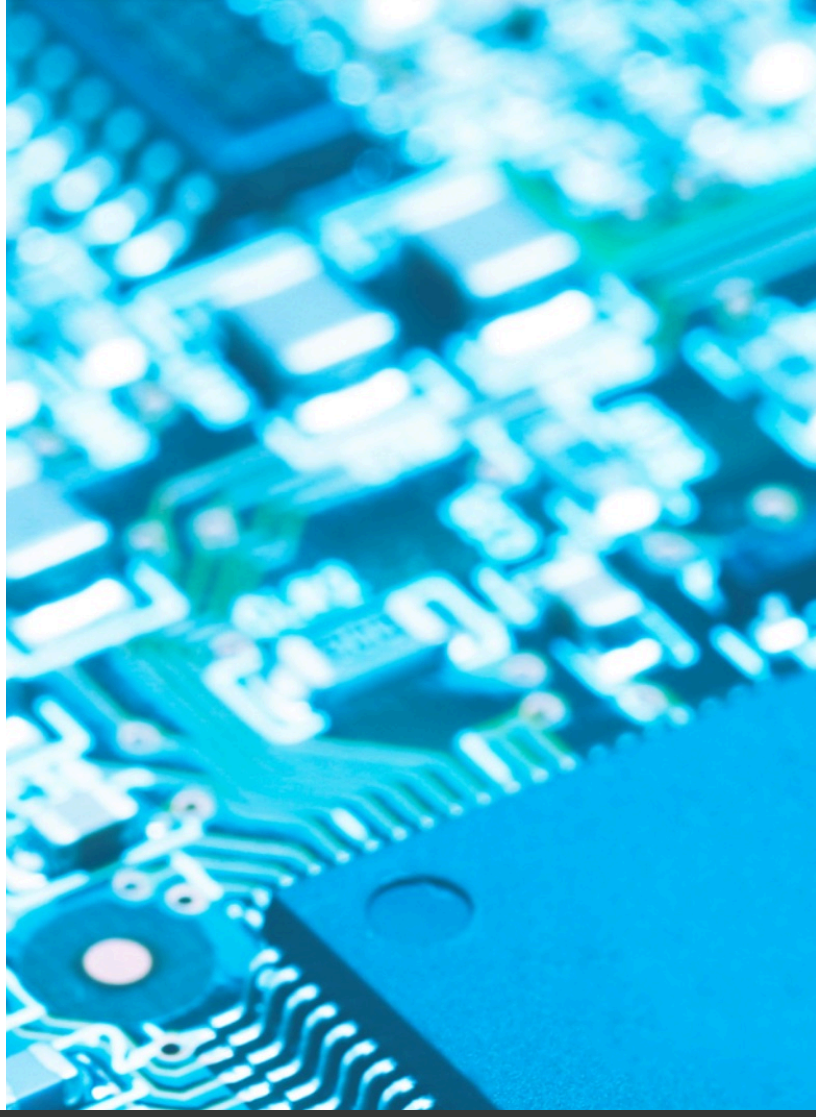
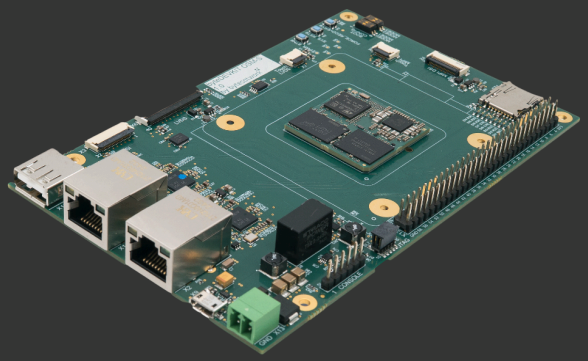
bytesatwork

DataSheet





industrial development kit

byteDEVKIT OSM-S



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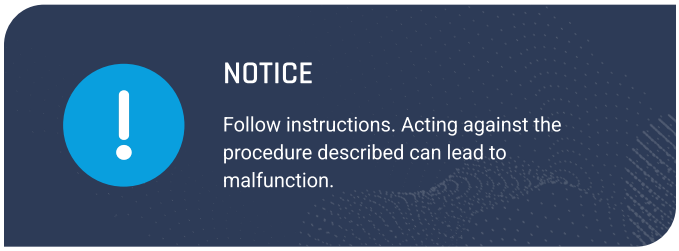
Imprint

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Symbols and Typographic Conventions

These symbols represent important details or aspects for working with bytesatwork-products.





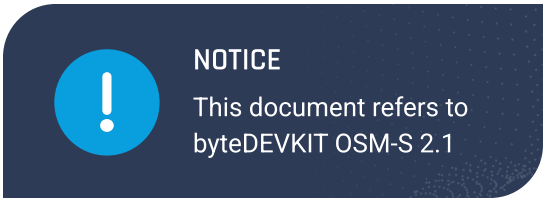
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1. Revision History

