TOPIC

Accelerate your development.

A family of System-on-Modules and development boards

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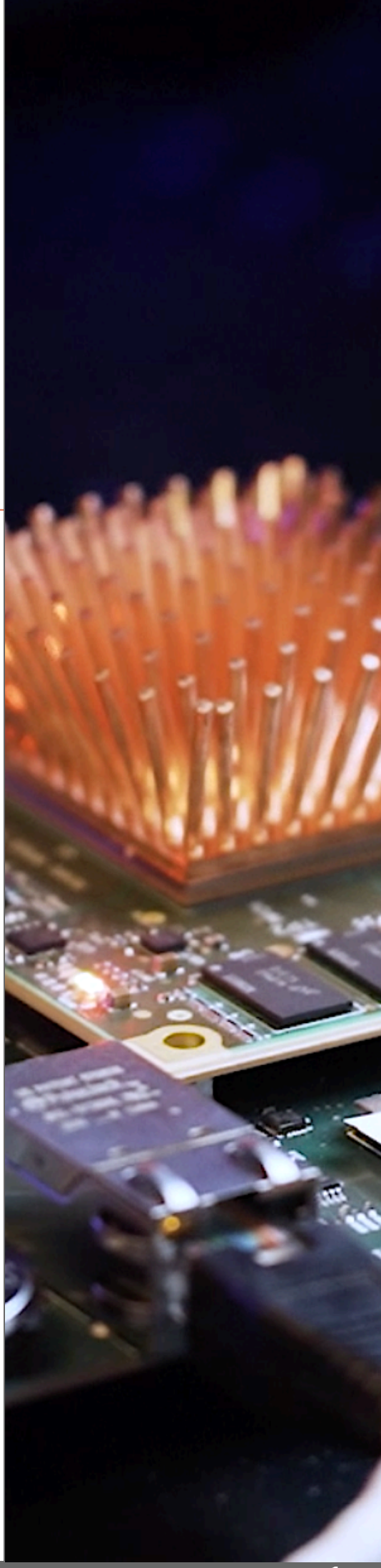

For more information go to www.topicembedded.com/products/system-on-modules
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Products portfolio

TOPIC Embedded Systems (TOPIC) offer a range of embedded solutions that assist developers of complex embedded systems to build their applications quickly, reliably and effectively.
Built on AMD System-on-Chip technology, products are available in the form of:

- **Miami System-on-Modules (SOMs)**
- **Florida development/carrier boards**
- **Board support packages based on embedded Linux**
- **FPGA and processor building blocks in the form of e.g. C/C++ and VHDL code**

Supported by our development organisation

A huge benefit of working with TOPIC products is the accessible design support by the TOPIC Projects organization. Apart from in-depth background knowledge of the products, the design teams have significant application development expertise.

Our products are supported by our development organization to help with:

- Design and development services for system engineering and software-, FPGA- and hardware design
- Customization services based on Florida development/carrier boards for rapid prototyping and product development
- Full-custom product development for optimized customer-specific designs
- Application software development (embedded, PCs, cloud, mobile devices)
- Operating System porting as well as BSP/ driver development for e.g. Linux, FreeRTOS and Windows
- Certified development processes for e.g. medical (ISO13485) and safety (CENELEC SIL3/4) projects

Miami System-on-Modules

Technology and concept

The Miami System-on-Modules (SOM) are based on the state-of-the-art silicon technologies of AMD: Zynq 7000, Ultrascale+ and Versal. Their System-on-Chips (SoC) combine processor(s), FPGA logic and accelerators into versatile devices, meeting the latest demanding requirements of applications in medical, industrial, avionics and test and measurement domains. The Miami SOMs enable embedded cutting- edge applications in stand-alone and connected environments. The modules combine high performance and high-density programmable logic with dedicated hardened IP blocks, such as DSP cores, memory controllers, PCIe endpoints and Ethernet MACs. The unique combination of multi-core application processors, real-time processors, optional GPU and AI engines, and feature-rich FPGA fabric makes the Miami a versatile and agile platform for various applications. The multi-gigabit high- speed transceivers enable communication links compatible with different interface standards, such as JESD204, PCIe, SGMII, DisplayPort, SATA, Aurora and SDI.

