

Verdin iMX95

PRODUCT BRIEF



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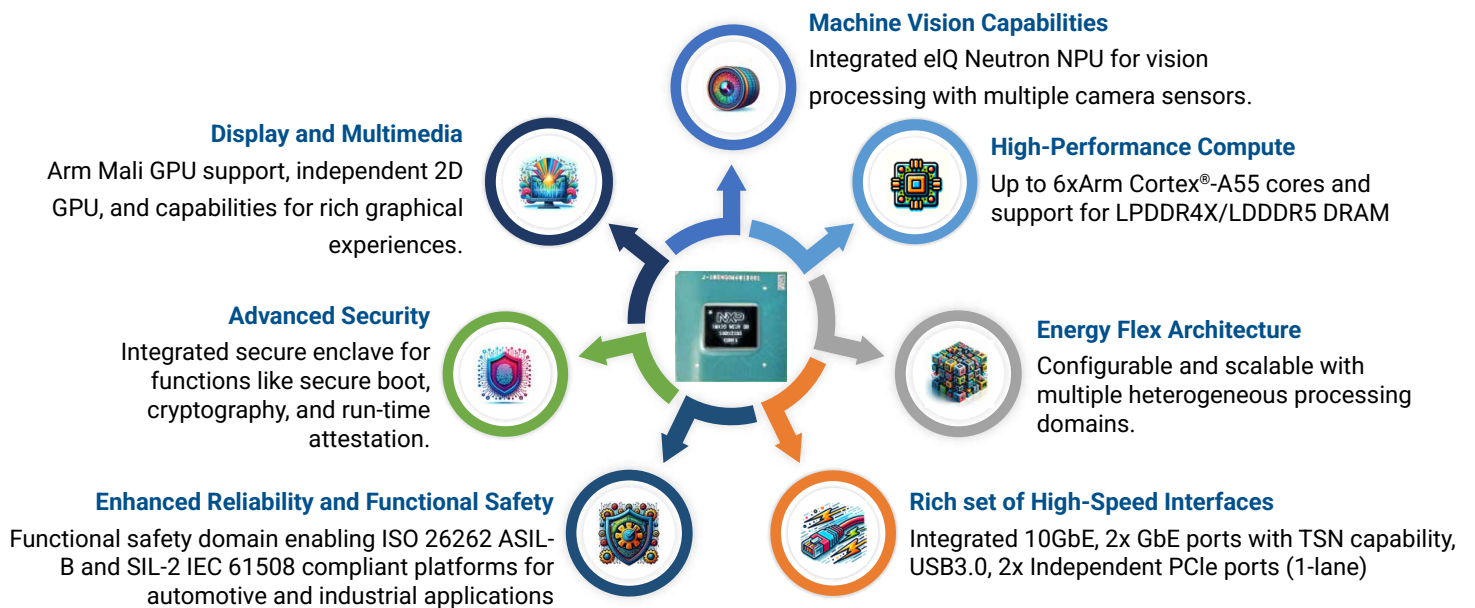
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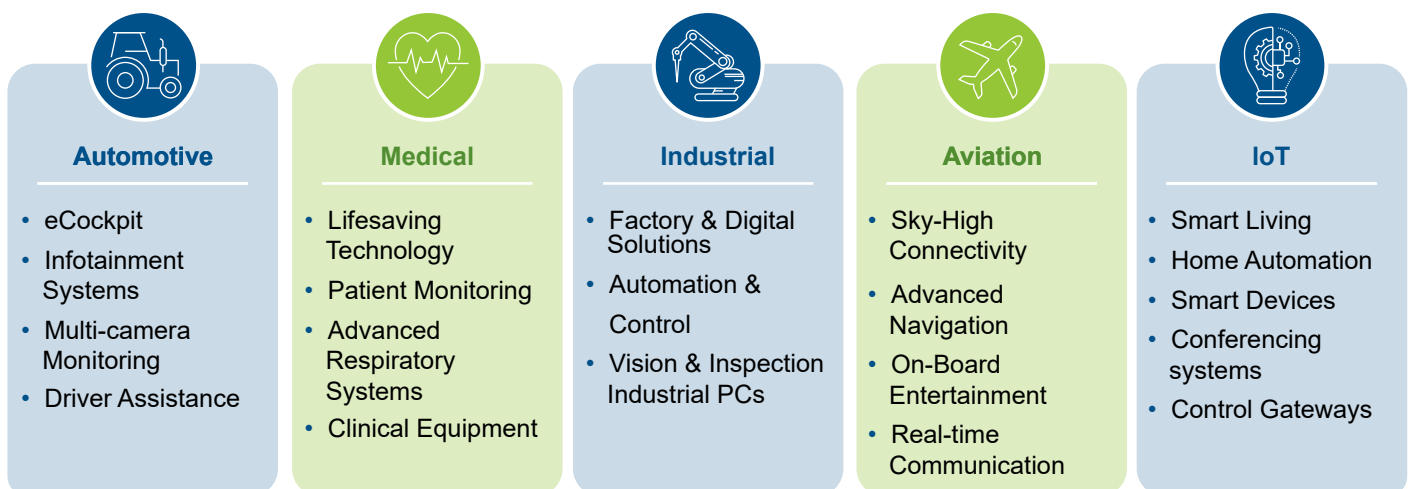
Verdin iMX95 Product Brief

