Toradex
Swiss. Embedded. Computing.

EMBEDDED COMPUTING MADE EASY

GLOBAL **PRESENCE**

Diverse geographical sales and engineering teams,
addressing specific local needs, technology requirements, and markets.

15 YEARS OF PASSION FOR THE **EMBEDDED MARKET**

With over 15 years in the industry, Toradex is one of the most trusted names in embedded computing. Offering Arm®-based System on Modules (SoMs) for industrial applications, we are committed to serving our fast-growing customer base in over 70 countries. Our pin-compatible SoMs offer scalability in terms of price and performance. Toradex production-quality Software offerings and industry-leading support reduces time-to-market. Our customers benefit from Toradex's close partnership with leading companies in the embedded market, including NXP®, NVIDIA®, Arm®, The Qt Company®, and Microsoft®.

Our Value Proposition

10+ years of product availability
Guaranteed availability for over 10 years ensures the longevity of your products.

Free lifetime product maintenance
Includes OS updates, bug fixes, feature additions, PCN management, and full traceability.

Free premium support by developers
Direct support from the development engineers and extensive online resources.

Scalability
Pin-compatible SoMs provide easy migration of your platform to future technologies.

In-house hardware and software development
Production-ready BSPs for Linux, Windows, and FreeRTOS, directly maintained by Toradex.

Competitive pricing
Direct sales with online store option for simple purchasing without distribution markups.

Free carrier board reference designs
Design guides, Pinout Designer, and free Toradex tools simplify your carrier board design.

Proven partner network
Get help with your hardware and software design from experienced Toradex partners.

Torizon: easy-to-use industrial Linux
Our all-new software platform that simplifies the process of developing and maintaining embedded software. Torizon is a secure, simple-to-update OS, and is ideal for new and experienced Linux users alike.

ECOSYSTEM

Operating Systems

In-house operating system support

- Free BSPs, tools, and libraries
- Continuous updates
- Out-of-the-box support for peripherals
- Production-grade software

Third-party operating system support

- Supported by proven partners
- Demo images available

Technical Support Channels

Toradex Community
Active forum, get answers directly and promptly from our experienced developers.
https://community.toradex.com/

Developer Center
Find technical articles, reference designs, and software downloads.
https://developer.toradex.com/

Blog
Learn about key insights and topical updates from our developers.
https://www.toradex.com/blog

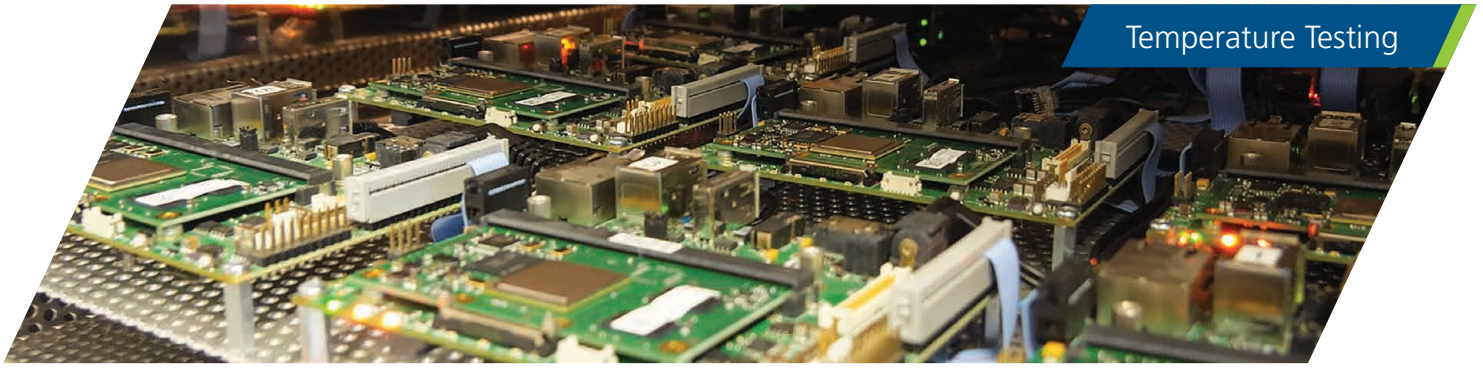
Webinars
Participate in free, in-depth, technical webinars conducted by our experts.
https://www.toradex.com/webinars

Email Support
Ask questions and let our trusted engineers give you the answers.
support@toradex.com

Phone Support
Talk with our engineers in your local language for technical support. Find your nearest office contact: https://www.toradex.com/support#phone

Our listed support channels are complimentary unless otherwise specified.

TORADEX MODULES: **QUALITY AND RELIABILITY**



Reliability by design
Reliability starts with product design. The SoCs and other key components used on our SoMs are designed to run 24/7 with high utilization and at high temperatures for many years.

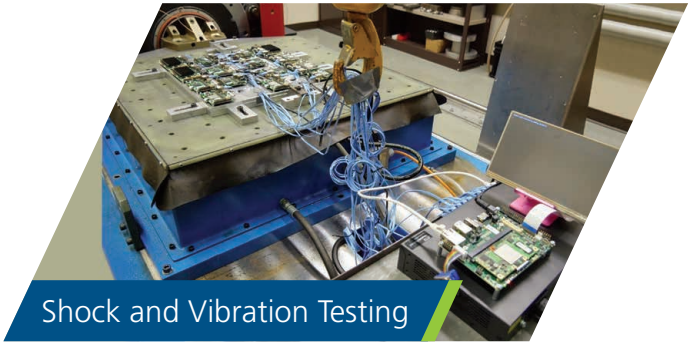
Dependable in extreme temperatures
Our industrial temperature rated products are extensively tested from –40° to +85°C.

Shock- and vibration-tested
Our SoMs are a popular choice for harsh environments like rally cars, helicopters, and railways. The modules are validated for shock and vibration resistance by an accredited Swiss test laboratory according to EN 60068-2-6 at up to 50g/20ms.

