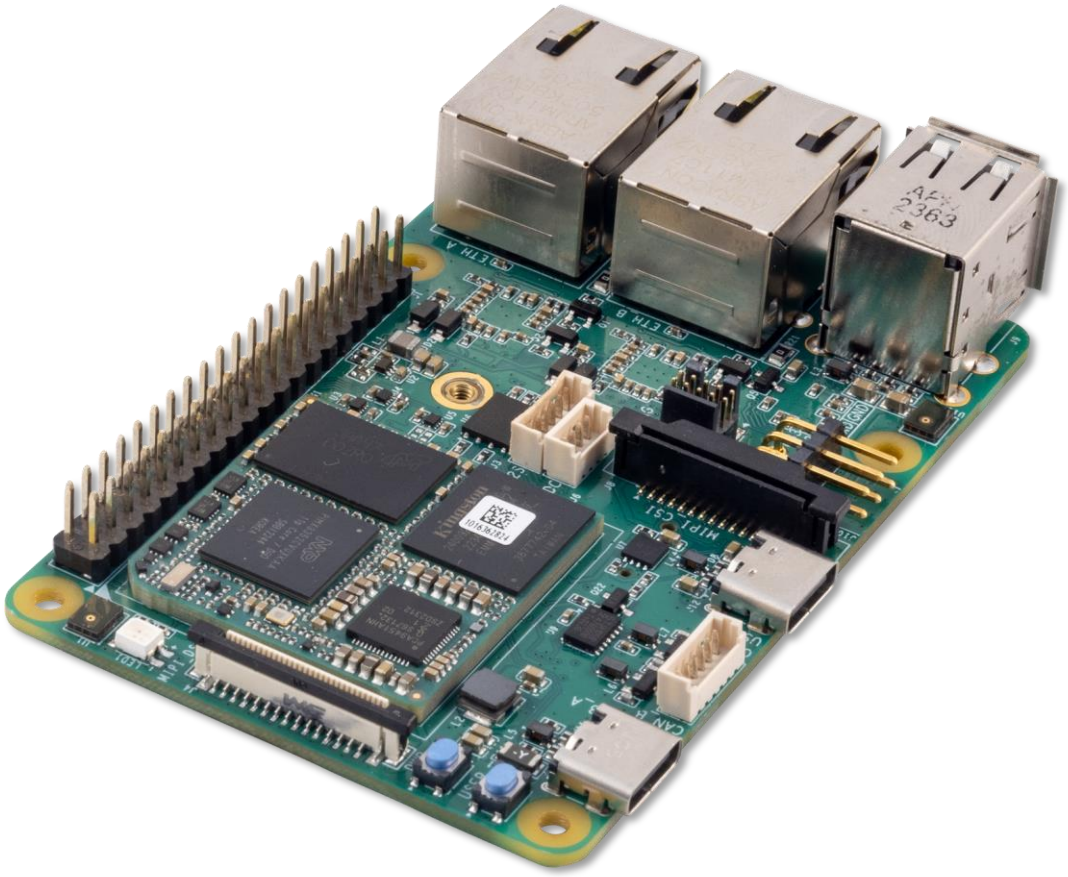
MAAXBOARD OSM93



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MaaXBoard OSM93 Development Kit Hardware User Guide

Version 1.0

Document Control

Document Version: 1.0

Document Date: 13 December 2024

Version History

Version	Date	Comment
1.0	12/13/2024	Initial Preliminary Release

Contents

Figures

Tables

1 Introduction

MaaXBoard OSM93 development kit integrates two TRIA-engineered board assemblies:

- **OSM-SF-IMX93** solder down module (30mm x 30mm) featuring NXP i.MX93 processor, NXP PCA9451A PMIC, eMMC and LPDDR4X memory plus associated support components.
- **MaaXBoard OSM93** SBC carrier baseboard in Raspberry Pi format (85mm x 56mm)

The carrier board supports multiple communication ports, MIPI display and camera interface:

- 2x 1Gbps Ethernet ports
- 2x USB 2.0 Type-A Host interface
- 1x USB 2.0 Type-C Host interface
- 1x USB 2.0 Type-C Device interface (power input to carrier board)
- MIPI CSI (2-lane)
- MIPI DSI (4-lane)

Audio application enablement is served by:

- 2x PDM Microphone

Expansion headers on the carrier board provide additional I/O paths:

- 40pin Pi-HAT compatible header
- 6pin, 2-channel CAN FD interface
- 4pin, 2-channel ADC interface
- 6pin, I2S serial-audio interface

On the backside of the carrier board, an M.2 connector allows integration of Wi-Fi 6, Bluetooth (5.3) and 802.15.4 wireless module.

The i.MX93 MPU equipped on the TRIA OSM-SF-IMX93 module is architected with 3 separate processer domains:

- Application Domain: 2x Arm® Cortex® A55 Cores (1.7 GHz)
- Real-Time Domain: 1x Arm® Cortex® M33 Core (250 MHz)
- AI Accelerator: 1x Arm® Ethos-U65® NPU Core (1 GHz / 0.5 TOPS)

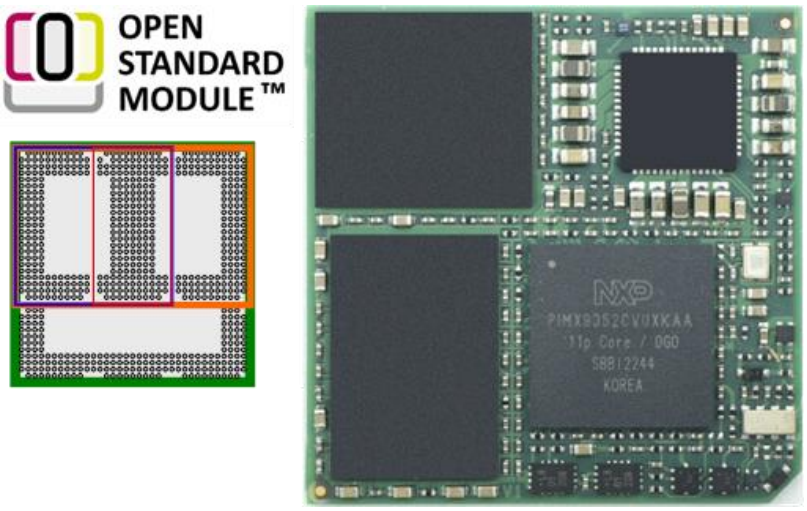


Figure 1 – OSM-SF-IMX93 Module

Part Name	Part #	Description
MSC OSM-SF-IMX93-DC-14N0A00I PCBFTX	111852	OSM 1.1 module based on NXP i.MX 9352, 2x Cortex-A55 @1.5GHz, NPU, 2GB LPDDR4, 16GB eMMC Flash, 2x GbE (RGMII), 1x USB2.0 Host, 1x USB2.0 Host/Device, 20x GPIO, MIPI-DSI, LVDS (on RGB interface), MIPI CSI-2 Camera input, 2x CAN-FD, Industrial -40...+85°C

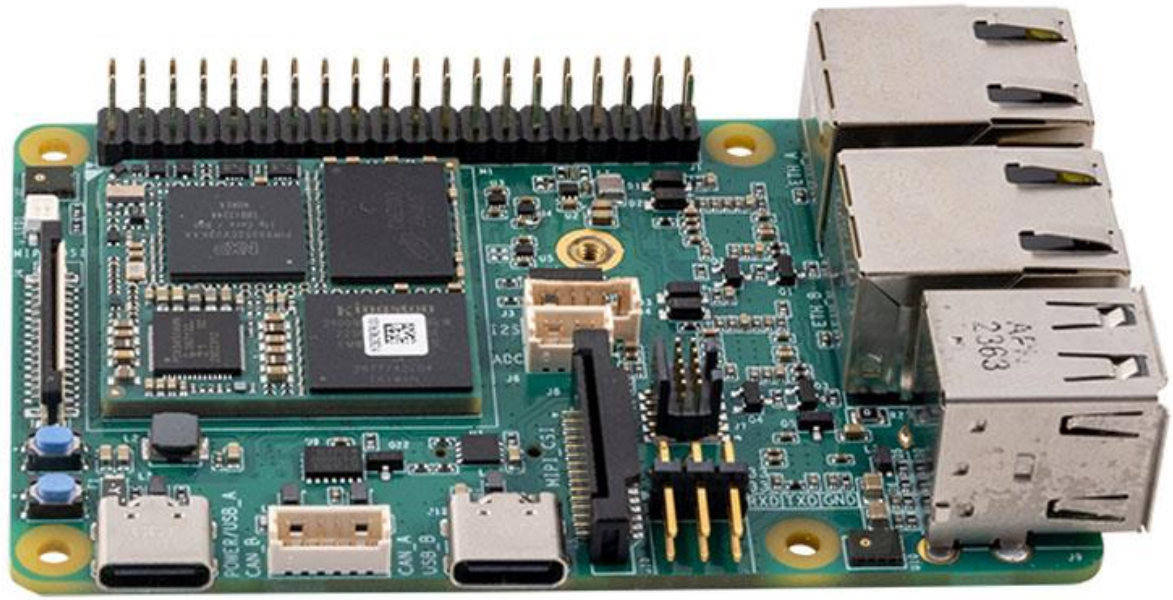


Figure 2 – MaaXBoard OSM93 BaseBoard plus i.MX93 OSM Module

1.1 MaaXBoard OSM93 Product Info

- Ordering Part Number : AES-MAAXB-OSM93-DK-G
- Product Portal Webage: https://avnet.me/MaaXBoard-OSM93

1.2 Items included with MaaXBoard OSM93

- MaaXBoard OSM93 board
- QuickStart Card
- Downloadable examples, reference designs and documentation

1.3 Optional Accessories

- Additional details are available on this topic in section 5 of this document

Accessory	Part Number
MIPI-DSI 7" touch display (720x1280) MIPI-DSI 5" touch display (720x1280) MIPI-DSI 7" touch display (800x1280)	AES-ACC-MAAX-DISP2 AES-ACC-DISP-5INCH *(Ampire)* AES-ACC-DISP-7INCH *(Ampire)*
MIPI-CSI camera (5MP, OV5640)	Arducam B0470 camera
USB-C power supply (5V/3A, UL-certified)	AES-ACC-MAAX-PWRUL
NXP MCU-LINK debug adapter (SWD and USB-serial debug adapter)	
CAN interface connector (6pin)	
ADC connector (4pin)	

Table 1 – Optional Add-on Accessories

1.4 Important Reference Documents

Document Name
MaaXBoard OSM93 QuickStart Card
MaaXBoard OSM93 Product Brief
MaaXBoard OSM93 Hardware User Manual *(this document)*
MSC OSM-SF-IMX93 User Manual
NXP MIMX9312XVXXMAB Reference Manual
MaaXBoard OSM93 Software Resources Github Guide
MaaXBoard-OSM93 Yocto User Manual