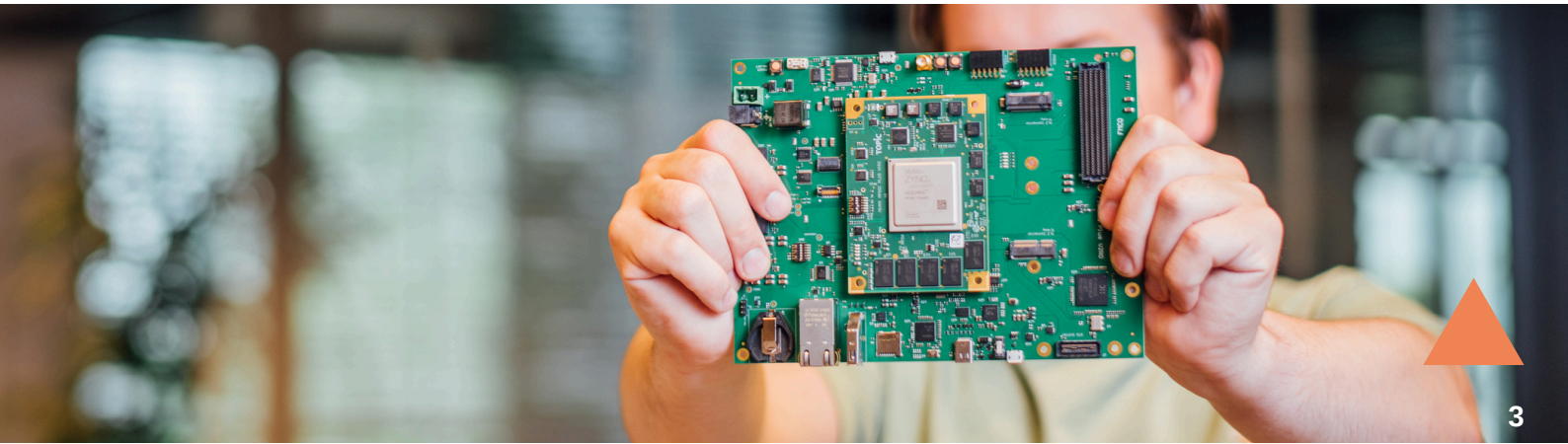
The Miami SOMs integrate all system components required to bring-up an embedded system including memory, power supplies, debugging facilities and connectivity interfaces at MAC and PHY level. The Miami family of SOMs provide best in class platforms for balancing performance and power consumption, making it a perfect solution for applications that need processing power, high-speed interfaces and have demanding reliability and quality requirements. Key features of the SOM are the ability to optimize system interfaces and component assemblies as well as to execute true real-time arithmetic and control,. The module comes with actively supported board support packages (BSP), including a maintained Linux distribution, supporting the AMD Vitis SDK. All the Miami SOMs are compatible and usable with one of our Florida carrier boards, allowing for rapid prototyping and evaluation purposes.

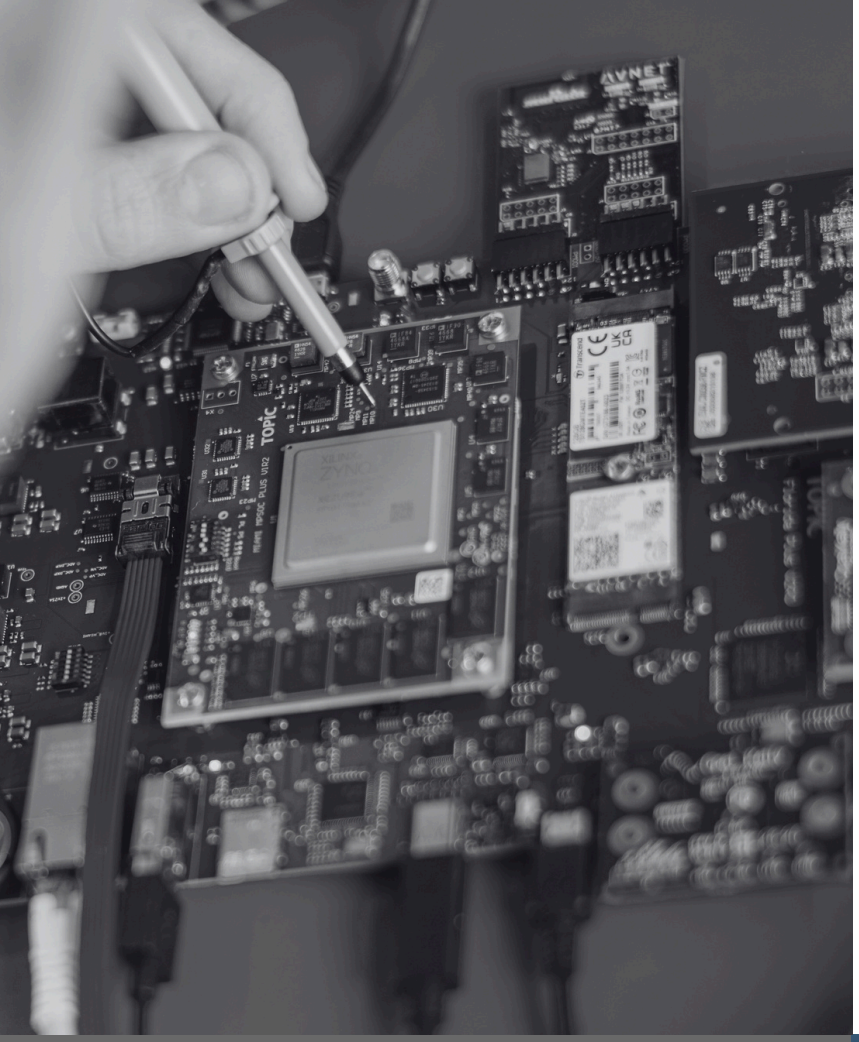
Physical hardware or a SOM-as-IP?