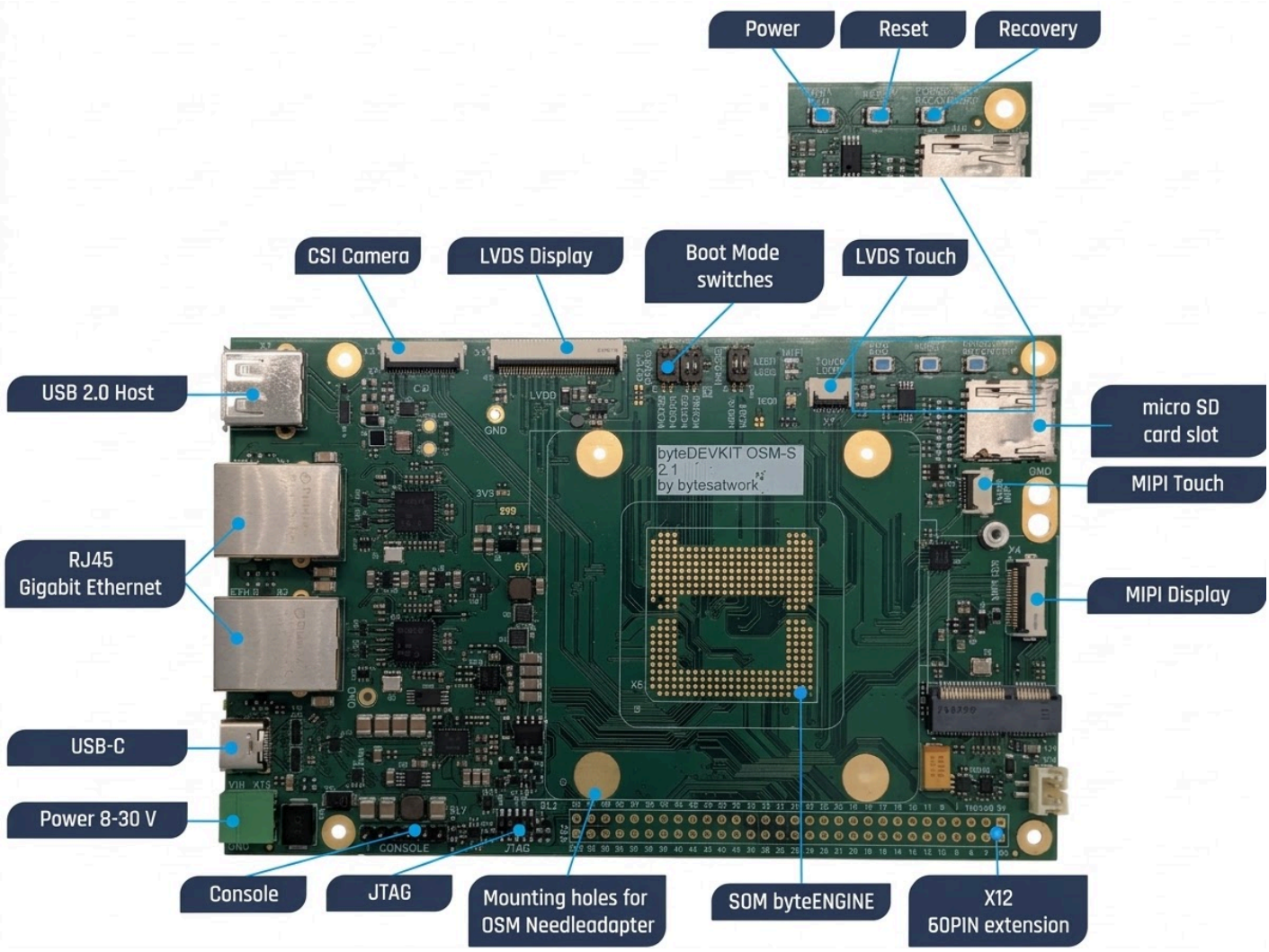
Hardware Revision	Marking on PCB	Release Date	Info
2.1	byteDEVKIT OSM-S 2.1	November 2026	small fixes and added MUX for VBUS and ID on USB-C
2.0	byteDEVKIT OSM-S 2.0	July 2026	added GND Testpoints, PCIe support for Key-E Cards, USB-C PD, Backup Battery connector
1.1	byteDEVKIT OSM-S 1.1	2026	Added Load switch for SD Card
1.0	byteDEVKIT OSM-S 1.0	2025	First version available for sales
0.1	byteDEVKIT OSM-S 0.1	2024	Prototypes



2. Overview

The byteDEVKIT OSM-S is a versatile evaluation and development platform designed specifically for rapid prototyping and seamless integration of the byteENGINE AM62L, STM32MP2 and IMX9x System-on-Modules (SOM). It offers a comprehensive set of interfaces to provide developers with an easy entry into application development and significantly shorten time-to-market.

The following graphic provides an overview of the diverse connectivity options.



2.1. General Information

Maximum flexibility and simplicity

The byteDEVKIT OSM-S enables you to work on your own projects while shortening time-to-market significantly. It is engineered for a huge variety of applications and the flexible structure allows easy implementations of even profound changes. Furthermore, it offers maximum flexibility and simplicity.

Wide range of byteENGINE-OSM SOMs

The byteDEVKIT OSM-S is available with SOMs of three major manufacturers:
Complete NXP i.MX9 Module family:
- > IMX9131, IMX9121,
- > IMX9352, IMX9351, IMX9332, IMX9331, IMX9301

Complete STM32MP2x Module family:
- > STM32MP251, STM32MP253,
- > STM32MP255, STM32MP257

Complete TI AM62L Module family
- > AM62L32, AM62L31

Plenty of possibilities

The byteDEVKIT OSM-S includes the base board that features a strong array of interfaces for a variety of applications:
- > 2x 1000Mbit Ethernet RJ45
- > 1x microSD Slot
- > 1x USB 2.0 Host
- > 1x USB OTG microUSB
- > PCIe Support for Key-E Cards
- > USD-C with Powerdelivery
- > Backup Battery connector
- > 5-inch LVDS Touchscreen Display
- > 5-inch MIPI DSI Touchscreen Display
- > 1x 60 PIN Header: Extension-Header X12: GPIO, SAI1, SPI7, CAN1, CAN2, PWM, ADC, UART2, UART3, UART5, UART8, I2C1, I2C2, SD3
- > Boot mode switches
- > CSI Camera 4lanes

Ready to start and use

The byteDEVKIT OSM-S package comes ready to run, which includes a power supply, a serial console and a microSD card with pre-installed embedded Linux. As a result, you benefit from rapid prototyping, maximum flexibility and a very short time-to-market.

