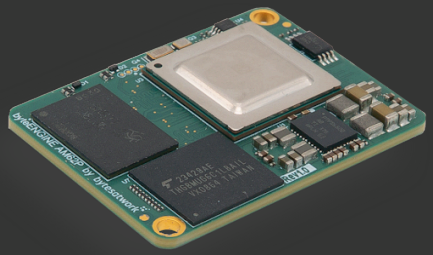
bytesatwork

DataSheet



industrial computing module

byteENGINE AM62Px

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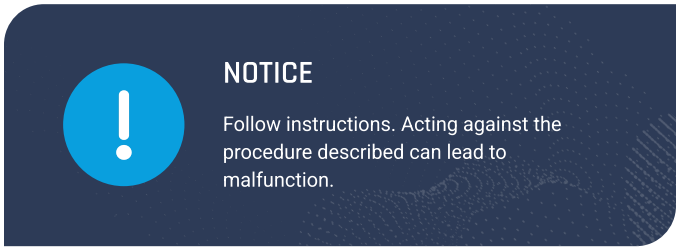
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Symbols and Typographic Conventions

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





www.bytesatwork.io

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1. Revision History

Hardware Revision	Marking on PCB	Release Date	Info
1.1	Rev 1.1	May 2025	First revision available for sales
1.0	Rev 1.0	January 2024	Prototypes

NOTICE

This document refers to byteENGINE AM62Px Rev. 1.1

2. Overview

2.1. General Information

The **byteENGINE AM62Px** is an ultra-compact, industrial-grade System-on-Module (SOM) designed to accelerate development cycles, reduce design risk, and significantly lower overall time-to-market. Measuring just 30 x 40 mm, the module brings enterprise-class processing and advanced graphics capabilities to embedded applications.

At its core, the byteENGINE AM62Px integrates Texas Instruments' Sitara™ AM62P application processor family, featuring up to four 64-bit Arm® Cortex®-A53 cores running at 1.4 GHz, alongside dual Arm® Cortex®-R5F microcontroller subsystems for real-time processing and device management. Graphics-rich applications benefit from the integrated Imagination IMG BXS-4-64 GPU with Vulkan and OpenGL ES support, hardware-accelerated 4K video decoding, and independent triple-display output (OLDI/LVDS, MIPI-DSI, and DPI).

Engineered for demanding industrial environments, the SOM is available in extended temperature ranges (-40 °C to +85 °C) and features flexible power input (3.3 V to 5.5 V). With four high-density Hirose board-to-board connectors providing 280 pins, it offers comprehensive peripheral access, including dual Gigabit Ethernet with TSN, 4x CAN-FD, MIPI-CSI camera input, and high-speed storage interfaces, backed by a production-ready Yocto/Linux Board Support Package (meta-bytesatwork).

2.2. Technical Data

Feature		Details
CPU	**Architecture**	Up to Quad ARM® Cortex® A53
	CPU	AM62Px See LINK for further information: „Block Diagram of AM62Px“ See TI Homepage for further information: AM62P
	Cache	> 32 kB L1 Instruction Cache > 32 kB L1 Data Cache > 512 kB L2 Cache
	Frequency (max)	1.4 GHz
	Floating Point	Floating Point Unit (FPU) with support of the ARM® single-precision data-processing instructions, and data types.
	Co-Processor	2 Single-Core Cortex®-R5F operating up to 800 MHz > 32 kB Data Cache, 32 kB Instruction Cache,
	Security	Secure boot, Trusted Execution Environment, Dedicated Security Controller, Cryptographic acceleration, Debugging security
GPU		IMG BXS-4-64 with 256KB cache > Up to 50GFLOPS
Memory On Chip	**ROM / RAM**	Up to 1.09MB of On-Chip RAM > 64KB of On-Chip RAM (OCRAM) with SECDED ECC > 256KB of On-Chip RAM with SECDED ECC in SMS Subsystem > 176KB of On-Chip RAM with SECDED ECC in SMS Subs. for TI security firmware > 512KB of On-chip RAM with SECDED ECC in Cortex-R5F MCU Subsystem > 64KB of On-chip RAM with SECDED ECC in Device Manager Subsystem
Memory External	**DRAM**	Up to 8GB LPDDR4-2400 32-bit
	Flash	Up to 128GB eMMC
Ethernet	**Speed**	2 x 10/100/1000 Mbps & IEEE 1588
Multimedia	**Display Subsystem**	Triple display support over OLDI (LVDS) (1x OLDI-DL, 1x or 2x OLDI-SL), DSI or DPI
	3D Graphic Processing Unit	IMG BXS-4-64 with 256KB cache – Up to 50GFLOPS – Single shader core – OpenGL ES3.2 and Vulkan 1.2 API support
	Camera	One Camera Serial Interface (CSI-2) Receiver with 4 Lane D-PHY
	Video Encoder/Decoder	Support for HEVC (H.265) Main profiles at Level 5.1 High-tier; Support for H.264

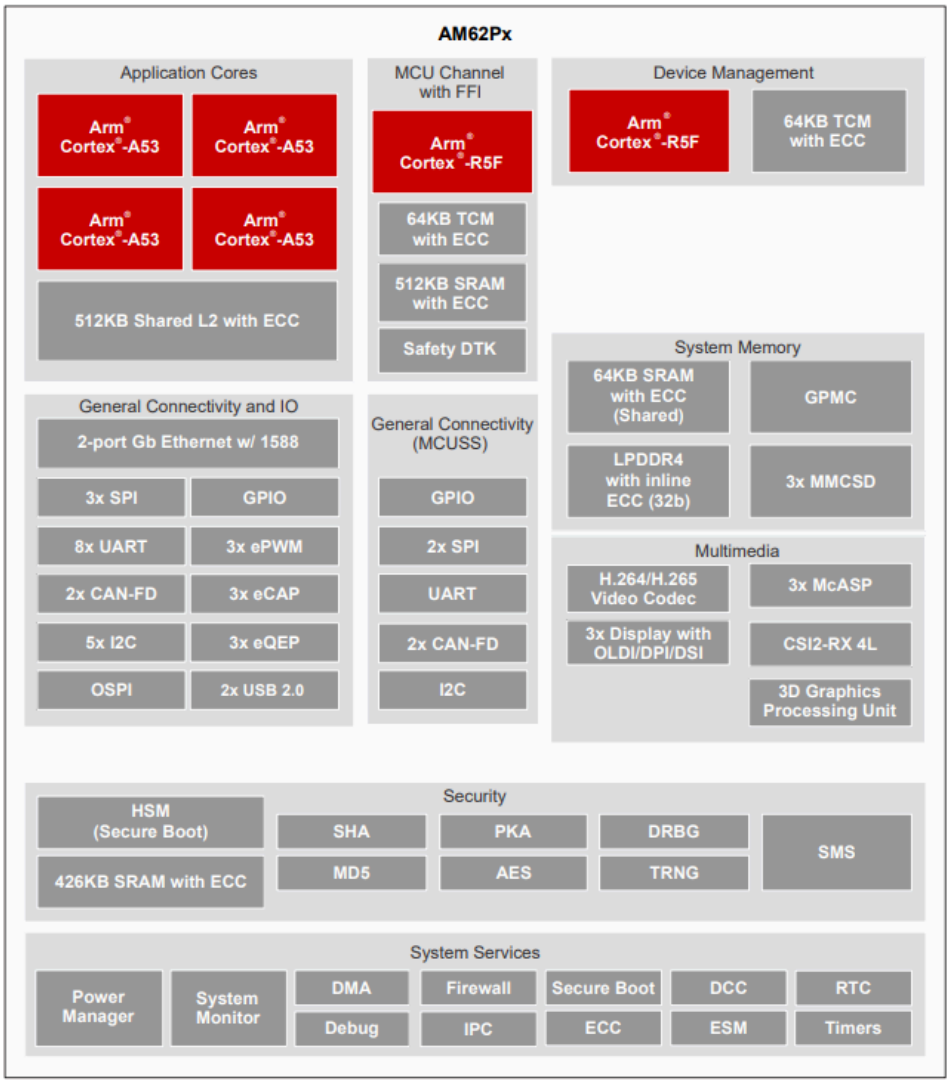
Feature		Details
		BaseLine/Main/High Profiles at Level 5.2; Support for up to 4K UHD resolution (3840 × 2160)
USB	**USB 2.0**	2
Serial	**SPI**	5
	I2C	6
	UART	9
	USART	4
	OctalSPI	1
	CAN-FD	4
	eQEP	3
Expansion	**MMC/SD®/ SDIO**	1x 8-bit eMMC interface up to HS400 speed 2x 4-bit SD/SDIO interfaces up to UHS-I
Miscellaneous	**Watchdog**	Yes
	GPIO	Up to 158
	PWM	3
	Timer	14
	Boot Mode	Secure Boot
Mechanical Information	**Input Voltage**	5.0 V
	Power Consumption	5 W
	Dimensions	30 x 40 x 4 mm
	Operation Temperature	> Industrial temperature range: -40 to +85° C > Consumer temperature range: 0 to 85° C
Operation System	**Linux**	meta-bytesatwork available on github