iMX95 SoC overview

The NXP i.MX 95 is a next-generation applications processor designed to power a wide range of intelligent edge applications. Combining up to six Arm Cortex-A55 cores, integrated machine learning acceleration with the eIQ Neutron NPU, and a robust multimedia pipeline, it delivers scalable performance, advanced graphics, and functional safety in a single industrial-grade platform. Built for demanding use cases, the i.MX 95 enables rich user experiences, vision-based AI, and secure, connected systems across diverse markets.



Designed to meet the complex demands of modern embedded systems, the i.MX 95 SoC supports diverse applications across multiple industries. From automotive eCockpit and advanced driver assistance systems, to smart medical devices, industrial automation, and high-performance IoT gateways – the i.MX 95 brings powerful processing, edge intelligence, and long-term reliability to market. Its modular architecture and scalability make it ideal for evolving product lines and mission-critical use cases.



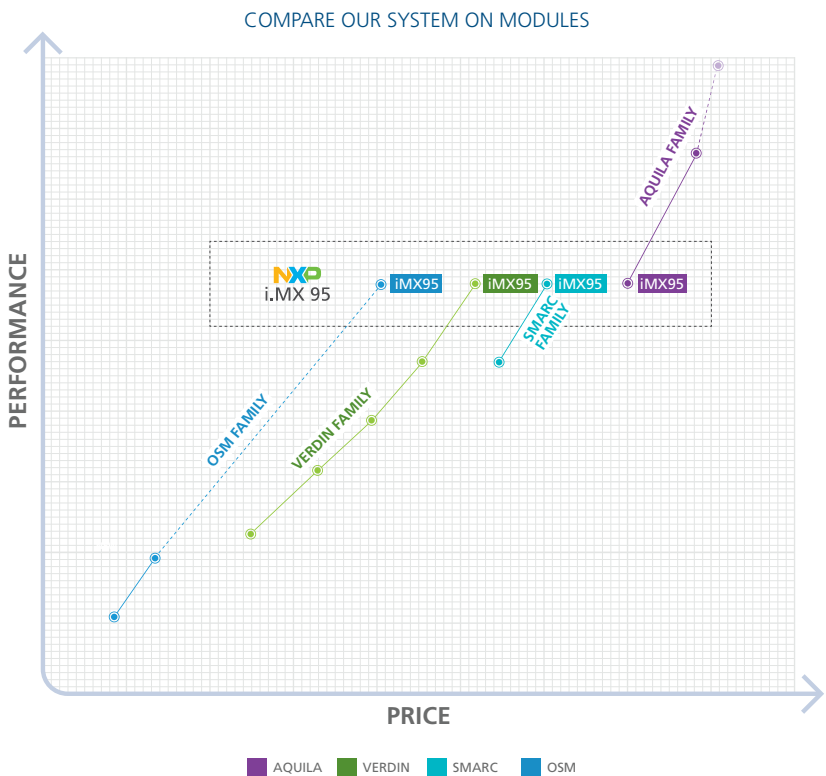
Verdin iMX95 Product Brief

Toradex iMX95 SoMs comparison

Toradex offers a versatile lineup of i.MX 95-based System on Modules (SoMs) to address a wide range of design requirements. Whether your priority is maximum performance and interface availability, a compact and cost-effective design, or adherence to industry standards like SMARC or OSM, there's an option tailored to your needs. The Aquila, Verdin, SMARC and OSM form factors provide flexibility in connectivity, mechanical layout, performance scalability and production requirements.