EMI/EMC
Toradex SoMs are tested for electromagnetic compliance (EMC), which helps reduce issues in your design. Reference designs and design guides further minimize risks in your final EMC tests.

Full functional testing and traceability
Purpose-built automated test equipment exercises every single SoM in an extensive functional test. All results are logged and archived, so each and every module is fully traceable. Advanced test data analytics allows possible manufacturing issues to be spotted before shipment.

Standardized product variants
As Toradex limits its number of product variations, every variation is tested and certified by numerous customers in various demanding



applications. This means your product configuration is extensively tested.

ISO 9001
Toradex partners with renowned industrial electronic manufacturing service (EMS) companies in Germany for the production of our SoMs. All our contract manufacturers are ISO 9001-certified.

Software quality
Toradex operating systems and BSPs are the base for critical applications, and are built with quality and reproducibility in mind. Continuous integration improves software quality and decreases time-to-market.

Long-term availability
We put extensive effort into selecting reliable suppliers, and validate and approve second source components to ensure you can order our SoMs for more than 10 years.

New, Easy-to-use Industrial Linux Software Platform

Torizon is a new Linux-based software platform that simplifies the process of developing and maintaining embedded software. It allows you to configure the system for your use case quickly and easily, so you can focus on application development instead of Linux builds.

Torizon

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

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

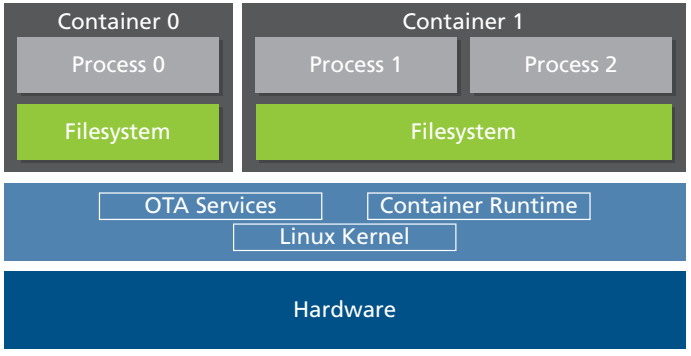
Secure
Frequent updates, accessible security features

Real-time
Optimized real-time option

Stable
Modern continuous integration infrastructure and verification

Architecture

- Built with OpenEmbedded/Yocto
- Optional Docker container runtime
- Open-source
- Support for mainline and downstream kernels
- Based on Linux microPlatform
- OSTree with Aktualizr OTA client



Out-of-the-box experience

Get started right away:

- Debian package manager for fast proof-of-concept
- Development tools for pin configurations, monitoring, display settings, and more
- Development tools with local and remote UIs

debian CONTAINER

Application containerization

- Simpler over-the-air updates
- Increased security
- Small resource footprint compared to virtual machines
- Access to hardware acceleration
- Support for Graphical UI

Torizon - Microsoft Developer Environment

Torizon Microsoft Developer Environment offers a familiar, productive environment for those used to working in Microsoft environments, with technologies like Visual Studio and .Net Core.

Powerful, familiar Windows developer environment

Seamless integration with Visual Studio

Focus on your application, not the OS

Visual Studio integration

- Currently supports C/C++
- On-device debugging
- Abstract container management
- Visual Studio plugin

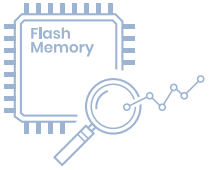
Visual Studio

Porting from Windows and Windows Embedded Compact

The Torizon Microsoft Environment does not provide a solution which is source code- or binary-compatible with Windows and Windows Embedded Compact. It provides Windows developers with a familiar environment, so that they can be productive without the need to deal with the inner workings of Linux. We are working on additional measures to further ease the move from Windows.

Flash Analytics Tool

- Lifetime estimation
- Remote web UI
- Health status
- Real-time per-process write statistics
- Block-level erase and bad block counts



https://labs.toradex.com/projects/flash-analytics-tool

Toradex Labs: Innovation, Experiments, and Research

Via labs.toradex.com, you'll get to test-drive experiments, give us your feedback, and influence our roadmaps. Some projects will develop into full-fledged products and services, along with Toradex's legendary support and long-term commitment.

Toradex LABS

https://labs.toradex.com/

Toradex Easy Installer and Partner Demos

The Toradex Easy Installer allows you to install Toradex's standard OS images, third-party operating systems, and demo images in just a few clicks. It comes with most modules preinstalled and simplifies your volume production.

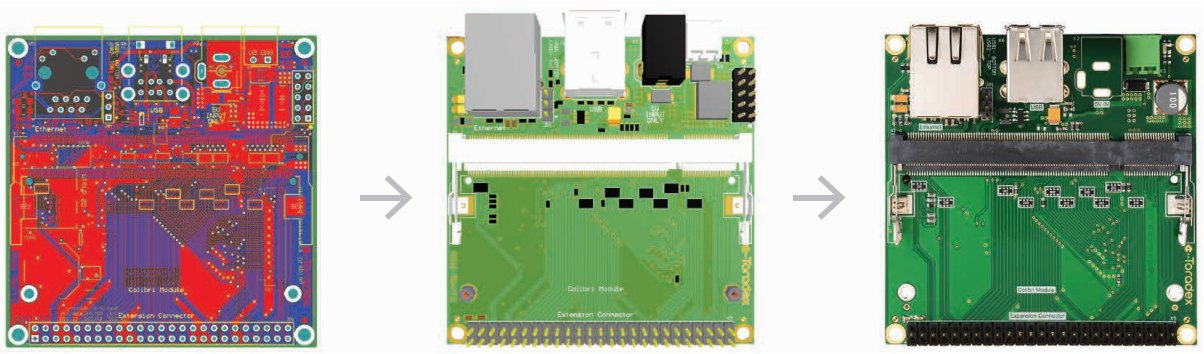
- Automate production programming
- Partner demo images available for evaluation
- Accelerate time-to-market
- Software tools and frameworks