2.3. Block Diagram of AM62Px

The AM62Px addresses the next wave of HMI designs with a new generation of 3D GPU and 4K video acceleration. Enhance your design connectivity with a comprehensive set of high-speed IOs, including 4x CAN-FD, 3-port Gigabit Ethernet switch with TSN support and two USB2.0 ports. The AM62Px meets the latest cybersecurity standards with its built-in Hardware Security Module (HSM) and offers intelligent features, such as an open-source AI software and tools.

Key features of AM62Px

- Quad ARM® Cortex®-A53 up to 1.4 GHz
- ARM® Cortex®-R5F up to 800 MHz
- GPU IMG BXS-4-64
- Triple Display supported
- Secure Boot supported
- Dedicated security controller





For further information regarding the AM62Px CPU, please visit the homepage of Texas Instruments:
TI AM62Px Family

2.4. Decision guidance

The following four steps help identifying the suitable byteENGINE for the specific customer application.

> Step 1: Select the needed CPU for the SOM

>> Choose Quad or DualArm® Cortex®-A53

Quad Core: AM62Px**4**

Dual Core: AM62Px**2**

> Choose with or without 3D-Graphics Engine

With 3D-Graphics Engine: AM62P**5**x

Without 3D-Graphics Engine: AM62P**3**x

> Step 2: Select the needed flash memory type and capacity

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

> Step 3: Select the needed RAM capacity

> Choose 512 / 1024 / 1536 / 2048 / 4096 / 6144 / 8192 MB

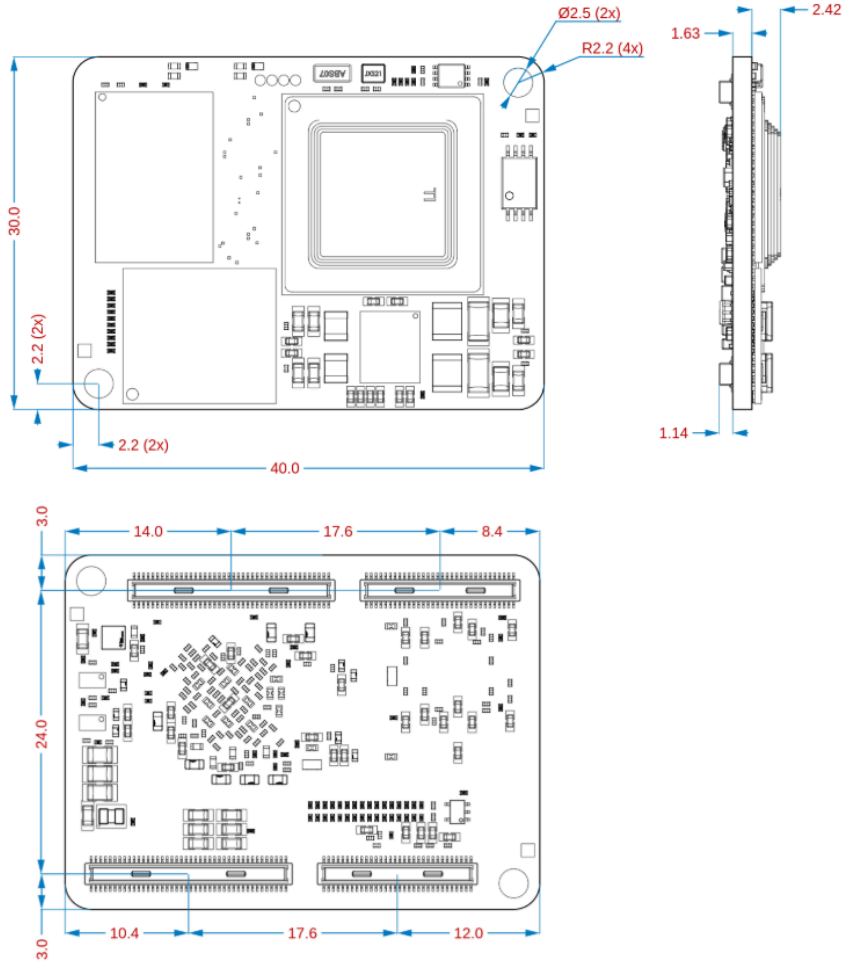
> Step 4: Select the needed temperature range

> Choose consumer or industrial

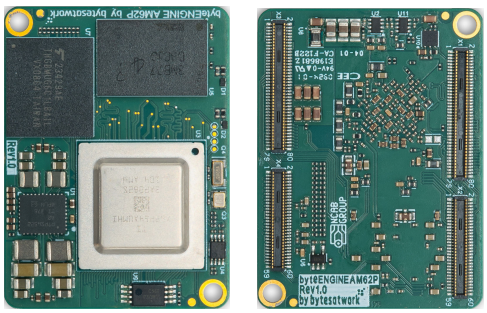
2.5. Dimensions of byteENGINE AM62Px

The following illustration shows all important dimensions for mounting and installation of the industrial computing module byteENGINE AM62Px.

> All dimensions are indicated in millimetres (mm).

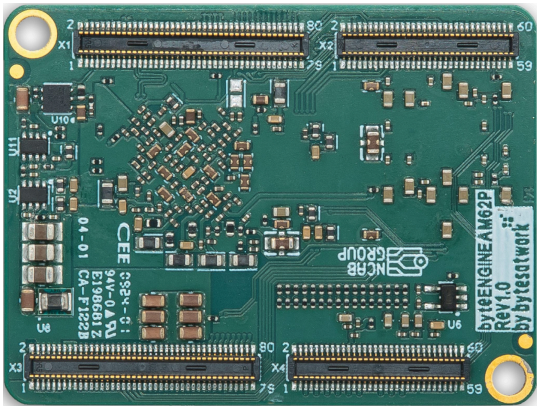


> Module design in scale 1:1:



2.6. byteENGINE AM62Px connectors layout

The AM62Px is connected to the carrier board with 2x 80 and 2x60 pins on four module connectors. The following picture shows the location of the connectors on the bottom side of the SOM byteENGINE.