Low consumption & high performance

The three CPU-families are on the cutting edge of their industry thanks to the combination of functional integration, high performance and extremely low power consumption.

Two in one

The byteENGINE IMX9x has up to two Cortex®-A55 cores for exceptionally high system performance. The Cortex®-M33 core enables real-time applications with low power consumption at the same time.

Similarly, the byteENGINE STM32MP2 has up to two Cortex®-A35 cores and a Cortex®-M33 MCU.

Both byteENGINEs feature an optional NPU and advanced security features.

The byteENGINE AM62L has up to two Cortex®-A53 cores and focuses on industrial application and optimized power architecture.

Easy to adapt to your project

Thanks to the 60PIN header, rapid prototyping is easy and efficient. The byteDEVKIT OSM-S offers a variety of interfaces such as I2C, SPI, CAN, UART, USART, PWM and GPIO.

Quality which endures

Our Swiss standard pays off. We only install components to the byteDEVKIT OSM-S with guaranteed availability of at least ten years. The byteDEVKIT OSM-S is engineered with the focus on robustness and longevity.

2.2. Technical Data byteDEVKIT OSM-S

byteDEVKIT OSM-S

Connectors	2x Gigabit Ethernet RJ45
Hardware Slot	1x microSD slot
Device Slot 1	1x USB 2.0 Host
Device Slot 2	1x USB-C with Powerdelivery and Superspeed
Display	5-inch LVDS Display with Touch or 5-inch MIPI DSI Display with Touch
Connector 60 PIN	X12: GPIO, SAI1, SPI7, CAN1, CAN2, PWM, ADC

2.3. Technical Data of the SOM byteENGINE IMX9x



Notice

For detailed information regarding the i.MX9x please refer to the document byteENGINE IMX9x Datasheet.

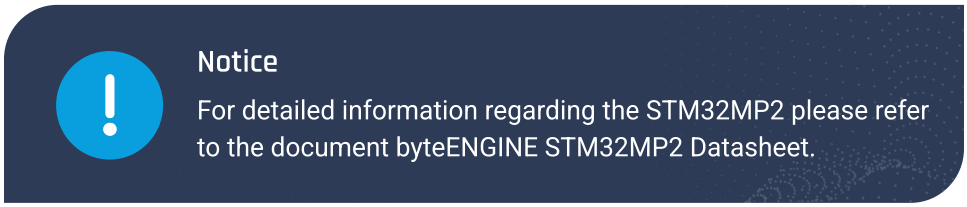


Datasheet byteENGINE IMX9x

byteENGINE IMX9x Specification

CPU	Up to Dual ARM® Cortex® A55 processors 1.7 GHz
Co-Processor	Cortex® M33 up to 250 MHz
Memory	512 MB to 2048 MB LPDDR4
Flash eMMC	up to 128 GB
Temperature	Industrial: -40° to +85° C, consumer: 0 to 70° C
Power Supply	5.0 V, 2 W
Dimensions	30 x 30 x 3 mm

2.4. Technical Data of the SOM byteENGINE STM32MP2



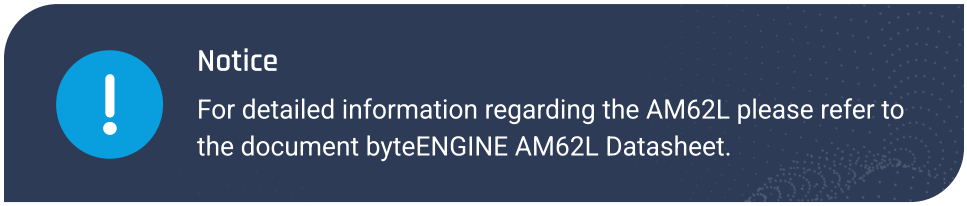


Datasheet byteENGINE STM32MP2

byteENGINE STM32MP2 Specification

CPU	Up to Dual ARM® Cortex® A35 processors 1.5 GHz
Co-Processor	Cortex® M33 up to 400 MHz
Memory	512 MB to 2048 MB LPDDR4
Flash eMMC	up to 128 GB
Temperature	Industrial: -40° to +85° C, consumer: 0 to 85° C
Power Supply	5.0 V, 2 W
Dimensions	30 x 30 x 3 mm

2.5. Technical Data of the SOM byteENGINE AM62L





Datasheet byteENGINE AM62L

byteENGINE AM62L Specification

CPU	Up to Dual ARM® Cortex® A53 processors at 1.25 GHz
Memory	512 MB to 2048 MB LPDDR4
Flash eMMC	up to 128 GB
Temperature	Industrial: -40° to +85° C, consumer: 0 to 85° C
Power Supply	5.0 V, 2 W
Dimensions	30 x 30 x 2.5 mm

2.6. Decision guidance byteDEVKIT OSM-S

The following six steps help identify the suitable DEVKIT with the needed SOM for the specific customer application.

> Step 1: Select the needed CPU for the SOM

> Choose Options as described in the Datasheets

STM32MP2	IMX9x	AM62L
Datasheet byteENGINE STM32MP2	Datasheet byteENGINE IMX9x	Datasheet byteENGINE AM62L

> Step 2: Select the needed CPU speed

STM32MP2	IMX9x	AM62L
1.2 GHz / 1.5 GHz	800 MHz / 900 MHz / 1.4 GHz / 1.7 GHz	1.25 GHz

> Step 3: Select the needed flash memory capacity

> Choose eMMC 8 / 16 / 32 / 64 GB / 128 GB

> Step 4: Select the needed RAM capacity

> Choose 512 / 1024 /1536 / 2048 MB

> Step 5: Select the needed temperature range

> Choose consumer or industrial

> Step 6: Select the needed Display

> Choose 5-inch LVDS with Touch / 5-inch MIPI DSI with Touch / without



Ordering info

2.7. Quickstart guide

The Quickstart guide simplifies the startup process with step-by-step instructions. Should you have questions you are always welcome to ask our experts for technical support. See Chapter Connectors for connector layout.