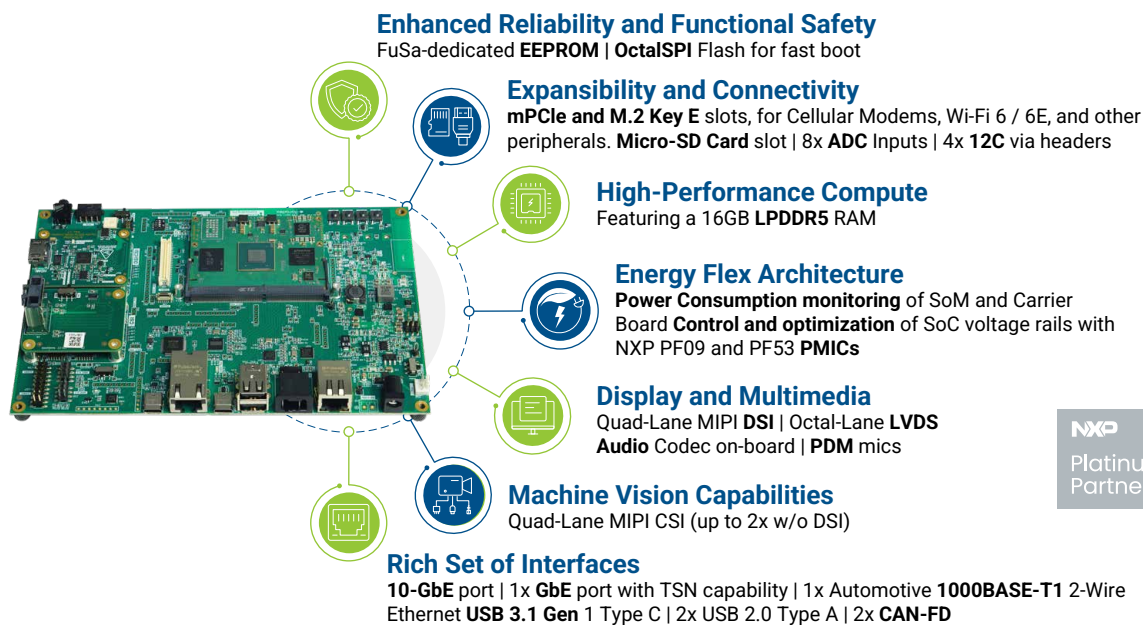
Features / SoMs	Aquila iMX95	Verdin iMX95	SMARC iMX95	OSM iMX95
Form Factor	Aquila	Verdin	SMARC	OSM Size-L
SoM Physical Size	85.0 × 55.0 mm	69.6 × 35.0 mm	82.0 × 50.0 mm	45.0 × 45.0 mm
SoM Connector	400 pin Board to Board	DDR4 SODIMM 260 pin Edge Connector	MXM 314 pin Edge Connector	662 BGA pins
Package Type	19 mm × 19 mm	15 mm × 15 mm	19 mm × 19 mm	19 mm × 19 mm
RAM Technology	LPDDR5 (6.4 GT/s)	LPDDR4x (4 GT/s)	LPDDR5 (6.4 GT/s)	LPDDR5 (6.4 GT/s)
GbE with onboard PHY	1x	1x	2x	-
ETH RGMII	1x	1x	-	2x
10GbE	Yes	No	Yes	Yes
PCIe Instances	2x	1x	2x	2x
Keywords	• High performance • Interface availability	• Low cost • Compact design	• SMARC 2.2 standard	• Solderable • High Volume
Recommend for	Manufacturers that... ... might need upwards scalability in performance (e.g., TI AM69) or a higher amount of interface availability.	Manufacturers that... ... might need downwards scalability in performance (e.g., NXP iMX8M Plus), a compact design, or lower costs.	Manufacturers that... ... have second sourcing as a hard requirement and need a standardized form factor for that.	Manufacturers that... ... needs automated SMT and reflow processes, for high-volume production and a reduced bill of material cost.