Table 2 – Reference Documents

1.5 Hardware Setup for Application Development

Typical test setups for software development are shown below…
Figure 3: shows basic setup with 5V power, A55 console UART and A55 Ethernet interfaces
Figure 4: adds an NXP MCU-LINK ($12) SWD + VCOM adapter interfaced with the M33 core

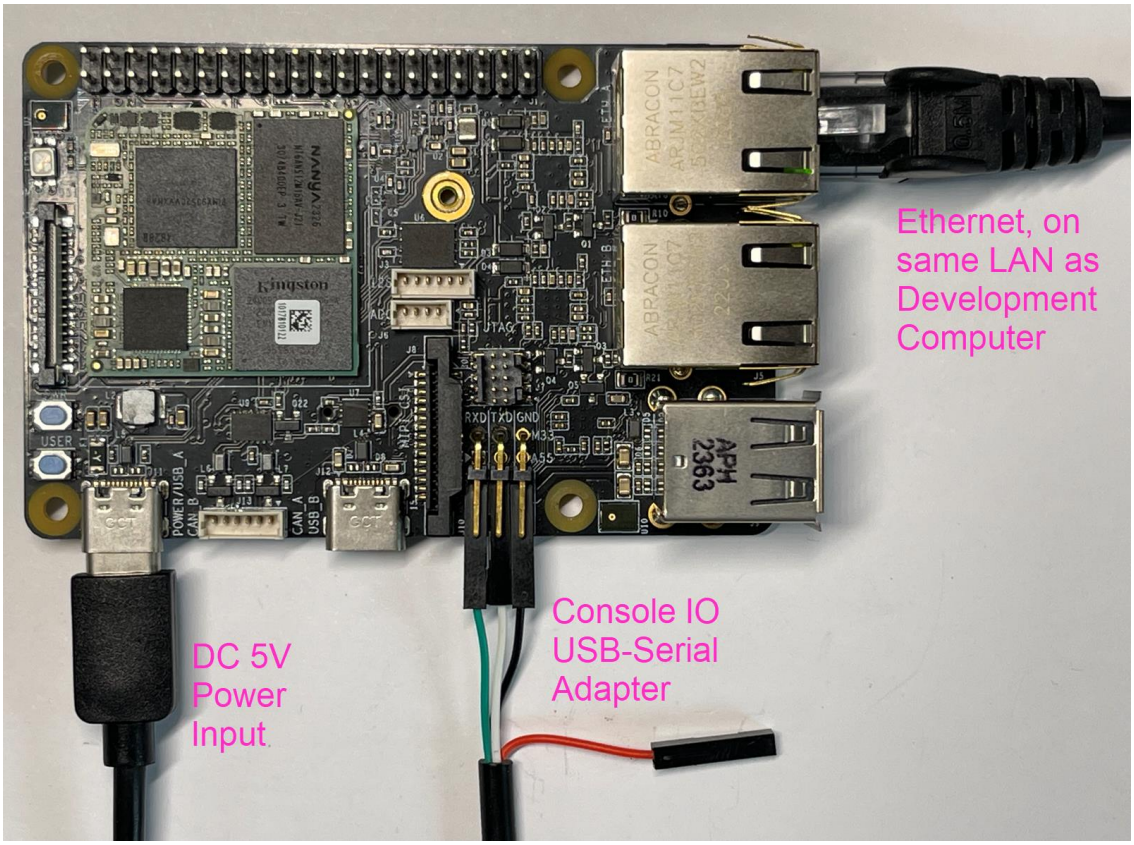


Figure 3 – A55 application development

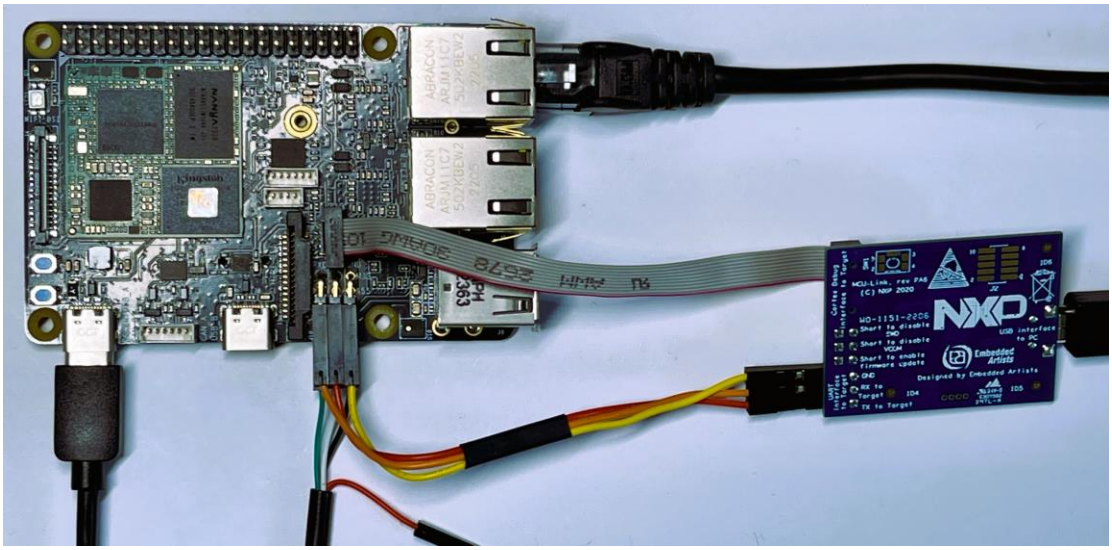


Figure 4 – A55 application and M33 application development

2 Architecture and Features

The MaaXBoard OSM93 Development Kit integrates an OSM-SF-IMX93 solder down module (based on NXP i.MX93 processor) and a production-ready IO carrier board. The OSM module includes NXP PMIC plus LPDDR4X and eMMC memory. The IO board adds dual high-speed 1Gb ethernet ports, multiple USB2.0 ports, dual CAN interfaces plus expansion headers for networking and connectivity.

2.1 Key Features

NXP Processor (MIMX9352CVTXMAB)
2x Arm Cortex-A55 (@1.7 GHz)
1x Arm Cortex-M33 (@250 MHz)
1x Arm Ethos-U65 NPU (@1 GHz / 0.5 TOPS)
EdgeLock Secure Enclave

NXP PMIC (PCA9451AHN)
PCA9451A with 6 switching regulators and 3 linear regulators, specifically for i.MX93 processor.

Memory
2 GB LPDDR4X (x16b)
16 GB eMMC

Camera and Display MIPI Interfaces
1x MIPI DSI (4-lane) with PHY (compatible 7-inch and 5-inch displays available from Avnet)
1x MIPI CSI (2-lane) with PHY(compatible 5MP CSI camera available from Arducam)

USB Host and Device Interfaces
2x USB 2.0 Host Ports (Type-A)
1x USB 2.0 Host Port (Type-C)
1x USB 2.0 Device Port (Type-C)

Network Connectivity
2x 1Gbps Ethernet (Microchip KSZ9131RNXC PHY)
Wi-Fi 6, Bluetooth 5.3 and 802.15.4 wireless M.2 module (optional add-on accessory)

Audio Resources
2x PDM Microphone (ST MEMS omnidirectional microphone MP34DT05-A)

Expansion Interfaces
Pi-Hat compatible 40pin header
6pin, 2-channel CAN FD interface (NXP high-speed CAN transceiver TJA1059TKJ)
6pin, I2S serial audio interface
4pin, 2-channel ADC interface

2.2 Block Diagram – NXP i.MX93 Processor

The following figure is a high-level block diagram of the NXP i.MX93 processor.

