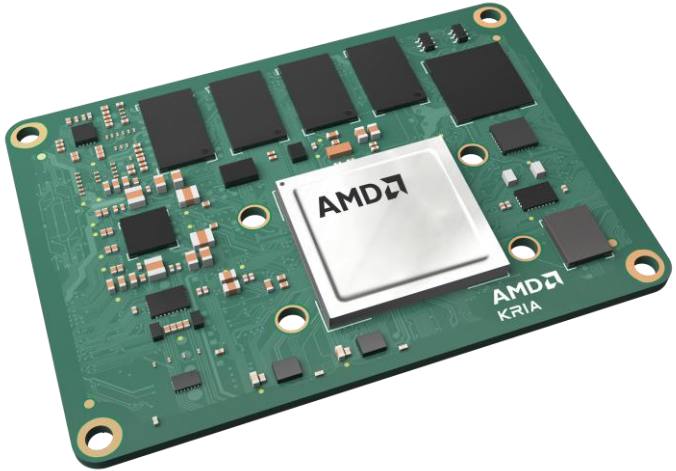
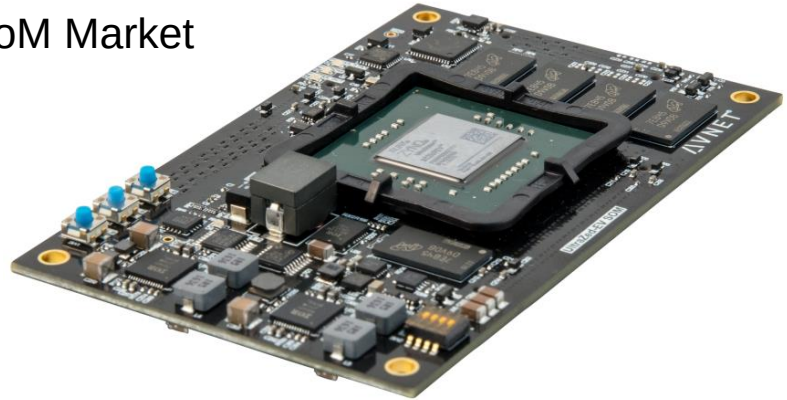
From SoC to SoM: AMD and AVNET Solutions

CERN – 3rd SoC Workshop 2023
Gregory Donzel - FPGA & SoC FAE – AVNET SILICA
Marco Hoefle, SoC Software & AIML Solutions FAE – AVNET SILICA

Agenda

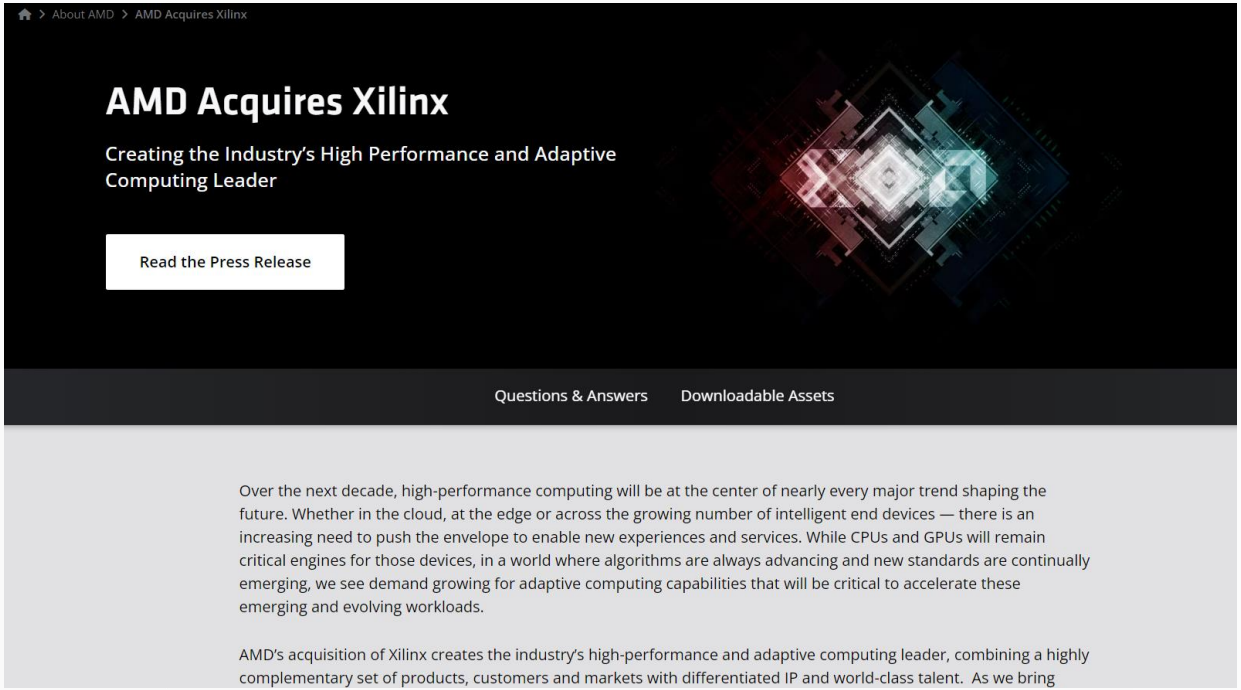


- **AMD: Versal Adaptive SoCs and Kria SoMs**
  - Versal Adaptive SoCs: Update and Roadmap
  - Kria SoMs: What's new?
- **AVNET : AMD Partner and SoM Manufacturer**
  - AVNET EMBEDDED : World leader on the SoM Market
  - AVNET SoMs :
    - Zynq US+ MPSoC/RFSoC based SoMs
    - Road to Versal…
- **Q&A**



AVNET

What happened since June 2021?...



