sysWORXX AM62x device series

Datasheet Addendum

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Revision History

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List of Abbreviations

ADC	Analog digital converter
AI	Analog Input
AO	Analog Output
BSP	Board Support Package
CAN	Controller Area Network (according to ISO 11898-1:2003 and ISO 11898-2:2003)
CPU	Central Processing Unit
EEPROM	Electrically Erasable Programmable Read-Only Memory
eMMC	embedded Multimedia card
EN	European Norm
ES1	Electrical Source Class 1
ETH	Ethernet
GB	Giga Byte (1024 x 1MB)
Gb	Giga bit
GbE	Gigabit Ethernet
GND	Ground Reference potential
GPIO	General Purpose Input Output
HW	Hardware
IEC	International Electro technical Commission
I/O	Input/Output
I^2C	Inter-integrated circuit
I^2S	Inter-Integrated circuit sound
kB	Kilo Byte (1024 byte)
MAC	Media Access Controller (e.g. Ethernet controller)
MCAN	Modular Controller Area Network
MCASP	Multichannel Audio Serial Port
MB	Mega Byte (1024 x 1kB)
MDI	Media Dependent Interface
nc	not connected
OS	Operating System
OTG	On-The-Go (USB interface mode)
PCB	Printed Circuit Board
PMIC	Power Management Integrated Circuit
PS1	Electrical Power Source Class 1
PWM	Pulse Width Modulation
RAM	Random Access Memory
RGMII	Reduced Gigabit Media-Independent Interface
RTC	Real Time Clock
RX	Receive
SAI	Synchronous Audio Interface
SCK	Continuous Serial Clock
SD	Serial Data (I2S)
SGMII	Serial Gigabit Media-Independent Interface
SPI	Serial Peripheral Interface
TX	Transmit
UART	Universal Asynchronous Receiver Transmitter
w/o	without
WS	Word Select (I2S)

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Reference documents

/1/ SYS TEC: Datasheet ECUcore-AM62x. L-2892
/2/ SYS TEC: Datasheet sysWORXX Pi-AM62x. L-2954

1 Introduction

The sysWORXX Pi-AM62x, designed as a Single Board Computer (SBC), is the evaluation platform for our sysWORXX ECUcore-AM62x. It offers you the opportunity to test the interaction between hardware and software and to validate the planned system concept in advance.

This document compares the different device variants of sysWORXX Pi-AM62x and ECUcore-AM62x.

Information about the products themselves with the description of the properties can be found in /1/ and /2/.

2 Hardware comparison sysWORXX Pi-AM62x and ECUcore-AM62x

The sysWORXX Pi-AM62x board is designed as an evaluation board for the ECUcore-AM62x module. The sysWORXX Pi-AM62x offers the opportunity to test the interaction between hardware and software in advance and to validate a planned system concept for the ECUcore-AM62x carrier board in advance.

Therefore, the hardware on both, the sysWORXX Pi-AM62x and the ECUcore-AM62x, are almost identical. Similarities and differences in the hardware design are presented in Table 1.

Both sysWORXX Pi-AM62x and ECUcore-AM62x work with the CPU AM62x derivate. The selected boot mode is identical for both devices. Except that the sysWORXX Pi-AM62x boot medium can be selected via a jumper. Further information is shown in /1/ and /2/.

Both CPUs on each board are powered by the Power Management IC. The sysWORXX Pi PMIC powered by 5V power supply via a USB-C connector. Detailed descriptions are shown in /1/ and /2/. The ECUcore-AM62 on the other hand must be powered by an external 3V3 power supply on an external carrier board. Such a carrier board needs to be design by user. Further information is presented in the ECUcore-AM62x manual.

Each board is equipped with two independent Ethernet interfaces, each with its own Ethernet transceiver. However, only the sysWORXX Pi-AM62x has access to two RJ45 connectors. The ECUcore-AM62x is without such connectors. To utilize these Ethernet interfaces on the ECUcore-AM62x, two RJ45 connectors with transformers must be placed on a carrier board.

Please note that the sysWORXX Pi-AM62x and ECUcore-AM62x are equipped with different eMMCs. The sysWORXX Pi-Am62x is assembled with a 32 GB eMMC and the ECUcore-AM62x with 8 GB eMMC. Please note that different eMMC assembly options are available for the sysWORXX Pi-AM62x and ECUcore-AM62x. For further information, please refer to /1/ and /2/ or contact our support team.

Similar to the eMMC, the sysWORXX Pi-AM62x and ECUcore-AM62x are equipped with different RAM ICs. The sysWORXX Pi-AM62x has an on-board 16 Gb RAM, while the ECUcore-AM62x has an 8 Gb RAM. Please note that different RAM assembly options are available for the sysWORXX Pi-AM62x and ECUcore-AM62x. For further information contact our support team.