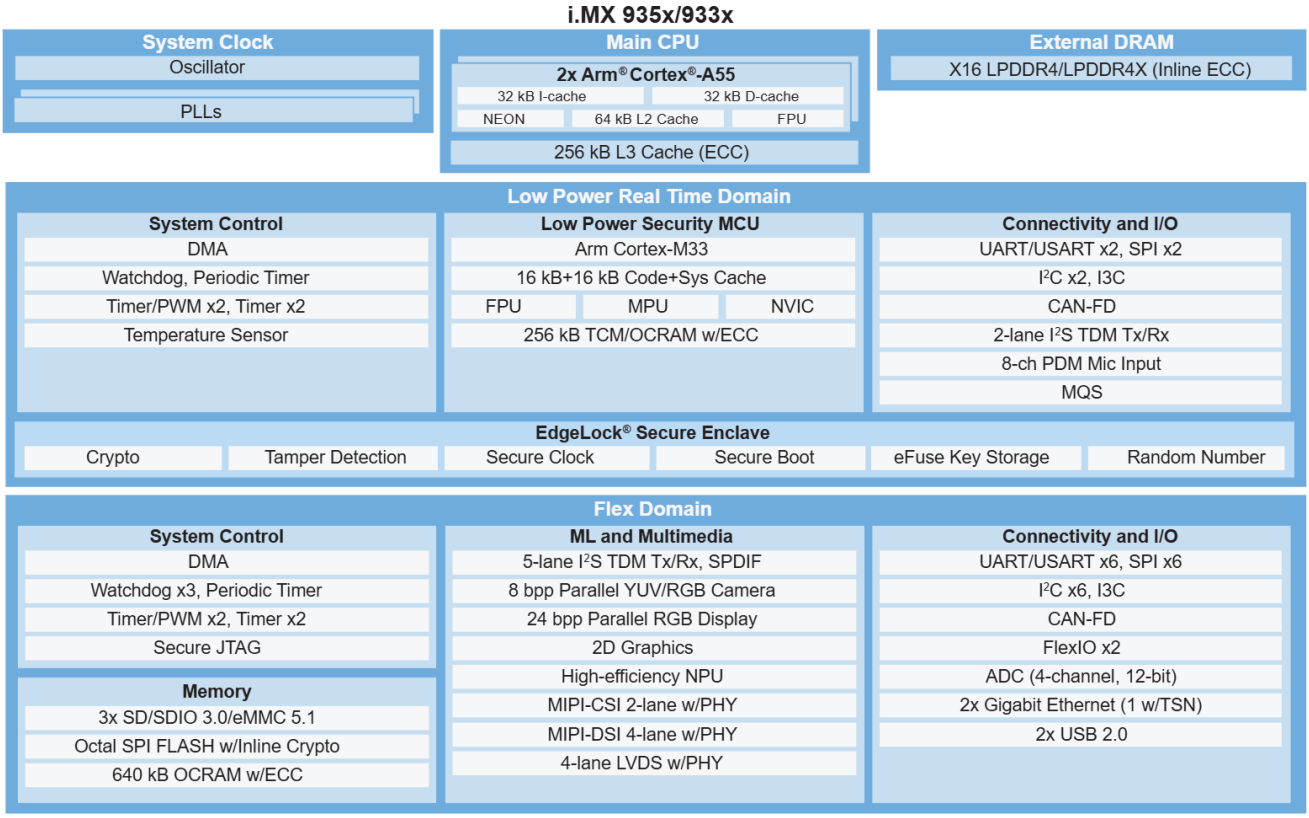


Figure 5 – NXP i.MX93 Processor Block Diagram

2.3 Block Diagram – TRIA OSM-SF-IMX93

Shown below is a high-level block diagram of the TRIA OSM-SF-IMX93 module

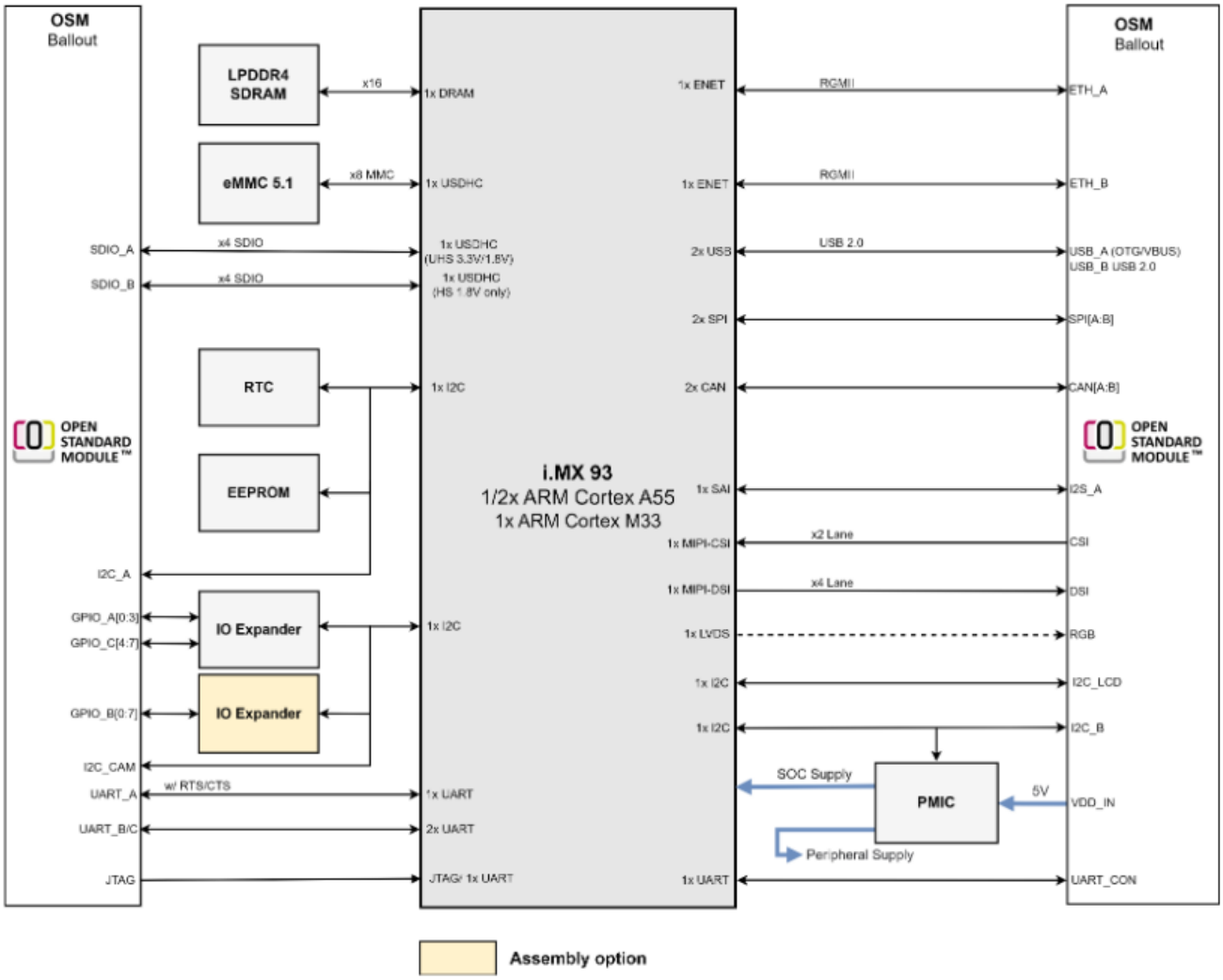


Figure 6 – OSM-SF-IMX93 Module Block Diagram

Refer to the MSC **OSM-SF-IMX93 User Manual** for further technical details on the i.MX93 OSM module

2.4 Block Diagram – MaaXBoard OSM93

The following figure is a high-level block diagram of the MaaXBoard OSM93 Development Kit and supporting interfaces.