> Step 1: Connect the USB-to-UART cable to SL1 (black wire is marking PIN 1)

> Step 2: (Optional) Connect the network cable

> Step 3: Put a valid micro SD-Card into the SD-Card slot

> Step 4: Connect the console cable to your computer serial or USB port if you're using the adapter.

> Start the Terminal Software and configure your serial port with the following port settings:

Port Settings

Bits per second	115200
Data bits	8
Parity	N
Stop bits	1

> Step 5: Connect the power supply to X13

> Step 6: Once connected to the power supply, the console displays the boot log

> Step 7: Login to the system with:

Login Data

User	root
Password	rootme

2.8. Yocto Project Quick Build

These steps guide you through the process for an image build using the Yocto Project. The following example is valid for the byteDEVKIT with a byteENGINE IMX9x. For quick builds with other modules or any other further information please visit our byteWIKI.



byteWIKI: byteDEVKIT with byteENGINE IMX93
bytewiki: byteDEVKIT with byteENGINE STM32MP2
bytewiki: byteDEVKIT with byteENGINE AM62L

> Step 1: Create the folder „yocto“ and change into directory using the following commands:

```
mkdir yocto
cd yocto
```

> Step 2: : Download all necessary repositories using repo:

```
repo init -u https://github.com/bytesatwork/bsp-platform-nxp.git -b scarthgap repo sync
```

> Step 3: When these commands are completed successfully, the following command will setup a Yocto Project environment for byteDEVKIT:

```
MACHINE=bytedevkit-imx93 DISTRO=poky-bytesatwork EULA=1 . setup-environment build
```

> Step 4: The final command builds a development image:

(this may take several hours, depending on the build machine)

```
bitbake bytesatwork-minimal-image
```

> Step 5: Create and write the SD-Card Image:

(replace sdX with SD-Card drive)

```
cd tmp/deploy/images/bytedevkit-imx93
xzcat bytesatwork-minimal-image-bytedevkit-imx93.wic.xz | dd of =/dev/sdX bs=1M
conv=fsync
```

3. Pinout functions

This chapter provides an overview of the pinout functions on the byteDEVKIT OSM-S.

NOTICE

For alternative modes, please refer to the datasheets of the byteENGINE AM62L, byteENGINE IMX9x or byteENGINE STM32MP2.

3.1. X4 MIPI DSI connector

Con	Pin	Signal Name
X4	1	NC
X4	2	LEDK
X4	3	NC
X4	4	LEDA
X4	5	NC
X4	6	VCI
X4	7	IOVCC
X4	8	TE
X4	9	RESET
X4	10	GND
X4	11	MIPI_D1P
X4	12	MIPI_D1N
X4	13	GND
X4	14	MIPI_CLP
X4	15	MIPI_CLN
X4	16	GND
X4	17	MIPI_D0P
X4	18	MIPI_D0N
X4	19	GND
X4	20	GND

3.2. X5 MIPI Touch Connector

Con	Pin	Signal Name
X5	1	GND
X5	2	VDDIO
X5	3	VDD
X5	4	I2C1_SCL
X5	5	I2C1_SDA
X5	6	TOUCH_INT
X5	7	TOUCH_RESET
X5	8	GND

3.3. X7 LVDS Touch connector

Con	Pin	Signal Name
X7	1	GND
X7	2	VDDIO
X7	3	VDD
X7	4	I2C1_SCL
X7	5	I2C1_SDA
X7	6	TOUCH_INT
X7	7	TOUCH_RESET
X7	8	GND

3.4. X6 5-inch LVDS Display Connector

Con	Pin	Signal Name
X6	1	LEDA
X6	2	LEDA
X6	3	YU(NC)
X6	4	XL(NC)
X6	5	YD(NC)
X6	6	XR(NC)
X6	7	U/D/HDIR
X6	8	L/R/VDIR
X6	9	LED-
X6	10	LED-
X6	11	GND
X6	12	NC
X6	13	NC
X6	14	NC
X6	15	NC
X6	16	GND
X6	17	NC
X6	18	NC
X6	19	GND
X6	20	OLDI0_A3P
X6	21	OLDI0_A3N
X6	22	GND
X6	23	OLDI0_CLK0P
X6	24	OLDI0_CLK0N
X6	25	GND
X6	26	OLDI0_A2N
X6	27	OLDI0_A2P
X6	28	GND
X6	29	OLDI0_A1N
X6	30	OLDI0_A1P
X6	31	GND
X6	32	OLDI0_A0N
X6	33	OLDI0_A0P
X6	34	GND
X6	35	DISPLAY1_ENABLE
X6	36	DISPLAY1_RESET
X6	37	NC
X6	38	3V3
X6	39	3V3
X6	40	NC

3.5. X3 Camera

Con	Pin	Signal Name
X3	1	GND
X3	2	CSI0_RXN0
X3	3	CSI0_RXP0
X3	4	GND
X3	5	CSI0_RXN1
X3	6	CSI0_RXP1
X3	7	GND
X3	8	CSI0_RXCLKN
X3	9	CSI0_RXCLKP
X3	10	GND
X3	11	NC
X3	12	NC
X3	13	GND
X3	14	NC
X3	15	NC
X3	16	GND
X3	17	CAMERA_nRST
X3	18	CAMERA_MCLK
X3	19	GND
X3	20	I2C_SCL
X3	21	I2C_SDA
X3	22	3.3V