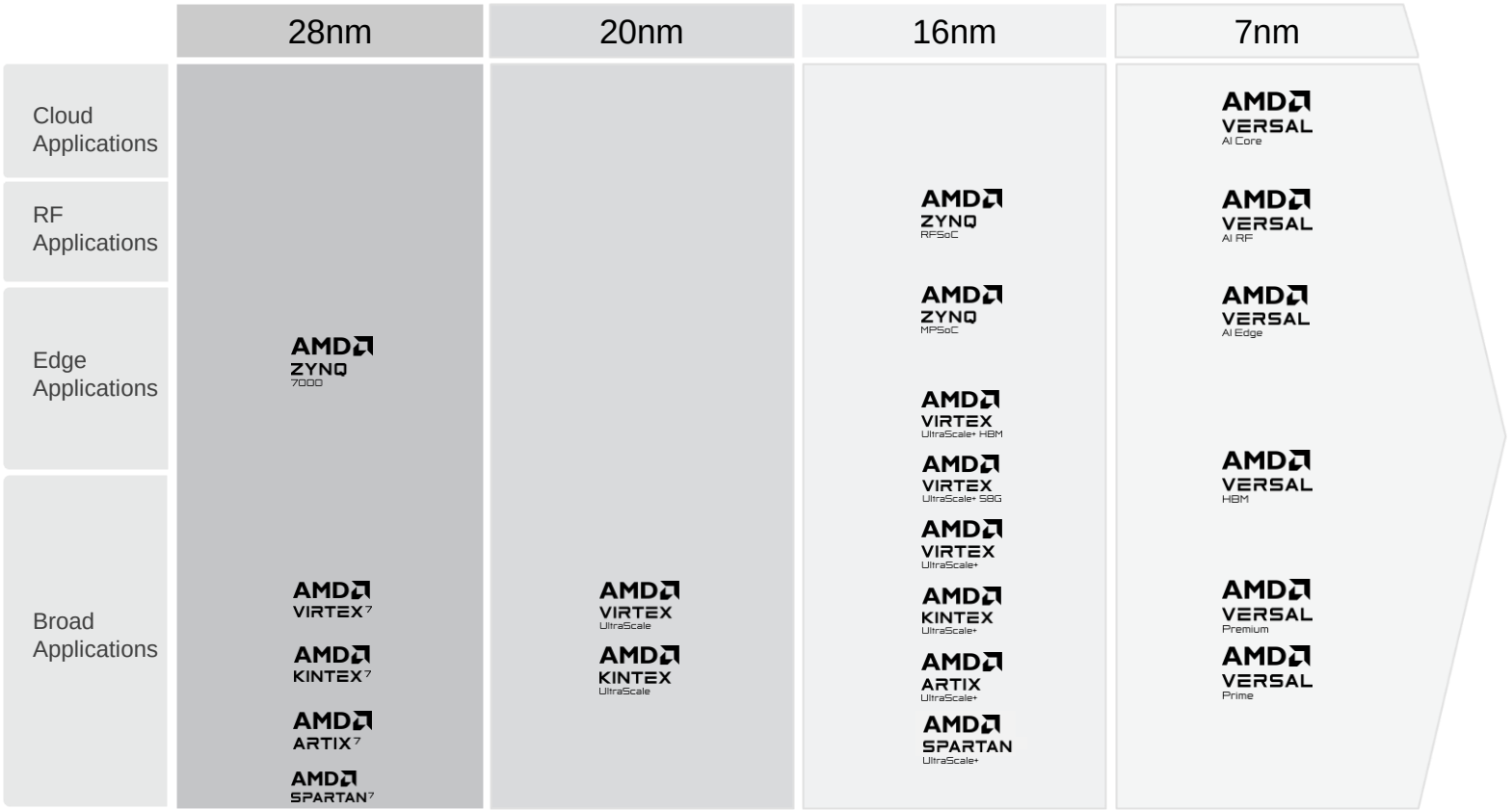
XILINX

AMD
together we advance_

What Changes?

- XILINX = AECG (Adaptive and Embedded Computing Group)
- Committed to XILINX roadmap: More products in the Cost Optimized Portfolio

Comprehensive Product Portfolio



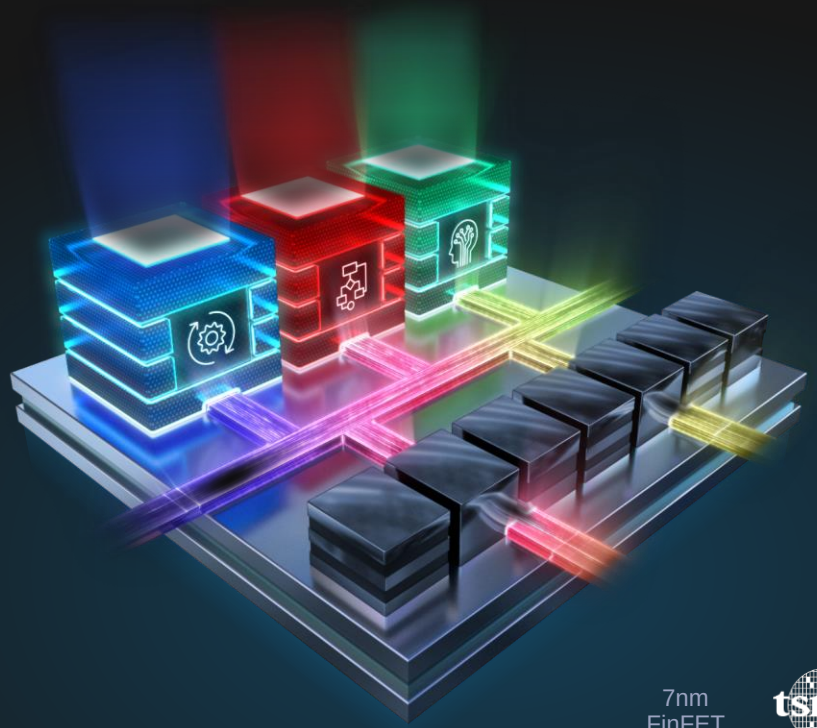
AMD VERSAL

Adaptive SoC

Heterogeneous Acceleration

For Any Application

For Any Developer

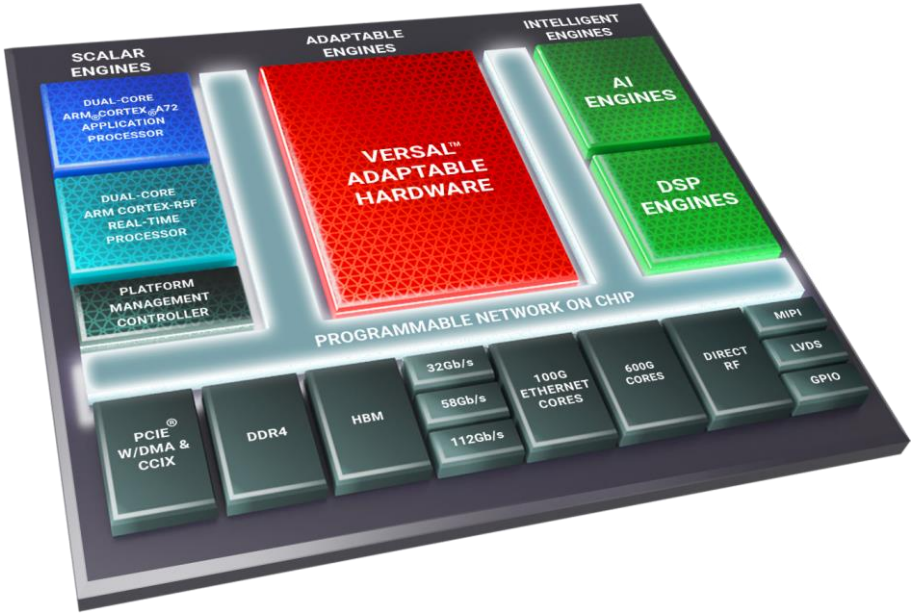


7nm
FinFET

tsmc

Versal™ Adaptive SoC Technology Tour

- Scalar Processing Engines
- Adaptable Hardware Engines
- Intelligent Engines
  SW Programmable, HW Adaptable
- Breakout Integration of Advanced Protocol Engines

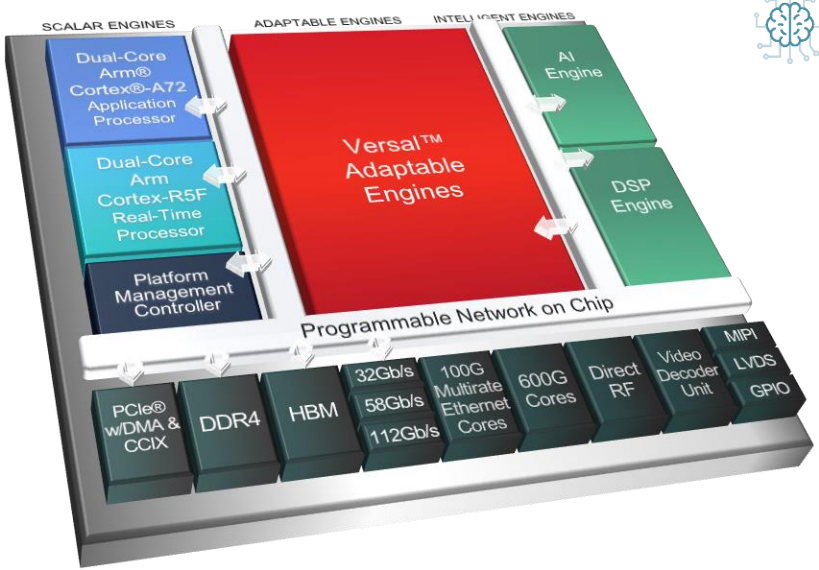


Versal™ Architecture Overview

Adaptable Engines
- Re-architected for faster timing closure
- Tune for power vs. performance
- Adaptable to any workload

