

# PHYTEC

## phyCORE®-AM62Px

## Arm® Cortex®-A53/-R5F

Latest processor technology and high-performance embedded 3D graphic features at a fair price

Being designed for high-performance embedded 3D display applications, the phyCORE-AM62Px is the perfect basis for a broad range industrial applications digital instrumentation, displays, industrial HMI, and many more.

The SoM is available with Samtec connectors or as solderable module, equipped with the new FPSC footprint. FPSC does not only provide all the features of the processor, but also allows the module to be interchanged with the existing FPSC modules and future SoMs. This allows scalable applications and increases the longevity of the application. The intelligent geometry of FPSC simplifies the design of a carrier board.





Gigabit



PGOOD

PMIC/

Regulator



phyCORE-AM62Px SOM

AM62Px

#### AM62Px Processor

- Scalable performance with 4x Arm Cortex-A53 (1.25 GHz)
- 2x isolatable Arm Cortex-R5F for functional safety tasks
- Designed for high-performance embedded 3D display applications
- Wide range of industrial interfaces (e.g. 2x Ethernet, 2x USB2.0, up to 4x CAN FD)
- Advanced hardware security with Secure boot, Trusted Execution Environment (TEE) and Arm TrustZone®

#### **Module Features**

- Up to 256 GB TLC eMMC and up to 8 GB LPDDR4 RAM
- · On-board Ethernet PHY and voltage conversion
- · Low power consumption
- With Samtec connectors or as a solder module with FPSC-Gamma 1.1 footprint allowing scalable applications with other FPSC SoMs (e.g. phyCORE-AM62Lx)
- Dimensions 35 mm x 50 mm, low profile

#### Your Advantages

- Ready adapted Linux® operating system
- Only one device design for different performance configurations
- Product Life-Cycle Management program
- · Global Technical Support



Reset In 3.3 V. 2 A CPSW\_RGMII1 CPSW RGMII2 LPDDR4 DDR SD Boot MMC1 MCASP0 еММС Debug UAR UART0 140 pin Samtech 140 OSPI VPP\_1V8 OSPI0 pin Samtec Connector 12C0 12C1 GPMC/BOOTMODE MCANO VOUT0 MCU 12C0 1.8 V/3.3 V 150 mA SoC VDDSHV5 SDIO Connector WKUP\_I2C0 OI DIO JTAG DSIO MCU\_SPI0 CSI0 MCU\_MCAN0 USB0 MCU MCAN1 USB1 WKUP UART PHYTEC MCU UARTO Customer EEPROM RTC