3.6. X12 60PIN Connector

Con	Pin	Signal Name
X12	1	5V
X12	2	3V3
X12	3	1V8
X12	4	CLKO4
X12	5	1V8
X12	6	PWM_3
X12	7	GPIO_A_0
X12	8	ADC_0
X12	9	GPIO_A_1
X12	10	ADC_1
X12	11	GPIO_A_2
X12	12	UART_A_RX
X12	13	GPIO_A_3
X12	14	UART_A_TX
X12	15	GPIO_A_4
X12	16	UART_A_RTS
X12	17	GPIO_A_5
X12	18	UART_A_CTS
X12	19	GPIO_A_6
X12	20	UART_B_RX
X12	21	GPIO_A_7
X12	22	UART_B_TX
X12	23	GPIO_B_0
X12	24	UART_B_RTS
X12	25	GPIO_B_1
X12	26	UART_B_CTS
X12	27	I2S_A_DATA_IN
X12	28	UART_C_RX
X12	29	I2S_A_DATA_OUT
X12	30	UART_C_TX
X12	31	I2S_LRCLK
X12	32	UART_D_RX
X12	33	I2S_BITCLK
X12	34	UART_D_TX
X12	35	I2S_MCLK
X12	36	I2C_A_SCL
X12	37	SPI_A_CS0#
X12	38	I2C_A_SDA
X12	39	SPI_A_SCK
X12	40	I2C_B_SCL
X12	41	SPI_A_SDI_(IO0)
X12	42	I2C_B_SDA
X12	43	SPI_A_SDO_(IO1)
X12	44	SDIO_B_CLK
X12	45	SPI_A_/WP_(IO2)
X12	46	SDIO_B_CMD
X12	47	SPI_A_/HOLD(IO3)
X12	48	SDIO_B_D0
X12	49	SPI_B_CS0#
X12	50	SDIO_B_D1
X12	51	SPI_B_SCK
X12	52	SDIO_B_D2
X12	53	SPI_B_SDI
X12	54	SDIO_B_D3
X12	55	SPI_B_SDO
X12	56	CAN_B_TX
X12	57	CAN_A_TX
X12	58	CAN_B_RX
X12	59	CAN_A_RX
X12	60	GND

4. Connectors

Power

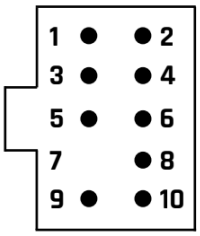
X13.1	8-30 V
X13.2	Ground (GND)

SL1: Console

SL1.1	GND
SL1.4	UART1-RXD
SL1.5	UART1-TXD
Do not connect other pins	

SL2: JTAG/SWD (ARM 10 Pin connector)

1	VTref
2	SWDIO/TMS
3	GND
4	SWCLK/TCK
5	GND
6	SWO/TDO
7	- - -
8	TDI
9	NC - TRSTN
10	nRESET



LEDs

LED1	Green: Power supply 3.3V

Buttons

Power Button	TA1 ON / OFF to SOC
Reset Button	System Reset
Recovery Button	Force to USB Boot

5. Boot modes

The OSM Standard implements two BOOT Pins: BOOT_SEL0# and BOOT_SEL1#.

BOOT_MODE2 and BOOT_MODE3 are connected to Vendor Defined Pins.
While BOOT_MODE0 and BOOT_MODE1 are automatically disconnected on the byteENGINE after power on reset, the logic for BOOT_MODE2 and BOOT_MODE3 must be handled on the baseboard separately. The boot sequence can be redefined with OTP writing.

5.1. byteENGINE IMX9x

Bootmode Pin	IMX9x PAD	OSM PAD	Note
BOOT_MODE0	UART1_TXD	(U19) BOOT_SEL0#	automatically disconnected after Boot
BOOT_MODE1	UART2_TXD	(R18) BOOT_SEL1#	automatically disconnected after Boot
BOOT_MODE2	SAI1_TXFS	(D6) Vendor Defined	Vendor defined pins, disconnect logic needed on baseboard
BOOT_MODE3	SAI1_TXD0	(D7) Vendor Defined	Vendor defined pins, disconnect logic needed on baseboard

CPU	BOOD_MODE (3:0)	BOOT Source
Cortex-A55	0000	Boot from internal Fuses
	0001	Serial Download (USB1)
	0010	USDHC1 8-bit eMMC 5.1
	0011	USDHC2 4-bit SD 3.0
	0100	FlexSPI Serial NOR
	0101	FlexSPI Serial NAND 2K
Cortex-M33	1000	LPB: Boot From Internal Fuses
	1001	LPB: Serial Downloader (USB1)
	1010	LPB: USDHC1 8-bit 1.8V eMMC 5.1
	1011	LPB: USDHC2 4-bit SD 3.0
	1100	LPB: FlexSPI Serial NOR
	1101	LPB: FlexSPI Serial NAND 2K

5.2. byteENGINE STM32MP2

Bootmode Pin	STM32MP2 PAD	OSM PAD	Note
BOOT_MODE0	T2	U19	Automatically disconnected after Boot
BOOT_MODE1	P3	R18	Automatically disconnected after Boot
BOOT_MODE2	T3	D6	Vendor defined pins, disconnect logic needed on baseboard
BOOT_MODE3	R3	D7	Vendor defined pins, disconnect logic needed on baseboard

CPU	BOOT_MODE [3:0]	BOOT Source
Cortex A35 + M33	0000	UART and USB
Cortex A35	0001	SD-Card
	0010	eMMC
	0011	Development boot
	0100	Serial NOR
	0101	Serial NAND
	0110	SLC NAND
Cortex M33	0111	SD-Card
	1000	e-MMC
	1001	-
	1010	-
Cortex M33	1011	Serial NOR
Cortex A35 + M33	1100	Development boot
	1101	-
	1110	-
Cortex A35 + M33	1111	UART and USB