Scalar Engines
- Platform Control
- Embedded Edge Compute

Intelligent Engines (DSP)
- AI Compute
- Diverse DSP Workloads



PCIe® Gen5 & CCIX
- 2X PCIe & DMA bandwidth
- Cache-coherency

Programmable NoC
- Guaranteed Bandwidth
- Enables SW Programmability

DDR4 Memory
- 3200-DDR4, 4266-LPDDR4
- 2X bandwidth/pin

Protocol Engines
- 400G/600G cores
- Power-Optimized

Transceiver Leadership
- Broad range, 1G →112G
- 58G in mainstream devices

Programmable I/O
- Any interface or sensor
- Includes 3.2Gb/s MIPI

HBM
- 820GB/s Bandwidth
- 32GB Capacity

Video Decoder Unit
- H.264/H.265 decoding
- Up to 4x 4K UHD (or 32x 1080p)

RF
- Direct-RFADC and RF-DAC
- SD-FEC

Versal™ Roadmap

Subject to Change

AI Core
AI Engine
DSP, ML Inference

Prime
Broadest Application

Premium
112G Serdes
600G Cores

HBM
Memory
Integration

AI Edge
Lowest Power AI

AI RF
AI DSP w/
Integrated RF

Versal™ Prime Series – Resources

		VM1102	VM1302	VM1402	VM1502	VM1802	VM2202	VM2302	VM2502	VM2902
Adaptable Engines	System Logic Cells (K)	329	693	1,238	981	1,968	1,139	1,575	1,969	2,233
	LUTs	150,272	316,928	565,760	448,512	899,840	520,704	719,872	900,224	1,020,928
	NoC Master / NoC Slave Ports	5	9	18	21	28	21	30	28	42
	Distributed RAM (Mb)	5	10	17	14	27	16	22	27	31
Memory	Total Block RAM (Mb)	5	18	40	34	34	21	49	47	70
	Total UltraRAM (Mb)	44	50	80	130	130	74	127	190	181
	Total PL Memory (Mb)	54	78	137	178	191	111	198	264	282
	DDR Memory Controllers	1	2	4	3	4	3	3	4	3
	DDR Bus Widths	64	128	256	192	256	192	192	256	192
Intelligent Engines	DSP Engines	464	832	1,696	1,312	1,968	1,312	1,904	3,984	2,672
Scalar Engines	Application Processing Unit	Dual-core Arm® Cortex-A72, 48KB/32KB L1 Cache w/ parity & ECC; 1MB L2 Cache w/ ECC								
	Real-time Processing Unit	Dual-core Arm Cortex-R5F, 32KB/32KB L1 Cache, and 256KB TCM w/ECC								
	Memory	256KB On-Chip Memory w/ECC								
	Connectivity	Ethernet (x2); USB 2.0 (x1); UART (x2); SPI (x2); I2C (x2); CAN-FD (x2)								
Serial Transceivers	GTY Transceivers (32.75Gb/s)	0	24	24	44	44	0	0	0	0
	GTYP Transceivers (32.75Gb/s)	8	0	0	0	0	32(1)	8	28(1)	8
	GTM Transceivers (56Gb/s)	0	0	0	0	0	0	40	16	40
Integrated Protocol IP	CCIX & PCIe® w/DMA (CPM)	-	1 x Gen4x16, CCIX	1 x Gen4x16, CCIX	1 x Gen4x16, CCIX	1 x Gen4x16, CCIX	2 x Gen5x8, CCIX	-	2 x Gen5x8, CCIX	-
	PCI Express®	1 x Gen4x8	2 x Gen4x8	2 x Gen4x8	4 x Gen4x8	4 x Gen4x8	4 x Gen5x4	2 x Gen5x4	2 x Gen5x4	2 x Gen5x4
	100G Multirate Ethernet MAC	1	2	2	4	4	2	6	2	6

Versal Prime Series

Notes:
1. 16 GTYP transceivers are dedicated to the CPM for PCI Express use.

All parameters listed are maximum values. Verify all data in this document with the device data sheets or product guides found at: www.xilinx.com.

Versal™ AI Core Series – Resources

		VC1352	VC1502	VC1702	VC1802	VC1902	VC2602	VC2802
Intelligent Engines	AI Engines Tiles	128	198	304	300	400	0	0
	AI Engine-ML Tiles	0	0	0	0	0	152	304
	AI Engine Data Memory (Mb)	32	50	76	75	100	76	152
	AIE-ML Shared Memory (Mb)	0	0	0	0	0	304	304
	DSP Engines	928	1,032	1,312	1,600	1,968	984	1,312
Adaptable Engines	System Logic Cells (K)	540	815	981	1,586	1,968	820	1,139
	LUTs	246,784	372,352	448,512	725,000	899,840	375,000	520,704
	NoC Master / NoC Slave Ports	10	21	21	28	28	21	21
	Distributed RAM (Mb)	8	11	14	22	27	11	16
Memory	Total Block RAM (Mb)	16	30	34	28	34	17	21
	UltraRAM (Mb)	59	110	130	91	130	63	74
	Accelerator RAM (Mb)	32	0	0	0	0	0	0
	Total PL Memory (Mb)	115	151	178	141	191	91	111
	DDR Memory Controllers	2	3	3	4	4	3	3
	DDR Bus Width	128	192	192	256	256	192	192
Scalar Engines	Application Processing Unit	Dual-core Arm® Cortex®-A72, 48KB/32KB L1 Cache w/ parity & ECC; 1MB L2 Cache w/ ECC						
	Real-time Processing Unit	Dual-core Arm Cortex-R5F, 32KB/32KB L1 Cache, and 256KB TCM w/ECC						
	Memory	256KB On-Chip Memory w/ECC						
	Connectivity	Ethernet (x2); UART (x2); CAN-FD (x2); USB 2.0 (x1); SPI (x2); I2C (x2)						
Serial Transceivers	GTY Transceivers (32.75Gb/s)	0	32	0	44	44	0	0
	GTYP Transceivers (32.75Gb/s)	8	0	44	0	0	32	32
Integrated Protocol IP	CCIX & PCIe® w/DMA (CPM)	–	1 x Gen4x16, CCIX	1 x Gen4x16, CCIX	1 x Gen4x16, CCIX	1 x Gen4x16, CCIX	2 x Gen5x8, CCIX	2 x Gen5x8, CCIX
	PCI Express®	1 x Gen4x8	4 x Gen4x8	4 x Gen4x8	4 x Gen4x8	4 x Gen4x8	4 x Gen5x4	4 x Gen5x4
	100G Multirate Ethernet MAC	1	3	4	4	4	2	2
	Video Decoder Engines (VDEs)	–	–	–	–	–	2	4
	Platform Management Controller	Boot, Security, Safety, Monitoring, and High-Speed Debug						

Versal AI Core Series

All parameters listed are maximum values. Verify all data in this document with the device data sheets or product guides found at: www.xilinx.com.