A SOM in the traditional sense is a physical board, integrating the features as described, exposing electrical signals on the connectors towards the mandatory carrier board. The signal assignments, form-factor, pin count and location are all fixed. Occasionally, these constraints are limiting your end-product design. What if you can integrate the SOM circuits, including layer stack-up, placement and routing in your carrier board design and seamlessly fuse your circuits with the SOM-as-IP? All the benefits of a SOM, none of the disadvantages.

The Miami SOM-as-IP is a completely verified and qualified SOM design, available as schematic and PCB design. It has become an integral part of the refence design that you tailor exactly to your needs. There are no connectors to interface with board peripherals and it offers you more flexibility in the board shaping. Never a short of SOC available pins. But most important: the peripheral utilization as well as the signal- and power integrity performance are guaranteed.

The SOM-as-module price is based on the physical variant you need and the volume you buy. The SOM-as-IP pricing is based on a license model. TOPIC Products can support various license models, tailored to your business case. The SOM-as-IP comes with mandatory integration support of our engineering department, covert by the license.





Evaluation and prototyping

Based on the Florida reference designs, customized carrier board variances can be realized reliably, with fast turn-around times. The reference design is available for you as board to start-off already with your prototyping application software and FPGA firmware.

Typical application areas include applications requiring a fair amount of processing power combined with a small system footprint, including but not limited to (secure) communication, high-performance computing, aerospace & defense, audio/video applications, medical, and industrial imaging.

Benefits

- A family of embedded computing solutions, focused on reliability, versatility and certifiability
- Scalable in performance, power, form factor and capabilities
- Based on AMD Zynq 7000, Zynq Ultrascale+ and Versal ACAP System-on-Chip (SOC) technology
- Provides a rich set of state-of-the-art peripherals

Key features

- Small dimensions: <100 mm x <70 mm
- On-board high efficiency power supplies
- Configurable board I/O voltages
- Fast booting capabilities using different processor boot stages and FPGA fabric
- High performance and reliable SAMTEC board-to-board connectors
- On-board DDR3/4 memory with optional ECC support
- Advanced debug support
- Industrial temperature range (-40°C to +85°C)

Miami SOM family in a glance

Miami

- AMD SOC technology: Zynq 7000 (7012S, 7015, 7030)
- Technology node: 28 nm
- Processors: Single or dual core ARM Cortex A9
- Logic density: 55k-125k cells
- Connectors: 2x 120 pins
- Gigabit transceivers: 4x GTH (PL)
- DDR-SDR memory: 1GB 32b DDR3 (PS)
- Introduction date: 2016
- Product details: Miami

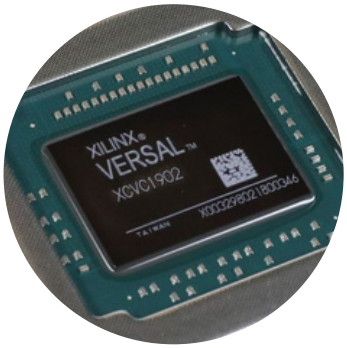
Miami Plus

- AMD SOC technology: Zynq 7000 (7035, 7045, 7100)
- Technology node: 28 nm
- Processors: Single/dual core ARM Cortex A9
- Logic density: 275k-444k cells
- Connectors: 2x 120 pins, 1x 180 pins
- Gigabit transceivers: 16x GTH (PL)
- DDR-SDR memory: 1GB 32b DDR3 (PS), 1GB 32b DDR3 (PL)
- Introduction date: 2016
- Product details: Miami Plus

Miami Plus

- AMD SOC technology: Zynq Ultrascale+ (ZU6, ZU9, ZU15)
- Technology node: 16 nm
- Processors: Dual/quad core ARM, Cortex A53, Dual core ARM, Cortex R7, ARM Mali-400 GPU
- Logic density: 469k-747k cells
- Connectors: 2x 120 pins, 1x 180 pins
- Gigabit transceivers: 3x GTP (PS), 16x GTH (PL)
- DDR-SDR memory: 2GB 72b DDR4 (PS)
- Introduction date: 2020
- Product details: Miami Plus

Miami Ultra (IP)



- AMD SOC technology: Versal Core (VC1502, VC1702, VC1802,VC1902), Prime (VM1502, VM1802) , Edge (VE1752)
- Technology node: 7 nm
- Processors: Dual core ARM Cortex A72, Dual core ARM Cortex R5F, AI Engine-ML Tiles
- Logic density: 981k – 1968k cells
- Connectors: Direct PCB interconnect
- Gigabit transceivers: 32x GTYP (PL/PS)
- DDR-SDR memory: 3x 8/16GB 64b+ECC DDR4 (PL/PS)
- Introduction date: Under development
- Product details: Miami Ultra