5.3. byteENGINE AM62L

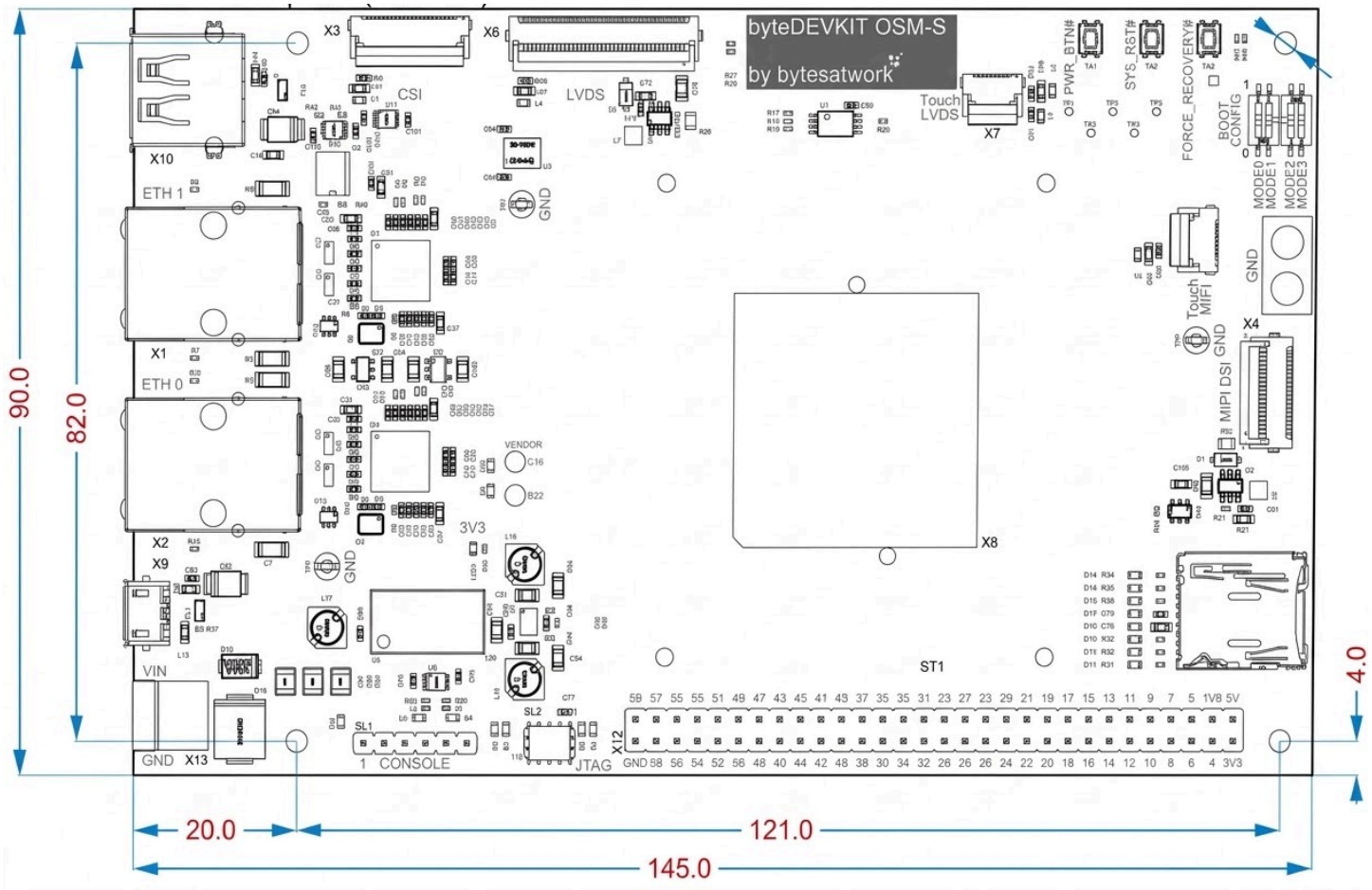
Bootmode Pin	AM62Lx PAD	OSM PAD	Note
BOOT_MODE[12]	G23 (GPMC AD12)	D14 (USART4.RXD)	OSM Boot Pin BOOT_SEL0#
BOOT_MODE[13]	G22 (GPMC AD13)	D13 (USART4.TXD)	Vendor Defined Pin
BOOT_MODE[14]	F22(GPMC AD14)	A14 (USART5.RXD)	OSM Boot Pin BOOT_SEL1#
BOOT_MODE[15]	F23 (GPMC AD15)	B13 (USART5.TXD)	Vendor Defined Pin

PIN VALUE BOOTMODE				Primary	Backup
15	14	13	12		
0	1	1	0	DEVBOOT	None
0	1	1	1	USB0 Host MSC	UART
1	0	0	0	MMC0 eMMC Boot Partition	USB DFU
1	0	1	0	MMC1 4 BIT UDA Filesystem	UART
1	0	1	1	MMC0 eMMC Boot Partition	MMC1
1	1	1	0	EXT. Host UART0	MMC1
1	1	1	1	EXT. Host USB0 DFU	MMC1