Versal™ Premium Series – Resources

		VP1002	VP1052	VP1102	VP1202	VP1402	VP1502	VP2502	VP1552	VP1702	VP1802	VP2802
Adaptable Engines	System Logic Cells (K)	833	1,186	1,575	1,969	2,233	3,763	3,738	3,837	5,558	7,352	7,326
	LUTs	380,800	542,080	719,872	900,224	1,020,928	1,720,448	1,708,672	1,753,984	2,540,672	3,360,896	3,349,120
	NoC Master / NoC Slave Ports	22	22	30	28	42	52	52	52	76	100	100
	Distributed RAM (Mb)	12	17	22	27	31	53	52	54	78	103	102
Memory	Total Block RAM (Mb)	19	26	49	47	70	89	89	89	132	174	174
	UltraRAM (Mb)	97	138	127	190	181	366	366	366	541	717	717
	Total PL Memory (Mb)	128	181	198	264	282	508	507	509	751	994	994
	DDR Memory Controllers	2	2	3	4	3	4	4	4	4	4	4
	DDR Bus Width	128	128	192	256	192	256	256	256	256	256	256
Intelligent Engines	DSP Engines	1,140	1,572	1,904	3,984	2,672	7,440	7,392	7,392	10,896	14,352	14,304
	AI Engines Tiles	-	-	-	-	-	-	472	-	-	-	472
	AI Engine Data Memory (Mb)	-	-	-	-	-	-	118	-	-	-	118
Scalar Engines	APU	Dual-core Arm® Cortex®-A72, 48KB/32KB L1 Cache w/ parity & ECC; 1MB L2 Cache w/ ECC										
	RPU	Dual-core Arm Cortex-R5F, 32KB/32KB L1 Cache, and 256KB TCM w/ECC										
	Memory	256KB On-Chip Memory w/ECC										
	Connectivity	Ethernet (x2); UART (x2); CAN-FD (x2); USB 2.0 (x1); SPI (x2); I2C (x2)										
Serial Transceivers	GTY Transceivers (32.75Gb/s)	20	20	-	-	-	-	-	-	-	-	-
	GTYP Transceivers (32.75Gb/s)	-	-	8	28(1)	8	28(1)	28(1)	68(1)	28(1)	28(1)	28(1)
	GTM Transceivers(2) (58G (112G))	24 (12)	48 (24)	64 (32)	20 (10)	96 (64)	60 (30)	60 (30)	20 (10)	100 (50)	140 (70)	140 (70)
Integrated Protocol IP	PCIe® w/DMA & CCIX (CPM4)	2 x Gen4x4	2 x Gen4x4	-	-	-	-	-	-	-	-	-
	PCIe w/DMA & CCIX (CPM5)	-	-	-	2 x Gen5x8	-	2 x Gen5x8	2 x Gen5x8	2 x Gen5x8	2 x Gen5x8	2 x Gen5x8	2 x Gen5x8
	PCI Express	1 x Gen4x8	1 x Gen4x8	2 x Gen5x4	2 x Gen5x4	2 x Gen5x4	2 x Gen5x4	2 x Gen5x4	8 x Gen5x4	2 x Gen5x4	2 x Gen5x4	2 x Gen5x4
	100G Multirate Ethernet MAC	3	5	6	2	6	4	4	4	6	8	8
	600G Ethernet MAC	2	3	7	1	11	3	3	1	5	7	7
	600G Interlaken	1	2	0	0	0	1	1	0	2	3	3
	400G High-Speed Crypto Engine	1	1	3	1	4	2	2	2	3	4	4
Ordering Information	Extended(3)	-1MSE, -1LSE, -2MSE, -2MLE, -2LSE, -2LLE		-1MSE, -1LSE, -2MSE, -2MLE, -2LSE, -2LLE, -3HSE								
	Industrial(3)	-1MSI, -1MLI, -1LSI, -1LLI, -2MSI, -2MLI, -2LLI, -2HSI		-1MSI, -1MLI, -1LSI, -1LLI, -2MSI, -2MLI								

All parameters listed are maximum values. Verify all data in this document with the device data sheets or product guides found at www.xilinx.com

Versal™ HBM Series – Resources

			VH1522	VH1542	VH1582	VH1742	VH1782
Adaptable Engines	System Logic Cells (K)		3,837	3,837	3,837	5,631	5,631
	LUTs		1,753,984	1,753,984	1,753,984	2,574,208	2,574,208
	NoC Master / NoC Slave Ports		52	52	52	76	76
	Distributed RAM (Mb)		54	54	54	79	79
Memory	Total Block RAM (Mb)		89	89	89	132	132
	UltraRAM (Mb)		366	366	366	541	541
	Total PL Memory (Mb)		509	509	509	752	752
	HBM DRAM (GB)		8	16	32	16	32
	DDR Memory Controllers		4	4	4	4	4
	DDR Bus Width		256	256	256	256	256
Intelligent Engines	DSP Engines		7,392	7,392	7,392	10,848	10,848
Scalar Engines	APU		Dual-core Arm® Cortex-A72, 48KB/32KB L1 Cache w/ parity & ECC; 1MB L2 Cache w/ ECC				
	RPU		Dual-core Arm Cortex-R5F, 32KB/32KB L1 Cache, and 256KB TCM w/ECC				
	Memory		256KB On-Chip Memory w/ECC				
	Connectivity		Ethernet (x2); UART (x2); CAN-FD (x2); USB 2.0 (x1); SPI (x2); I2C (x2)				
Serial Transceivers	GTYP[1] 32G		68	68	68	68	68
	GTM[2] 56G (112G)		20 (10)	20 (10)	20 (10)	60 (30)	60 (30)
Integrated Protocol IP	CCIX & PCIe® w/DMA (CPM5)		2 x Gen5x8, CCIX	2 x Gen5x8, CCIX	2 x Gen5x8, CCIX	2 x Gen5x8, CCIX	2 x Gen5x8, CCIX
	PCI Express (PLPCIE5)		8 x Gen5x4	8 x Gen5x4	8 x Gen5x4	8 x Gen5x4	8 x Gen5x4
	100G Multirate Ethernet MAC		4	4	4	6	6
	600G Ethernet MAC		1	1	1	3	3
	600G Interlaken		0	0	0	1	1
	400G High-Speed Crypto Engines		2	2	2	3	3
Package Footprint	Package Dimensions (mm)	Ball Pitch (mm)	XPIO DDR Only, XPIO DDR+PL HDIO, MIO GTYP, GTM (112G)				
VSVA3697	57.5x57.5	0.92	132, 570 0, 78 68, 20 (10)	132, 570 0, 78 68, 20 (10)	132, 570 0, 78 68, 20 (10)		
LSVA4737	70x70	1.0		132, 570 0, 78 68, 20 (10)	132, 570 0, 78 68, 20 (10)	132, 570 0, 78 68, 60 (30)	132, 570 0, 78 68, 60 (30)

Versal HBM Series

Notes:
1. GTY transceivers operate at data rates up to 32.75Gb/s
2. GTM transceivers can operate at data rates up to 112Gb/s by combining two transceivers together

Versal™ AI Edge Series – Resources

		VE2002	VE2102	VE2202	VE2302	VE2602	VE1752	VE2802
Intelligent Engines	AI Engine-ML Tiles	8	12	24	34	152	0	304
	AI Engine Tiles	0	0	0	0	0	304	0
	AIE/AIE-ML Data Memory (Mb)	4	6	12	17	76	76	152
	AIE-ML Shared Memory (Mb)	48	48	68	68	304	0	304
	DSP Engines	90	176	324	464	984	1,312	1,312
Adaptable Engines	System Logic Cells	43,750	80,080	229,688	328,720	820,313	981,120	1,139,040
	LUTs	20,000	36,608	105,000	150,272	375,000	448,512	520,704
	NoC Master / NoC Slave Ports	2	2	5	5	21	21	21
	Distributed RAM (Mb)	0.6	1.1	3.2	4.6	11.4	13.7	15.9
Memory	Total Block RAM (Mb)	0.8	1.7	3.8	5.4	16.7	33.5	21.1
	UltraRAM (Mb)	6.8	13.2	30.4	43.6	63.0	129.9	74.3
	Accelerator RAM (Mb)	32	32	32	32	0	0	0
	Total PL Memory (Mb)	40.2	48	69.4	85.6	91.1	177.1	111.3
	DDR Memory Controllers	1	1	1	1	3	3	3
	DDR Bus Width	64	64	64	64	192	192	192
Scalar Engines	Application Processing Unit	Dual-core Arm® Cortex-A72, 48KB/32KB L1 Cache w/ parity & ECC; 1MB L2 Cache w/ ECC						
	Real-Time Processing Unit	Dual-core Arm Cortex-R5F, 32KB/32KB L1 Cache, and 256KB TCM w/ECC						
	Memory	256KB On-Chip Memory w/ECC						
	Connectivity	Ethernet (x2); UART (x2); CAN-FD (x2); USB 2.0 (x1); SPI (x2); I2C (x2)						
Serial Transceivers	GTY Transceivers (32.75Gb/s)	0	0	0	0	0	44	0
	GTYP Transceivers (32.75Gb/s)	0	0	8	8	32	0	32
Integrated Protocol IP	CCIX & PCIe® w/DMA (CPM)	-	-	-	-	1 x Gen4x16, CCIX	1 x Gen4x16, CCIX	1 x Gen4x16, CCIX
	PCI Express®	-	-	1 x Gen4x8	1 x Gen4x8	4 x Gen4x8	4 x Gen4x8	4 x Gen4x8
	40G Multirate Ethernet MAC	0	0	1	1	2	2	2
	Video Decoder Engines (VDEs)	–	–	–	–	2	–	4
	Platform Mgmt Controller	Boot, Security, Safety, Monitoring, and High-Speed Debug						