Connectors

X1	LVDS1, LVDS0, OSPI, CSI1, RGMII2, DSI
X2	Reset, UART0, USB1, MCU_MCAN0, MCU_MCAN1, MCAN0, JTAG, USB0, WKUP
X3	Power, MMC1, MMC2, MDIO, MCU_UART0, RGMII1, SPIO, MCU_SPI0, MCASP0
X4	LCD, GPMC, I2C1, MCU_I2C0

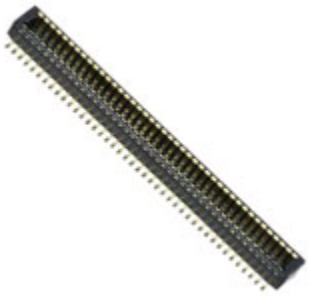
Schematic of the connectors X1, X2, X3 and X4

NOTICE

The module is held in the connectors with a considerable retention force. To avoid damaging the modules' connectors as well as the carrier board connectors while removing the module the use of an extraction tool is strongly recommended.

2.7. Connectors

The byteENGINE uses four Hirose 0.4 mm Board to Board Plug connectors. For more specific information about the connectors used, please consult the datasheet of the manufacturer.

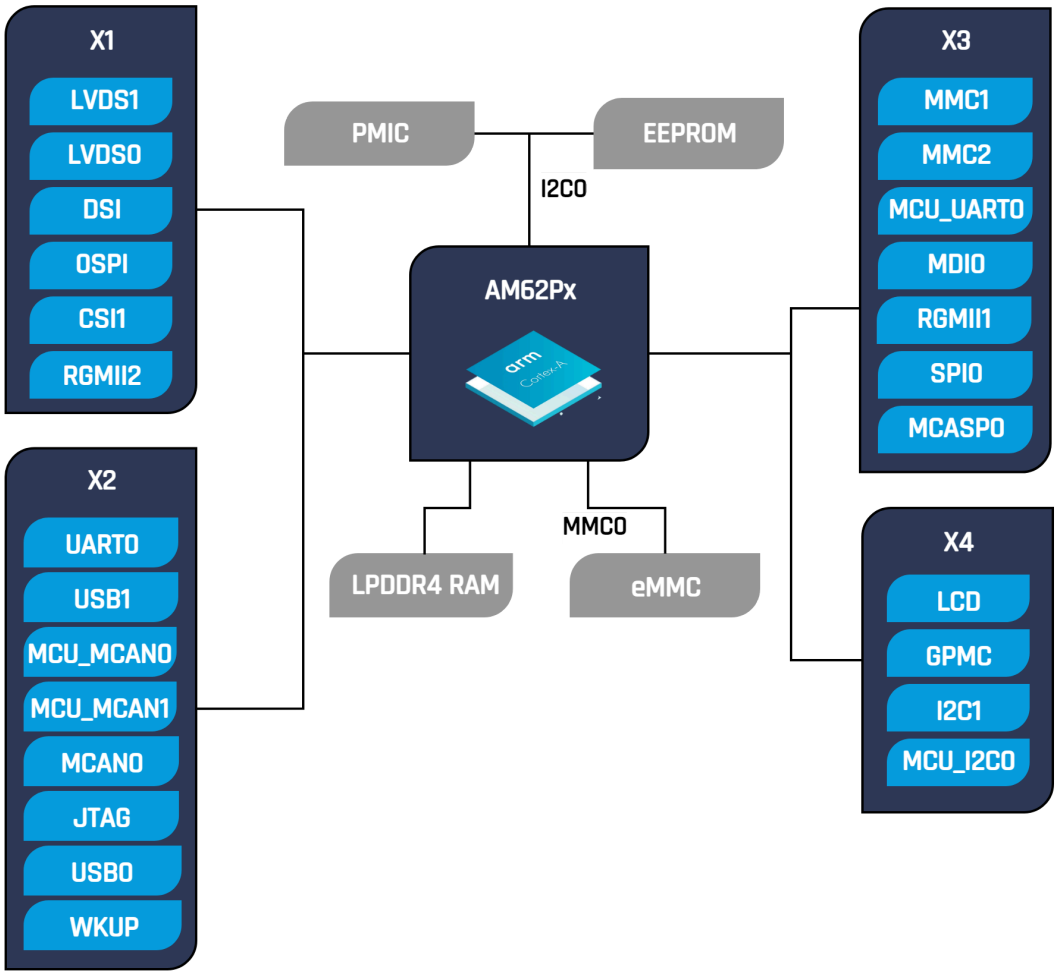


Connectors	
X1, X3	DF40HC(3.0)-80DS-0.4V(51)
X2, X4	DF40HC(3.0)-60DS-0.4V(51)

Hirose DF40-Series Connectors

2.8. byteENGINE AM62Px Connectors Overview

The following illustration shows the „default configuration“ of the byteENGINE AM62Px. The function of the components shown in gray squares cannot be changed. The blue squares show the module connectors X1, X2, X3 and X4. The functions of X1, X2, X3 and X4 can be adapted and each connector module serves multiple functions. The detailed pinout functions are shown in chapter 3. Pinout functions.

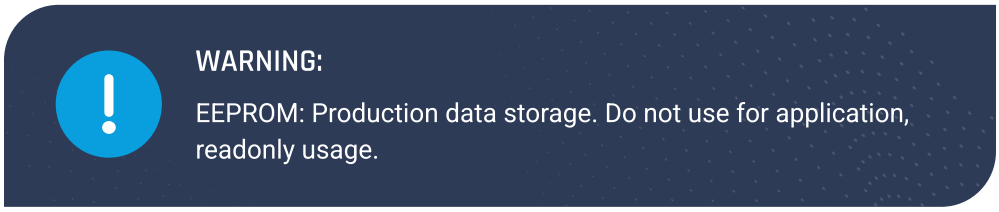


3. Pinout functions

This chapter provides all relevant information for connecting and configuring the byteENGINE AM62Px on a carrier board, including pin functions, available alternatives, restrictions, signal propagation delay, power supply and boot modes.

3.1. Restrictions

The following peripherals are internally connected to components on the module. They must not be used for external functions on the carrier board when the corresponding on-module components are populated and in use.