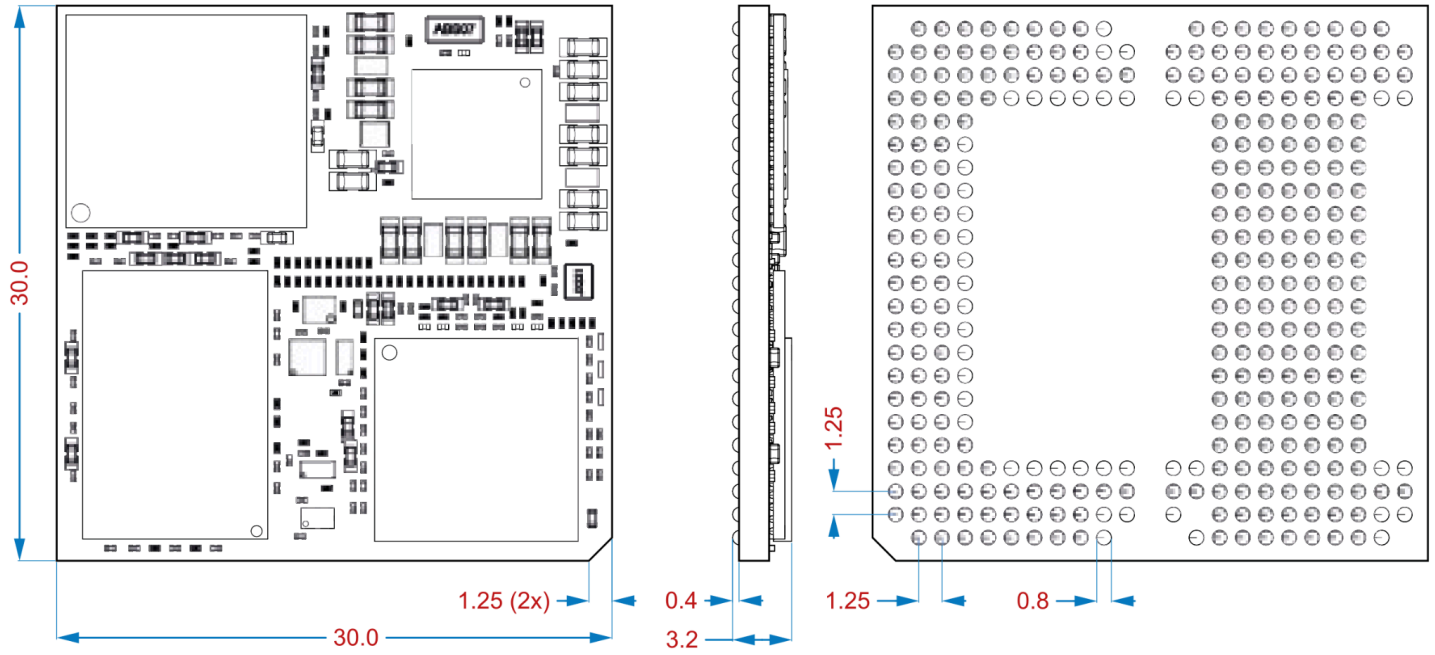
6. Mechanical dimensions byteDEVKIT OSM-S

The following illustration shows all important dimensions for mounting and installation of the byteDEVKIT OSM-S.

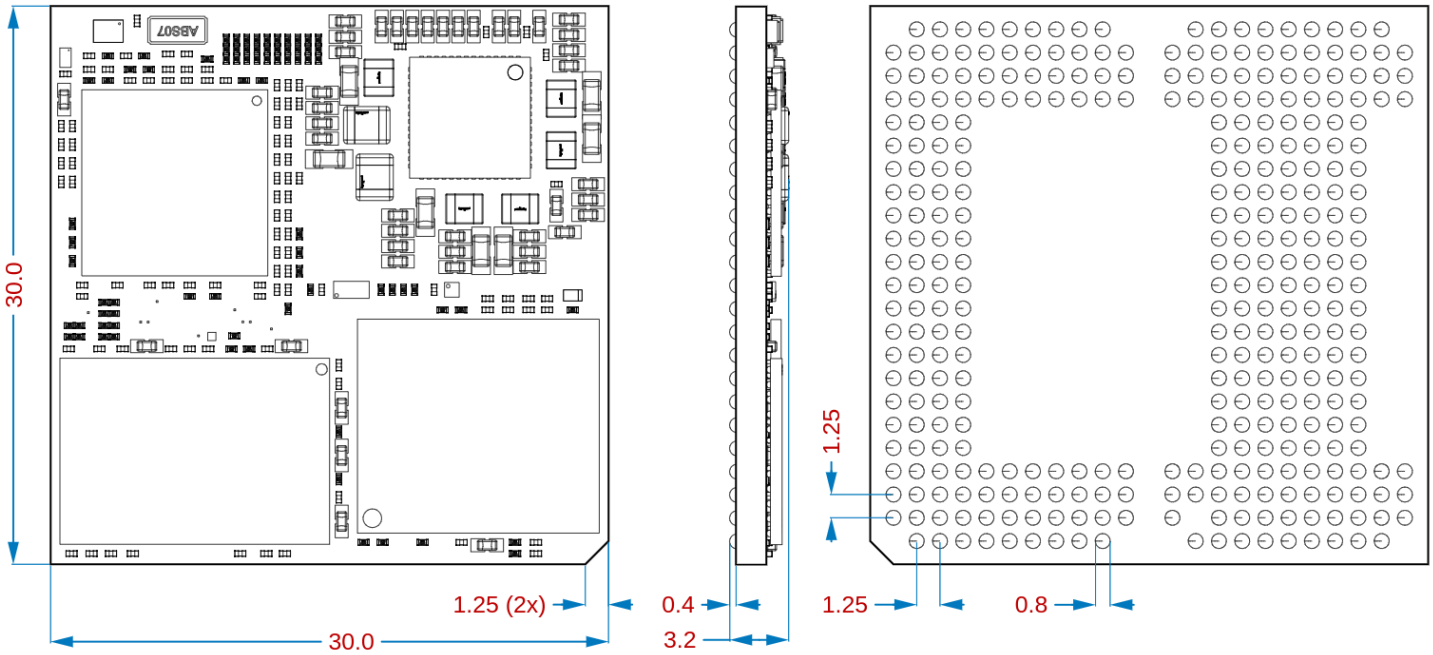
> All dimensions are indicated in millimetres (mm)