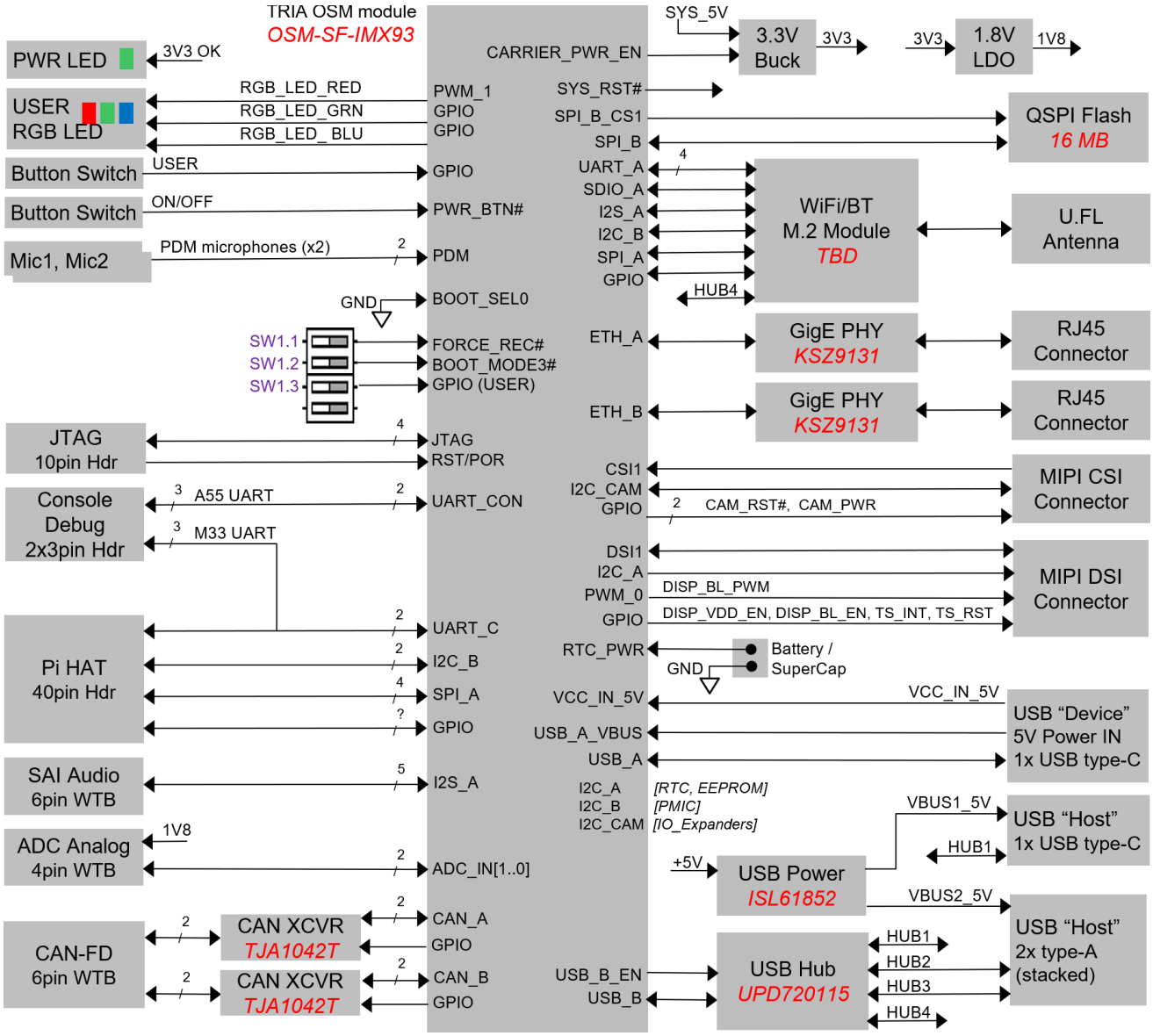


Figure 7 – Development Kit Block Diagram

2.5 MaaXBoard OSM93 SOM Component Locations

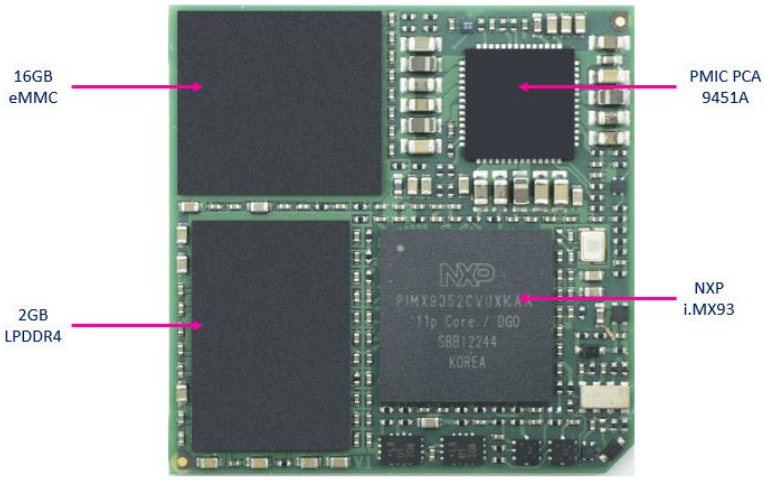


Figure 8 – OSM93 Component Placement

2.6 MaaXBoard OSM93 BaseBoard Component Locations (Top)

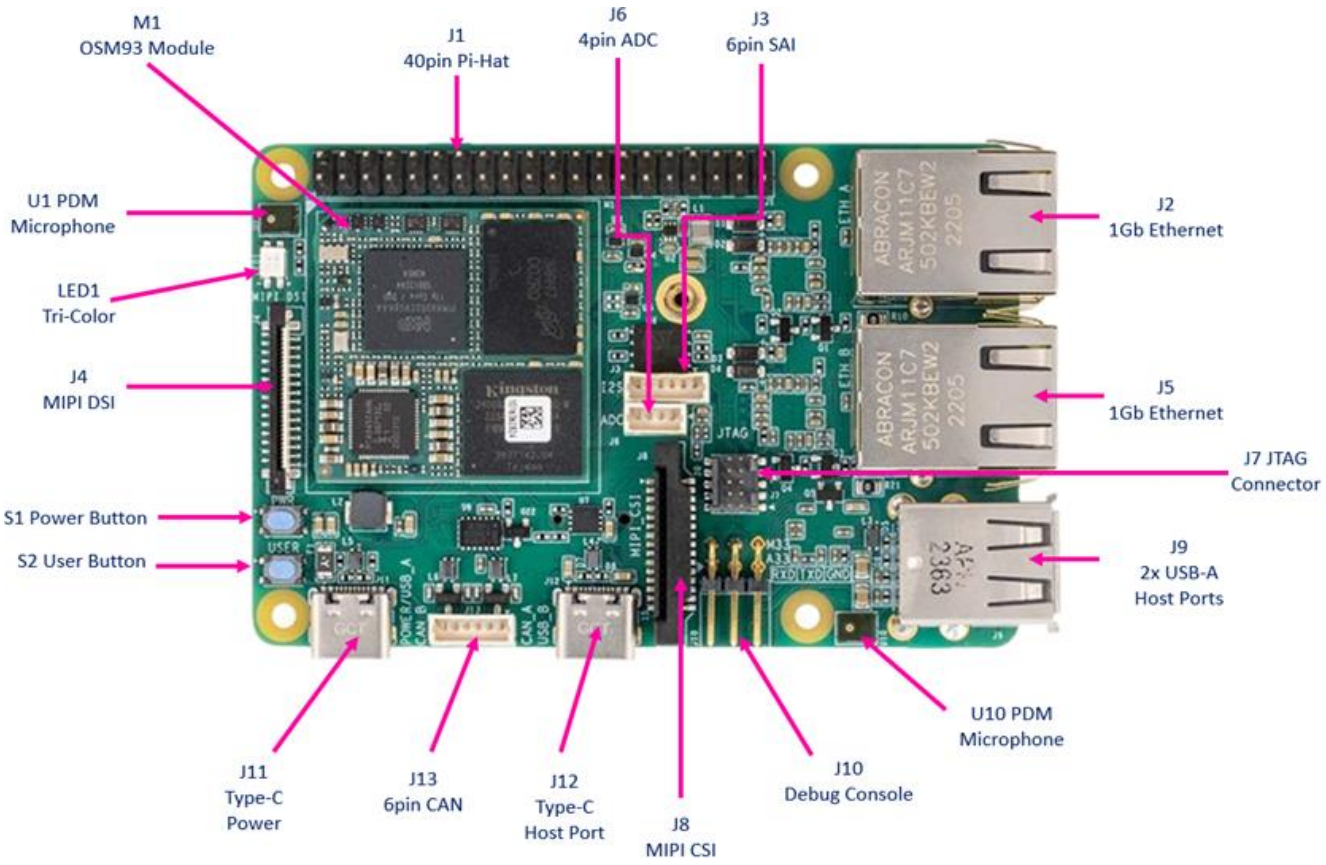


Figure 9 – MaaXBoard OSM93 Features (Top)

2.7 MaaXBoard OSM93 BaseBoard Component Locations (Bottom)

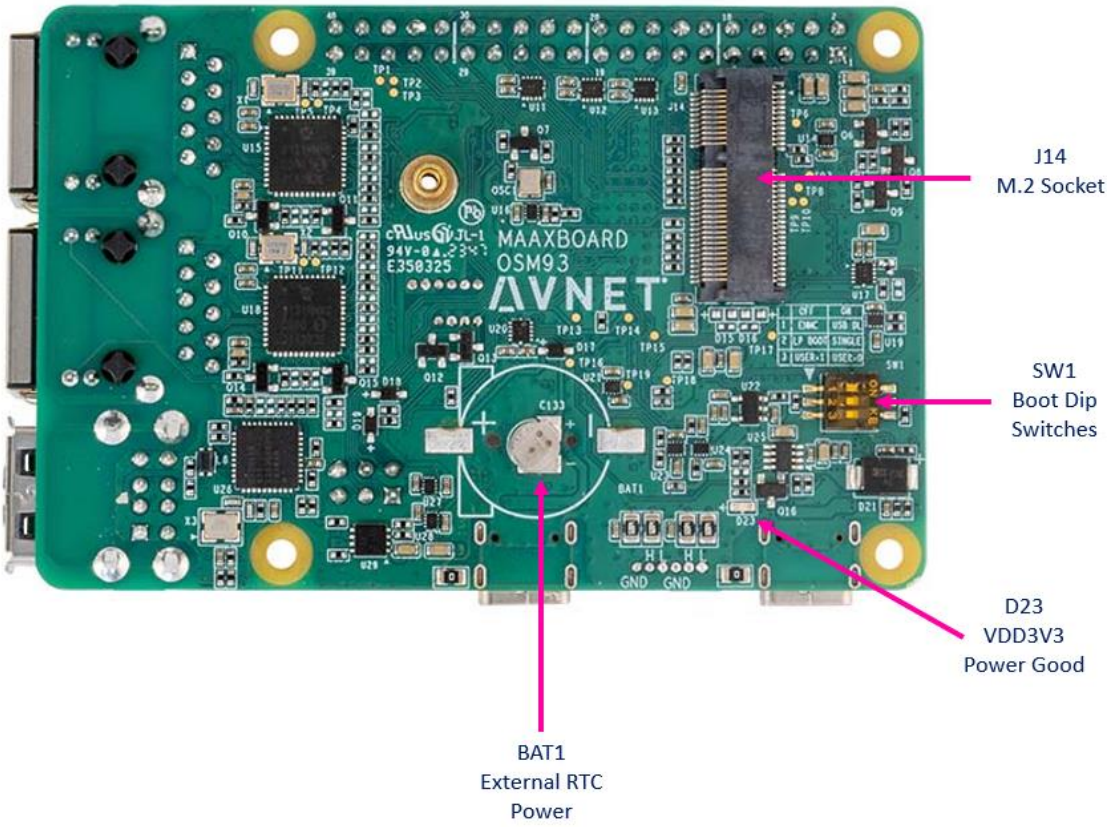


Figure 10 – MaaXBoard OSM93 Features (Bottom)

3 Functional Description

The following sections provide brief descriptions of the various MaaxBoard OSM93 features.

3.1 Powering MaaXBoard OSM93

MaaXBoard OSM93 requires a 5V / 2A Type-C power supply to power the board. The power supply and Type-C cable is not included in the kit. The power supply Type-C connector plugs into the Type-C power receptacle (J11) to supply the +5V power source to MaaXBoard OSM93

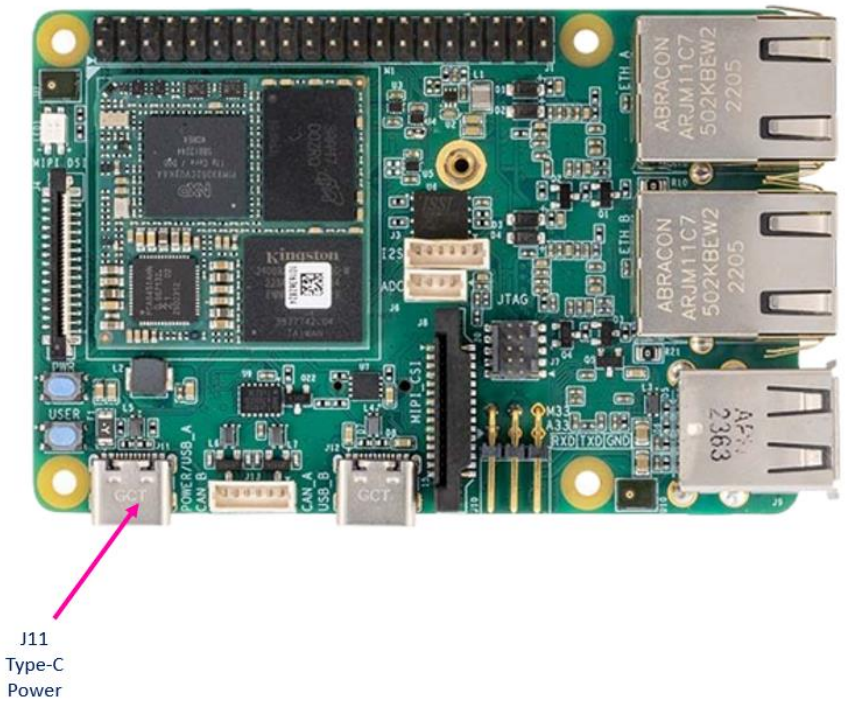


Figure 11 – Type-C 5V Connector for Power

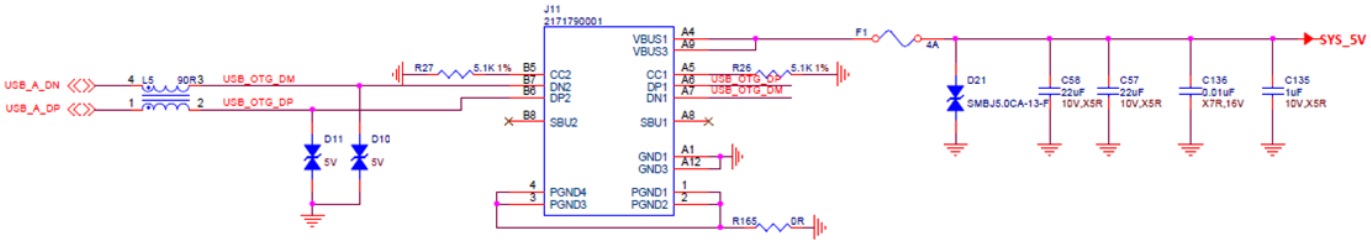


Figure 12 – Type-C Power Input (Schematic)

Note: When 5V power is supplied via USB-C power connector (J11), status LED D23 (backside of board) will illuminate and the board will boot using the mode set by DIP SW1 (also on backside of the board).

3.1.1 Boot Mode DIP Switches

SW1 DIP switches (on backside of board) allows the user to manually configure the boot mode.

