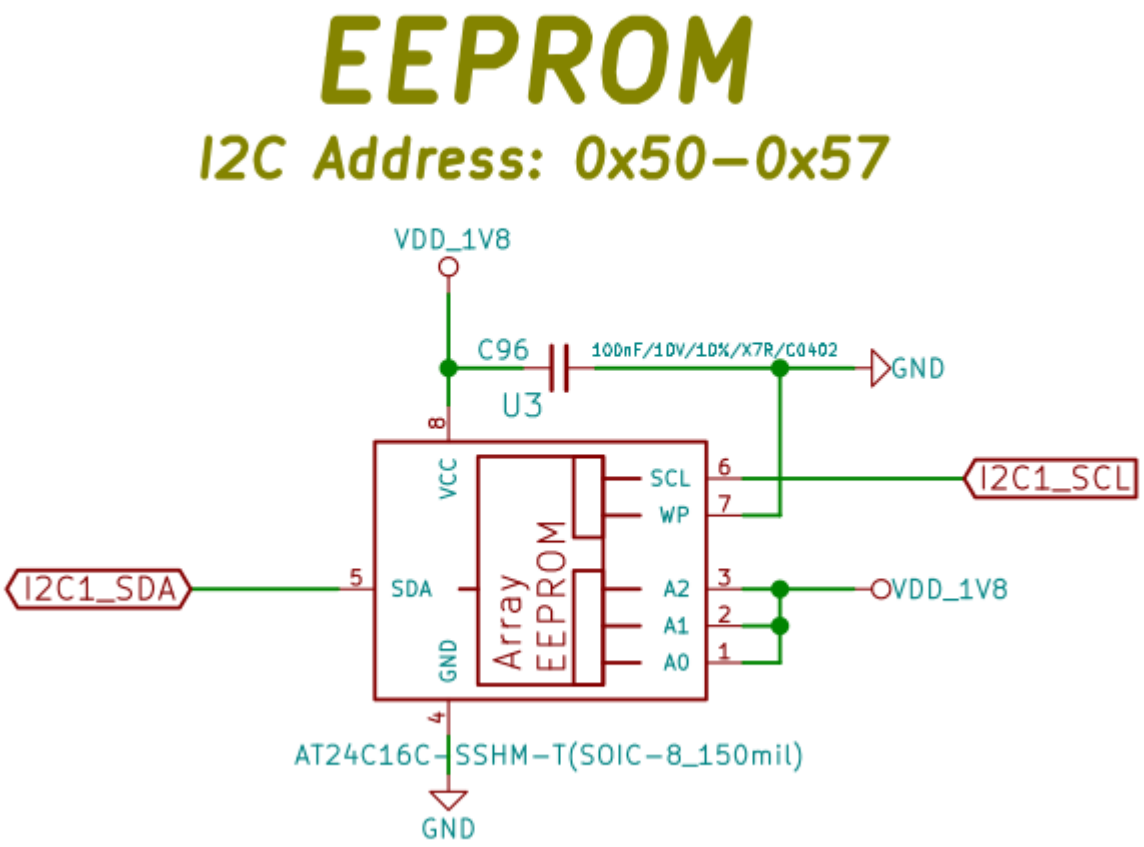
MIPI-DSI


MiPi_DSI1
GND
DSI_D0_N
DSI_D0_P
GND
DSI_D1_N
DSI_D1_P
GND
DSI_CK_N
DSI_CK_P
GND
DSI_D2_N
DSI_D2_P
GND
DSI_D3_N
DSI_D3_P
GND
GND
I2C2_SCL_3V3
I2C2_SDA_3V3
VDD_3V3
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
FPV-WZB21-22-LF

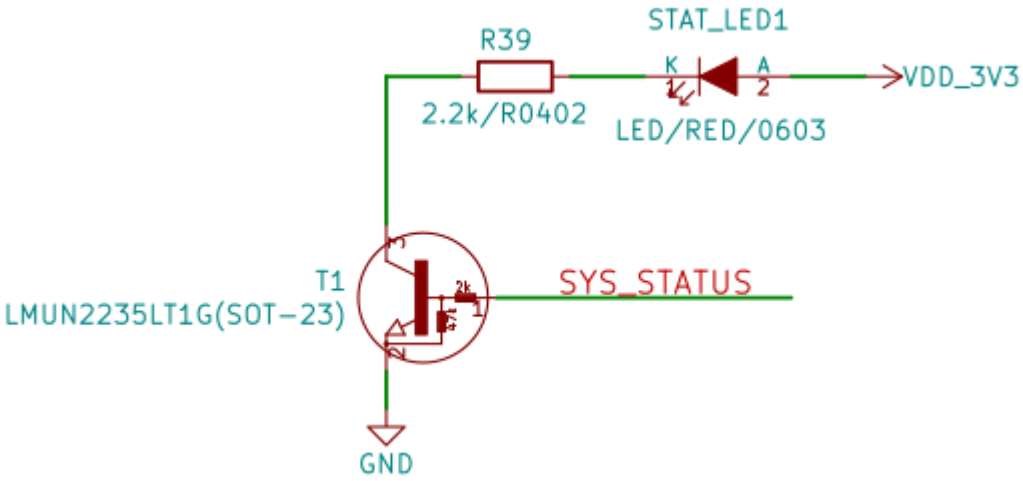
MIPI-CSI


Note: MiPi_CSI1, MiPi_CSI2 and MiPi_DSI1 are RPi compatible!
MiPi_CSI2
GND
CSI2_D0_N
CSI2_D0_P
GND
CSI2_D1_N
CSI2_D1_P
GND
CSI2_CK_N
CSI2_CK_P
GND
CSI2_D2_N
CSI2_D2_P
GND
CSI2_D3_N
CSI2_D3_P
GND
GPIO1_IO06_3V3\CAM2_EN
GND
I2C3_SCL_3V3
I2C3_SDA_3V3
VDD_3V3
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
FPV-WZB21-22-LF
MiPi_CSI1
GND
CSI1_D0_N
CSI1_D0_P
GND
CSI1_D1_N
CSI1_D1_P
GND
CSI1_CK_N
CSI1_CK_P
GND
CSI1_D2_N
CSI1_D2_P
GND
CSI1_D3_N
CSI1_D3_P
GND
GPIO1_IO05_3V3\CAM1_EN
GND
I2C2_SCL_3V3
I2C2_SDA_3V3
VDD_3V3
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
FPV-WZB21-22-LF

EEPROM


EEPROM
I2C Address: 0x50–0x57
VDD_1V8
C96
100nF/10V/10%/X7R/C0402
GND
U3
8
VCC
SCL
6
I2C1_SCL
WP
7
I2C1_SDA
5
SDA
A2
3
VDD_1V8
A1
2
A0
1
GND
Array
EEPROM
4
AT24C16C-SSHM-T(SOIC-8_150mil)
GND

User LED


R39
2.2k/R0402
STAT_LED1
K
A
LED/RED/0603
VDD_3V3
T1
LMUN2235LT1G(SOT-23)
SYS_STATUS
GND

SOFTWARE

Olimex provides buildroot for the board that can be found here:

https://images.olimex.com/release/imx8mp/

Document Revision History

Revision 2.0 December 2024

- Improved formatting

- Fixed wrong info about Linux available

Revision 1.0 May 2024

- Initial document