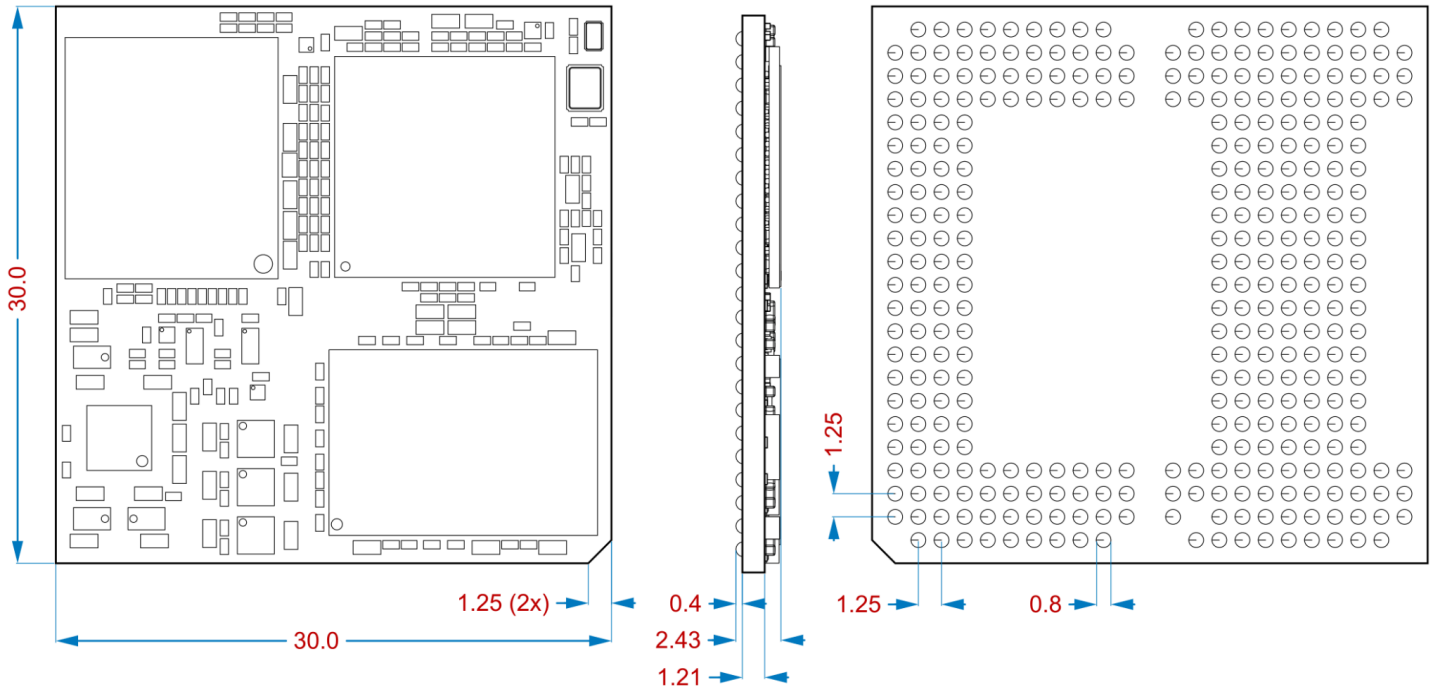
6.1. Mechanical dimensions of byteENGINE IMX9x



6.2. Mechanical dimensions of byteENGINE STM32MP2



6.3. Mechanical dimensions of byteENGINE AM62L



7. Ordering info

The Order Code allows customers to easily recognize the detailed specification of the ordered SOM. Please refer to chapter Decision guidance byteDEVKIT OSM-S for further information.

byte[KIT]-[CPU]-[SPEED]-[RAM]-[FLASH]-[temp-range]-[revision]-[display]

[KIT]	**Display Option**	DEVKIT: With Display STARTKIT: Without Display
[CPU]	**CPU Type**	Comprehensive, see Decision guidance byteDEVKIT OSM-S
[SPEED]	**Clock speed**	800 MHz / 900 MHz / 1.2 GHz / 1.25 GHz / 1.4 GHz / 1.5 GHz / 1.7 GHz
[RAM]	**RAM size**	512 / 1024 /1536 / 2048 MB
[FLASH]	**eMMC flash size**	8 / 16 / 32 / 64 / 128 GB
[temp-range]	**Temperature range**	[C] Consumer 0° to +70° C (byteENGINE IMX9) or 0° to +85° C (others) [I] Industrial -40°C to +85 °C
[revision]	**Revision**	2.1
[display]	**Display Option**	LVDS or MIPI (if applicable)

8. References byteDEVKIT OSM-S



NOTICE

Files can only be downloaded with login credentials. Please request your download credentials via support@bytesatwork.ch or contact your sales representative.



Links

Hardware Design

byteDEVKIT OSM-S Schematic V2.1

Component Documentation

Datasheet byteENGINE AM62L

Datasheet byteENGINE STM32MP2

Datasheet byteENGINE IMX9x

Software & Configuration

byteWIKI: byteDEVKIT with byteENGINE IMX93

bytewiki: byteDEVKIT with byteENGINE STM32MP2

bytewiki: byteDEVKIT with byteENGINE AM62L

meta-bytesatwork on github

bytesatwork

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Help

bytewiki.readthedocs.io

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