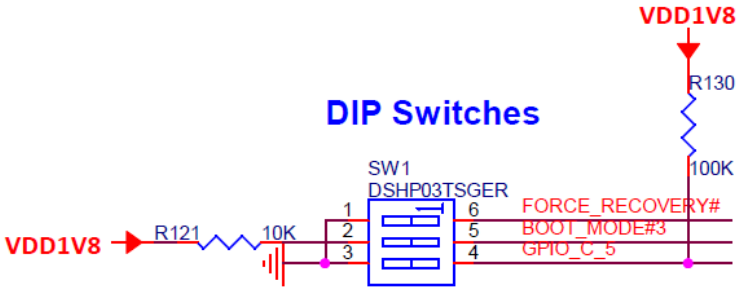


Figure 13 – DIP Switch SW1

SW1.x	Signal Name	Selected Function Description	
1	Force Recovery	**OFF** ON	eMMC USB Download
2	Boot_Mode#3	OFF **ON**	Low Power Boot Single Boot
3	GPIO_C_5	OFF ON	User = 1 User = 0

Table 3 – Boot Mode SW1 DIP Switch

3.1.2 Button Switches

Ref. Des	Button Function	i.MX93 GPIO Pin	MaaXBoard OSM93 Function
S1	USER Button	n/a (I/O Expander PO3)	USER_A
S2	PWR Button	A19 (OnOff)	System Reset (active low)

Table 4 – Button Switches

3.1.3 Status LEDs

Ref. Des	LED Status Function	i.MX93 GPIO Pin	MaaXBoard OSM93 Function
D23	Power	N/A	3V3 Status
LED1	USER-RED	GPIO_A_1	GPIO/PWM
LED1	USER-BLUE	GPIO_A_2	GPIO/PWM
LED1	USER-GREEN	PWM_1	GPIO/PWM

Table 5 – Status LEDs

3.1.4 MaaXBoard OSM93 Power Tree Diagram

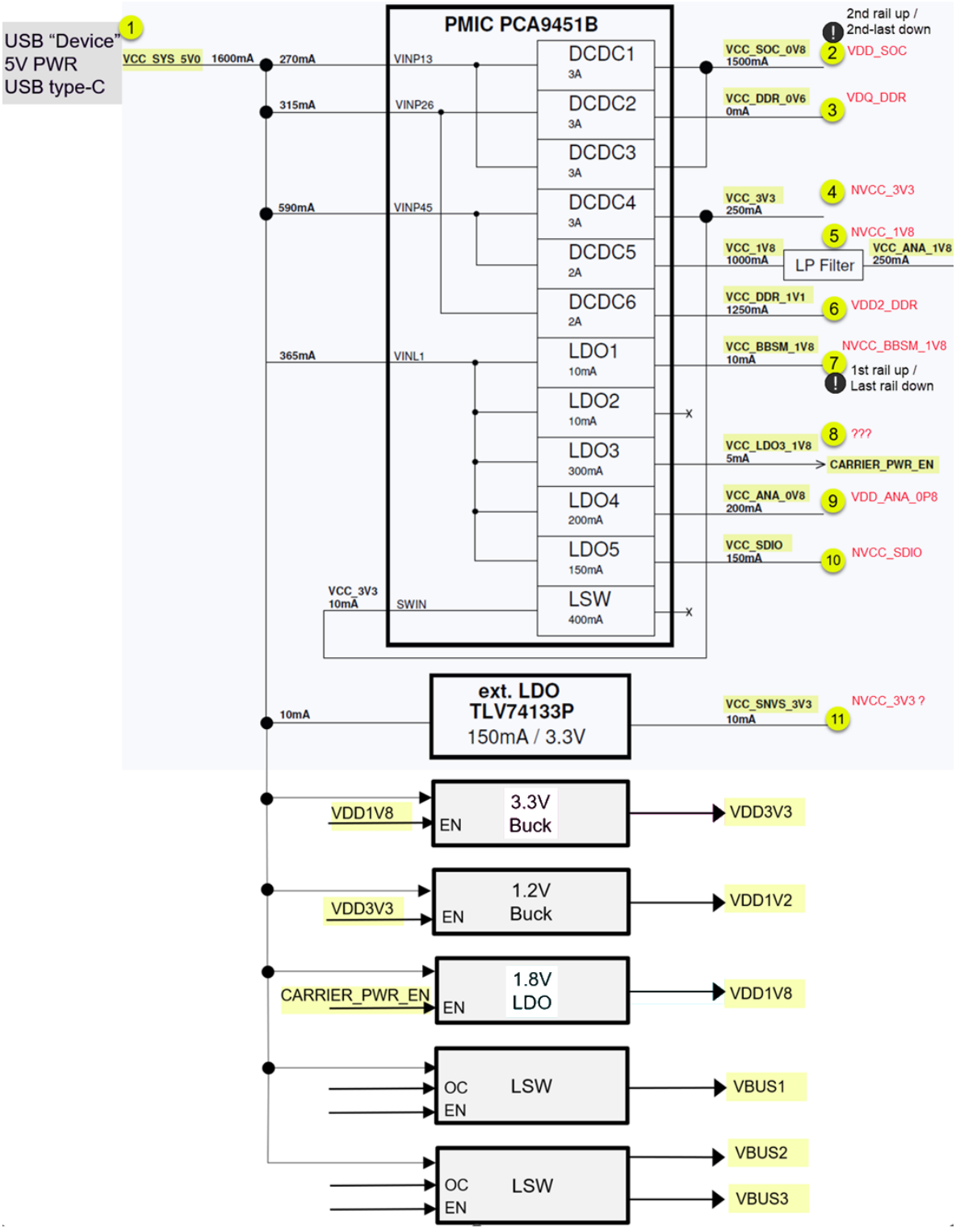


Figure 14 – MaaXBoard OSM93 Power Tree Diagram

3.1.5 RTC External Battery Power

MaaXBoard OSM93 hardware provides options for externally powering the RTC for time keeping. When the board is nominally powered by the +5V Type-C connector, the OSM93 module will generate and use a 3V3 power supply for RTC power. If time keeping is required while having the MaaXBoard OSM93 powered off, a CR1220 coin cell battery pad and the J15 2pin connector can be used for external RTC power.

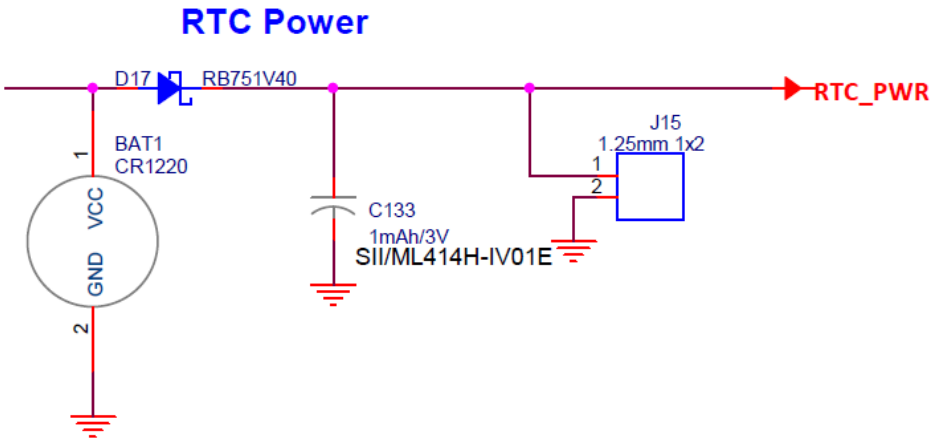


Figure 15 – RTC External Power

- The coin cell holder does **NOT** come pre-populated on board and will need to be installed by the user. Part number of XXXX (Link?) should be used

- A connector with PN / LINK? should be used to interface with **J15** 2pin connector.

3.2 Wireless Connectivity

MaaXBoard OSM93 has an M.2 socket connector, reference designator J14, to interface with WiFi/BLE modules.

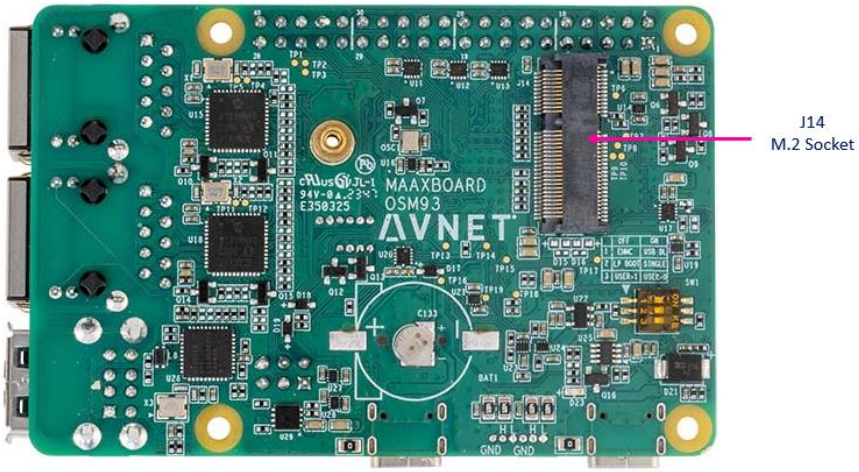


Figure 16 - M.2 Socket Connector

Multiple suitable M.2 wireless modules are available. Use the search tool at:
https://mcuxpresso.nxp.com/eb-hub?search=MCIMX93-EVK

A wireless module based on NXP IW612 is recommended (as used on NXP i.MX93 EVK)
eg. **u-Blox Maya-W271 Module**

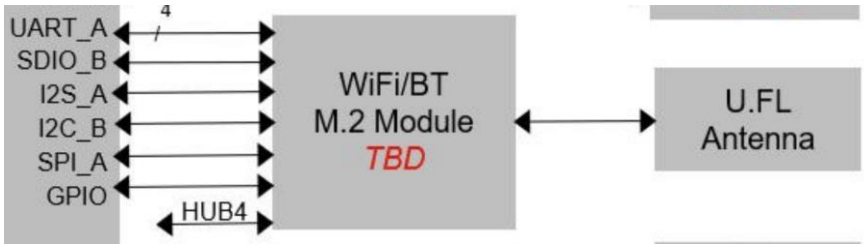


Figure 17 – WiFi/BLE Module Interface Diagram

3.2.1 Wi-FI SDIO Interface

USHDC3 interface is configured for 1.8V operation and supports full-speed (25MHz), high-speed (50MHz) and UHS-I mode (208MHz).

3.2.2 BT/BLE UART Interface

UART_A signals (including H/W flow-control) is routed from the OSM93 module to the Bluetooth interface of the 2EL module. UART_A is configured at 1.8V from the OSM93 module.

3.2.3 Tri-Band Support via I2C/SPI

I2C_B and **SPI_A** are configured for 1.8V and routed from the OSM93 module to the M.2 connector to support Tri-Band operation on the 2EL module.

Note that both **I2C_B** and **SPI_A** signals on the carrier are also routed to the Pi-Hat connector through separate 1.8V to 3.3V level shifters.

3.2.4 BT PCM / I2S

I2S_A is configured at 1.8V and routed from the OSM93 module to the M.2 connector to interface with Bluetooth Audio PCM.

Note that **I2S_A** is also routed to the Nexperia NXB0104GU12 bi-directional transceiver and pinned-out on the carrier board via a 6pin connector **J3**.

3.3 Peripheral Devices and Interfaces

3.3.1 USB 2.0 Device Interface / Power Input

USB0 controller is assigned as a USB Device interface, implemented with a USB-C connector.

3.3.2 USB 2.0 Host Interface

USB1 controller is assigned as a USB Hub interface, which supports 4 USB Host interfaces:

- Two stacked USB type-A connectors (eg. for keyboard and mouse)
- USB interface on M.2 connector (unused for Wi-Fi/BT M.2 modules)

3.3.3 10/100/1000 Ethernet

The 10/100 Ethernet subsystem is comprised of:

- **ENET** i.MX 93 Ethernet MAC
- Microchip KSZ9131RNXC Ethernet PHY (U15 & U18)
- 2x RJ45 (J2 & J5) connectors with integrated magnetics

3.3.4 Pi-Hat 40pin Expansion Header

MaaXBoard OSM93 follows the Raspberry Pi form factor (85mm x 56mm) and supports mostly the same pin assignments on it's 40pin Pi-Hat header. Signals missing from the 40pin header are denoted with a red X in the header pinout table below.