Restricted peripherals

I2C0	PMIC and EEPROM
MMC0	eMMC

Ball	Pin Name	Used for
B25	I2C0_SCL	PMIC/EEPROM
A24	I2C0_SDA	PMIC/EEPROM
AA6	MMC0_CLK	eMMC
AB8	MMC0_CMD	eMMC
AC7	MMC0_DAT0	eMMC
AB7	MMC0_DAT1	eMMC
AB6	MMC0_DAT7	eMMC
AE5	MMC0_DAT3	eMMC
AE6	MMC0_DAT4	eMMC
AC6	MMC0_DAT5	eMMC
AA7	MMC0_DAT6	eMMC
AD6	MMC0_DAT2	eMMC
AD5	MMC0_DS	eMMC
L24	OSPI0_CSn1	VSEL_SD

3.2. Carrier board connector X1

Con	Pin	MPU Pin	Pin Name	GPIOx / Dedicated function	Alternative Modes on Pin							
					1	2	3	4	5	6	7	8
X1	1	-	GND	GND								
X1	2	-	GND	GND								
X1	3	-	PowerButton									
X1	4	AA16	LVDS1.D3_P	OLDI0_A7P								
X1	5	N/A	-									
X1	6	AB16	LVDS1.D3_N	OLDI0_A7N								
X1	7	N/A	-									
X1	8	AC15	LVDS1.D2_P	OLDI0_A6P								
X1	9	N/A	-									
X1	10	AC16	LVDS1.D2_N	OLDI0_A6N								
X1	11	N23	OSPI.LBCLKO	OSPI0_LBCLKO	UART5_RTSn	GPIO0_1						
X1	12	AD14	LVDS1.CLK_P	OLDI0_CLK1P								
X1	13	-	GND	GND								
X1	14	AD15	LVDS1.CLK_N	OLDI0_CLK1N								
X1	15	AE19	LVDS0.D3_P	OLDI0_A3P								
X1	16	AD16	LVDS1.D0_P	OLDI0_A4P								
X1	17	AD18	LVDS0.D3_N	OLDI0_A3N								
X1	18	AD17	LVDS1.D0_N	OLDI0_A4N								
X1	19	AB19	LVDS0.D2_P	OLDI0_A2P								
X1	20	AC17	LVDS1.D1_P	OLDI0_A5P								
X1	21	AA19	LVDS0.D2_N	OLDI0_A2N								
X1	22	AB17	LVDS1.D1_N	OLDI0_A5N								
X1	23	AE17	LVDS0.CLK_P	OLDI0_CLK0P								

Con	Pin	MPU Pin	Pin Name	GPIOx / Dedicated function	Alternative Modes on Pin							
					1	2	3	4	5	6	7	8
X1	24	-	GND	GND								
X1	25	AE18	LVDS0.CLK_N	OLDI0_CLK0N								
X1	26	AE15	DSI.D3_P	DSI0_TXP3								
X1	27	AD19	LVDS0.D1_P	OLDI0_A1P								
X1	28	AE14	DSI.D3_N	DSI0_TXN3								
X1	29	AC19	LVDS0.D1_N	OLDI0_A1N								
X1	30	AC13	DSI.D2_P	DSI0_TXP2								
X1	31	AD20	LVDS0.D0_P	OLDI0_A0P								
X1	32	AC12	DSI.D2_N	DSI0_TXN2								
X1	33	AE20	LVDS0.D0_N	OLDI0_A0N								
X1	34	AA13	DSI.CLK_P	DSI0_TXCLKP								
X1	35	-	GND	GND								
X1	36	AA12	DSI.CLK_N	DSI0_TXCLKN								
X1	37	P23	OSPI.CLK	OSPI0_CLK	GPIO0_0							
X1	38	AB14	DSI.D1_P	DSI0_TXP1								
X1	39	L25	OSPI.IO0	OSPI0_D0	GPIO0_3							
X1	40	AB13	DSI.D1_N	DSI0_TXN1								
X1	41	N24	OSPI.IO1	OSPI0_D1	GPIO0_4							
X1	42	AD12	DSI.D0_P	DSI0_TXP0								
X1	43	N25	OSPI.IO2	OSPI0_D2	GPIO0_5							
X1	44	AD11	DSI.D0_N	DSI0_TXN0								
X1	45	M24	OSPI.IO3	OSPI0_D3	GPIO0_6							
X1	46	M25	OSPI.CS0	OSPI0_CSn0	GPIO0_11							
X1	47	N21	OSPI.IO4	OSPI0_D4	SPI1_CS0	MCASP1_AXR1	UART6_RXD	GPIO0_7				
X1	48	L22	OSPI.CS2	OSPI0_CSn2	SPI1_CS1	OSPI0_RESET_OUT1	MCASP1_AFSR	MCASP1_AXR2	UART5_RXD	GPIO0_13		
X1	49	N22	OSPI.IO5	OSPI0_D5	SPI1_CLK	MCASP1_AXR0	UART6_TXD	GPIO0_8				
X1	50	L23	OSPI.CS3	OSPI0_CSn3	OSPI0_RESET_OUT0	OSPI0_ECC_FAIL	MCASP1_ACLKR	MCASP1_AXR3	UART5_TXD	GPIO0_14		

Con	Pin	MPU Pin	Pin Name	GPIOx / Dedicated function	Alternative Modes on Pin							
					1	2	3	4	5	6	7	8
X1	51	P21	OSPI.IO6	OSPI0_D6	SPI1_D0	MCASP1_ACLKX	UART6_RTSn	GPIO0_9				
X1	52	P22	OSPI.DQS	OSPI0_DQS	UART5_CTSn	GPIO0_2						
X1	53	N20	OSPI.IO7	OSPI0_D7	SPI1_D1	MCASP1_AFSX	UART6_CTSn	GPIO0_10				
X1	54	C25	EXT_REFCLK1	EXT_REFCLK1	SYNC1_OUT	SPI2_CS3	SYSCLKOUT0	TIMER_IO4	CLKOUT0	CP_GEMAC_CPTS0_RFT_CLK	GPIO1_30	ECAP0_IN_APWM_OUT
X1	55	F13	WKUP_CLKOUT0	WKUP_CLKOUT0	MCU_GPIO0_23							
X1	56	-	GND	GND								
X1	57	-	GND	GND								
X1	58	A20	RGMII2.TCTL	RGMII2_TX_CTL	RMII2_TX_EN	MCASP2_AXR4	GPIO0_87					
X1	59	AD8	CSI1.D3_P	CSI0_RXP3								
X1	60	D16	RGMII2.TCLK	RGMII2_TXC	RMII2_CRS_DV	MCASP2_AXR5	GPIO0_88					
X1	61	AD9	CSI1.D3_N	CSI0_RXN3								
X1	62	B19	RGMII2.TD0	RGMII2_TD0	RMII2_TXD0	MCASP2_AXR6	GPIO0_89					
X1	63	AA9	CSI1.D2_P	CSI0_RXP2								
X1	64	A21	RGMII2.TD1	RGMII2_TD1	RMII2_TXD1	MCASP2_ACLKR	MCASP2_AXR8	GPIO0_90				
X1	65	AA10	CSI1.D2_N	CSI0_RXN2								
X1	66	D17	RGMII2.TD2	RGMII2_TD2	MCASP2_AFSX	GPIO0_91	EQEP2_I					
X1	67	AE11	CSI1.CLK_P	CSI0_RXCLKP								
X1	68	A19	RGMII2.TD3	RGMII2_TD3	CLKOUT0	MCASP2_ACLKX	GPIO1_0	EQEP2_S				
X1	69	AE12	CSI1.CLK_N	CSI0_RXCLKN								
X1	70	F19	RGMII2.RCTL	RGMII2_RX_CTL	RMII2_RX_ER	MCASP2_AXR3	GPIO1_1					
X1	71	AC9	CSI1.D1_P	CSI0_RXP1								
X1	72	D19	RGMII2.RCLK	RGMII2_RXC	RMII2_REF_CLK	MCASP2_AXR1	GPIO1_2					
X1	73	AC10	CSI1.D1_N	CSI0_RXN1								
X1	74	E19	RGMII2.RD0	RGMII2_RD0	RMII2_RXD0	MCASP2_AXR2	GPIO1_3					
X1	75	AB10	CSI1.D0_P	CSI0_RXP0								
X1	76	E16	RGMII2.RD1	RGMII2_RD1	RMII2_RXD1	MCASP2_AFSR	MCASP2_AXR7	GPIO1_4				