Versal AI Edge Series

All parameters listed are maximum values. Verify all data in this document with the device data sheets or product guides found at: www.xilinx.com.

Granular Control of Power vs. Performance

Voltage Scaling with Speed Grade Options

FABRIC	V_{LOW}		V_{MID}		V_{HIGH}	
	F_{MAX}	Power	F_{MAX}	Power	F_{MAX}	Power
-1 Speed Grade	1x	1x	1.2x	1.3x	1.2x	1.3x
-2 Speed Grade	1.1x	1x	1.3x	1.3x	1.45x	1.6x
-3 Speed Grade	–	–	–	–	1.45x	1.6x

SerDes	V_{LOW}	V_{MID}	V_{HIGH}
-1 Speed Grade	26G	27G	27G
-2 Speed Grade	28G	28G	28G
-3 Speed Grade	–	–	32G

Processor (A72)	V_{LOW}	V_{MID}	V_{HIGH}
-1 Speed Grade	1GHz / 1.45GHz*	1.3GHz	1.45GHz
-2 Speed Grade	1.15GHz	1.35GHz	1.5GHz
-3 Speed Grade	–	–	1.7GHz

*When $V_{CCINT\_PS} = V_{HIGH}$ (.88V)

V_{HIGH}	=	.88V
V_{MID}	=	.80V
V_{LOW}	=	.70V

Getting Started with Versal Adaptive SoC Boards & Kits

Versal™ Prime Series

VMK180

General Purpose Development Kit
(VM1802 Silicon)

Available Now

Versal™ AI Core Series

VCK190

AI Engine Development Kit
(VC1902 Silicon)

Available Now

Versal™ Premium Series

VPK120

Essential
Hard IP Development Kit
(VP1202 Silicon)

Available Now

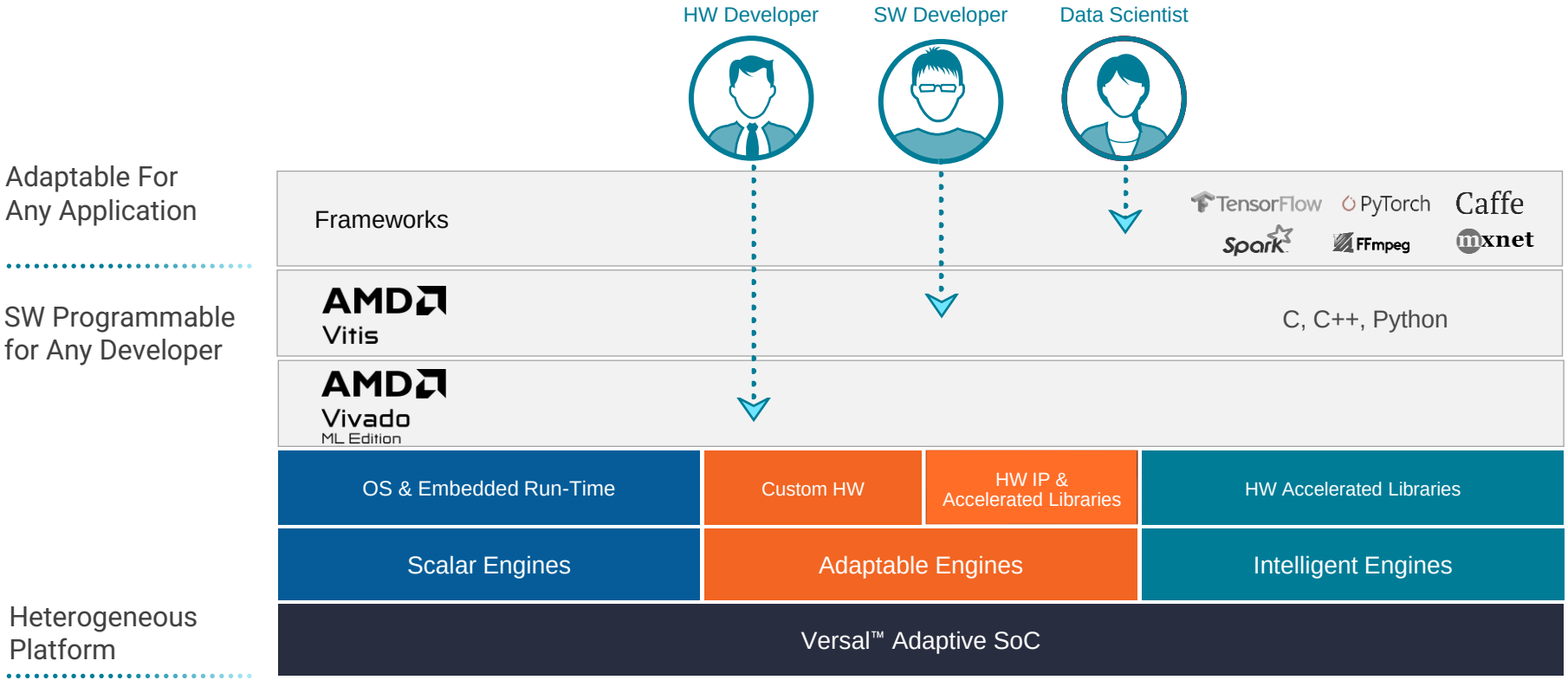
Versal™ Premium Series

VPK180

Comprehensive
Hard IP Development Kit
(VP1802 Silicon)

Early Access Available Now

Versal™ Development Experience for All Developers



Learning Center to Get You Started

On-Demand Training

Recorded lectures and forums w/ experts

Virtual Classroom

Live online training, interact w/instructors

Live Classroom

In-person, immersive classroom environment

Recommended Courses

Getting Started with the Versal™ Adaptive SoC Platform

Designing with the Versal Adaptive SoC : Architecture and Methodology

Designing with the Versal Adaptive SoC : Programmable Network on Chip

Designing with the Versal Adaptive SoC : Power and Board Design

Designing with Versal AI Engine 1: Architecture and Design Flow

Designing with Versal AI Engine 2: Graph Programming with AI Engine Kernels

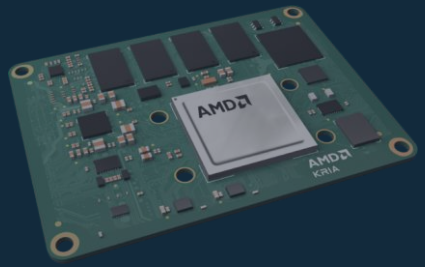
Designing with Versal AI Engine 3: Kernel Programming and Optimization

Visit www.xilinx.com/training.html

AMD Kria SOMs: What's new?