Each Toradex i.MX 95 SoM is strategically positioned within its own product family to offer clear scalability options. The **Aquila iMX95** is the entry-level option in the Aquila lineup, ideal for high-end designs needing strong performance and interface availability, with room to scale up later. The **Verdin iMX95** is the highest-performance Verdin module, bringing more power to a compact and cost-effective form factor. The **SMARC iMX95** follows the SMARC 2.2 standard, offering a standardized option for customers who need second sourcing and mechanical compatibility. The **OSM iMX95** is a solderable module optimized for fully automated SMT (Surface-Mount Technology) and reflow processes, enabling high-volume production with a reduced bill of material cost.



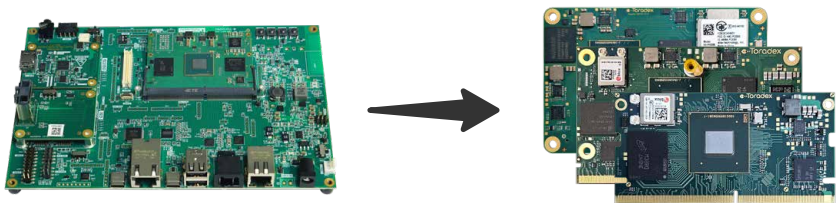
Verdin iMX95 Product Brief

Migrating from i.MX 95 Verdin EVK



The Verdin i.MX 95 EVK Board was designed to give early access to the i.MX 95's capabilities, enabling developers to quickly evaluate, test, and integrate the SoC before general availability. It comes as a fixed single-board computer combining SoM and carrier, with key interfaces exposed for prototyping. This platform is ideal for initial bring-up, performance benchmarking and early-stage software development, supported through the NXP-Toradex partnership.

As your project moves beyond evaluation, migrating to a Toradex i.MX 95-based System on Module ensures production-grade reliability and design flexibility. You can scale with different carrier boards, including your own, while benefiting from full Torizon support, robust documentation, and long-term product availability. This transition helps you streamline development and reduce risk as you move toward full deployment and volume production.



Features / SoMs	i.MX 95 Verdin EVK	i.MX 95 Toradex SoMs
Goal	Evaluate and integrate the i.MX 95 before GA	Go-to-market with the i.MX 95
Ownership	NXP and Toradex partnership	Toradex
Availability	Early access, low quantities	General availability, volume quantities
Interface Set Flexibility	EVK combo only (single-board computer)	Scale with any Carrier Board, or develop your own
BSP	From NXP	From Toradex
Torizon OS	Community Support - Limited	Full Support
Customer Support	Toradex	Toradex
Documentation	Limited/Private (NXP + Toradex)	Toradex-quality documentation
Ecosystem Driver	NXP and Toradex	Toradex
Flashing Method	uuu only	Toradex Easy Installer

Verdin iMX95 Product Brief

Verdin iMX95 SoM

The Verdin System on Module (SoM) family streamlines embedded design by integrating complex high-speed circuitry directly on the module, allowing developers to focus on their application-specific carrier boards. With its Direct Breakout™ interface, Verdin simplifies the routing of high-speed signals, enabling clean and layer-efficient connections. It also features support for 1.8V I/Os and a wide input voltage range, making power supply design more efficient. Verdin is an ideal fit for compact, fanless, and battery-powered devices.

The Verdin iMX95 is a versatile and scalable SoM built to address diverse applications in Industrial Automation, Medical, Transportation, Smart Cities, Test and Measurement, and more. It combines balanced performance with advanced multimedia and AI capabilities, providing a powerful foundation for next-generation edge designs.

Connectivity is at the core of Verdin iMX95. Optional Wi-Fi 6 and Bluetooth 5.2 ensure cutting-edge wireless communication, while a rich set of interfaces supports a wide variety of system designs:

- GPIOs, I2C, I3C, SPI, USB, CAN FD, UART
- PCIe Gen3 x1
- Up to two MIPI CSI interfaces with internal ISP
- 2 TOPS NPU for edge AI and vision workloads

For multimedia and networking, the module integrates:

- Dual display interfaces with LVDS up to 1080p and MIPI DSI up to 4K resolution
- Arm Mali 3D GPU with OpenGL® ES 3.2, Vulkan® 1.2, and OpenCL™ 3.0
- 4K VPU for advanced multimedia processing
- Integrated Gigabit Ethernet PHY with IEEE1588 support
- Second Ethernet MAC via RGMII for dual Ethernet flexibility