Con	Pin	MPU Pin	Pin Name	GPIOx / Dedicated function	Alternative Modes on Pin							
					1	2	3	4	5	6	7	8
X1	77	AB11	CSI1.D0_N	CSI0_RXN0								
X1	78	E17	RGMII2.RD2	RGMII2_RD2	MCASP2_AXR0	GPIO1_5	EQEP2_A					
X1	79	-	GND	GND								
X1	80	C19	RGMII2.RD3	RGMII2_RD3	AUDIO_EXT_REFCLK0	GPIO1_6	EQEP2_B					

3.3. Carrier board connector X2

Con	Pin	MPU Pin	Pin Name	GPIOx / Dedicated function	Alternative Modes on Pin							
					1	2	3	4	5	6	7	8
X2	1	-	GND	GND								
X2	2	-	GND	GND								
X2	3	A22	UART0.RXD	UART0_RXD	ECAP1_IN_APWM_OUT	SPI2_D0	EHRPWM2_A	GPIO1_20				
X2	4	Y10	USB1.VBUS	USB1_VBUS								
X2	5	B22	UART0.TXD	UART0_TXD	ECAP2_IN_APWM_OUT	SPI2_D1	EHRPWM2_B	GPIO1_21				
X2	6	N/A	-									
X2	7	A23	UART0.CTSN	UART0_CTSn	SPI0_CS2	I2C3_SCL	UART2_RXD	TIMER_IO6	AUDIO_EXT_REFCLK0	GPIO1_22	MCASP2_AFSX	MMC2_SDCD
X2	8	G21	USB1.DRVVBUS	USB1_DRVVBUS	GPIO1_51							
X2	9	C22	UART0.RTSN	UART0_RTSn	SPI0_CS3	I2C3_SDA	UART2_TXD	TIMER_IO7	AUDIO_EXT_REFCLK1	GPIO1_23	MCASP2_ACLKX	MMC2_SDWP
X2	10	N/A	-									
X2	11	-	GND	GND								
X2	12	-	GND	GND								
X2	13	D6	MCU_MCAN0.RX	MCU_MCAN0_RX	MCU_TIMER_IO0	MCU_SPI1_CS3	MCU_GPIO0_14					

Con	Pin	MPU Pin	Pin Name	GPIOx / Dedicated function	Alternative Modes on Pin							
					1	2	3	4	5	6	7	8
X2	14	AE10	USB1.D_N	USB1_DM								
X2	15	E8	MCU_MCAN0.TX	MCU_MCAN0_TX	WKUP_TIMER_IO0	MCU_SPI0_CS3	MCU_GPIO0_13					
X2	16	AE9	USB1.D_P	USB1_DP								
X2	17	E7	MCU_MCAN1.RX	MCU_MCAN1_RX	MCU_TIMER_IO3	MCU_SPI0_CS2	MCU_SPI1_CS2	MCU_SPI1_CLK	MCU_GPIO0_16			
X2	18	-	GND	GND								
X2	19	F8	MCU_MCAN1.TX	MCU_MCAN1_TX	MCU_TIMER_IO2	MCU_SPI1_CS1	MCU_EXT_REFCLK0	MCU_GPIO0_15				
X2	20	N/A	-									
X2	21	-	GND	GND								
X2	22	N/A	-									
X2	23	N/A	-									
X2	24	-	GND	GND								
X2	25	F20	MCAN0.RX	MCAN0_RX	UART5_TXD	TIMER_IO3	SYNC3_OUT	UART1_RIn	EQEP2_S	GPIO1_25	MCASP2_AXR1	EHRPWM_TZn_IN4
X2	26	N/A	-									
X2	27	B23	MCAN0.TX	MCAN0_TX	UART5_RXD	TIMER_IO2	SYNC2_OUT	UART1_DTRn	EQEP2_I	GPIO1_24	MCASP2_AXR0	EHRPWM_TZn_IN3
X2	28	N/A	-									
X2	29	-	GND	GND								
X2	30	-	GND	GND								
X2	31	C13	JTAG.TCK	TCK								
X2	32	Y7	USB0.VBUS	USB0_VBUS								
X2	33	E14	JTAG.TMS	TMS								
X2	34	N/A	-									
X2	35	E13	JTAG.TDI	TDI								
X2	36	G22	USB0.DRVVBUS	USB0_DRVVBUS	GPIO1_50							
X2	37	C14	JTAG.TDO	TDO								
X2	38	N/A	-									
X2	39	N/A	-									

Con	Pin	MPU Pin	Pin Name	GPIOx / Dedicated function	Alternative Modes on Pin							
					1	2	3	4	5	6	7	8
X2	40	-	GND	GND								
X2	41	-	GND	GND								
X2	42	AE8	USB0.D_N	USB0_DM								
X2	43	B13	JTAG.TRSTN	TRSTn								
X2	44	AE7	USB0.D_P	USB0_DP								
X2	45	B12	JTAG.EMU0	EMU0								
X2	46	-	GND	GND								
X2	47	D13	JTAG.EMU1	EMU1								
X2	48	A13	WKUP.I2C0_SCL	WKUP_I2C0_SCL	MCU_GPIO0_19							
X2	49	G6	nMCU_SAFETY_ERROR	MCU_ERRORn								
X2	50	C11	WKUP.I2C0_SDA	WKUP_I2C0_SDA	MCU_GPIO0_20							
X2	51	F14	MCU_RESETSTATZ	MCU_RESETSTATz	MCU_GPIO0_21							
X2	52	D8	WKUP.UART0_RXD	WKUP_UART0_RXD	MCU_SPI0_CS2	MCU_GPIO0_9						
X2	53	F11	nMCU_RESET	MCU_RESETz								
X2	54	D7	WKUP.UART0_TXD	WKUP_UART0_TXD	MCU_SPI1_CS2	MCU_GPIO0_10						
X2	55	H24	PORZ_OUT	PORz_OUT								
X2	56	C6	WKUP.UART0_RTSN	WKUP_UART0_RTSn	WKUP_TIMER_IO1	MCU_SPI1_CLK	MCU_GPIO0_12					
X2	57	G24	nSYS_WARMRESET	RESET_REQz								
X2	58	C7	WKUP.UART0_CTSN	WKUP_UART0_CTSn	WKUP_TIMER_IO0	MCU_SPI1_CS0	MCU_GPIO0_11					
X2	59	-	GND	GND								
X2	60	-	GND	GND								