Pin Number	Function	Pin Number	Function
1	+3.3V	**21**	SPI_MISO
2	+5V	**22**	GPIO25
3	I2C_SDA	**23**	SPI_SCLK
4	+5V	**24**	GPIO8
5	I2C_SCL	**25**	GND
6	GND	**26**	GPIO7
7	GPIO4	**27**	GPIO0
8	GPIO14	**28**	GPIO1
9	GND	**29**	GPIO5
10	GPIO15	**30**	GND
11	X	**31**	GPIO6
12	GPIO18	**32**	GPIO12
13	GPIO27	**33**	GPIO13
14	GND	**34**	GND
15	GPIO22	**35**	GPIO19
16	GPIO23	**36**	X
17	+3.3V	**37**	GPIO26
18	GPIO24	**38**	GPIO20
19	SPI_SDO	**39**	GND
20	GND	**40**	GPIO21

Table 6 – 40Pin Pi-Hat Header Pin Definitions

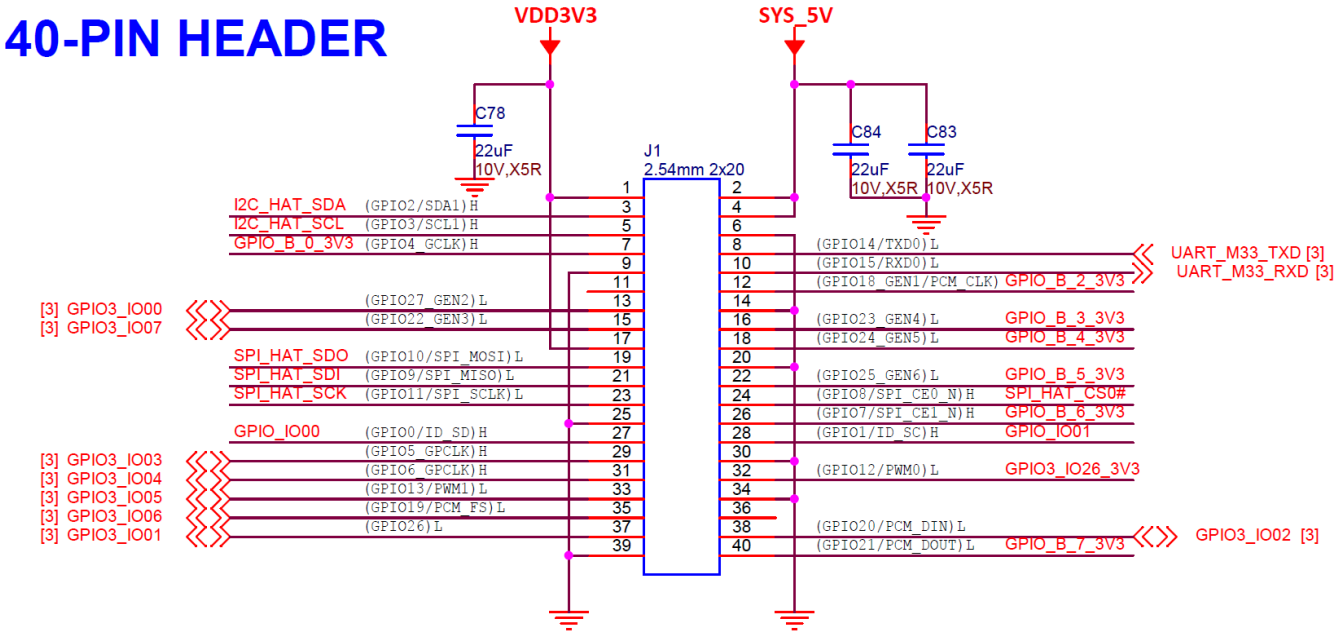


Figure 18 – 40pin Pi-Hat Header

3.3.5 MIPI-DSI Touchscreen Display Connector

4-lane, supports up to 1280x720 display. This has same 30-pin MIPI connector form-factor as on Raspberry Pi but has an enhanced pinout to include the I2C touchscreen controller interface.

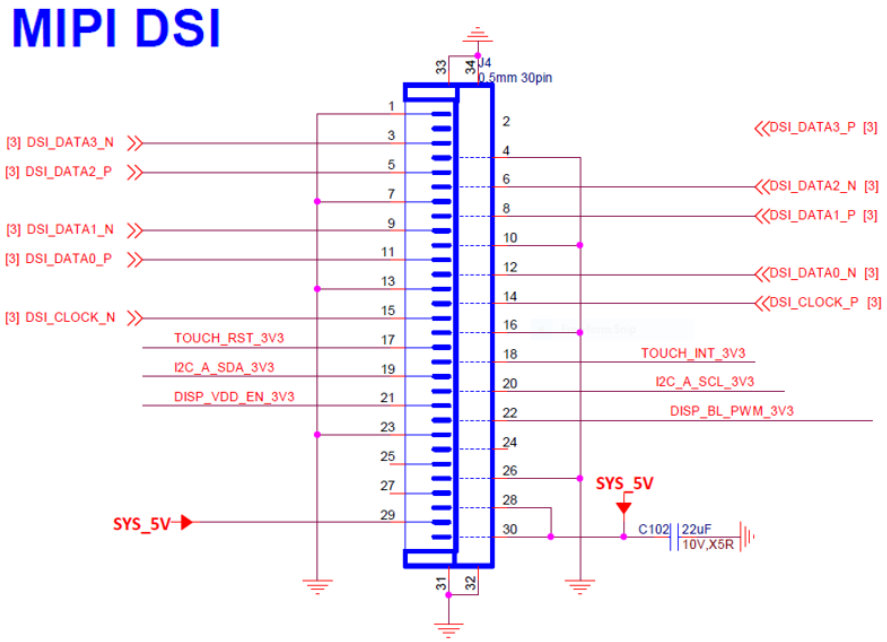


Figure 19 – MIPI Display Connector

3.3.6 MIPI-CSI Camera Connector

The 2-lane, 15-pin MIPI connector pinout is the same as what is used on Raspberry-Pi board.

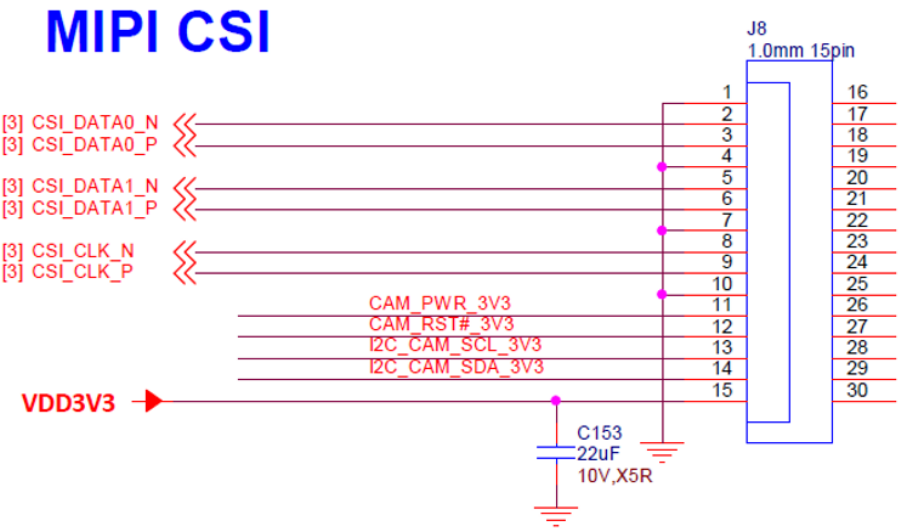


Figure 20 – MIPI CSI Connector

3.3.7 CAN-FD (x2) Connector

A two-channel CAN interface is provided on the carrier board through 4pin connector **J13**.
CAN_A and **CAN_B** from the OSM module are level-shifted to 3.3V on the carrier card before input into an NXP **TJA1059TK** CAN transceiver.

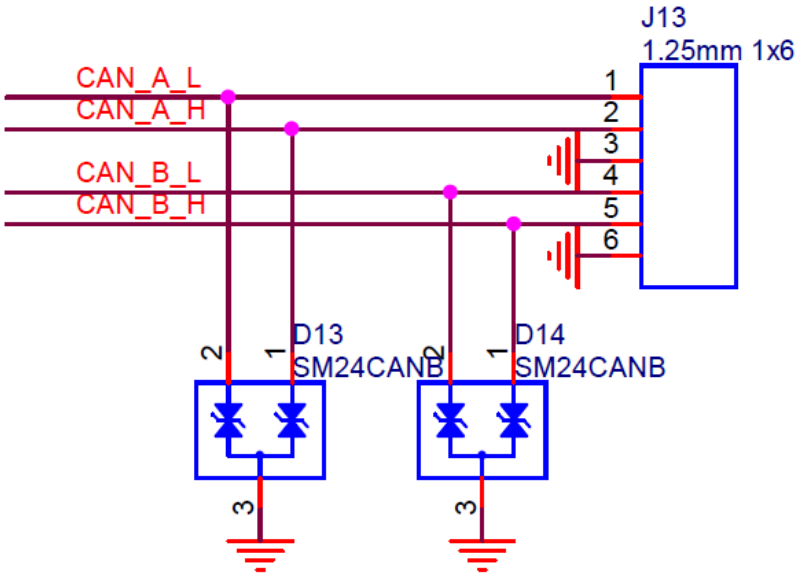


Figure 21 – CAN-FD Interface

3.3.8 SAI Digital Audio Connector

I2S_A signals from the OSM93 module, configured at 1.8V, are routed to a 3.3V level shifter and broken out via 6pin interface connector J3.

Note that I2S signals entering into the level shifter are also routed to the M.2 connector.