www.phytec.eu/en/phycore-am62px

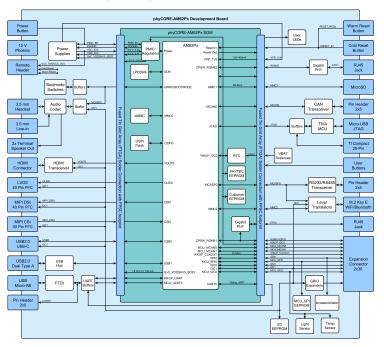
## **Technical Data**

## **Module Configuration**

Processor  Core(s)  up to 4x Arm® Cortex®-A53  Additional core(s)  2x Arm® Cortex®-R5F  Clock frequency  up to 1.4 GHz (A53), up to 800 MHz (R5F)  L2 Cache  512 kB shared with ECC  GPU  IMG BXS-4-64 - Vulkan 1.2, OpenGL ES 3.2, OpenCL 1.2 EP,  Video processing  H.256/HEVC, H.264/AVC Codec (up to 8bit 4k@60fps Vision Pre-processing Accelerator (VPAC)  Cryptogr. acceleration  AES 128-256, SHA2 224-512, DRBG, PKA  HW Security  Secure boot, Arm TrustZone®, ext. firewall, secure watchdog/timer/IPC, dedicated security cntlr., etc.  Functional Safety  Hardware Integrity: SIL 2 targeted Systematic capability: up to SIL 3 targeted  MEMORY  eMMC  32 GB up to 256 GB  LPDDR4  2 GB up to 8 GB maximal  NOR Flash  64 MB up to 4 GB (Octal SPI/Dual SPI Flash)  EEPROM  4 kB up to 32 KB  PHYSICAL PROPERTIES  Dimensions  35 mm x 50 mm  Weight  tbd.  Operating temperature  -40 °C to +85 °C  Humidity  95 % rF non condensing  Operating voltage  5.0 V  Power consumption typ.  tbd.  PCB connection  2x 140 pin Samtec, 0.5 mm pitch or FPSC-Gamma 1.1 (FTGA, 1.27 mm pitch)  SOFTWARE  Operating system  Linux (Yocto based)	SOC	
Additional core(s)  2x Arm® Cortex®-R5F  Clock frequency  up to 1.4 GHz (A53), up to 800 MHz (R5F)  L2 Cache  512 kB shared with ECC  GPU  IMG BXS-4-64 - Vulkan 1.2, OpenGL ES 3.2, OpenCL 1.2 EP,  Video processing  H.256/HEVC, H.264/AVC Codec (up to 8bit 4k@60fps Vision Pre-processing Accelerator (VPAC)  Cryptogr. acceleration  AES 128-256, SHA2 224-512, DRBG, PKA  HW Security  Secure boot, Arm TrustZone®, ext. firewall, secure watchdog/timer/IPC, dedicated security cntlr., etc.  Functional Safety  Hardware Integrity: SIL 2 targeted Systematic capability: up to SIL 3 targeted  MEMORY  eMMC  32 GB up to 256 GB  LPDDR4  2 GB up to 8 GB maximal  NOR Flash  64 MB up to 4 GB (Octal SPI/Dual SPI Flash)  EEPROM  4 kB up to 32 KB  PHYSICAL PROPERTIES  Dimensions  35 mm x 50 mm  Weight  tbd.  Operating temperature  -40 °C to +85 °C  Humidity  95 % rF non condensing  Operating voltage  5.0 V  Power consumption typ.  tbd.  PCB connection  2x 140 pin Samtec, 0.5 mm pitch or FPSC-Gamma 1.1 (FTGA, 1.27 mm pitch)  SOFTWARE	Processor	TI AM62Px
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L2 Cache  GPU  IMG BXS-4-64 - Vulkan 1.2, OpenGL ES 3.2, OpenCL 1.2 EP,  Video processing  H.256/HEVC, H.264/AVC Codec (up to 8bit 4k@60fps Vision Pre-processing Accelerator (VPAC)  Cryptogr. acceleration  AES 128-256, SHA2 224-512, DRBG, PKA  HW Security  Secure boot, Arm TrustZone®, ext. firewall, secure watchdog/timer/IPC, dedicated security cntlr., etc.  Functional Safety  Hardware Integrity: SIL 2 targeted Systematic capability: up to SIL 3 targeted  MEMORY  eMMC  32 GB up to 256 GB  LPDDR4  2 GB up to 8 GB maximal  NOR Flash  64 MB up to 4 GB (Octal SPI/Dual SPI Flash)  EEPROM  4 kB up to 32 KB  PHYSICAL PROPERTIES  Dimensions  35 mm x 50 mm  Weight  tbd.  Operating temperature  -40 °C to +85 °C  Humidity  95 % rF non condensing  Operating voltage  5.0 V  Power consumption typ.  tbd.  PCB connection  2x 140 pin Samtec, 0.5 mm pitch or FPSC-Gamma 1.1 (FTGA, 1.27 mm pitch)	Additional core(s)	2x Arm® Cortex®-R5F
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OpenCL 1.2 EP,  Video processing	L2 Cache	512 kB shared with ECC
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LPDDR4 2 GB up to 8 GB maximal  NOR Flash 64 MB up to 4 GB (Octal SPI/Dual SPI Flash)  EEPROM 4 kB up to 32 KB  PHYSICAL PROPERTIES  Dimensions 35 mm x 50 mm  Weight tbd.  Operating temperature -40 °C to +85 °C  Humidity 95 % rF non condensing  Operating voltage 5.0 V  Power consumption typ. tbd.  PCB connection 2x 140 pin Samtec, 0.5 mm pitch or FPSC-Gamma 1.1 (FTGA, 1.27 mm pitch)  S O F T W A R E	MEMORY	
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EEPROM 4 kB up to 32 KB  PHYSICAL PROPERTIES  Dimensions 35 mm x 50 mm  Weight tbd.  Operating temperature -40 °C to +85 °C  Humidity 95 % rF non condensing  Operating voltage 5.0 V  Power consumption typ. tbd.  PCB connection 2x 140 pin Samtec, 0.5 mm pitch or FPSC-Gamma 1.1 (FTGA, 1.27 mm pitch)  S O F T W A R E	LPDDR4	2 GB up to 8 GB maximal
PHYSICAL PROPERTIES  Dimensions 35 mm x 50 mm  Weight tbd.  Operating temperature -40 °C to +85 °C  Humidity 95 % rF non condensing  Operating voltage 5.0 V  Power consumption typ. tbd.  PCB connection 2x 140 pin Samtec, 0.5 mm pitch or FPSC-Gamma 1.1 (FTGA, 1.27 mm pitch)  SOFTWARE	NOR Flash	64 MB up to 4 GB (Octal SPI/Dual SPI Flash)
Dimensions  35 mm x 50 mm  Weight  tbd.  Operating temperature  -40 °C to +85 °C  Humidity  95 % rF non condensing  Operating voltage  5.0 V  Power consumption typ.  tbd.  PCB connection  2x 140 pin Samtec, 0.5 mm pitch or FPSC-Gamma 1.1 (FTGA, 1.27 mm pitch)  S O F T W A R E	EEPROM	4 kB up to 32 KB
Weight tbd.  Operating temperature -40 °C to +85 °C  Humidity 95 % rF non condensing  Operating voltage 5.0 V  Power consumption typ. tbd.  PCB connection 2x 140 pin Samtec, 0.5 mm pitch or FPSC-Gamma 1.1 (FTGA, 1.27 mm pitch)  S O F T W A R E	PHYSICAL PROPER	RTIES
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PCB connection 2x 140 pin Samtec, 0.5 mm pitch or FPSC-Gamma 1.1 (FTGA, 1.27 mm pitch) SOFTWARE	Operating voltage	5.0 V
FPSC-Gamma 1.1 (FTGA, 1.27 mm pitch) SOFTWARE	Power consumption typ.	tbd.
	PCB connection	•
Operating system Linux (Yocto based)	SOFTWARE	
	Operating system	Linux (Yocto based)