3.4. Carrier board connector X3

Con	Pin	MPU Pin	Pin Name	GPIOx / Dedicated function	Alternative Modes on Pin						
					1	2	3	4	5	6	7
X3	1	-	VSYS	VSYS							
X3	2	-	VSYS	VSYS							
X3	3	-	VSYS	VSYS							
X3	4	-	VSYS	VSYS							
X3	5	-	VSYS	VSYS							
X3	6	-	VSYS	VSYS							
X3	7	-	VSYS	VSYS							
X3	8	-	VSYS	VSYS							
X3	9	-	VSYS	VSYS							
X3	10	-	VSYS	VSYS							
X3	11	-	GND	GND							
X3	12	-	GND	GND							
X3	13	-	GND	GND							
X3	14	-	GND	GND							
X3	15	-	GND	GND							
X3	16	-	GND	GND							
X3	17	J24	MMC1.CLK	MMC1_CLK	TIMER_IO4	UART3_RXD	SPI1_CS0	SPI2_CS2	GPIO1_46		
X3	18	F17	MDIO.MDC	MDIO0_MDC	GPIO0_86						
X3	19	H20	MMC1.CMD	MMC1_CMD	TIMER_IO5	UART3_TXD	SPI1_CLK	SPI2_CS0	GPIO1_47		
X3	20	F16	MDIO.MDIO	MDIO0_MDIO	GPIO0_85						
X3	21	H21	MMC1.DATA0	MMC1_DAT0	CP_GEMAC_CPTS0_HW2TSPUSH	TIMER_IO3	UART2_CTSn	ECAP2_IN_APWM_OUT	SPI2_D1	GPIO1_45	
X3	22	B18	RGMII1.TCTL	RGMII1_TX_CTL	RMII1_TX_EN	GPIO0_73					
X3	23	H23	MMC1.DATA1	MMC1_DAT1	CP_GEMAC_CPTS0_HW1TSPUSH	TIMER_IO2	UART2_RTSn	ECAP1_IN_APWM_OUT	SPI1_CS2	SPI2_D0	GPIO1_44

Con	Pin	MPU Pin	Pin Name	GPIOx / Dedicated function	Alternative Modes on Pin						
					1	2	3	4	5	6	7
X3	24	B17	RGMII1.TCLK	RGMII1_TXC	RMII1_CRS_DV	GPIO0_74					
X3	25	H22	MMC1.DATA2	MMC1_DAT2	CP_GEMAC_CPTS0_TS_SYNC	TIMER_IO1	UART2_TXD	MCAN1_RX	SPI1_D1	SPI2_CS3	GPIO1_43
X3	26	A18	RGMII1.TD0	RGMII1_TD0	RMII1_TXD0	GPIO0_75					
X3	27	H25	MMC1.DATA3	MMC1_DAT3	CP_GEMAC_CPTS0_TS_COMP	TIMER_IO0	UART2_RXD	MCAN1_TX	SPI1_D0	SPI2_CS1	GPIO1_42
X3	28	C17	RGMII1.TD1	RGMII1_TD1	RMII1_TXD1	GPIO0_76					
X3	29	D23	MMC1.CD	MMC1_SDCD	UART6_RXD	TIMER_IO6	UART3_RTSn	MCAN1_TX	SPI1_CS3	SPI2_CLK	GPIO1_48
X3	30	A17	RGMII1.TD2	RGMII1_TD2	GPIO0_77						
X3	31	D24	MMC1.WP	MMC1_SDWP	UART6_TXD	TIMER_IO7	UART3_CTSn	MCAN1_RX	SPI1_CS1	GPIO1_49	
X3	32	C16	RGMII1.TD3	RGMII1_TD3	CLKOUT0	GPIO0_78					
X3	33	B6	MCU_UART0.RXD	MCU_UART0_RXD	MCU_GPIO0_5						
X3	34	A15	RGMII1.RCTL	RGMII1_RX_CTL	RMII1_RX_ER	GPIO0_79					
X3	35	C8	MCU_UART0.TXD	MCU_UART0_TXD	MCU_GPIO0_6						
X3	36	A16	RGMII1.RCLK	RGMII1_RXC	RMII1_REF_CLK	GPIO0_80					
X3	37	B8	MCU_UART0.CTSN	MCU_UART0_CTSn	MCU_TIMER_IO0	MCU_SPI1_D0	MCU_GPIO0_7				
X3	38	B15	RGMII1.RD0	RGMII1_RD0	RMII1_RXD0	GPIO0_81					
X3	39	B7	MCU_UART0.RTSN	MCU_UART0_RTSn	MCU_TIMER_IO1	MCU_SPI1_D1	MCU_GPIO0_8				
X3	40	B16	RGMII1.RD1	RGMII1_RD1	RMII1_RXD1	GPIO0_82					
X3	41	-	GND	GND							
X3	42	A14	RGMII1.RD2	RGMII1_RD2	GPIO0_83						
X3	43	K21	MMC2.CLK	MMC2_CLK	MCASP1_ACLKR	MCASP1_AXR5	UART6_RXD	EHRPWM0_SYNCI	I2C3_SCL	GPIO0_69	
X3	44	B14	RGMII1.RD3	RGMII1_RD3	GPIO0_84						
X3	45	K24	MMC2.CMD	MMC2_CMD	MCASP1_AFSR	MCASP1_AXR4	UART6_TXD	EHRPWM0_SYNCO	EHRPWM_TZn_IN0	I2C3_SDA	GPIO0_70
X3	46	E20	SPI0.CS1	SPI0_CS1	CP_GEMAC_CPTS0_TS_COMP	EHRPWM0_B	ECAP0_IN_APWM_OUT	MAIN_ERRORn	GPIO1_16	EHRPWM_TZn_IN5	
X3	47	K23	MMC2.DATA0	MMC2_DAT0	MCASP1_AXR0	EHRPWM1_B	I2C2_SCL	GPIO0_68			
X3	48	D20	SPI0.CS0	SPI0_CS0	EHRPWM0_A	GPIO1_15					
X3	49	K22	MMC2.DATA1	MMC2_DAT1	MCASP1_AXR1	EHRPWM1_A	I2C2_SDA	GPIO0_67			

Con	Pin	MPU Pin	Pin Name	GPIOx / Dedicated function	Alternative Modes on Pin						
					1	2	3	4	5	6	7
X3	50	B20	SPI0.D0	SPI0_D0	CP_GEMAC_CPTS0_HW1TSPUSH	EHRPWM1_B	GPIO1_18				
X3	51	L20	MMC2.DATA2	MMC2_DAT2	MCASP1_AXR2	UART5_TXD	EHRPWM0_B	I2C2_SDA	GPIO0_66		
X3	52	C21	SPI0.D1	SPI0_D1	CP_GEMAC_CPTS0_HW2TSPUSH	EHRPWM_TZn_IN0	GPIO1_19				
X3	53	L21	MMC2.DATA3	MMC2_DAT3	MCASP1_AXR3	UART5_RXD	EHRPWM0_A	GPIO0_65			
X3	54	B21	SPI0.CLK	SPI0_CLK	CP_GEMAC_CPTS0_TS_SYNC	EHRPWM1_A	GPIO1_17				
X3	55	K25	MMC2.WP	MMC2_SDWP	MCASP1_AFSX	UART4_TXD	EHRPWM2_B	EHRPWM_TZn_IN2	GPIO0_72		
X3	56	E10	MCU_SPI0.CS1	MCU_SPI0_CS1	MCU_OBSCLK0	MCU_SYSCLKOUT0	MCU_EXT_REFCLK0	MCU_TIMER_IO1	MCU_GPIO0_1		
X3	57	J25	MMC2.CD	MMC2_SDCD	MCASP1_ACLKX	UART4_RXD	EHRPWM2_A	EHRPWM_TZn_IN1	GPIO0_71		
X3	58	B10	MCU_SPI0.CS0	MCU_SPI0_CS0	WKUP_TIMER_IO1	MCU_GPIO0_0					
X3	59	N/A	-								
X3	60	D10	MCU_SPI0.D1	MCU_SPI0_D1	MCU_GPIO0_4						
X3	61	-	VSELECT								
X3	62	B11	MCU_SPI0.D0	MCU_SPI0_D0	MCU_GPIO0_3						
X3	63	-	VDD_3V3	VDD_3V3							
X3	64	C10	MCU_SPI0.CLK	MCU_SPI0_CLK	MCU_GPIO0_2						
X3	65	-	VDD_IO	VDD_IO							
X3	66	E25	MCASP0.AXR2	MCASP0_AXR2	SPI2_D1	UART1_RTSn	UART6_TXD	ECAP2_IN_APWM_OUT	GPIO1_8	EQEP0_B	
X3	67	-	VMMC_IO	VMMC_IO							
X3	68	D25	MCASP0.AXR3	MCASP0_AXR3	SPI2_D0	UART1_CTSn	UART6_RXD	ECAP1_IN_APWM_OUT	GPIO1_7	EQEP0_A	
X3	69	-	VPP	VPP							
X3	70	F25	MCASP0.AFSX	MCASP0_AFSX	SPI2_CS3	AUDIO_EXT_REFCLK1	GPIO1_12	EQEP1_B			
X3	71	-	GND	GND							
X3	72	F24	MCASP0.ACLKX	MCASP0_ACLKX	SPI2_CS1	ECAP2_IN_APWM_OUT	GPIO1_11	EQEP1_A			
X3	73	N/A	-								
X3	74	E24	MCASP0.AXR1	MCASP0_AXR1	SPI2_CS2	ECAP1_IN_APWM_OUT	MAIN_ERRORn	EHRPWM1_A	GPIO1_9	EQEP0_S	
X3	75	N/A	-								