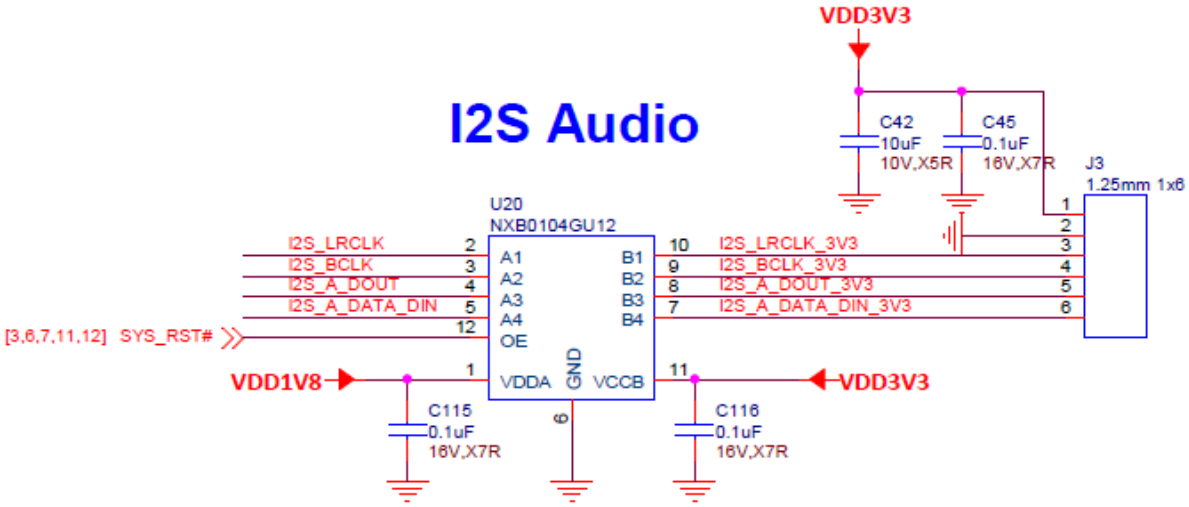


Figure 22 – I2S/SAI Audio Interface

3.3.9 ADC Connector

A 2x 12-bit channel ADC interface can be accessed via the J6 4pin connector on the carrier card. **ADC_0** and **ADC_1** are configured for operation over a 1.8V range.

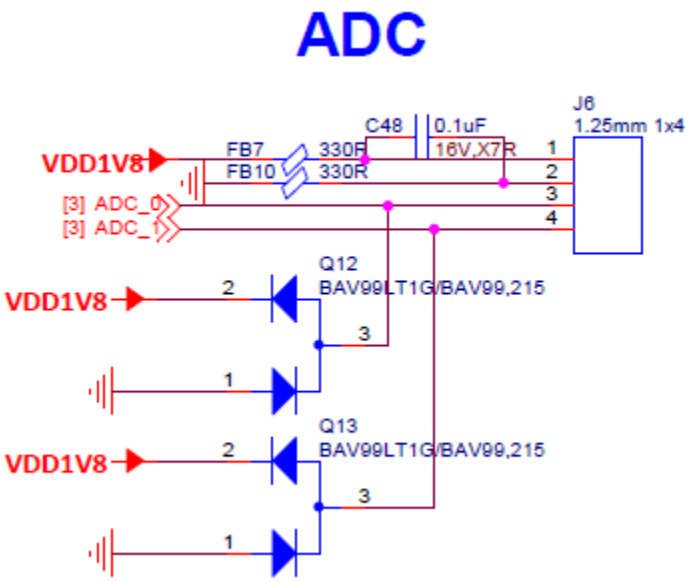


Figure 23 – ADC Interface

3.3.10 Digital Microphones

Two PDM microphones (**U10** and **U1**) are located at diagonally opposite corners of the board for maximum spacing and overall utility.

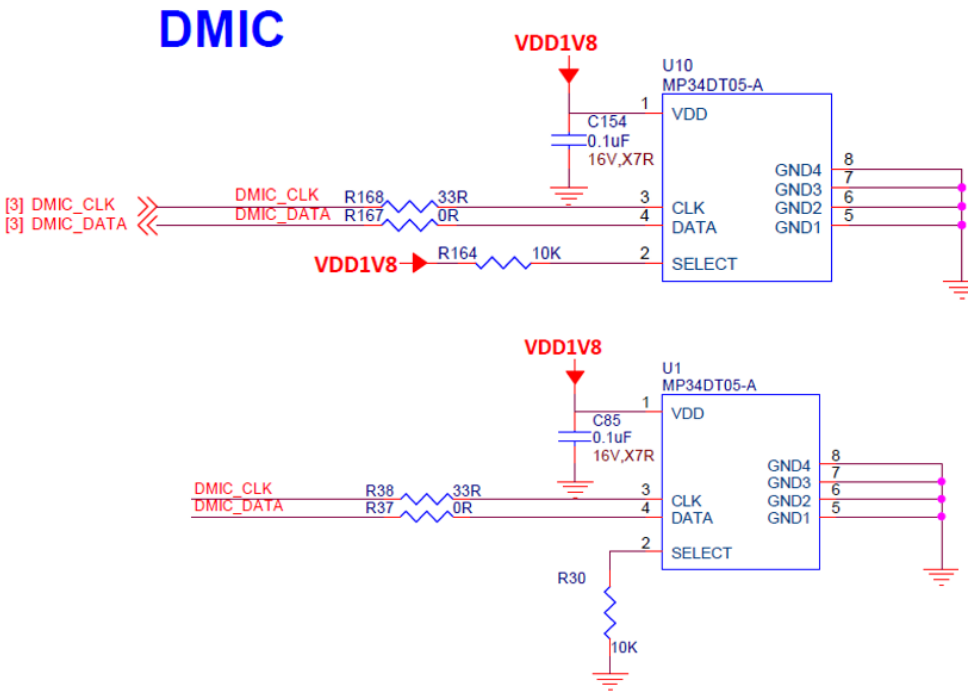


Figure 24 – PDM Microphones

3.3.11 SWD/JTAG Debugger 10pin Header

The 10-pin Mini-header by default supports the SWD interface tabled below

Pin#	MCU-LINK SWD	JTAG Signal	Pin#	MCU-LINK SWD	JTAG Signal
1	?	VCC	2	?	JTAG_TMS
3	?	GND	4	?	JTAG_TCK
5	?	GND	6	?	JTAG_TDO
7	?	GND	8	?	JTAG_TDI
9	?	GND	10	?	nRST

Table 7 – JTAG 10pin Header (J7)

3.4 Power Input, Protection, Regulation

3.4.1 USB-C Power Input Connector

The USB-C connector, reference designator J11, is used for +5V power supply to MaaXBoard OSM93 and provides a USB device interface.

3.4.2 ESD Protection

All USB connectors have high-speed ESD protection on their power rails and data lines.

3.4.3 Power Regulation

A 5V to 3.3V dc/dc buck convertor regulates the Vcc rail voltage (rated @ 3A max).

4 Getting Help and Support

Multiple support resources are available.

4.1 NXP-hosted Technical Support Resources

For questions specific to the i.MX 93 processor, use the NXP Community Technical Support Forums: **https://community.nxp.com/t5/i-MX-Processors/bd-p/imx-processors**

NXP also provide a wealth of online i.MX training and App Note resources, accessible from this page: **https://www.nxp.com/design/training:TRAINING-EVENTS**

4.2 TRIA-hosted Technical Support Resources

https://avnet.me/maaxboard-osm93 is the formal MaaXBoard OSM93 product page, providing access to technical documents, videos and tutorials, software reference designs and related material

https://github.com/avnet/maaxboard-osm93-hub is a github landing page with links to the key software resources, example repositories and more

Questions specifically regarding MaaXBoard OSM93 hardware, TRIA software enablement and customer training opportunities, can be posted to the TRIA Technical Support Forum at **https://avnet.me/AvnetBoards_support**

(Avnet's technical support team monitors these forums during North America business hours)

Developers needing customized options on MaaXBoard OSM93 (and meeting the MOQ requirement) should contact their local FAE and/or send an inquiry to **customize@avnet.com**

5 MaaXBoard OSM93 Accessories

5.1 MIPI DSI 7-inch Capacitive Touch LCD Display *(optional)*

- Supports up to 800 x 1280 resolution
- Compatible with all MaaXBoard SBC platforms.
- Connects to host via a 4-lane MIPI-DSI interface
- Capacitive multi-touch display overlay
- Custom displays available via Avnet Embedded

Part# (and link): **AES-ACC-MAAX-DISP2** (MSRP = $105.00)

Figure 25 – MIPI DSI 7” Touchscreen (ILI9881C, GT911)

5.2 MIPI DSI 5-inch Capacitive Touch LCD Display *(optional)*

- Supports up to 720 x 1280 resolution
- Compatible with all MaaXBoard SBC platforms.
- Connects to host via a 4-lane MIPI-DSI interface
- Capacitive multi-touch display overlay
- Custom displays available via Avnet Embedded

Part# (and link): **AES-ACC-DISP-5INCH** (MSRP = call for more information)

***** [Available 1Q25] *****

5.3 MIPI CSI 5 MP Camera *(optional)*

- High quality 5 MP image sensor
- Compatible with all MaaXBoard SBCs and Raspberry Pi
- Attaches to host via 2-lane MIPI CSI ribbon cable
- Supports 1080p30, 720p60 and 640x480p90 video
- Small dimensions (24mm x 25mm x 9mm)

Part# (and link): **Arducam B0470 camera** (MSRP = $19.99)

Figure 26 – MIPI CSI 5MP Camera (OV5640 sensor)

5.4 MCU-LINK Debugger/Programmer Probe *(optional for M33 debug)*

The **NXP MCU-LINK Debugger Probe** configured for CMSIS-DAP protocol, is supported by multiple IDEs and is available for purchase separately from Avnet

Standard MCU-Link features:

- High speed USB,
- SWD debug,
- SWO profiling,
- VCOM (USB to UART bridge)

Part# (and link): **MCU-LINK** (MSRP = $13.21)

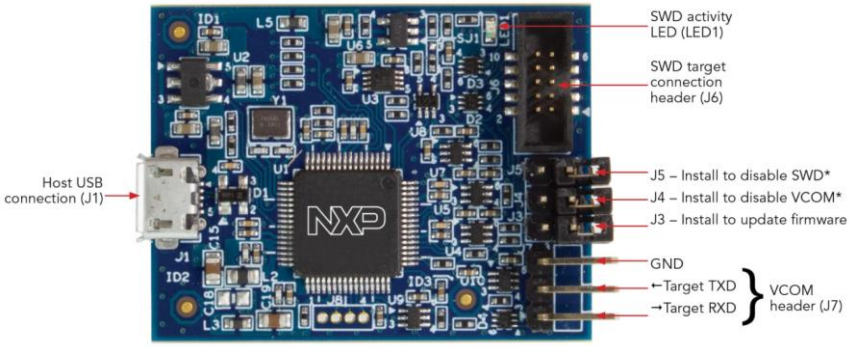


Figure 27 – NXP MCU-LINK Debug/Programmer Probe

5.5 MCU-LINK-PRO Debugger/Programmer Probe *(optional for M33 debug)*

The **NXP MCU-LINK-PRO Debugger Probe** debugger probe has several enhancements

All features of MCU-Link, plus the following more advanced MCU-Link-Pro features:

- Target energy/power measurement
- USB SPI & I2C bridges for programming/provisioning & host-based application development
- On-board, user-programmable LPC804 for peripheral emulation
- SEGGER J-Link firmware option
- Option to power target system (at 1.8V or 3.3V)
- Hardware capabilities for future enhancements

Part# (and link): **MCU-LINK-PRO** (MSRP = $48.07)