Partner Network

- Custom carrier board designs and manufacturing
- Off-the-shelf carrier boards
- Product design and application development

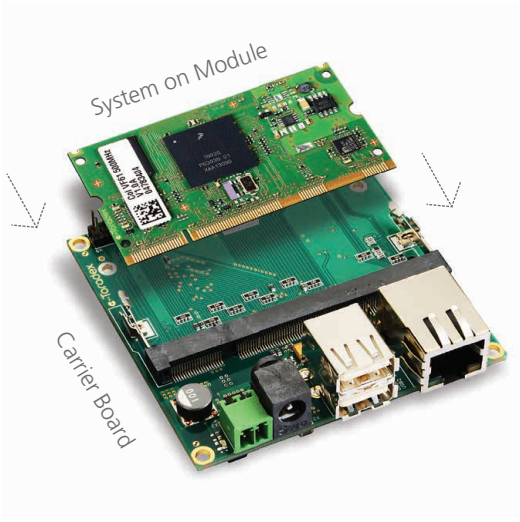
Carrier Board Design

- Free schematics, layouts, 3D models, and design guides
- Pinout Designer tool
- Schematic reviews



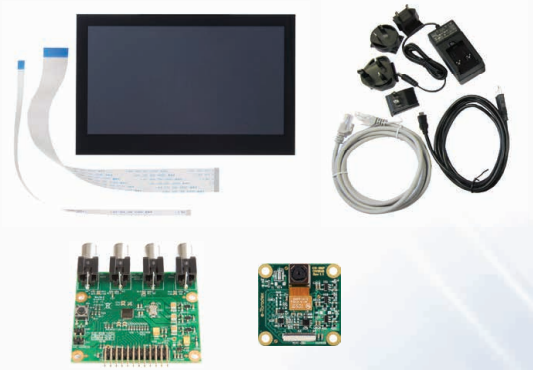
Customized Single Board Computers

Combine a Toradex SoM with an off-the-shelf carrier board for a customizable, scalable single board computer. Extend your options even further with off-the-shelf carrier boards from our partners.



Getting Started Accessories

- Resistive/Capacitive touch displays
- CSI camera module 5MP OV5640
- Analog camera adapter
- DSI to HDMI adapter
- and more...



APALIS **SYSTEM ON MODULES**

Toradex's Apalis family of pin-compatible SoMs offers advanced computing with supreme graphics at optimal power consumption, along with support for high-speed interfaces and extensive multimedia formats.

Apalis iMX8

A72 @1.6 GHz
A53 @1.26 GHz
M4F @266MHz
Vivante GPU GC7000

Torizon

RAM: 4GB
Flash: 16GB

Apalis iMX8X

A35 @1.2 GHz
M4F @266MHz
Vivante GPU GC7000 Lite

Torizon

RAM: 2GB
Flash: 8GB

Apalis iMX6

A9 @1.0 GHz
Vivante GPU GC2000

Torizon

RAM: 2GB
Flash: 4GB

Apalis TK1

A15 @2.1 GHz
M4 @100MHz Companion core
Kepler GPU with 192 CUDA® cores

NVIDIA CUDA

RAM: 2GB
Flash: 16GB

Apalis T30

A9 @1.4 GHz
GeForce GPU Ultra-low power

RAM: 2GB
Flash: 8GB

COLIBRI **SYSTEM ON MODULES**

The Colibri family offers an extensive portfolio of pin-compatible SoMs. These SoMs have a small form factor, complemented with many industrial interfaces.

Colibri iMX8X

A35 @1.2 GHz | M4F @266MHz | Vivante GPU GC7000 Lite

Torizon

RAM: 2GB | Flash: 8GB

Colibri iMX6

A9 @1.0 GHz | Vivante GPU GC880

Torizon

RAM: 512MB | Flash: 4GB

Colibri iMX7

A7 @1.0 GHz | M4F @200MHz

Torizon

RAM: 1GB | Flash: 4GB

Colibri VF61/VF50

A5 @500 MHz | M4F @167MHz

RAM: 256MB | Flash: 512MB

Colibri T30

A9 @1.4 GHz | GeForce GPU Ultra-low power

RAM: 1GB | Flash: 4GB

Colibri T20

A9 @1.0 GHz | GeForce GPU Ultra-low power

RAM: 512MB | Flash: 1GB

Colibri iMX6ULL

A7 @900 MHz

Torizon

RAM: 512MB | Flash: 512MB

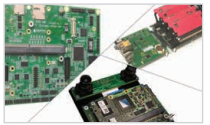
Note: Maximum configurations for all SoMs have been shown.

APALIS **SYSTEM ON MODULES**

	Apalis iMX8 (IT)	Apalis TK1	Apalis iMX8X*	Apalis T30 (IT)	Apalis iMX6 (IT)
					