Con	Pin	MPU Pin	Pin Name	GPIOx / Dedicated function	Alternative Modes on Pin						
					1	2	3	4	5	6	7
X3	76	G23	MCASP0.AFSR	MCASP0_AFSR	SPI2_CS0	UART1_RXD	EHRPWM0_A	GPIO1_13	EQEP1_S		
X3	77	N/A	-								
X3	78	G20	MCASP0.ACLKR	MCASP0_ACLKR	SPI2_CLK	UART1_TXD	EHRPWM0_B	GPIO1_14	EQEP1_I		
X3	79	-	GND	GND							
X3	80	F23	MCASP0.AXR0	MCASP0_AXR0	AUDIO_EXT_REFCLK0	EHRPWM1_B	GPIO1_10	EQEP0_I			

3.5. Carrier board connector X4

Con	Pin	MPU Pin	Pin Name	GPIOx / Dedicated function	Alternative Modes on Pin							
					1	2	3	4	5	6	7	8
X4	1	-	GND	GND								
X4	2	Y25	GPMC.CLK	GPMC0_CLK	MCASP1_AXR3	GPMC0_FCLK_MUX	TRC_DATA6	GPIO0_31				
X4	3	AE24	LCD.DATA0	VOUT0_DATA0	GPMC0_A0	UART2_RXD	GPIO0_45					
X4	4	U22	GPMC.AD0	GPMC0_AD0	MCASP2_AXR4	TRC_CLK	GPIO0_15	BOOTMODE00				
X4	5	W23	LCD.DATA1	VOUT0_DATA1	GPMC0_A1	UART2_TXD	GPIO0_46					
X4	6	U21	GPMC.AD1	GPMC0_AD1	MCASP2_AXR5	TRC_CTL	GPIO0_16	BOOTMODE01				
X4	7	AA23	LCD.DATA2	VOUT0_DATA2	GPMC0_A2	UART3_RXD	GPIO0_47					
X4	8	U20	GPMC.AD2	GPMC0_AD2	MCASP2_AXR6	TRC_DATA0	GPIO0_17	BOOTMODE02				
X4	9	Y23	LCD.DATA3	VOUT0_DATA3	GPMC0_A3	UART3_TXD	AUDIO_EXT_REFCLK0	GPIO0_48				
X4	10	V25	GPMC.AD3	GPMC0_AD3	MCASP2_AXR7	TRC_DATA1	GPIO0_18	BOOTMODE03				
X4	11	AB23	LCD.DATA4	VOUT0_DATA4	GPMC0_A4	UART4_RXD	EQEP2_I	GPIO0_49				
X4	12	T20	GPMC.AD4	GPMC0_AD4	MCASP2_AXR8	TRC_DATA2	GPIO0_19	BOOTMODE04				
X4	13	AD23	LCD.DATA5	VOUT0_DATA5	GPMC0_A5	UART4_TXD	EQEP2_S	GPIO0_50				
X4	14	T21	GPMC.AD5	GPMC0_AD5	MCASP2_AXR9	TRC_DATA3	GPIO0_20	BOOTMODE05				

Con	Pin	MPU Pin	Pin Name	GPIOx / Dedicated function	Alternative Modes on Pin							
					1	2	3	4	5	6	7	8
X4	15	AC23	LCD.DATA6	VOUT0_DATA6	GPMC0_A6	UART5_RXD	EQEP2_A	GPIO0_51				
X4	16	-	GND	GND								
X4	17	AE23	LCD.DATA7	VOUT0_DATA7	GPMC0_A7	UART5_TXD	EQEP2_B	GPIO0_52				
X4	18	V24	GPMC.AD6	GPMC0_AD6	MCASP2_AXR10	TRC_DATA4	GPIO0_21	BOOTMODE06				
X4	19	AE22	LCD.DATA8	VOUT0_DATA8	GPMC0_A8	UART6_RXD	GPIO0_53					
X4	20	W25	GPMC.AD7	GPMC0_AD7	MCASP2_AXR11	TRC_DATA5	GPIO0_22	BOOTMODE07				
X4	21	AC22	LCD.DATA9	VOUT0_DATA9	GPMC0_A9	UART6_TXD	GPIO0_54					
X4	22	AC25	GPMC.AD8	GPMC0_AD8	VOUT0_DATA16	UART2_RXD	MCASP2_AXR0	GPIO0_23	BOOTMODE08			
X4	23	W22	LCD.DATA10	VOUT0_DATA10	GPMC0_A10	UART6_RTSn	GPIO0_55					
X4	24	AB25	GPMC.AD9	GPMC0_AD9	VOUT0_DATA17	UART2_TXD	MCASP2_AXR1	GPIO0_24	BOOTMODE09			
X4	25	AE21	LCD.DATA11	VOUT0_DATA11	GPMC0_A11	UART6_CTSn	GPIO0_56					
X4	26	AA25	GPMC.AD10	GPMC0_AD10	VOUT0_DATA18	UART3_RXD	MCASP2_AXR2	GPIO0_25	OBSCLK0	BOOTMODE10		
X4	27	AD21	LCD.DATA12	VOUT0_DATA12	GPMC0_A12	UART5_RTSn	GPIO0_57					
X4	28	W24	GPMC.AD11	GPMC0_AD11	VOUT0_DATA19	UART3_TXD	MCASP2_AXR3	TRC_DATA23	GPIO0_26	BOOTMODE11		
X4	29	AC21	LCD.DATA13	VOUT0_DATA13	GPMC0_A13	UART5_CTSn	GPIO0_58					
X4	30	Y24	GPMC.AD12	GPMC0_AD12	VOUT0_DATA20	UART4_RXD	MCASP2_AFSX	TRC_DATA22	GPIO0_27	BOOTMODE12		
X4	31	AA20	LCD.DATA14	VOUT0_DATA14	GPMC0_A14	UART4_RTSn	GPIO0_59					
X4	32	AD25	GPMC.AD13	GPMC0_AD13	VOUT0_DATA21	UART4_TXD	MCASP2_ACLKX	TRC_DATA21	GPIO0_28	BOOTMODE13		
X4	33	Y20	LCD.DATA15	VOUT0_DATA15	GPMC0_A15	UART4_CTSn	GPIO0_60					
X4	34	AB24	GPMC.AD14	GPMC0_AD14	VOUT0_DATA22	UART5_RXD	MCASP2_AFSR	MCASP2_AXR4	TRC_DATA20	GPIO0_29	UART2_CTSn	BOOTMODE14
X4	35	Y21	LCD.PCLK	VOUT0_PCLK	GPMC0_A19	UART2_CTSn	GPIO0_64					
X4	36	AC24	GPMC.AD15	GPMC0_AD15	VOUT0_DATA23	UART5_TXD	MCASP2_ACLKR	MCASP2_AXR5	TRC_DATA19	GPIO0_30	UART2_RTSn	BOOTMODE15
X4	37	W21	LCD.DE	VOUT0_DE	GPMC0_A17	UART3_CTSn	GPIO0_62					
X4	38	T23	GPMC.CSN0	GPMC0_CSn0	MCASP2_AXR14	TRC_DATA15	GPIO0_41					
X4	39	AC20	LCD.VSYNC	VOUT0_HSYNC	GPMC0_A16	UART3_RTSn	GPIO0_61					
X4	40	U23	GPMC.CSN1	GPMC0_CSn1	MCASP2_AXR15	TRC_DATA16	GPIO0_42					
X4	41	W20	LCD.HSYNC	VOUT0_VSYNC	GPMC0_A18	UART2_RTSn	GPIO0_63					