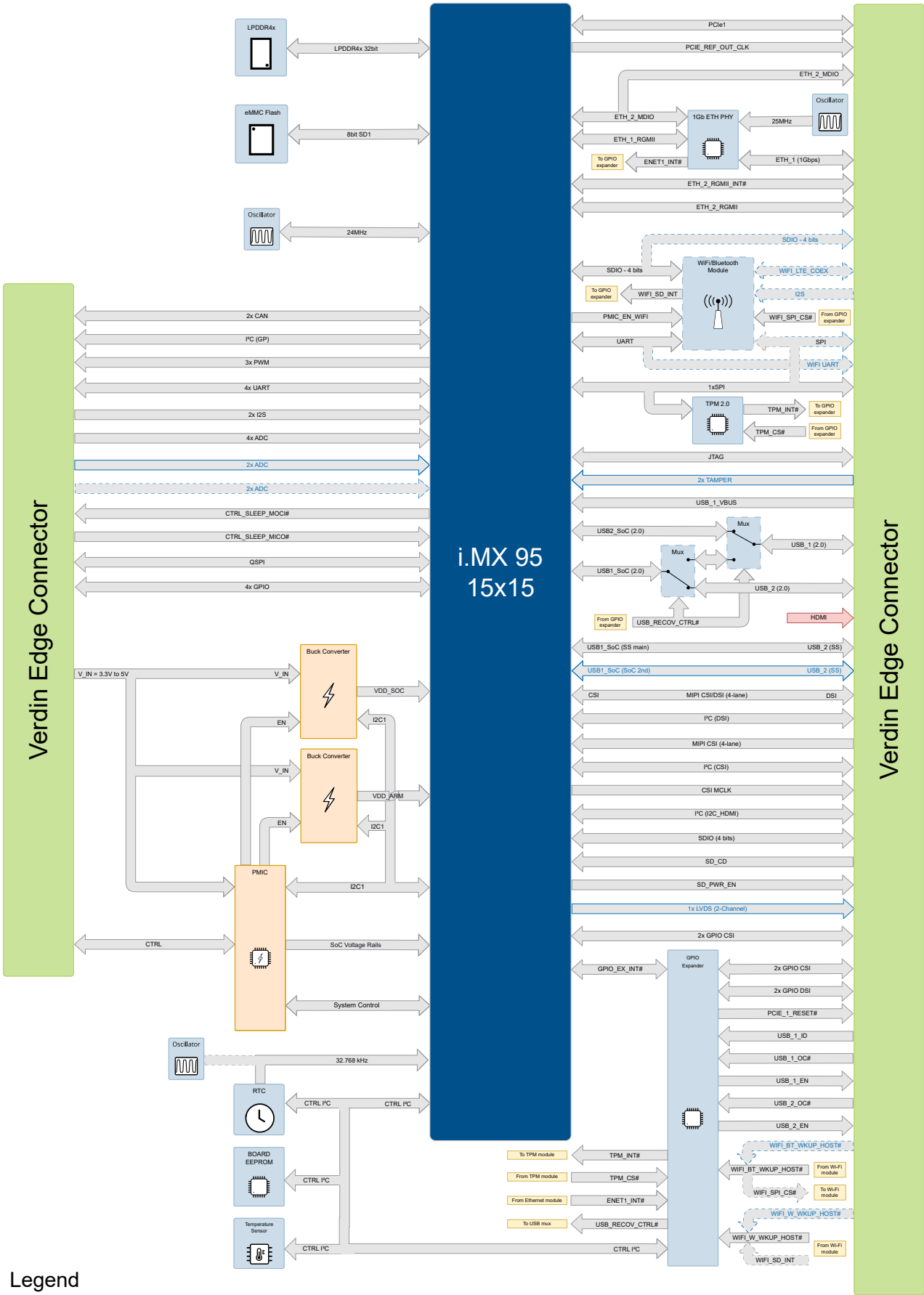
Security and safety are built in. The EdgeLock® secure enclave supports secure boot and cryptographic operations, while the integrated Safety Island allows execution of safety-critical workloads in line with NXP's SafeAssure® program.

In essence, the Verdin iMX95 delivers a compact yet comprehensive solution, blending scalable performance, robust connectivity, advanced multimedia, and strong security into a versatile platform for industrial and connected edge applications.



Verdin iMX95 Product Brief

Block Diagram



Verdin iMX95 Product Brief

Interfaces Overview

The Verdin module interfaces are organized into three categories: Always Compatible, Reserved, and Module-specific. Always Compatible interfaces are present on every Verdin SoM, ensuring scalability and easy upgrades. Reserved interfaces are defined and electrically compatible but may be absent on some models depending on SoC features or cost-optimized configurations. Module-specific interfaces can vary between modules and may limit upgradeability if used in a carrier design.