SoC/CPU	NXP i.MX 8QuadPlus/8QuadMax 1x/2x Arm Cortex-A72, 1.6GHz 4x Arm Cortex-A53, 1.26GHz	NVIDIA Tegra K1 4x Arm Cortex-A15, Up to 2.1GHz	NXP i.MX 8QuadXPlus/8DualXPlus 4x/2x Arm Cortex-A35, 1.2GHz	NVIDIA Tegra 3 4x Arm Cortex-A9, Up to 1.4GHz	NXP i.MX 6Dual/6Quad 2x/4x Arm Cortex-A9, Up to 1GHz
Microcontroller	2x Arm Cortex-M4F, 266MHz	1x Arm Cortex-M4, 100MHz	1x Arm Cortex-M4F, 266MHz	–	–
DSP	–/HiFi4 DSP	–	HiFi4 DSP/–	–	–
Memory					
RAM	2GB/4GB LPDDR4 (64 Bit)	2GB DDR3L (64 Bit)	1GB/2GB DDR3L (32 Bit) (ECC)	1GB/2GB DDR3 (32 Bit)	512MB to 2GB DDR3 (64 Bit)
Flash	16GB eMMC	16GB eMMC	4GB/8GB eMMC	4GB/8GB eMMC	4GB eMMC
Connectivity					
USB 3.0	1x Host	2x Host	1x Host	–	–
USB 2.0	2x Host/1x OTG	1x Host/1x OTG	2x Host/1x OTG	2x Host/1x OTG	4x Host/1x OTG
Ethernet	Gigabit with AVB (+2nd RGMII/RMII)	Gigabit with IEEE 1588	Gigabit with AVB (+2nd RGMII/RMII)	Gigabit with IEEE 1588	Gigabit with IEEE 1588
Wi-Fi/Bluetooth	802.11ac/BT 5	–/–	802.11ac/BT 5	–/–	–/–
PCIe	2 (x1 Gen 3)	1 (x2 Gen 2) + 1 (x1 Gen 2)	1 (x1 Gen 3)	1 (x1 Gen 1) + 1 (x4 Gen1)	1 (x1 Gen 2)
Serial ATA	1x (SATA-III)	1x (SATA-II)	–	1x (SATA-II)	1x (SATA-II)
SD/MMC/SDIO	1x 8 Bit, 1x 4 Bit	3x 4 Bit (2x UHS-I)	1x 4 Bit	2x 8 Bit (1x UHS-I), 1x 4 Bit	3x 8 Bit
I2C/SPI	7x/4x	6x/5x	7x/3x	4x/4x	3x/3x
UART	7x	10x	4x	5x	5x
PWM	8x	16x	5x	4x	4x
Analog Input	8x	21x	4x	4x	4x
CAN	3x	2x	3x	2x	2x
GPIOs	Up to 133	Up to 87	Up to 90	Up to 127	Up to 135
Multimedia					
Display Controller	Quad, Independent	Dual, Independent	Dual, Independent	Dual, Independent	Dual, Independent
2D/3D Acceleration	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓
Video Decoder	✓	✓	✓	✓	✓
HDMI	4K UHD (V2.0a, 2160p)	4K UHD (V1.4b, 2160p)	Full HD (V1.4a, 1080p)	Full HD (V1.4a, 1080p)	Full HD (V1.4a, 1080p)
Display Port	1x eDP 1.4 or 1x DP 1.3	1x eDP	–	–	–
LVDS	1x 1920 x 1200 x 24bpp Dual + 1x 1366 x 768 x 24bpp Single/ 3x 1366 x 768 x 24bpp Single	1x 1920 x 1200 x 24bpp Single	1x 1920 x 1200 x 24bpp Dual/ 2x 1366 x 768 x 24bpp Single	1x 2048 x 1536 x 24bpp Dual/ 1x 1280 x 1024 x 24bpp Single	1x 1920 x 1200 x 24bpp Dual/ 2x 1366 x 768 x 24bpp Single
RGB	–	–	1280 x 720 x 18bpp	2048 x 1536 x 24bpp	1920 x 1200 x 24bpp
Display Serial Interface	2x Quad Lane MIPI DSI	1x Quad + 1x Dual Lane MIPI DSI	2x Quad Lane MIPI DSI	2x Dual Lane MIPI DSI	1x Dual Lane MIPI DSI
Digital Audio	3x AC97 or 3x I2S, 1x ESAI	1x I2S	3x AC97 or 3x I2S, 1x ESAI	1x HDA or 1x I2S	3x AC97 or 3x I2S, 1x ESAI
S/PDIF In/Out	1x/1x	1x/1x	1x/1x	1x/1x	1x/1x
Analog Audio	Line-In, Line-Out, Mic-In	Line-In, Line-Out, Mic-In	Line-In, Line-Out, Mic-In	Line-In, Line-Out, Mic-In	Line-In, Line-Out, Mic-In
Resistive Touch	4 Wire	4 Wire	4 Wire	4 Wire	4 Wire
Camera Parallel Interface	–	–	1x 8 Bit	1x 8/10 Bit	2x 8/16/20 Bit
Camera Serial Interface	2x Quad Lane MIPI CSI-2	2x Quad + 1x Single Lane MIPI CSI-2	1x Quad Lane MIPI CSI-2	1x Quad or 2x Dual Lane MIPI CSI-2	1x Quad Lane MIPI CSI-2
Software					
Operating Systems	Torizon, Linux, FreeRTOS	Linux	Torizon, Linux	Linux, Windows Embedded Compact 7/2013	Torizon, Linux, Windows Embedded Compact 7/2013
Runtime License	–	–	–	Windows Embedded Compact 2013	Windows Embedded Compact 2013
Physical					
Size	82.0 x 45.0 x 6.0 mm	82.0 x 45.0 x 6.0 mm	82.0 x 45.0 x 6.0 mm	82.0 x 45.0 x 6.0 mm	82.0 x 45.0 x 6.0 mm
Temperature	–25° to +85°C/IT: –40° to +85°C	–25° to +85°C	–25° to +85°C/IT: –40° to +85°C	0° to +70°C/IT: –40° to +85°C	0° to +70°C/IT: –40° to +85°C
Vibration/Shock	EN 60068-2-6/50g 20ms	EN 60068-2-6/50g 20ms	EN 60068-2-6/50g 20ms	EN 60068-2-6/50g 20ms	EN 60068-2-6/50g 20ms
Power Dissipation	5 - ~16 W	3 - ~15 W	TBD	1.4 - ~6 W	1.9 - ~7 W
Minimum Availability	2030	2025	2030	2025	2028

*This data is preliminary and is subject to change.