AMD
together we advance_

Expanding Our Portfolio of Adaptive System-on-Modules



AVAILABLE NOW

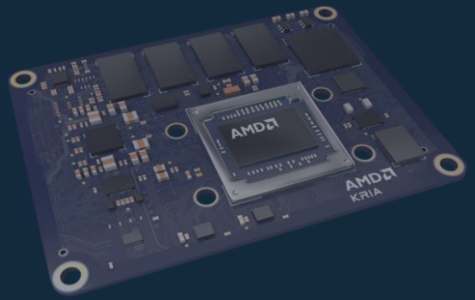
Kria™ K26 SOM

For vision AI and robotics in smart cities and smart factories

NEW: AVAILABLE NOW

Kria K24 SOM

For electric drives and other digital signal processing-intensive applications



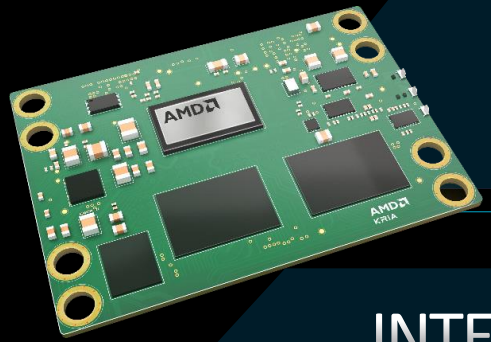
ROADMAP

High AI Compute

High real-time compute/watt for edge AI applications

Kria K24 SOM Overview

Based on Zynq™ UltraScale+™ MPSoC Technology



ADAPTIVE SOC (Custom Device for Kria™ K24 SOM)

Arm® Core
A53 Quad core
R5F Dual core

Ubuntu OS
Supports latest 22.04 version

154K
System logic cells for custom acceleration

INT8
B2304 DPU support

INTERFACES

132 I/Os
Flexible for connecting multiple motors, sensors, and connectors

Industrial Ethernet
4x 1G Ethernet, support for converged traffic[1]

4x USB
Mix of USB 3.0 and 2.0

2 GB
32-bit LPDDR4 memory (w/ ECC config[2])

Security Features
HW Root of Trust along with TPM 2.0[3]

1: TSN is enabled only through programmable logic (PL)-based Ethernet interfaces
2: ECC support only available on industrial grade SKU of K24 SOM, 32-bit LPDDR4 @ 1066 Mbps
3: HW-based security for remote attestation, measured boot, cryptographic functions

Ruggedization for Extreme Operating Conditions Including Industrial Applications

- Built for indoor/outdoor and low/high temperature ranges
- Meets country-specific compliance and certification requirements
- Ruggedized connectors for shock resistance

Meeting Reliability Requirements

	Kria™ K24 SOM	
	C-Grade	**I-Grade[1]**
Shock	40G, 11ms	40G, 11ms
Vibration	1.9g RMS	5g RMS
Temp Range at Module TTP	0°C to 85°C	–40°C to 100°C
Humidity	85°C / 80% RH	85°C / 80% RH
Operating Life[2]	5 years	10 years
Availability[3]	10 years	10 years
Warranty (Production SOM)[4]	2 years	3 years

1: I-grade specs are tentative and subject to change
2: Operating Life – Suitable for deployment in a production environment
3: Availability – Time period SOM product will be available for purchase
4: Kria KD240 Drives Starter Kits are not intended for production use and come with a 90-day warranty

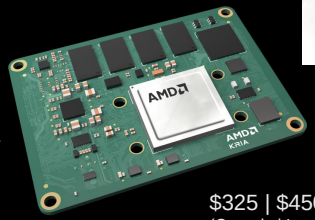
Certifications

Country	Certification
US ; Canada	FCC, UL ; IC
EU	CE, ROHS 10
China	CC, ROHS 10
Vietnam	ICT
Japan ; Korea	VCCI ; KCC
Malaysia	ST CoA, SIRIM
Singapore	SPRING Safety
South Africa	SABS EMC, NRSC

Comparing Kria™ K24 vs. K26 SOM

$250 | $350
(C-grade | I-grade)

CONNECTOR COMPATIBLE



$325 | $450
(C-grade | I-grade)

Cost-optimized SOM for lower power, smaller form-factor & cost sensitive industrial applications

Mid-range SOM for Vision AI and Robotics applications requiring higher performance per watt

	K24 SOM		K26 SOM
SILICON (SYS LOGIC CELLS)	XCK24 InFO (154K)	SILICON	XCK26 (256K)
SOM I/O ACCESS	1x 240-Pin Connector, 1x 40-Pin Connector	SOM I/O	2x 240-Pin Connectors
FORM FACTOR	60 x 42mm	46% SMALL	60 x 77mm
MEMORY	2GB LPDDR4[1], 32 GB	DDR, eMMC	4GB DDR4, 16 GB
POWER[2]	2.5W	51% LESS	5.1W
STARTER KITS	KD240 DRIVES	DEV KITS	KV260 VISION AI, KR260 ROBOTICS

[1] ECC support available on K24 SOM I-grade
[2] Measured power while loading application specific bitstream on the SOM-based starter kit