Con	Pin	MPU Pin	Pin Name	GPIOx / Dedicated function	Alternative Modes on Pin							
					1	2	3	4	5	6	7	8
X4	42	T22	GPMC.CSN2	GPMC0_CSn2	I2C2_SCL	MCASP1_AXR4	UART4_RXD	MCAN1_TX	TRC_DATA17	GPIO0_43	MCASP1_AFSR	
X4	43	N/A	-									
X4	44	U25	GPMC.CSN3	GPMC0_CSn3	I2C2_SDA	GPMC0_A20	UART4_TXD	MCASP1_AXR5	MCAN1_RX	TRC_DATA18	GPIO0_44	MCASP1_ACLKR
X4	45	-	GND	GND								
X4	46	R25	GPMC.ADV_ALE	GPMC0_ADVn_ALE	MCASP1_AXR2	TRC_DATA7	GPIO0_32					
X4	47	C24	I2C1.SCL	I2C1_SCL	UART1_RXD	TIMER_IO0	SPI2_CS1	EHRPWM0_SYNCI	GPIO1_28	EHRPWM2_A	MMC2_SDCD	
X4	48	U24	GPMC.BE0N_CLE	GPMC0_BE0n_CLE	MCASP1_ACLKX	TRC_DATA10	GPIO0_35					
X4	49	B24	I2C1.SDA	I2C1_SDA	UART1_TXD	TIMER_IO1	SPI2_CLK	EHRPWM0_SYNCO	GPIO1_29	EHRPWM2_B	MMC2_SDWP	
X4	50	T24	GPMC.BE1N	GPMC0_BE1n	MCASP2_AXR12	TRC_DATA11	GPIO0_36					
X4	51	E11	MCU_I2C0.SCL	MCU_I2C0_SCL	MCU_GPIO0_17							
X4	52	P25	GPMC.DIR	GPMC0_DIR	MCASP2_AXR13	MAIN_ERRORn	TRC_DATA14	GPIO0_40	EQEP2_S			
X4	53	D11	MCU_I2C0.SDA	MCU_I2C0_SDA	MCU_GPIO0_18							
X4	54	AA24	GPMC.WAIT0	GPMC0_WAIT0	MCASP1_AFSX	TRC_DATA12	GPIO0_37					
X4	55	T25	GPMC.WEN	GPMC0_WEn	MCASP1_AXR0	TRC_DATA9	GPIO0_34					
X4	56	AD24	GPMC.WAIT1	GPMC0_WAIT1	VOUT0_EXTPCLKIN	GPMC0_A21	UART6_RXD	GPIO0_38	EQEP2_I			
X4	57	R24	GPMC.OEN_REN	GPMC0_OEn_REn	MCASP1_AXR1	TRC_DATA8	GPIO0_33					
X4	58	P24	GPMC.WPN	GPMC0_WPn	AUDIO_EXT_REFCLK1	GPMC0_A22	UART6_TXD	TRC_DATA13	GPIO0_39			
X4	59	-	GND	GND								
X4	60	-	GND	GND								

3.6. Signal Propagation Delay

The signal propagation delay table provides the relevant propagation delay values for module signals and supports timing analysis and carrier board design. For detailed signal propagation delay values, refer to the Signal Propagation Delay Table. These values should be considered when performing timing analysis and designing the carrier board.



Signal Propagation Delay Table for byteENGINE AM62Px

3.7. Power Supply

> The byteENGINE can be powered with 3.3V to 5.5V.
> The recommended power supply is 5V.

3.8. Boot Modes byteENGINE AM62Px

> Bootmode Pins B[0…15] are GPMC0_AD[0…15]

BOOTMODE Pin Mapping															
B15	B14	B13	B12	B11	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0
Reserved		Backup Boot Mode Config	Backup Boot Mode			Primary Boot Mode Config			Primary Boot mode				PLL Config (b011 → 25 MHz on SOM)		



See chapter 5.3.1 of the Technical Reference Manual for more Details:
Technical Reference Manual

Primary Boot Mode	**B9**	**B8**	**B7**	**B6**	**B5**	**B4**	**B3**
MMCSD	1	0	0	1	0	0	0
QSPI	0	0	0	0	0	1	0
UART	0	0	0	0	1	1	1
Ethernet RMII	0	0	0	0	1	0	1
eMMC	0	0	0	1	0	0	1
USB	0	0	0	1	0	1	0

Backup BootMode	**B13**	**B12**	**B11**	**B10**
MMCSD	1	1	0	1
UART	0	0	1	1
USB DFU	0	0	0	1

4. Ordering info

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

byteENGINE-AM62P[TYPE]-[SPEED]-[RAM]-[FLASH]-[temp-range]-[revision]

[TYPE]	**CPU type**	AM62P32, AM62P34, AM62P52, AM62P54
[SPEED]	**Clock speed**	1400 MHz
[RAM]	**RAM size**	512 / 1024 / 1536 / 2048 / 4096 / 6144 / 8192 MB
[FLASH]	**eMMC flash size**	8 / 16 / 32 / 64 / 128 GB
[temp-range]	**Temperature range**	[C] Consumer 0° to +85° C [I] Industrial -40°C to +85 °C
[revision]	**Revision**	1.1

5. References



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

- Schematic of the connectors X1, X2, X3, X4
- Altium Schematic of the connectors X1, X2, X3, X4
- Altium Library
- STEP Model
- Detailed Pinout of byteENGINE AM62Px
- Signal Propagation Delay Table for byteENGINE AM62Px

Component Documentation

- Hirose DF40-Series Connectors
- TI AM62Px Family

Software & Configuration

- meta-bytesatwork on github
- byteWIKI

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Help

bytewiki.readthedocs.io

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