APALIS **CARRIER BOARDS**

	Apalis Evaluation Board	Ixora Carrier Board	Apalis Partner Carrier Boards*
			

Connectivity

USB 3.0	1x Host/1x OTG	2x Host	Up to 1x Host/1x OTG
USB 2.0	4x Host	1x Host/1x OTG	Up to 4x Host
Ethernet	Gigabit	Gigabit	Up to 11x 10/100/1000 Mbit
PCIe	2x 1 Slot/1x Mini PCIe	1x Mini PCIe	Up to 2x Mini PCIe
Serial ATA	1x/1x mSATA (Shared)	1x mSATA	Up to 1x mSATA
SD/MMC/SDIO	1x 8 Bit, 1x 4 Bit	1x 4 Bit (Micro SD)	Up to 1x SD/MMC 4 Bit
I2C/SPI	3x/2x	2x/1x	Up to 2x/Up to 2x
UART/IrDA	2x RS232, 1x RS422/485 1x USB/1x IrDA	3x RS232/–	Up to 8x RS232/422/485/–
PWM	4x	4x	Up to 4x
Analog Input	4x	4x	Up to 4x
CAN	2x	2x	Up to 2x
GPIOs	Up to 135	Up to 40	Up to 16
RTC on Board	✓	✓	✓
Type-specific Connector	✓	–	–

Multimedia

Video Out	VGA/DVI-D	Digital (TDMS) Interface on HDMI Connector	VGA/HDMI
LCD Interface	RGB/LVDS (Dual Channel)	RGB/LVDS (Dual Channel)	LVDS (Dual Channel)
Resistive Touch	4/5 Wire	4/5 Wire	Up to 4/5 Wire
Digital Audio	7.1 Channel HD Audio Codec (Including analog connectors)	–	–
S/PDIF In/Out	1x (Out also on TOSLINK)	1x/1x	1x/1x
Analog Audio	Line-In, Line-Out, Mic-In	Line-In, Line-Out, Mic-In	Line-In, Line-Out, Mic-In
Camera Parallel Interface	1x 8/10/12 Bit (Including Patch Panel)	1x 10 Bit	–
Camera Serial Interface	On Mezzanine	1x 4 Lane MIPI CSI-2	Up to 2x Quad + 1x Single Lane MIPI CSI-2

Physical

Supply Voltage	7 - 27V DC	7 - 27V DC	9 - 36V DC
Size	250 x 250 mm	125 x 90 mm	–
Temperature	–	0° to +70°C/–20° to +85°C	–40° to +85°C
Altium® CAE Data Freely Available	✓	✓	–
Volume Production	–	✓	✓

*This references all available carrier boards from partners, with the maximum number of interface values shown for all.

COLIBRI **SYSTEM ON MODULES**

	Colibri iMX8X* (IT)	Colibri T30 (IT)	Colibri iMX6 (IT)	Colibri T20 (IT)	Colibri iMX7
					
SoC/CPU	NXP i.MX 8DualX/8QuadXPlus 2x/4x Arm Cortex-A35, 1.2GHz	NVIDIA Tegra 3 4x Arm Cortex-A9, Up to 1.4GHz	NXP i.MX 6Solo/6DualLite 1x/2x Arm Cortex-A9, Up to 1GHz	NVIDIA Tegra 2 2x Arm Cortex-A9, 1GHz	NXP i.MX 7Solo/7Dual 1x/2x Arm Cortex-A7, Up to 1GHz
Microcontroller	1x Arm Cortex-M4F, 266MHz	–	–	–	1x Arm Cortex-M4F, 200MHz
DSP	–/HiFi4 DSP	–	–	–	–
Memory					
RAM	1GB LPDDR4 (16 Bit)/ 2GB LPDDR4 (32 Bit)	1GB DDR3 (32 Bit)	256MB DDR3 (32 Bit)/ 512MB DDR3 (64 Bit)	256MB/512MB DDR2 (32 Bit)	256MB to 1GB DDR3L (32 Bit)
Flash	4GB/8GB eMMC	4GB eMMC	4GB eMMC	512MB/1GB SLC NAND	512MB SLC NAND/4GB eMMC
Connectivity					
USB 2.0	1x Host/1x OTG	1x Host/1x OTG	1x Host/1x OTG	1x Host/1x OTG	1x Host#/1x OTG
Ethernet	10/100 Mbit with AVB (+2nd RGMII/RMII)	10/100 Mbit	10/100 Mbit with IEEE 1588	10/100 Mbit	10/100 Mbit with IEEE 1588 (+2nd RGMII/RMII)#
Wi-Fi/Bluetooth	802.11ac/BT 5	–/–	–/–	–/–	–/–
External Bus	–	16 Bit	32 Bit	32 Bit	16 Bit
SD/MMC/SDIO	1x	3x	3x	4x	2x
I2C/SPI	8x/3x	4x/6x	3x/4x	3x/5x	3x/4x
UART	5x	5x	5x	5x	7x
PWM	10x	4x	4x	4x	20x
Analog Input	4x	4x	4x	4x	4x
One-Wire	–	1x	–	1x	–
CAN	3x	–	2x	–	2x
GPIOs	Up to 97	Up to 158	Up to 154	Up to 153	Up to 126
Multimedia					
Display Controller	Dual, Independent	Dual, Independent	Single	Dual, Independent	Single
2D/3D Acceleration	✓/✓	✓/✓	✓/✓	✓/✓	–/–
Video Decoder	✓	✓	✓	✓	–
Display Serial Interface	2x Quad Lane MIPI DSI (1080p60)	–	–	–	–
LVDS	1x 1920 x 1200 x 24bpp Dual/ 2x 1366 x 768 x 24bpp Single	–	–	–	–
HDMI	1080p60 (via DSI Adapter)	V1.4a 1080p (1920 x 1080)	V1.4a 1080p (1920 x 1080)	V1.3 1080p (1920 x 1080)	–
RGB	1280 x 720 x 24bpp	2048 x 1536 x 24bpp	1920 x 1200 x 24bpp	1920 x 1200 x 24bpp	1920 x 1080 x 24bpp
Resistive Touch	4 Wire	4 Wire	4 Wire	4/5 Wire	4 Wire
Analog Audio	Line-In, Line-Out, Mic-In	Line-In, Line-Out, Mic-In	Line-In, Line-Out, Mic-In	Line-In, Line-Out, Mic-In	Line-In, Line-Out, Mic-In
Camera Parallel Interface	1x 8/10 Bit	1x 8/10/12 Bit	2x 8/16/20 Bit	1x 8/10/12 Bit	1x 8/10/16/24 Bit
Camera Serial Interface	1x Quad Lane MIPI CSI-2	–	–	–	–
Software					
Operating Systems	Torizon, Linux	Linux, Windows Embedded Compact 7/2013	Torizon, Linux, Windows Embedded Compact 7/2013	Linux, Windows Embedded Compact 7/CE 6.0	Torizon, Linux, Windows Embedded Compact 7/2013, FreeRTOS
Runtime License	–	Windows Embedded Compact 2013	Windows Embedded Compact 2013	Windows Embedded Compact 2013	Windows Embedded Compact 2013
Physical					
Size	67.6 x 36.7 x 6.2 mm	67.6 x 36.7 x 6.2 mm	67.6 x 36.7 x 6.2 mm	67.6 x 36.7 x 6.2 mm	67.6 x 36.7 x 6.2 mm
Temperature	–25° to +85°C/IT: –40° to +85°C	0° to +70°C/IT: –40° to +85°C	0° to +70°C/IT: –40° to +85°C	0° to +70°C/IT: –40° to +85°C	–20° to +85°C
Vibration/Shock	EN 60068-2-6/50g 20ms	EN 60068-2-6/50g 20ms	EN 60068-2-6/50g 20ms	EN 60068-2-6/50g 20ms	EN 60068-2-6/50g 20ms
Power Dissipation	TBD	1.2 - 5.1 W	0.6 - 1.8/2.3 W	1.1 - 2.8 W	0.6 - ~0.9/1.1 W
Minimum Availability	2030	2025	2028	2025	2027