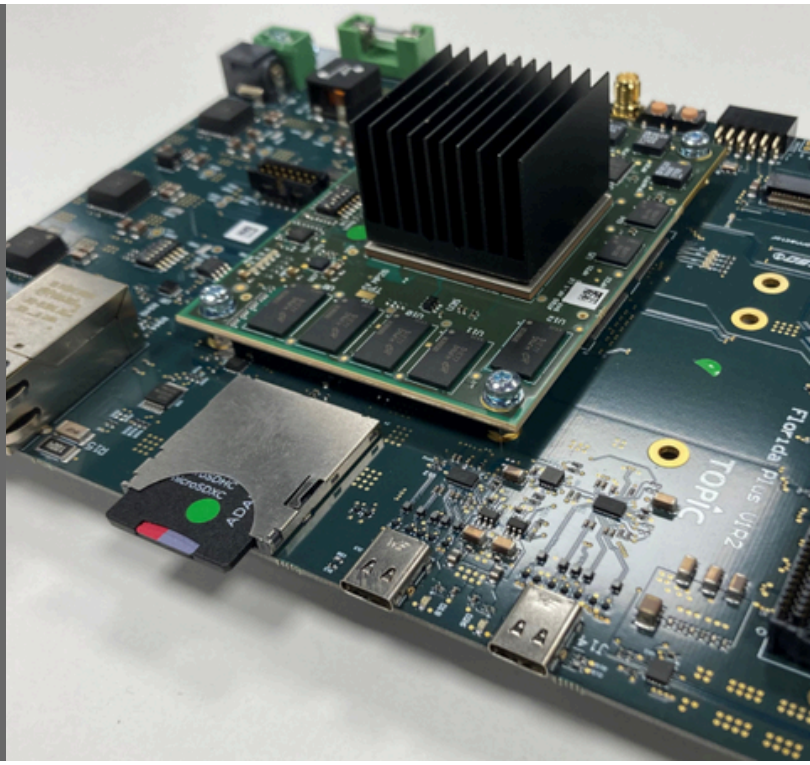
Florida carrier boards

Benefits

- Evaluation boards for the Miami System-on-Modules
- Development platform for kick-starting a design
- Reference designs, schematics and printed circuit board layouts available
- Customize the board to your own needs or make use of our fast-turn-around board customization services

Key features

- Gigabit transceiver support for PCI Express, SATA, Aurora
- Ethernet LAN interface
- Display interfaces
- Opal Kelly SYZYGY compliant interfaces
- Digilent PMOD compliant interfaces
- FMC compliant interfaces
- Bluetooth, WiFi, mass-storage
- USB-C, 3.0 and 2.0 OTG
- UART via USB



Evaluation and prototyping

The Florida carrier boards are designed to evaluate the capabilities of the AMD Zynq® or Zynq Ultrascale+® based Miami System-on-Modules (SoM) and provide a means for rapid prototyping. The boards offer a rich pool of peripherals. Together with an accessories bag, a Florida carrier board and Miami SoM of choice form a complete development platform. The kit configuration helps kick-starting your application development in an early stage, giving access to the complete feature set of the processing system using the provided reference design and Linux board support package (BSP).

The interfaces on the carrier boards provide functionality to support data acquisition, visualization, human-machine interfaces, and communication. With a Florida platform, an application can be prototyped and validated. Software and FPGA reference designs, schematics and printed circuit board layout are available as a starting point for a dedicated carrier board design. The functions on the carrier boards are validated in different applications, guaranteeing high quality circuitry. TOPIC also offers driver development support as a service. The same is applicable for the carrier board customization: TOPIC offers board design and production services to facilitate quick and reliable hardware realization.

Florida carrier boards are off-the-shelf available in a number of configurations. Each Florida supports a specific Miami SoM. The carrier boards differ in supported peripherals and evaluation context. The peripherals supported meet the capabilities of the processing system as well as the intended use cases of the FPGA fabric and other SoC features. The Florida Plus supports the latest generation peripherals and communication interfaces, for the Miami MPSOC Plus capabilities.

Peripheral diversity

Given the flexibility of the connectors and interfaces on the carrier boards, a variety of functionality is made available: SATA, M.2 based PCIe, Gigabit Ethernet, SDIO/SDcard interface, FMC and PMOD Generic I/O expansion ports, DisplayPort/HDMI/DVI/MIPI video capture and generation, virtual COM ports, JTAG debug ports, LEDs and switches. This makes it possible to prototype a complete instrument containing visualization, communication, control, and data storage/offloading.

Customization services

Customized application

TOPIC offers Florida carrier board customization services to rapidly create a custom carrier-board according to specific requirements with short times and optionally succeeded by the production and assembly of the boards. Peripherals used on the evaluation boards are applied in various applications, resulting in robust circuit design, thorough testing, extensive software support and compliant (EMC) qualification. Customization can be supported by our board- and reference designs. The carrier board schematics and board layout files are available as inspiration and under certain conditions as Mentor Graphics or Altium design files.

TOPIC can customize a carrier board according to specific needs. As an experienced product development organization, we design and manufacture customized boards according to the requirements we agreed upon, as well as test and qualification criteria that are applicable. As the Miami SoMs are qualified according to industrial design constraints, TOPIC customized carrier boards can comply to these same constraints when required.

Prototype production of the carrier boards is always carried-out under the responsibility of TOPIC as this is part of the qualification process. Thereafter, the choice of production partner is open. Feel free to contact TOPIC to discuss the possibilities.

Benefits

- The development services provided by TOPIC are flexible and customer specific
- Customization services are available for board design, software development and FPGA design
- Application software development based on e.g. Qt, OpenCV, Python, Docker, ROS, .NET
- Operating System porting as well as (Linux) BSP/ driver development and support
- RAMS (Reliability, Availability, Maintainability, Safety) aware development
- Development processes executed according to e.g. IEC60601, ISO13485 and ISO14971 standards.