In addition, certain pins can serve alternate functions, such as GPIOs, when their primary role is not in use. The table below shows the Verdin iMX95 interfaces and their classification.

For detailed definitions, see the [Verdin Family Specification](#).

Features	Total (up to)	Always compatible	Reserved	Module specific or Alternate Function
Analog				
Analog Input (ADC)	6		4	2
Audio				
I2S	2		2	
S/PDIF (RX and TX)	1			1 (alternate)
PDM Mic Input	4			4 (alternate)
Camera				
MIPI CSI-2	2		1	1 (alternate)
Display				
MIPI DSI	1		1	
LVDS (dual channel)	1			1
Low speed				
I2C	7	1	3	3 (alternate)
I3C	1			1 (alternate)
SPI	6	1		5 (alternate)
UART	8	3	1	4 (alternate)
PWM	21	1	2	18 (alternate)
CAN FD	5		2	3 (alternate)
JTAG	1	1		
QSPI	1		1	
OSPI	1			1 (alternate)
GPIO	82	4	6	~72 (alternate)
Network				
Gigabit Ethernet	1	1		
RGMII (for 2nd Gigabit Ethernet)	1		1	
Other				
PCIe Gen3	1		1	
Storage				
SD/SDIO/MMC	2	1		1 ¹
USB				
USB 2.0 OTG	1	1		
USB 3.2 OTG (SS Signals for USB 2.0 OTG)	1		1	
USB 2.0 Host	1	1		

1¹: Only on SoMs without WiFi.

Verdin iMX95 Product Brief

Configuration Overview

The Verdin iMX95 SoM is designed to deliver scalable performance, advanced multimedia, AI capabilities and versatile connectivity. It combines multiple display support, an integrated vision and NPU pipeline, plus flexible expansion options such as PCIe, Ethernet, Wi-Fi and Bluetooth to provide an efficient yet powerful foundation for a wide range of industrial and connected edge applications.

The first configuration to be released is shown in the table below: Verdin iMX95 Hexa 8GB WB IT.

Family	iMX95 Segment	A-Core Qty	RAM	eMCC	ETH PHY	Wi-Fi	TPM	Temperature
VRIMX95	9	6	-8G	-32G	-E1	-W6	-T	-IT

Additional configurations will be developed over time. In the meanwhile, the tables below summarizes the available configuration elements and how they can be combined. Use the "Configuration Inputs" tables to fill in the open fields from "NPI part number table" in order to build the desired configuration.

For additional specific requirements or tailored options, please, get in touch with us.

Note: The New Product Introduction (NPI) part number nomenclature shown below does not reflect volume or sellable part numbers from Toradex. They should only be used to communicate your desired configuration.

NPI part number table

Family	iMX95 Segment	A-Core Qty	RAM	eMCC	ETH PHY	Wi-Fi	TPM	Temperature
VRIMX95	9	6						

Configuration Inputs

iMX95 Segment	Description	A-Cores Qty	ISP	NPU	GPU	VPU	Display ¹
9	Full Featured	6 / 4	Yes	Yes	Yes	Yes	Yes
5	HMI	6 / 4		Yes	Yes	Yes	Yes
3	Compute	6 / 4		Yes			

1. The MIPI-DSI and LVDS interfaces are disabled. The display controller is enabled.

RAM Density	
-1G	1 GB
-2G	2 GB
-4G	4 GB
-8G	8 GB
-16G	16 GB

eMMC Capacity	
-4G	4 GB
-8G	8 GB
-16G	16 GB
-32G	32 GB
-64G	64 GB
-128G	128 GB
-256G	256 GB

ETH PHY	
-E1	1GbE PHY assembled
-E0	1GbE PHY not assembled

TPM	
-T	TPM 2.0 assembled
-N	TPM 2.0 not assembled

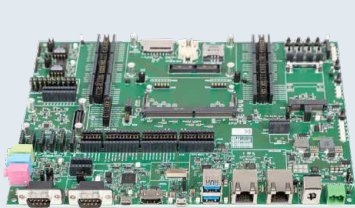
Wi-Fi	
-W6	Wi-Fi 6 and BT 5.2 module
-W0	No WiFi-BT module

Temperature	
-IT	Industrial (-40°C to 85°C)
-ET	Extended (-25°C to 85°C)
-CT	Commercial (0°C to 70°C)

Contact us for more information, or visit our website product page: [Verdin iMX95 product page](#).