*This data is preliminary and is subject to change.
#Not available on the Colibri iMX7S.

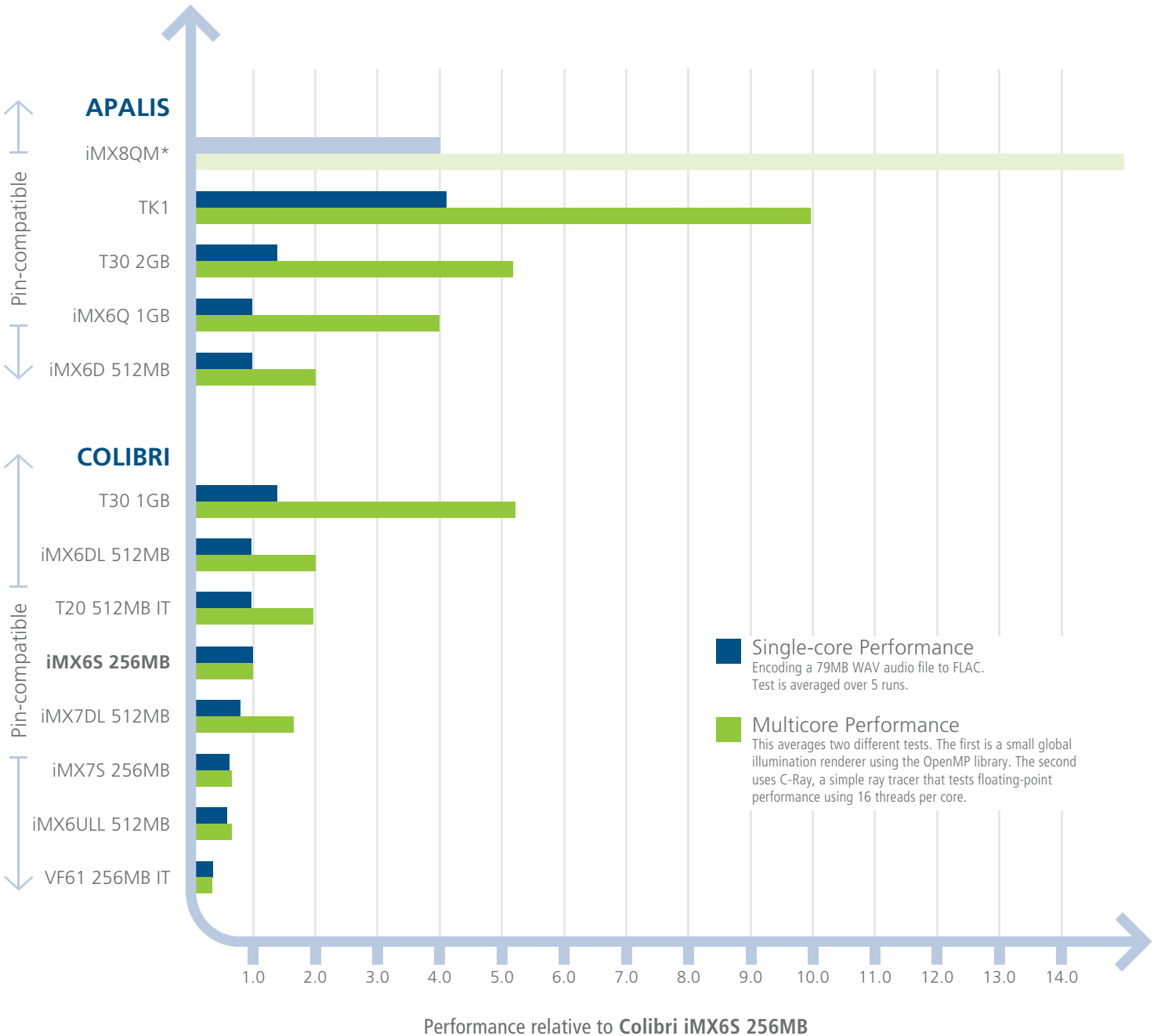
	Colibri iMX6ULL (IT)	Colibri VF61 IT	Colibri VF50 (IT)
			