About TOPIC Embedded Systems

“We make the world a little better, healthier and smarter every day”. Our mission statement reflects exactly what we do: developing innovative systems for our customers. The way we do that, is by combining our customers domain specific know-how with our expertise in hardware and software development. This results in the most optimal product for our customers. TOPIC has a strong background of more than 27 years in developing systems, which can contain embedded-, application- and cloud software, FPGA code and PCB designs. We help customers in different domains such as medical, imaging, machine control & safety. With over 130 employees, we are a strong and established company with our headquarters in Best, the Netherlands. TOPIC has an ISO13485 (medical) certified Quality Management System and adopted the Agile way-of-working for optimal interaction with the customer.

Premier Partnership with AMD | TOPIC is one of the few AMD Premier Adaptive Computing partners in the world. Our partnership started in 2009 and since than we have been working closely together over the last years.

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Product details Miami

Miami type	Miami	Miami	Miami
AMD SOC Technology	AMD ZYNQ 7000	AMD ZYNQ 7000	AMD ZYNQ 7000
Order number	mia-7z12-1-2-3	mia-7z15-1-2-3	mia-7z30-1-2-3
FPGA			
Device*	XC7Z012S-CLG485-1	XC7Z015-CLG485-1	XC7Z030-SBG485-1
Technology	Artix®-7	Artix®-7	Kintex®-7
Logic cells	55K	74K	125K
Flip Flops	68,8	92,4	157,2
Block RAM	320KB	380KB	1.060MB
UltraRAM	-	-	-
DSP slices	120	160	400
GTx (PL controlled)	4x (3.75Gb/s each)	4x (3.75Gb/s each)	4x (6.6 Gb/s each)
Processor System			
Application Processor (cores)	ARM Cortex-A9 (single)	ARM Cortex-A9 (dual)	ARM Cortex-A9 (dual)
CPU Performance	666MHz	666MHz	800MHz
Co-Processor	1x ARM NEON™	2x ARM NEON™	2x ARM NEON™
Real-Time Processor (cores)	-	-	-
H.264/H.265 Video Codec	-	-	-
AI Engine-ML Tiles	-	-	-
Network-on-Chip M/S ports	-	-	-
Graphics Processor	-	-	-
GTx (PS controlled)	-	-	-
Memory			
Cache (application processor)	L1: 32KB instruction/core, 32KB data/core, L2: 512KB		
Cache (real-time processor)	-		
Cache (GPU)	-		
SDRAM (PS/PL controlled)	DDR3/DDR3L @ 533MHz, 1 GB		
SDRAM (PL only controlled)	-		
NOR	Quad-speed SPI, 32MB		
NAND	-		
EEPROM	4 Kb configuration/parameter storage		
User programmable/configurable interfaces			
PS connected I/O	26x PS controlled 1V8 I/O (MIO)		
PL connected HD I/O	49x programmable user I/O (HR)		
PL connected HP I/O	47x + 45x programmable user I/O (HP)		
Safety and security			
Supported safety standards	ISO26262, IEC61508, IEC62061, ISO13849, DO-254/DO178b		
Certification support	AMD functional safety package		
Security support	Anti-tempering, cyber-security, embedded encryption, secure-boot, isolation		
Time synchronisation	Precision timing (IEEE 1588 HA), White Rabbit, SyncE, PTP		
Dedicated interfaces on SoM connector			
Network	2x 10/100/1000 Mbps Ethernet		
USB	2x USB OTG 2.0		
PS peripherals	2x CAN (ISO 11898-1, 2.0A, 2.0B), 2x UART, 2x SDIO, 2x I2C, 2x SPI		
Gigabit transceivers	SATA-2/3, PCIe GEN2 4 lanes, Aurora, CoaXPress, HDMI, USB 3.0		
PCI-Express (end-point/root-complex)	GEN2 - 4 lanes		
GTx (PS controlled)	-		
GTx (PL controlled)	4x (SATA-2/3, PCIe GEN3, 40Gb Ethernet, CoaXPress, HDMI)		
Miscellaneous	GPIOs, SD/SDIO 2.0/MMC 3.31 compliant controllers		
JTAG	PL JTAG chain for carrier board programming		
Debug	Debug UART, console		
Supply			
Power supply input	3.3V/4A via connector On-board voltage regulation, current measurement for PL and PS		
Logic I/O supply output	Configurable I/O standards and voltages		
Software support			
Bootloader / BSP	U-Boot		
Boot resources	JTAG, NOR, (carrier board) SD-Card		
Operating System	Yocto/PetaLinux managed Linux kernel/BSP		
FPGA reference design	Vivado BSP and module configuration		
Carrier board (order number)	Florida Gen (flo-gen)		
Mechanical and environmental			
Dimensions	65mm x 68.4mm		
Connectors	2x 120 pin Samtec high performance mezzanine carrier board connectors		
Temperature	Industrial graded, IEC 60068-2-38:2009		
Temperature and humidity	0%-95%, non-condensing, IEC 60068-2-38:2009		
EMC/EMI	EN 55032 / IEC 61132, EN 61326, IEC 55024		
Shock and vibration	MIL-STD-202F (method 204D), MIL-STD-202F (method 213B)		