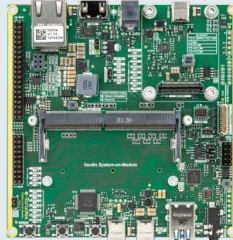
Verdin iMX95 Product Brief

Verdin - Development and Evaluation



Verdin Development Board

Fully featured carrier board providing easy access to all features of the Verdin family. Several display adapter boards will be available to support HDMI, LVDS, DSI and Parallel RGB display Interfaces



Dahlia

Compact carrier board providing easy access to the most common features of the Verdin family. It is an ideal platform for software development and demonstration purposes



Yavia

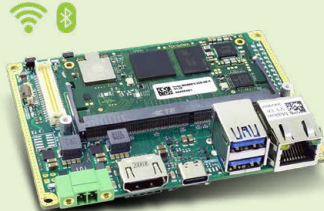
Compact carrier board providing easy access to the most common features of the Verdin family. It is an ideal platform for software development and demonstration purposes

Verdin - Volume Production



Ivy

- Optimized for industrial and harsh environments
- Small 125 x 90 mm form factor
- Dual Gigabit Ethernet
- Isolated I/O



Mallow

- Small 100 x 72 mm Pico-ITX form factor
- Simple extension header
- M.2 PCIe slot for modems and accelerators
- MIPI-CSI camera interfaces



Zinnia

- Optimized for industrial environments
- Perfect fir for gateways and industrial PCs
- Small 110 x 80 mm form factor
- Dual Gigabit Ethernet

Verdin iMX95 Product Brief



Torizon™

**Easily Develop, Manage and
Secure Your Linux Devices**

Torizon is a ready-to-use Linux-based ecosystem that simplifies the development, management, and security of embedded devices. Built on a robust Linux foundation, it accelerates time-to-market with a production-grade software stack and no vendor lock-in.

Designed for reliability at scale, Torizon offers secure over-the-air updates, real-time capabilities, and streamlined device management throughout the product lifecycle. It empowers you to build, deploy, and maintain Linux devices with confidence.



Fast time-to-market
Ready-to-use
Linux distribution



Open Source
Based on open software,
no lock-in



Simple updates
Built-in, automotive-grade,
over-the-air update
capabilities



Real-time
Optimized real-time option



Secure
Frequent updates, accessible
security features



**Device
Monitoring**



**Subsystem
Updates**



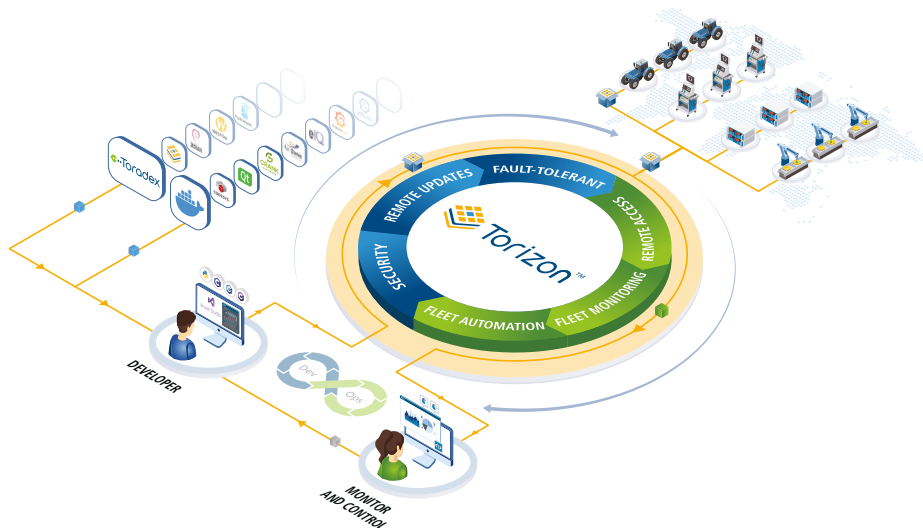
**Remote
Access**



**Remote
Updates**



**Secure
by Default**



To explore the full potential of the Torizon ecosystem, visit [Torizon.io](https://torizon.io)

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