



# phyCORE<sup>®</sup>-i.MX 93

Arm<sup>®</sup> Cortex<sup>®</sup>-A55/-M33

The module based on the i.MX 93 processor from NXP offers high computing performance with low power consumption. At just 36mm x 36mm, equipped with an Arm<sup>®</sup> Ethos<sup>™</sup>-U65 microNPU and NXP's innovative Energy Flex architecture, the module enables the development of more powerful, cost-effective and energy-efficient ML applications, e.g. for IoT applications. The fully industrial phyCORE-i.MX 93 SOM features a price-optimized bill of material. Direct Solder Connect technology makes the module suitable for high-volume production and significantly reduces the manufacturing cost of the end application. Pin compatibility between the phyCORE-i.MX 6UL and phyCORE-STM32MP13x enables the development of scalable applications in terms of price/performance ratio.



## i.MX 93 Prozessor

- Cost-efficient, scalable NXP i.MX 93, Cortex<sup>®</sup>-A55 supports up to 1.7 GHz frequency
- Cortex<sup>®</sup>-M33 MCU (up to 250 MHz) for real-time and safety-critical applications
- Powerful AI thanks to Arm<sup>®</sup> Ethos<sup>™</sup>-U65 microNPU
- Arm<sup>®</sup> NEON<sup>™</sup> SIMD extension for acceleration of multimedia and signal processing algorithms
- 3.3 V/ 1.8 V tolerant I/Os, advanced low-power modes

## Advanced hardware security

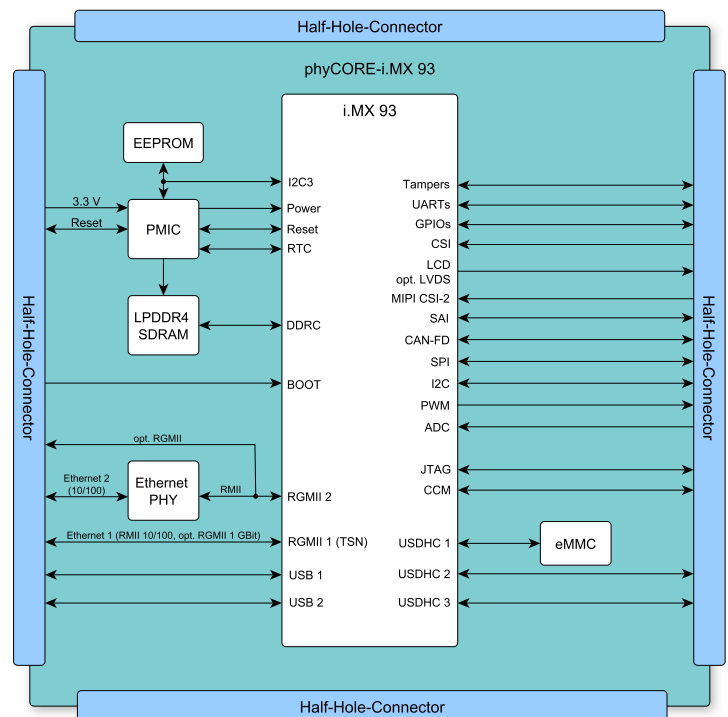
- Advanced security with integrated EdgeLock<sup>®</sup> Secure Enclave
- Tamper, WDT, temperature and voltage monitoring

## Integrated functionality

- Up to 256 GB TLC eMMC
- On-board Ethernet PHY and voltage conversion
- 159-pin DSC layout supports Dual LAN, Dual USB, Dual CAN FD, UART, I<sup>2</sup>S /SAI, 12-bit ADC, parallel LCD, camera, etc.
- Dimensions 36 mm x 36 mm , low profile (ca. 3 mm )

## Development advantages

- Ready adapted Linux<sup>®</sup> operating system
- FCC / CE product reference design
- Only one device design for different performance configurations
- Global Technical Support



[www.phytec.eu/en/phycore-imx-93](http://www.phytec.eu/en/phycore-imx-93)