Product details Miami Plus

Miami type	Miami Plus	Miami Plus	Miami Plus
AMD SOC Technology	AMD ZYNQ 7000	AMD ZYNQ 7000	AMD ZYNQ 7000
Order number	miap-7z35-2-2-3	miap-7z45-2-2-3	miap-7z100-2-2-3
FPGA			
Device*	XC7Z035-FFG900-2	XC7Z045-FFG900-2	XC7Z100-FFG900-2
Technology	Kintex®-7	Kintex®-7	Kintex®-7
Logic cells	275K	350K	444K
Flip Flops	343,8	437,2	554,8
Block RAM	17,6	19,1	26,5
UltraRAM	-	-	-
DSP slices	900	900	2020
GTx (PL controlled)	16x (10.3125 Gb/s each)	16x (10.3125 Gb/s each)	16x (10.3125 Gb/s each)
Processor System			
Application Processor (cores)	ARM Cortex-A9 (dual)	ARM Cortex-A9 (dual)	ARM Cortex-A9 (dual)
CPU Performance	2x 800MHz	2x 800MHz	2x 800MHz
Co-Processor	2x ARM NEON™	2x ARM NEON™	2x ARM NEON™
Real-Time Processor (cores)	-	-	-
H.264/H.265 Video Codec	-	-	-
AI Engine-ML Tiles	-	-	-
Network-on-Chip M/S ports	-	-	-
Graphics Processor	-	-	-
GTx (PS controlled)	-	-	-
Memory			
Cache (application processor)	L1: 32KB instruction/core, 32KB data/core, L2: 512KB		
Cache (real-time processor)	-		
Cache (GPU)	-		
SDRAM (PS/PL controlled)	DDR3/DDR3L @ 533MHz, 1 GB		
SDRAM (PL only controlled)	DDR3/DDR3L @ 533MHz, 1 GB		
NOR	2x Quad-speed SPI, 64MB		
NAND	-		
EEPROM	4 Kb configuration/parameter storage		
User programmable/configurable interfaces			
PS connected I/O	49x + 47 + 48 Configurable 1V8, 2V5 and 3V3 user I/O (HR)		
PL connected HD I/O	48x Configurable 1V8 user I/O (HP)		
PL connected HP I/O	38x PS controlled 1V8 I/O (MIO)		
Safety and security			
Supported safety standards	ISO26262, IEC61508, IEC62061, ISO13849, DO-254/DO178b		
Certification support	AMD functional safety package		
Security support	Anti-tempering, cyber-security, embedded encryption, secure-boot, isolation		
Time synchronisation	Precision timing (IEEE 1588 HA), White Rabbit, SyncE, PTP		
Dedicated interfaces on SoM connector			
Network	2x 10/100/1000Mbps Ethernet		
USB	2x USB OTG 2.0		
PS peripherals	2x CAN (ISO 11898-1, 2.0A, 2.0B), 2x UART, 2x SDIO, 2x I2C, 2x SPI		
Gigabit transceivers	SATA-3, PCIe GEN2 8 lanes, Aurora, CoaXPress, HDMI, USB 3.0		
PCI-Express (end-point/root-complex)	GEN2 – 8 lanes		
GTx (PS controlled)	-		
GTx (PL controlled)	16x (SATA-2/3, PCIe GEN3, 40Gb Ethernet, CoaXPress, HDMI)		
Miscellaneous	GPIOs, SD/SDIO 2.0/MMC 3.31 compliant controllers		
JTAG	PL and PS JTAG chain for shared debugging		
Debug	Debug UART, console		
Supply			
Power supply input	15V/3A		
Logic I/O supply output	Configurable I/O standards and voltages		
Software support			
Bootloader / BSP	U-Boot		
Boot resources	JTAG, NOR, (carrier board) SD-Card		
Operating System	Yocto/PetaLinux managed Linux kernel/BSP		
FPGA reference design	Vivado BSP and module configuration		
Carrier board (order number)	Florida Test (flo-test)		
Mechanical and environmental			
Dimensions	85mm x 68.5mm		
Connectors	2x 120 pins + 1x 180 pins Samtec high performance mezzanine carrier board connectors + 1x 3 pin fan connector		
Temperature	Industrial grade		
Temperature and humidity	IEC 60068-2-1 (Cold), IEC 60068-2-2 (Dry heat), IEC 60068-2-78 (Damp heat)		
EMC/EMI	EN 55032, IEC 61132, EN 61326, IEC 55024		
Shock and vibration	MIL-STD-202G (method 204D), MIL-STD-202G (method 213B)		