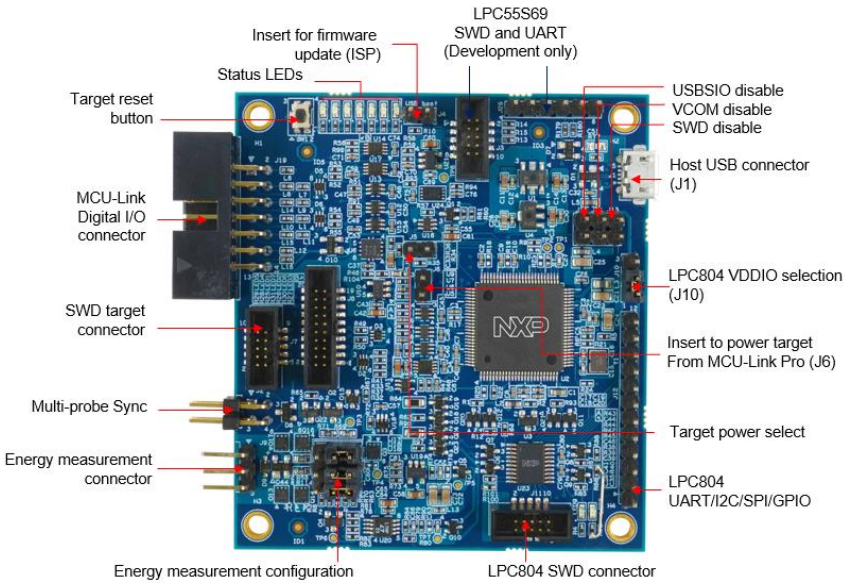


Figure 28 – NXP MCU-LINK-PRO Debug/Programmer Probe

5.6 Other SBCs, SOMs and Accessories from Avnet Boards

The TRIA America (Avnet Boards) team work in close partnership with key suppliers to develop advanced enablement solutions

- Kits / boards / SOMs / modules
- Reference Designs
- Trainings / Tutorials / Blogs

For more info visit:
avnet.me/avnetboards

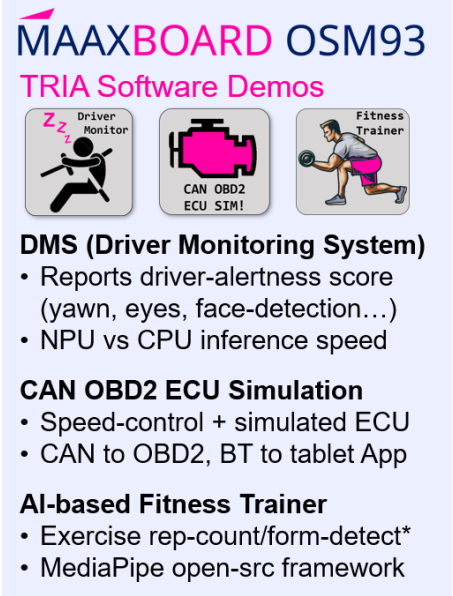
The TRIA **Solution Guide** catalog is at:
avnet.me/TRIA-CATALOG

6 Software Example Applications

6.1 TRIA-engineered example applications

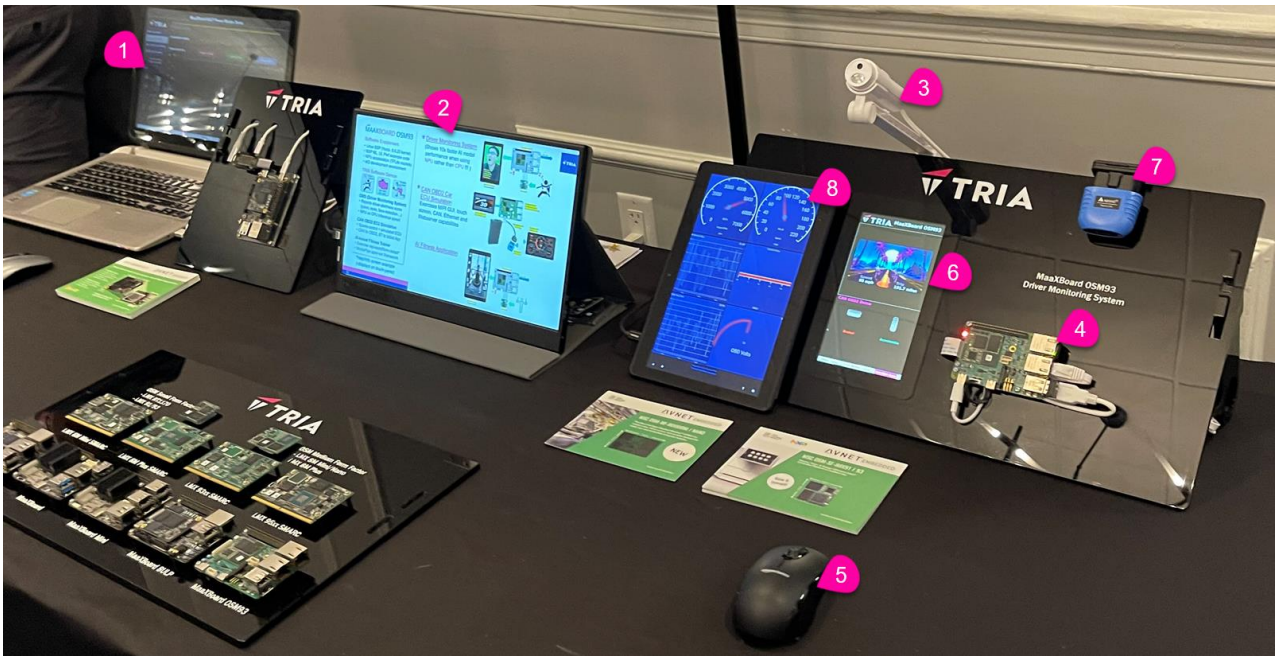
Refer to the “Hub” page for links to example embedded software application repositories and documentation

https://github.com/avnet/maaxboard-osm93-hub



The **OBD2 ECU Simulation** CAN + MIPI display-based MaaXBoard OSM93 example application is shown below…

(Adjacent to this is a **Low-Power Modes** example, here run on MaaXBoard 8ULP, instrumenting a subset of low-power modes)



1) Laptop displaying MaaXBoard 8ULP demo and PPT slides on portable HDMI screen
2) Portable HDMI screen (15-inch 1080p)
3) USB Camera for MaaXBoard OSM93 DMS demo and Fitness Trainer demo
4) MaaXBoard OSM93 SBC board
5) Wireless mouse (redundant is using touch screen, connects to MaaXBoard OSM930
6) MIPI-DSI 7-inch touch screen (displays output from MaaXBoard OSM93)
7) OBD-II diagnostic dongle (attached via CAN bus from MaaXBoard OSM93)
8) Android tablet (connected via Bluetooth with OBD-II dongle)

6.2 NXP-engineered example applications

Multiple “GoPoint for i.MX” applications have also been ported for use on MaaXBoard OSM93 by TRIA. This useful example material helps to accelerate custom deployment of e.g. Vision AI capabilities.

GoPoint for i.MX Applications Processors

GoPoint for i.MX Application Processors User Guide

Details of the growing subset of NXP GoPoint examples already ported and tested on MaaXBoard OSM93 will be provided via the Hackster.io website.

Hackster.io Project blogs for MaaXBoard series

Examples of these include the following…

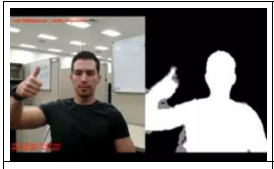
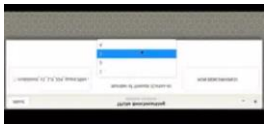
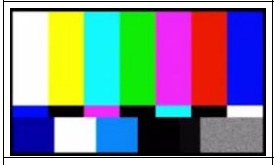
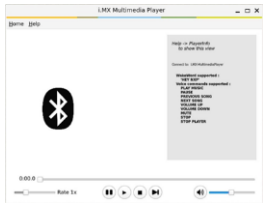
	**Selfie Segmenter** Shows i.MX93 NPU accelerating an instance segmentation model. This model lets you segment the portrait of a person and can be used to replace or modify image background.
	**Smart Fitness** Shows i.MX93 NPU accelerating two vision-based Deep Learning models. Together, these models detect the person plus 33 3D-keypoints to generate a complete body landmark "pose estimation”. From this pose estimation, a K-NN pose classifier classifies two different body poses: 'Squat-Down' and 'Squat-Up'. The application tracks fitness 'squats' exercise using x`looped 12-repetition counter.
	**DMS Driver Monitoring** Camera-based AI inference using tflite runtime framework and NPU delegate. NPU accelerates four ML models: Face-Detection, Face-Landmark, Iris-Landmark (Mediapipe models) plus Smoking and Calling Detection (YOLOv4)
	**ML Benchmark** Tool for performance comparison of TensorFlow Lite models running on the CPU (Cortex-A55) and the NPU
	**Video Test** Simple demo utility that facilitates playback of video capture from camera or a video test source.
	**i.MX Multimedia Player** Application to control (via bluetooth) an audio player, using voice commands. WakeWord supported: HEY NXP Voice commands supported: PLAY MUSIC, PAUSE, PREVIOUS SONG, NEXT SONG, VOLUME UP, VOLUME DOWN, MUTE, STOP, STOP PLAYER. (Application uses the dual PDM microphones onboard MaaXBoard OSM93)

Table 8 – Sample NXP GoPoint Demos Ported to MaaXBoard OSM93

7 Software Tools and Enablement

7.1 A55 Apps Processor cores: Yocto Linux BSP

MaaXBoard OSM93 ships with a pre-built Yocto Linux BSP and Out-of-box test application

Please check under the "**Reference Designs**" tab (in "**Technical Documents**" area of MaaXBoard OSM93 product page) for the latest release files and documents for building and using this Linux BSP.

At time of publishing this User Guide, links to the following items are provided there:

#	Documents and Websites
1	MaaXBoard OSM93 Software Resources Github Guide
2	MaaXBoard-OSM93-Yocto-UserManual v6.6.3
3	MaaXBoard-OSM93-Yocto-Development-Guide v6.6.3
4	MaaXBoard-OSM93-Yocto-ReleaseNote v6.6.3

#	Pre-built Linux BSP Image and Related Files
5	Pre-Built Linux Image (Full)
6	Manifest for Linux Image (Full)
7	BootLoader u-boot Image
8	Yocto SDK Install Script - Full

Note: This BSP is a customized build, based on i.MX Embedded Linux resources that NXP provides at: https://www.nxp.com/IMXLINUX

7.2 M33 Realtime Processor

For examples, documentation and toolsthe NXP MCUXpresso SDK package should be downloaded

#	Documents and Websites
1	MaaXBoard OSM93 Software Resources Github Guide
2	Getting Started with MCUXpresso SDK for MCIMX93-EVK