Both the sysWORXX Pi-AM62x and the ECUcore-AM62x are equipped with the same WLAN/Bluetooth module. Please refer to /1/ and /2/ for further information.

Regarding display communication, the sysWORXX Pi-AM62x and the ECUcore-AM62x differ slightly. The sysWORXX Pi-AM62x is equipped with HDMI interface including a HDMI transmitter with 24 bit RGB DPI video data and a HDMI connector. Please refer to /1/ and /2/ for further information. Compared to the ECUcore-AM62x the sysWORXX Pi-AM62x has no LVDS/OLDI interface available. On the other hand, the ECUcore-AM62x has only access to 16 bit RGB video data lines.

Please note that, in contrast to the ECUcore-AM62x, the sysWORXX Pi-AM62x does not include an on-board ADC.

Both the sysWORXX Pi-AM62x and the ECUcore-AM62x are equipped with the same EEPROM. Please refer /1/ and /2/ for further information.

Both systems are equipped with multiple USB interfaces – USB0, USB1 and USB2 (Service USB). The internal connections on the AM62x for the USB0 and USB1 interfaces are identical for the sysWORXX Pi-AM62x and the ECUcore-AM62x. Except only sysWORXX Pi is equipped with USB-C connectors for USB1 and USB2 as well as a USB Type A connector for USB0. In order to use the USB interfaces on ECUcore-AM62x USB connectors must be considered on external carrier board.
The Service USB interface on the sysWORXX Pi-AM62x device translates incoming USB data into UART data on the UART0 interface and vice versa via a USB-UART bridge. The same UART0 interface is reserved on the ECUcore-AM62x module for Service USB purposes. It is necessary to include a sufficient USB-UART bridge on a carrier board in order to utilize the Service USB for the Linux console.

A µSD card interface is available for both systems via MMC1 interface of AM62x. Difference is, that only sysWORXX Pi-AM62x is equipped with a SD card holder.

Both the sysWORXX Pi-AM62x and the ECUcore-AM62x systems have two CAN interfaces available: MCAN0 and MCU_MCAN0. On the sysWORXX Pi-AM62x, both CAN interfaces are accessible via the IO-pin header. On the ECUcore-AM62x, these interfaces are routed to the module socket and are only accessible via a carrier board. Only on the ECUcore-AM62x, there are 4k7 pull-up resistors at the TX lines of both CAN interfaces.

Both the sysWORXX Pi-AM62x and the ECUcore-AM62x systems are equipped with a JTAG interface for debugging purposes. Although the sysWORXX Pi-AM62x has a potential connector, designated X500, for the JTAG interface, it should be noted that the X500 connector is typically not populated. Similarly, the ECUcore-AM62x has no on-board connector for the JTAG interface. However, all JTAG data lines are connected to the DIMM socket, and thus can be utilized on an external carrier board.

Table 1: Hardware comparison sysWORXX Pi-AM62x and ECUcore-AM62x variants

Component	sysWORXX Pi-AM62x	sysWORXX Pi-AM62x	ECUcore-AM62x	ECUcore-AM62x
Part number	24011100	24011200	23351012	23351013
CPU	Quad Core with GPU	Quad Core with GPU	Dual Core without GPU	Dual Core without GPU
CPU type	AM6254ATCGGAALW	AM6254ATCGGAALW	AM6232ATCGGAALW	AM6232ATCGGAALW
Ethernet	RJ45 socket	RJ45 socket	Gigabit Ethernet[2]	Gigabit Ethernet[2]
Boot mode	SD-Card, eMMC	SD-Card	SD-Card, eMMC	SD-Card, eMMC
eMMC	32 Gbyte	-	8 Gbyte	8 Gbyte
WLAN/Bluetooth	yes	yes	yes	-
RAM	2 Gbyte	2 Gbyte	1 Gbyte	1 Gbyte
Display	HDMI socket	HDMI socket	LVDS/OLDI[2]	LVDS/OLDI[2]
ADC	-	-	4 Analog input[2]	4 Analog input[2]
EEPROM	yes	yes	yes	Yes
USB0	USB-A connector	USB-A connector	yes[2]	yes[2]
USB1	USB-C connector	USB-C connector	yes[2]	yes[2]
USB Service	UART0 + USBC	UART0 + USBC	UART0[2]	UART0[2]
SD-Card	µSD-Card socket	µSD-Card socket	yes[2]	yes[2]
Reset	Reset-Button	Reset-Button	Reset input[2]	Reset input[2]
JTAG	No connector	No connector	yes[2]	yes[2]
Power supply	5V	5V	3V3	3V3

[2] Signals on module connector available

3 Release and Comments

Released by	Date,Signature
Comments regarding the release:	