Product details Miami Plus

Miami type	Miami Plus	Miami Plus	Miami Plus
AMD SOC Technology	AMD ZYNQ MPSoC	AMD ZYNQ MPSoC	AMD ZYNQ MPSoC
Order number	miap-zu6-1-6-4-2	miap-zu9-1-6-4-2	miap-zu15-1-6-4-2
FPGA			
Device*	XCZU6-EG-1FFVB1156I	XCZU9-EG-1FFVB1156I	XCZU15-EG-1FFVB1156I
Technology	Ultrascale+®	Ultrascale+®	Ultrascale+®
Logic cells	469K	600K	747K
Flip Flops	429K	548K	682K
Block RAM	25.1Mbit	32.1Mbit	26.2Mbit
UltraRAM	-	-	31.5Mbit
DSP slices	1973	2520	3528
GTx (PL controlled)	16x (12.5 Gbit/s each)	16x (12.5 Gbit/s each)	16x (12.5 Gbit/s each)
Processor System			
Application Processor (cores)	ARM Cortex-A53 (quad)	ARM Cortex-A53 (quad)	ARM Cortex-A53 (quad)
CPU Performance	4x 1.2GHz	4x 1.2GHz	4x 1.2GHz
Co-Processor	4x ARM NEON™	4x ARM NEON™	4x ARM NEON™
Real-Time Processor (cores)	ARM Cortex R5 (dual)	ARM Cortex R5 (dual)	ARM Cortex R5 (dual)
H.264/H.265 Video Codec	-	-	-
AI Engine-ML Tiles	-	-	-
Network-on-Chip M/S ports	-	-	-
Graphics Processor	ARM Mali™-400 MP2	ARM Mali™-400 MP2	ARM Mali™-400 MP2
GTx (PS controlled)	3x (6 Gbit/s each)	3x (6 Gbit/s each)	3x (6 Gbit/s each)
Memory			
Cache (application processor)	L1: 32KB I / D per core, L2: 1MB, on chip memory 256 KByte		
Cache (real-time processor)	L1: 32KB I / D per core, tightly coupled memory 128 KByte per core		
Cache (GPU)	64 Kbyte		
SDRAM (PS/PL controlled)	2,4 or 8 GByte DDR4 with/without ECC (assembly option 32, 64 or 72 bits wide)		
SDRAM (PL only controlled)	-		
NOR	Quad-speed SPI, (64 MByte, 128 MByte, 256 MByte)		
NAND	0, 8, 16, 32 or 64 GByte pseudo-SLC or MLC		
EEPROM	32 Kbit I2C EEPROM storage		
User programmable/configurable interfaces			
PS connected I/O	PS connected 1.8V GPIO, multiplexed peripherals (MIO)		
PL connected HD I/O	HP and HD GPIO, 100 Ohm impedance controlled and length matched within quads		
PL connected HP I/O			
Safety and security			
Supported safety standards	ISO26262, IEC61508, IEC62061, ISO13849, DO-254/DO178b		
Certification support	AMD functional safety package		
Security support	Anti-tempering, cyber-security, embedded encryption, secure-boot, isolation		
Time synchronisation	Precision timing (IEEE 1588 HA), White Rabbit, SyncE, PTP		
Dedicated interfaces on SoM connector			
Network	10/100/1000Mbps Ethernet, (PHY included), IEEE 1588 and SyncE support		
USB	10G/40G/50G support (external PHY needed)		
PS peripherals	CAN (ISO 11898-1, 2.0A, 2.0B), UART, SDIO, I2C, SPI		
Gigabit transceivers	e.g. FPD link, SDI, TFT, HDMI (PL), DisplayPort (PS)		
PCI-Express (end-point/root-complex)	2x USB 3.0, including on-board ULPI media		
GTx (PS controlled)	3x (6 Gbit/s each, DisplayPort, PCIe, USB 3.0)		
GTx (PL controlled)	16x (PCIe GEN3/4, 40Gb Ethernet, USB 3.0, CoaXPress, HDMI, DisplayPort)		
Miscellaneous	GPIOs, SD/SDIO 2.0/MMC 3.31 compliant controllers		
JTAG	PL and PS JTAG chain for shared debugging		
Debug	Debug UART, console, PS JTAG, PL JTAG, 4 pins		
Supply			
Power supply input	9.0– 16.0 Vdc via carrier board connector, 50[W] maximum. On-board voltage regulation.		
Logic I/O supply output	Selectable I/O standards and voltages for I/O banks		
Software support			
Bootloader / BSP	U-Boot / Linux		
Boot resources	JTAG, QSPI-NOR, eMMC, SD-Card, USB		
Operating System	Topic Linux distribution on GitHub		
FPGA reference design			
Carrier board (order number)	Florida Plus (flo-plus)		
Mechanical and environmental			
Dimensions	95mm x 68.5mm		
Connectors	2x 120 + 1x 180 pin Samtec high performance mezzanine carrier board connectors + 1x 3 pin fan connector		
Temperature	Industrial grade		
Temperature and humidity	IEC 60068-2-1 (Cold), IEC 60068-2-2 (Dry heat), IEC 60068-2-78 (Damp heat)		
EMC/EMI	EN 55032, IEC 61132, EN 61326, IEC 55024		
Shock and vibration	MIL-STD-202G (method 204D), MIL-STD-202G (method 213B)		

Product details Miami Ultra (as IP)