Comparing Kria™ Starter Kits

$249

For mainstream vision AI camera & smart city applications

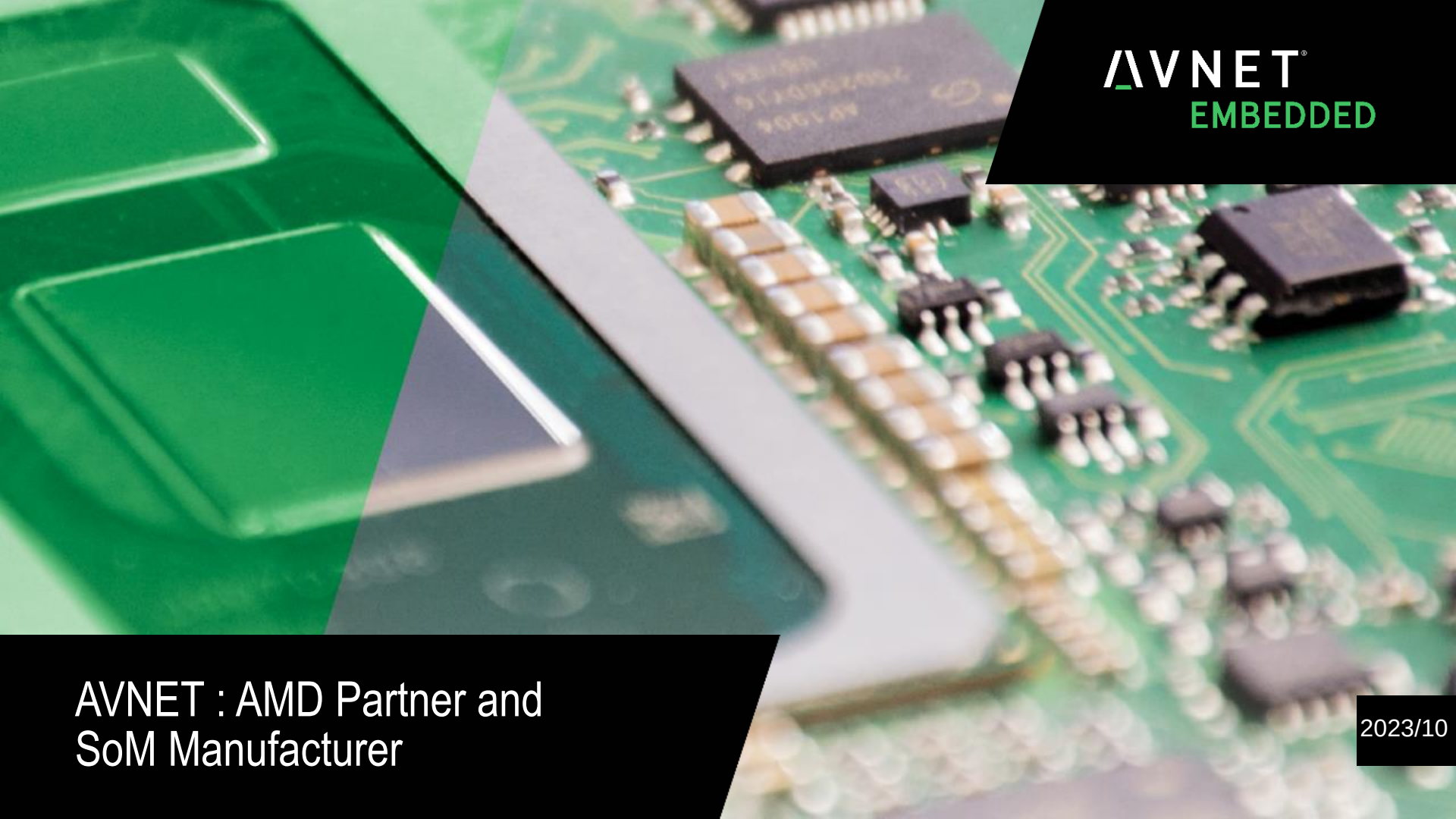
$349

For high-performance industrial systems including ROS 2-based robotics applications

$399

For deterministic motor control and DSP applications

	KV260 VISION AI	KR260 ROBOTICS	KD240 DRIVES
NON-PROD SOM	K26	K26	K24
SOM I/O ACCESS	1x 240-Pin Connector	2x 240-Pin Connectors	1x 240-Pin, 1x 40-Pin Connector
NETWORK	1x Ethernet	4x Ethernet, SFP+	3x Ethernet
KEY INTERFACES	MIPI Vision Sensors	SLVS-EC Vision Sensors	3-phase inverter & quadrature encoder
EXPANSION	1x Pmod	4x Pmod	1x Pmod
ACCESSORIES	Basic Accessory Pack	Sony IMX547 Camera Kits	Motor Accessory Pack



AVNET EMBEDDED

AVNET : AMD Partner and SoM Manufacturer

2023/10

AVNET EMBEDDED : World leader on the SoM Market

MSC HCC-CFLS

MSC HSD-ILDL

COM-HPC

intel

First COM-HPC® Client and Server module on the market

Leading next generation roadmap.
Innovating the future in Edge computing.

MSC C6B-ALP

MSC C6C-ALP

COM Express

intel

Intel 12. Generation
(products formally Alder Lake P)

"iCore" performance on
COM Express® Basic/Compact and COM-HPC.

MSC Q7-EL

MSC C6C-

MSC SM2S-EL

SMARC module

MSC C10M-EL

COM Express

intel

Intel Atom® Processor X Series
(products formally Elkhart Lake)

Flexible choice of COM module standards with best in class performance and feature sets.

MSC C6C-RYZ

MSC C6C-RYZ

COM Express

MSC SM2S-ZUSP

AMD

SMARC module

AMD Ryzen™ V1000/R1000 and Zynq® UltraScale+ MPSoC

Industry leading SMARC® module

NXP® i.MX 8M Plus and i.MX 93

Scalable Solutions in combination with high computing power and efficient power consumption:
i.MX 8M Plus - for Edge based embedded vision and audio AI applications
i.MX 93 - performance and energy efficiency for Edge applications

NXP

MSC SM2S-IMX8PLUS

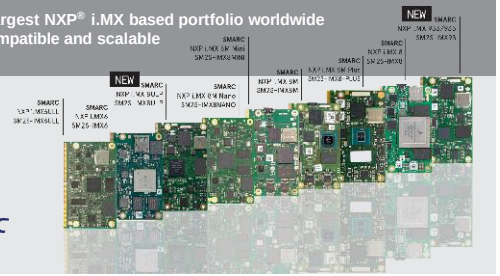
MSC SM2S-IMX93

SMARC module

NXP® SMARC® Portfolio

- **Leading SMARC® module vendor with largest NXP® i.MX based portfolio worldwide**
- **Complete portfolio is pin and feature compatible and scalable in price and performance**

NXP



SMARC module

MSC SM2S-ZUSP
AMD Zynq UltraScale+ MPSoC

- ZU2CG, ZU3CG, ZU4CG or ZU5CG, ZU2EG, ZU3EG, ZU4EG, ZU5EG, ZU4EV or ZU5EV
- Up to 8GB DDR4 SDRAM, ECC support (optional)
- Up to 2GB DDR4 SDRAM for FPGA (optional)
- Up to 64GB eMMC Flash
- SATA-III interface (6Gbps)
- Up to 2x PCI Express x2 Gen. 3
- Up to 1x USB 3.0/2.0 Host interface
- Up to 3x USB 2.0 Host interface/1x USB 2.0 Host/Device interface
- Gigabit Ethernet (single or dual)
- Wireless Module (optional)
- 1x MMC/SD/SDIO interface
- 2x CAN interface
- UART, SPI, I2C
- Rich FPGA I/O
- SMARC 2.0 Compliant
- Estimated Lifetime 2030

AMD

SMARC module

SMARC Module
Zynq UltraScale+ MPSoC

AVNET EMBEDDED / MSC

SOMs – Zynq UltraScale+

/ULTRAZED-EG

- CG and EG families
- 103-154K LCs
- 5.3-7.6Mb Block RAM
- 240-360 DSP Slices
- Pin compatible family
- Commercial and industrial temps

/ULTRAZED-EV

- EG and EV families
- 192-504K LCs
- 4.5-11Mb Block RAM
- 728-1728 DSP Slices
- Pin compatible family
- Commercial and industrial temps

ZU2CG	◆	
ZU3CG	◆	
ZU2EG	◆	
ZU3EG	◆	
ZU4EG		◆
ZU5EG		◆
ZU7EG		◆
ZU4EV		◆
ZU5EV		◆
ZU7EV		◆

AVNET

/ XRF16

Available Now

- 5 GHz Bandwidth
- 16x 2.22 GSPS ADCs
- 16x 6.554 GSPS DACs
- Xilinx RFSoC Gen2 ZU39DR

/ XRF8

Available Now

- 6 GHz Bandwidth
- 8x 5 GSPS ADCs
- 8x 10 GSPS DACs
- Xilinx RFSoC Gen3 ZU47DR

Power Management

- Single 5.5V to 16V input
- Temp and voltage monitoring

RF Clocking

- On-board ultra-low jitter RF PLLs
- External or 10 MHz TCXO reference

High Bandwidth Data Interface

- 1GbE, USB2.0 (PHYs on-board)
- 4 GTR for PCIe Gen2, SATA3, USB3
- 16 GTY for PCIe Gen3, 100 GbE, Aurora
- Up to 36 differential GPIO