SoC/CPU	NXP i.MX 6ULL 1x Arm Cortex-A7, Up to 900MHz	NXP Vybrid VF6xx 1x Arm Cortex-A5, 500MHz	NXP Vybrid VF5xx 1x Arm Cortex-A5, 400MHz
Microcontroller	–	1x Arm Cortex-M4F, 167MHz	–
DSP	–	–	–
Memory			
RAM	256MB/512MB DDR3L (16 Bit)	256MB DDR3 (16 Bit) (or 128MB with ECC)	128MB DDR3 (16 Bit) (or 64MB with ECC)
Flash	512MB SLC NAND	512MB SLC NAND	128MB SLC NAND
Connectivity			
USB 2.0	1x Host/1x OTG	1x Host/1x OTG	1x Host/1x OTG
Ethernet	10/100 Mbit with IEEE 1588 (+2nd RMII)	10/100 Mbit with IEEE 1588 (+2nd RMII)	10/100 Mbit with IEEE 1588 (+2nd RMII)
Wi-Fi/Bluetooth	802.11ac/BT 5	–/–	–/–
External Bus	–	–	–
SD/MMC/SDIO	2x	2x	2x
I2C/SPI	3x/3x	4x/4x	4x/4x
UART	8x	5x	5x
PWM	8x	17x	18x
Analog Input	7x/8x	12x	16x
One-Wire	–	–	–
CAN	2x	2x	2x
GPIOs	Up to 94	Up to 99	Up to 103
Multimedia			
Display Controller	Single	Single	Single
2D/3D Acceleration	–/–	–/–	–/–
Video Decoder	–	–	–
Display Serial Interface	–	–	–
LVDS	–	–	–
HDMI	–	–	–
RGB	1366 x 768 x 18bpp	1024 x 768 x 24bpp	1024 x 768 x 24bpp
Resistive Touch	4 Wire	4 Wire	4 Wire
Analog Audio	–	Line-In, Line-Out, Mic-In	–
Camera Parallel Interface	1x 8/10/16/24 Bit	1x 8/10 Bit	1x 8/10 Bit
Camera Serial Interface	–	–	–
Software			
Operating Systems	Torizon, Linux	Linux, Windows Embedded Compact 7/2013/CE 6.0, FreeRTOS	Linux, Windows Embedded Compact 7/2013/CE 6.0
Runtime License	–	Windows Embedded Compact 2013	Windows Embedded Compact 2013
Physical			
Size	67.6 x 36.7 x 6.2 mm	67.6 x 36.7 x 6.2 mm	67.6 x 36.7 x 6.2 mm
Temperature	0° to +70°C/IT: –40° to +85°C	IT: –40° to +85°C	0° to +70°C/IT: –40° to +85°C
Vibration/Shock	EN 60068-2-6/50g 20ms	EN 60068-2-6/50g 20ms	EN 60068-2-6/50g 20ms
Power Dissipation	0.4 - 0.6/1.2 W	0.6 - 0.9 W	0.5 - 0.8 W
Minimum Availability	2028	2028	2028

COLIBRI **CARRIER BOARDS**

	Colibri Evaluation Board	Iris Carrier Board	Viola (Plus) Carrier Boards	Aster Carrier Board	Colibri Partner Carrier Boards[1]
					
Connectivity					
USB 2.0	4x Host, 1x OTG/Client	1x Host, 1x OTG	2x Host, 1x Client (Shared)	2x Host, 1x Client (Shared)	Up to 4x Host
Ethernet	10/100 Mbit	10/100 Mbit	10/100 Mbit	10/100 Mbit	Up to 2x 10/100 Mbit
SD/MMC/SDIO	SD/MMC	Micro SD	Micro SD	SD/MMC	SD/MMC
I2C/SPI	4x/4x	1x/1x	1x/1x	1x/1x	1x/1x
UART/IrDA	2x RS232, 1x RS422/485/1x IrDA	3x RS232/–	3x TTL/–	2x TTL, 1x USB-UART/–	1x RS422, 1x RS485/–
PWM	4x	4x	4x	4x	Up to 4x
Analog Input	4x	4x	4x	4x	Up to 4x
CAN	1x	–	1x (Available with Colibri VFxx and iMX)	1x (Available with Colibri VFxx and iMX)	Up to 2x
GPIOs	Up to 158	Up to 26	Up to 35	Up to 39	Up to 24
Switches/LEDs	6x/4x	–	–	–/3x	–
RTC on Board	✓	✓	✓*	✓	✓
Extension Compatibility	–	–	–	Arduino® UNO and Raspberry Pi® B+	–
Multimedia					
Video Out	VGA/DVI-I	DVI-I	–	VGA	VGA/HDMI
LCD Interface	RGB/LVDS	RGB/LVDS	RGB	RGB	RGB/LVDS
Resistive Touch	4/5 Wire	4/5 Wire	4 Wire	4 Wire	Up to 4/5 Wire
Analog Audio	Line-In, Line-Out, Mic-In	Line-In, Line-Out, Mic-In	Line-In, Line-Out, Mic-In (On header)*	Line-In, Line-Out, Mic-In	Line-In, Line-Out, Mic-In
Camera Parallel Interface	1x	–	1x (On header)*	1x	–
Physical					
Supply Voltage	7 - 27V DC	6 - 27V DC	5V DC +/– 5%	5V DC +/– 5%	9 - 36V DC
Size	200 x 200 mm	100 x 72 mm (Pico ITX)	74 x 74 mm	100 x 80 mm	–
Temperature	–	–10° to +70°C/–20° to +85°C#	–40° to +85°C	–25° to +85°C	–40° to +85°C
Altium CAE Data Freely Available	✓	✓	✓	✓	–
Volume Production	–	✓	✓	–	✓

*Only assembled on the Viola Plus.
#The LVDS picture quality might be lower at this range.
[1]This references all available carrier boards from partners, with the maximum number of interface values shown for all.