## phyCORE-AM62Px Development Board

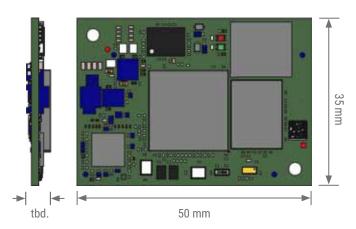
#### Versatile development platform



### Module Interfaces

MAXIMUM INTERFACES*,**		
Ethernet	2x GbE (1x on-board PHY or RGMII/ 1x RGMII. all TSN)	
USB	2x 2.0 Dual Role	
UART	up to 9	
CAN	up to 4 CAN FD	
I <sup>2</sup> C	up to 6	
SPI	up to 5 (+1x QSPI)	
ePWM, eCAP, eQEP	up to 3 each	
Timer	up to 14	
MMC/SD/SDIO	up to 2	
GPMC	1x (16-bit)	
Display	Trpl. dspl. sup. OLDI(LVDS) (1x OLDI-DL, 1x or 2x OLDI-SL), MIPI DSI (4-lanes) or DPI (24-bit)	
Audio	up to 3 McASP	
Camera	MIPI CSI-2 v1.3	
Debugging	JTAG	
RTC	on-board	

- $\ ^{\star}$  Due to multiplexing, not all interfaces may be fully available.
- \*\* Due to the exclusive use of individual interfaces on the module, the maximum number may differ from the processor specification.



INTERFACES	
Ethernet	2x 10/100/1000BASE-T (TSN support)
USB	2x USB 2.0 OTG (Type-A) 1x USB 2.0 host (Type-C)
Serial	1x RS-232/RS-485 (pin header 2x5), 1x CAN FD (pin header 2x5)
Display	1x OLDI(LVDS) (2x 4-lane), HDMI, MIPI DSI
Camera	MIPI CSI-2 (phyCAM-M Con.)
Audio	Mikrophone/Headset (3.5 mm jack socket), Line Out, Speaker
Wireless	M.2 Connector for Wi-Fi/BI
Debugging	JTAG (pin header), XDS110 (Micro-AB)
Various	I <sup>2</sup> C, SPI, GPIO, McASP (Expansion sockets)
MISCELL	ANEOUS
MMC/SD/SDIO	microSD Card Slot
User Control	2x LED, 5x button
Dimensions	160 mm x 200 mm

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