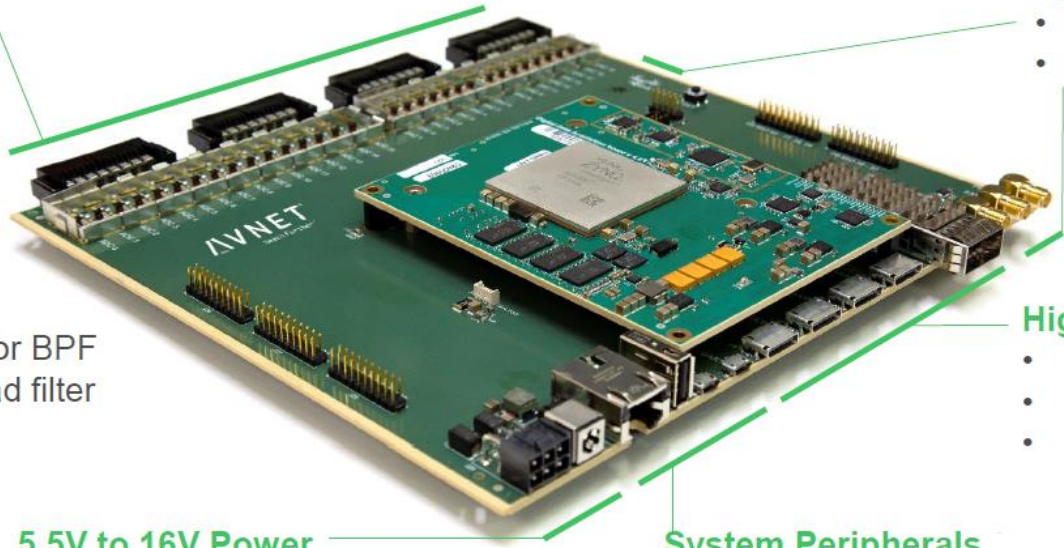
Memory

- 4GB PL-DDR4 64-bit
- 4GB PS-DDR4 64-bit
- 32GB eMMC
- 128 MB QSPI Flash

AVNET

/ XRF CarrierCard

RF Interface
- 16 ADC
- 16 DAC
- Single-ended



System Sync
- External Ref In/Out
- Trigger In/Out

Filter Options
- FV1206 LPF or BPF
- Optional pi-pad filter

High Speed Data Transfer
- QSFP28
- 1x PS Oculink4
- 3x PL Oculink4

5.5V to 16V Power
- 6-pin custom rugged
- 2.5mm laptop supply

System Peripherals
- 1 GbE
- USB, UART
- JTAG (10-pin)

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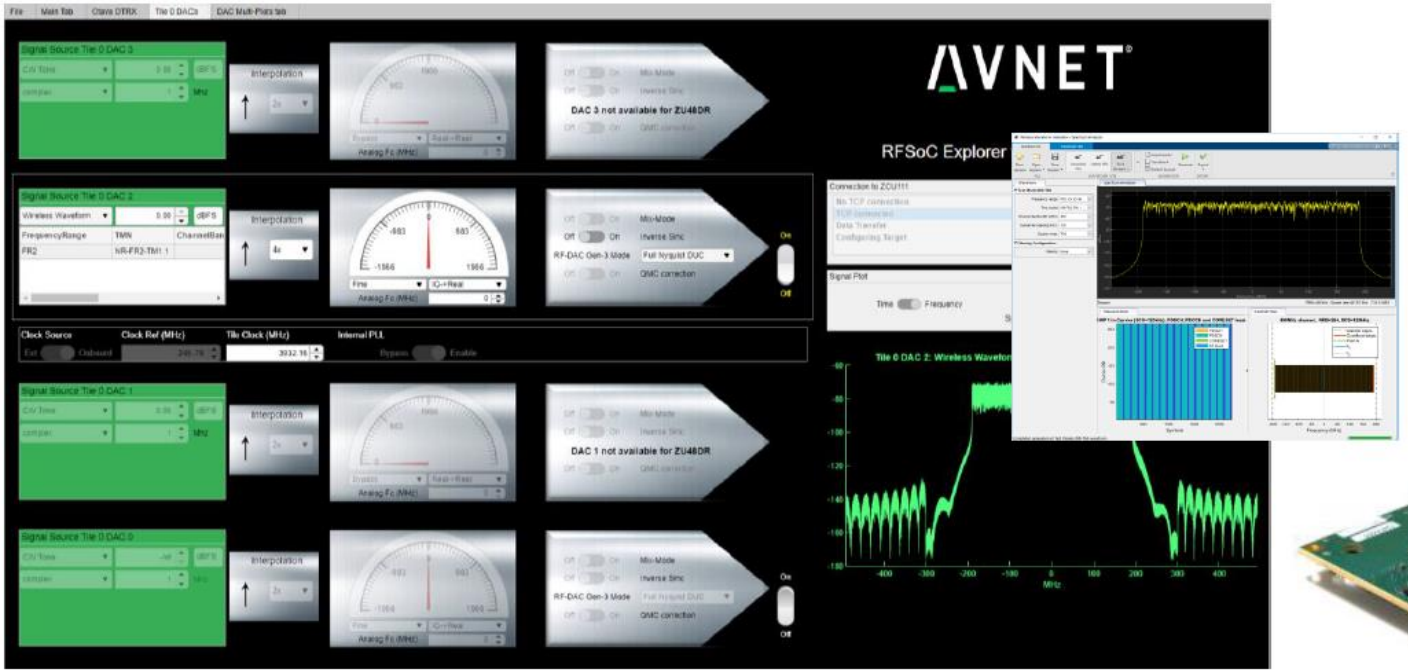
Avnet RFSoC Explorer – Native MATLAB App



5G Toolbox from MathWorks

Simulate, analyze, and test the physical layer of 5G communications systems

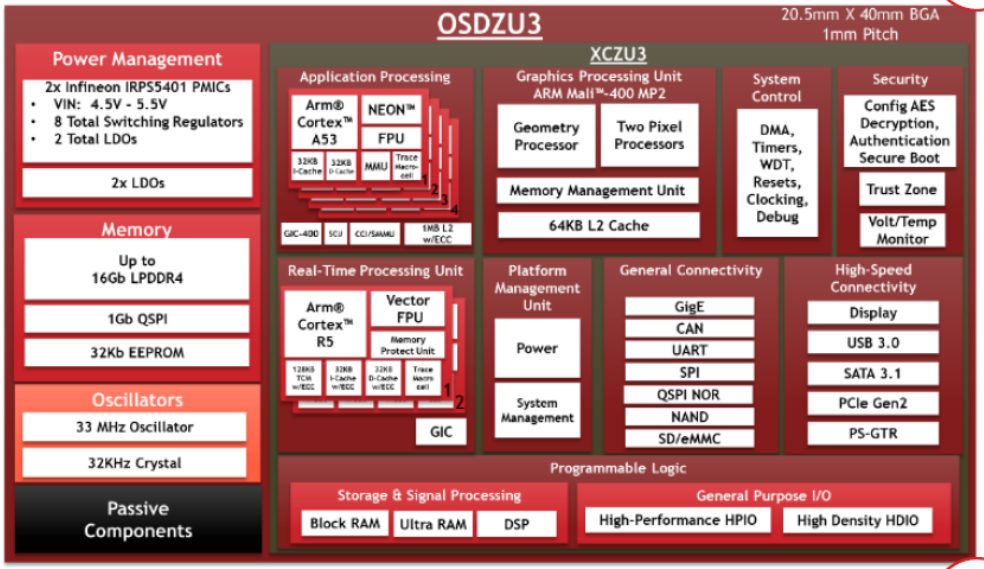
Create waveforms in MATLAB → Control RFSoC in MATLAB → Capture & analyze in MATLAB

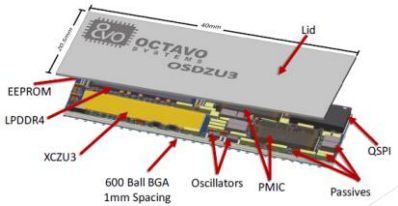
AVNET

Road to Versal…

Come visit us at our booth…

OCTAVO SYSTEMS: No SoC, No SoM… SiP!!!





- Integrates ZU3 MPSoC, Power Management, DDR, Oscillators, and Passives into single BGA
- Access to All ZU3 I/O in the 784 pin Package
- 2GB LPDDR4 integrated
- Single 4.5V to 5.5V Vin Generates all required power rails
- Provides 2 Configurable Power rails for System Use.
- Over 150 Components integrated into one 20.5mm x 40 mm package
- 1mm Pitch BGA allows for low-cost PCB Design Rules

AVNET

Thank You

Questions