TORADEX PRODUCTS **PERFORMANCE GRAPH**



Note:

All benchmarks were conducted under Toradex's Linux BSP 2.7.3 with all compiler optimizations available for the architecture. Dynamic Frequency and Voltage Switching were disabled.
All numbers are relative to the performance of a Colibri iMX6S.
*Preliminary test conducted with pre-production silicon and software.
For the Colibri iMX8X, the performance is currently being ascertained.

APPLICATIONS

Industrial Automation and Robotics

- Optimized for real-time applications
- Rugged and reliable, designed to run 24/7
- Ecosystem support for CODESYS, EtherCAT, HALCON, Qt, QNX, …
- RS485, RS422, Modbus, CAN, GbE, USB 3.0, camera interface,…

roboception

3D Real-Time Computer Vision: rc_visard™

The rc_visard for industrial robotic systems enables 3D perception and localization. It is built with the Apalis TK1 and utilizes stereo cameras.

Medical

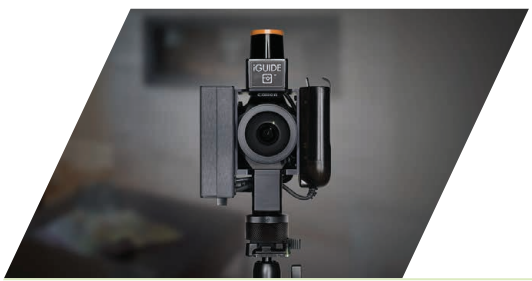
- Proven in certified medical devices around the world
- Extensive functional testing and trackability
- Heterogeneous multicore and SoC virtualization to isolate critical tasks
- 10+ years of product availability with proven track record

Connected Infusion Pump: UniQueCONCEPT™

Network-enabled infusion pump to reduce medical errors, utilizing a Colibri SoM.

arcomed ag Systems

Test and Measurement



- Ready-to-use industrial grade Linux
- Out-of-the-box Qt and Crank Storyboard support for user-friendly UIs
- Wi-Fi and Bluetooth 5 connectivity
- Altium reference designs

iGUIDE

iGUIDE® Camera by Planitar

iGuide quickly builds a floor map with immersive 360° pictures. HDR pictures are processed in the GPU of the Apalis iMX6.

Transportation and Special Vehicles

- Multiple CAN bus interfaces for SAE J1939, ODB, CANOpen
- Vibration- and shock-tested
- High-performance OpenGL™ graphics
- Industrial temperature rating: –40° to +85° C

GEODETICS INCORPORATED Precision in Motion.

Rugged Navigation Platform

Geodetics offers navigational solutions such as the Geo-APNT®, which is a highly reliable small form factor mil-spec platform built around the Colibri T30/T20 SoMs.

Building Automation and Security

- Built-in security
- Over-the-air update functionality
- GPU-accelerated computer vision
- Small and power-efficient

Wireless Manager for Networked Light Management Systems

The Wireless Manager is a ceiling or wall mounted control device that collects, processes and communicates lighting control information to ENCELIUM® EXTEND control modules, wall stations, and other devices via a mesh network based on ZigBee® standards.

OSRAM

Toradex
Swiss. Embedded. Computing.

Europe

Switzerland

Toradex AG
Altsagenstrasse 5
6048 Horw
Switzerland
T: +41 41 500 48 00
info@toradex.com

Americas

USA

Toradex Inc.
219 1st Ave S, Suite 410
Seattle, WA 98104
United States
T: +1 (206) 452 2031
+1 (800) 871 6550
F: +1 (206) 452 2033
seattle@toradex.com

Brazil

Toradex Brasil
R. Luiz Spiandorelli Neto
60 - Sala 802 - Ed. Paineiras
CEP: 13271-570
Valinhos - São Paulo
Brazil
T: +55 19 3327 3738
brazil@toradex.com

Asia Pacific

India

Toradex Systems (India) Pvt. Ltd. (Bengaluru)
3rd Floor, #63, RMZ Gateway
100 Feet Road
Koramangala 4th Block
Bengaluru - 560 034
India
T: +91 80 4111 9096
india@toradex.com

Toradex Systems (India) Pvt. Ltd. (New Delhi)
816, Indraprakash Building 21
Barakhamba Road
New Delhi - 110 001
India
T: +91 11 4101 7183
india@toradex.com

Toradex Systems (India) Pvt. Ltd. (Pune)
93 (409), B Wing, 4th Floor, Shreenath Plaza
Dnyaneshwar Paduka Chowk
FC Road, Pune - 411 005
India
T: +91 20 4125 5777
india@toradex.com

Vietnam

Toradex Vina Co. Ltd.
348/58 Hoang Van Thu
Ward 4, Tan Binh District
Ho Chi Minh City
Vietnam
T: +84 28 3602 9188
M: +84 90 8172 887
hcmc@toradex.com

China

Toradex (China) Ltd.
Room 1802
No.188 East Nan Dan Road
Xu Hui District
200030 Shanghai
PR of China
T: +86 21 5425 0902, 5438 0582
F: +86 21 5438 0582-101
M: +86 13 8189 03078
shanghai@toradex.com

Japan

Toradex K.K.
tokyo@toradex.com

Connect with us

Toradex AG I Altsagenstrasse 5 I 6048 Horw I Switzerland
T: +41 41 500 48 00 I info@toradex.com

www.**toradex**.com I **developer**.toradex.com I **community**.toradex.com I **labs**.toradex.com