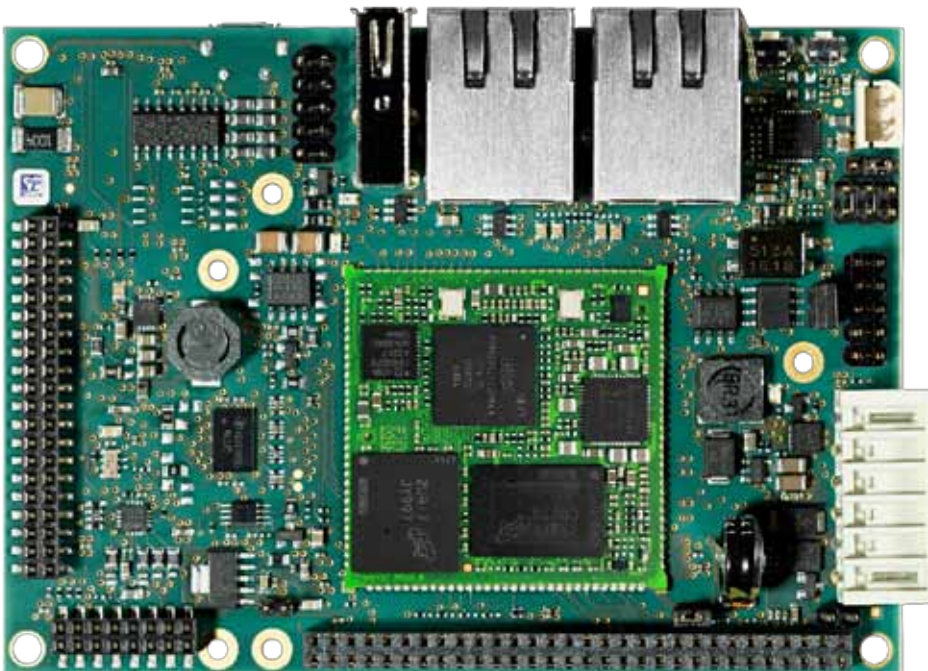
## Technical Data

### Module Configuration

SOC	
Processor	i.MX 93
Core	up to 2x 64-bit Arm® Cortex®-A55
Coprocessor	Arm® Cortex®-M33
Clock frequency	up to 1.7 GHz (A55), up to 250 MHz (M33)
Cache	L1: 64 kB (A55), 32 kB (M33); L2: up to 2x 64 kB (A55)
Internal RAM	640 kB SRAM
Processor extension	Arm® NEON™ and Arm® TrustZone®
AI / ML	Arm® Ethos™-U65 microNPU
HW Security	Secure boot, TrustZone®, SNVS, SRTC, EdgeLock® secure enclave
HW Crypto Accelerator	yes
EXT. MEMORY	
Flash	up to 256 GB TLC eMMC
LPDDR4	512 MB up to 2 GB 16-bit bus width
EEPROM	4 kB up to 32 kB
PHYSICAL PROPERTIES	
Dimensions	36 mm x 36 mm x 3 mm
Weight	tbd.
Operating temperature	-40 °C to +85 °C
Humidity	95 % rF non condensing
Operating voltage	3.3 V
Power consumption typ.	tbd.
Connector	159 plated half-holes, 1 mm pitch
SOFTWARE	
Operating system	Linux® (Yocto based)
Real-time operating system	freeRTOS™

### phyBOARD®-Segin

Development platform or powerful, industry-compatible SBC

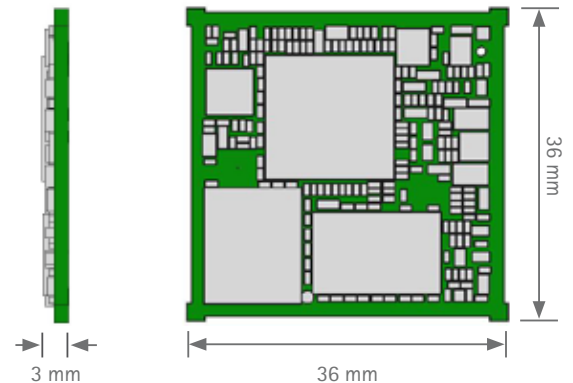


### Module Interfaces

MAXIMUM INTERFACES*, **	
Ethernet	1x 10/100 Mbit/s (on-board PHY), 1x RMII (optional RGMII with TSN)
USB	2x 2.0 host / OTG
UART	3x (up to 8)
CAN	1x (up to 2) CAN FD
I²C	1x (up to 8) (2x I3C)
SPI	1x (up to 8)
MMC/SD/SDIO	1x (up to 2)
PWM	1x (up to 24)
A/D	3x 12-bit
Display	1x parallel up to 24-bit, optional 1x LVDS
Audio	3x I²S/SAI, 1x S/PDIF, PDM input
Camera	1x MIPI CSI-2, optional 1x parallel 10-bit
Debugging	JTAG

\* 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 10/100BASE-T
USB	1x USB 2.0 OTG (Micro-AB) 1x USB 2.0 host (Type-A)
Seriell	1x RS-232 or RS-485, 1x CAN (2x pin header 2x5)
Display	18-bit parallel via A/V-expansion board PEB-AV-02
Debugging	JTAG via PEB-EVAL-01 adapter
Other	I²C, SPI, Tamper, GPIO (Expansion pin header)
MISCELLANEOUS	
MMC/SD/SDIO	microSD Card Slot
Control elements	3x LED, 2x button
Dimensions	100 mm x 72 mm (Pico-ITX)
Supply Voltage	12 V to 24 V