Miami type	Miami Ultra				Miami Ultra	Miami Ultra	
AMD SOC Technology	AMD VERSAL AI Core				AMD VERSAL AI Edge	AMD VERSAL Prime	
Order number	miav-ip-vc1902	miav-ip-vc1802	miav-ip-vc1702	miav-ip-vc1502	miav-ip-ve1752	miav-ip-vm1802	miav-ip-vm1502
FPGA							
Device*	XCVC1***[9/8/7/5]***02-1MSEVSA2197				XCVE1752-1MSEVSA2197	XCVM1***[8/5]***802-1MSEVSA2197	
Technology	Versal® AI Core				Versal® AI Edge	Versal® AI Prime	
Logic cells	1968K	1600K	1312K	1032K	981K	1968K	981K
Flip Flops							
Block RAM	34Mbit	28Mbit	34Mbit	30Mbit	34Mbit	34Mbit	34Mbit
UltraRAM	130Mbit	91Mbit	130Mbit	130Mbit	130Mbit	130Mbit	130Mbit
DSP slices	1968	1600	1312	1032	1312	1968	1312
GTx (PL controlled)	VC1502: 32x GTY, all others: 44x GTY (32 Gbit/s each)						
Processor System							
Application Processor (cores)	ARM Cortex-A72 (dual)						
CPU Performance	2x 1.5GHz						
Co-Processor	2x ARM NEON™						
Real-Time Processor (cores)	ARM Cortex R5F (dual)						
H.264/H.265 Video Codec	-						
AI Engine-ML Tiles	400	300	304	198	304	-	-
Network-on-Chip M/S ports	28	28	21	21	21	28	21
Graphics Processor	-						
GTx (PS controlled)	-						
Memory							
Cache (application processor)	L1: 32KB I / D per core, L2: 1MB, on chip memory 256 KByte						
Cache (real-time processor)	L1: 32KB I / D per core, tightly coupled memory 128 KByte per core						
Cache (GPU)	-						
SDRAM (PS/PL controlled)	-						
SDRAM (PL only controlled)	3x, 8 or 16 GByte LPDDR4 with/without ECC (assembly option) 64 or 72 bits wide)						
NOR	Quad/octal-speed SPI, (128 MByte, 256 MByte)						
NAND	0, 16, 32, 64 or 128 GByte pseudo-SLC or MLC eMMC						
EEPROM	64 Kbit I2C EEPROM storage						
User programmable/configurable interfaces							
PS connected I/O	PS connected 1.8V GPIO, multiplexed peripherals (MIO)						
PL connected HD I/O	100 Ohm impedance controlled and length matched within SelectIO banks, 3V3 max.						
PL connected HP I/O	100 Ohm impedance controlled and length matched within SelectIO banks, 1V5 max.						
Safety and security							
Supported safety standards	ISO26262, IEC61508, IEC62061, ISO13849, DO-254/DO178b						
Certification support	AMD functional safety package, board pre-qualification						
Security support	Anti-tempering, cyber-security, embedded encryption, secure-boot, isolation						
Time synchronisation	Precision timing (IEEE 1588 HA), White Rabbit, SyncE, PTP						
Dedicated interfaces on SoM connector							
Network	10/100/1G/2.5G/10G/100G/400Gbps Ethernet, IEEE 1588v2 support						
USB	2x USB 3.0						
PS peripherals	UART, I2C, SPI, I2S, CAN (user configurable/selectable)						
Gigabit transceivers	e.g. FPD link, SDI, TFT, HDMI (PL), DisplayPort (PS), Ethernet, ADC/DAC						
PCI-Express (end-point/root-complex)	1x GEN4x16, 4x GEN4x8						
GTx (PS controlled)	-						
GTx (PL controlled)	16x (PCIe, 100Gb/40Gb Ethernet, CoaXPress, HDMI, DisplayPort, JESD204B/C)						
Miscellaneous	GPIOs, SD/SDIO 2.0/MMC 3.31 compliant controllers						
JTAG	PL and PS JTAG chain for shared debugging, ARM Core Connect support						
Debug	Debug UART, console, PS JTAG, PL JTAG, 4 pins						
Supply							
Power supply input	42-54 Vdc via carrier board connector, 100[W] maximum. On-board voltage regulation.						
Logic I/O supply output	Selectable I/O standards and voltages for						
Software support							
Bootloader / BSP	U-Boot						
Boot resources	JTAG, NOR, SD-Card						
Operating System	Topic Linux distribution on GitHub, AMD Vitis reference design						
FPGA reference design	Vivado reference design and module configuration						
Carrier board (order number)	Florida Ultra (flo_ultra)						
Mechanical and environmental							
Dimensions	80mm x 80mm						
Connectors	Not applicable. Wiring stubs on defined edges of the IP block						
Temperature	Industrial grade (extended temperature range on request)						
Temperature and humidity	IEC 60068-2-1 (Cold), IEC 60068-2-2 (Dry heat), IEC 60068-2-78 (Damp heat)						
EMC/EMI	EN 55032, IEC 61132, EN 61326, IEC 55024						
Shock and vibration	MIL-STD-202G (method 204D), MIL-STD-202G (method 213B)						
**) Some I/O pins have dedicated assignements on the SOM: LED output, switch input, hardware version ID, AD converter inputs*							

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