AMD Versal™ AI Core Series Product Selection Guide

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AMD Versal™ AI Core Series – Resources

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

		VC1502	VC1702	VC1802	VC1902	VC2602	VC2802
AI Engine	AI Engines Tiles	198	304	300	400	0	0
	AI Engine-ML Tiles	0	0	0	0	152	304
	AI Engine Data Memory (Mb)	50	76	75	100	76	152
	AIE-ML Shared Memory (Mb)	0	0	0	0	304	304
Programmable Logic	System Logic Cells (K)	815	981	1,586	1,968	820	1,139
	LUTs	372,352	448,512	725,000	899,840	375,000	520,704
	DSP Engines	1,032	1,312	1,600	1,968	984	1,312
	Distributed RAM (Mb)	11	14	22	27	11	16
Memory	Total Block RAM (Mb)	30	34	28	34	17	21
	UltraRAM (Mb)	110	130	91	130	63	74
	Accelerator RAM (Mb)	0	0	0	0	0	0
	Total PL Memory (Mb)	151	178	141	191	91	111
	DDR Memory Controllers (DDRMC)	3	3	4	4	3	3
	DDR Bus Width	192	192	256	256	192	192
Processing System	Application Processing Unit	Dual-core Arm® Cortex®-A72, 48 KB/32 KB L1 Cache w/ parity & ECC; 1 MB L2 Cache w/ ECC					
	Real-Time Processing Unit	Dual-core Arm Cortex-R5F, 32 KB/32 KB L1 Cache, and 256 KB TCM w/ECC					
	Memory	256 KB 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	44	44	44	0	0
	GTYP Transceivers	0	0	0	0	32(1)	32(1)
Integrated Protocol IP	PCIe® w/DMA (CPM4)	1 x Gen4x16	1 x Gen4x16	1 x Gen4x16	1 x Gen4x16	–	–
	PCIe w/DMA (CPM5)	–	–	–	–	2 x Gen5x8	2 x Gen5x8
	PCIe (PL PCIE4)	4 x Gen4x8	4 x Gen4x8	4 x Gen4x8	4 x Gen4x8	–	–
	PCIe (PL PCIE5)	–	–	–	–	4 x Gen5x4	4 x Gen5x4
	100G Multirate Ethernet MAC	3	4	4	4	2	2
Platform	Video Decoder Engines (VDEs)	–	–	–	–	2	4
	Platform Management Controller	Boot, Security, Safety, Monitoring, and High-Speed Debug					
Ordering Information	Extended Temp(2)	-1MSE, -1LSE, -2MSE, -2MLE, -2LSE, -2LLE					
	Industrial Temp(2)	-1MSI, -1MLI, -1LSI, -1LLI, -2MSI, -2MLI, -2LLI, -2HSI					

Notes:
1. 16 GTYP transceivers are dedicated to CPM5 for PCI Express use.
2. In extended and industrial temperature grades, some ordering combinations can operate for a limited time with a junction temperature of 110°C. Timing parameters adhere to the same speed file at 110°C as they do below 110°C, regardless of operating voltage. Operation at 110°C Tj is limited to 3% of the device lifetime and can occur sequentially or at regular intervals as long as the total time does not exceed 3% of device lifetime.

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AMD Versal™ AI Core Series – Packaging

			VC1502	VC1702	VC1802	VC1902	VC2602	VC2802
Package	Package Dimensions (mm)	Ball Pitch (mm)	XPIO DDR Only, XPIO DDR+PL, XPIO PL Only HDIO, MIO GTY, GTYP					
NSVG1369	35x35	0.92	132, 246, 0 22, 78 24, 0	132, 246, 0 44, 78 24, 0				
NSVH1369	35x35	0.92					132, 192, 0 44, 78 0, 32	132, 192, 0 44, 78 0, 32
VSVA1596	37.5x37.5	0.92	132, 246, 0 22, 78 32, 0	132, 246, 0 44, 78 32, 0				
VIVA1596	40x40	0.92			132, 246, 0 44, 78 32, 0	132, 246, 0 44, 78 32, 0		
VSVD1760	40x40	0.92			186, 462, 0 0, 78 24, 0	186, 462, 0 0, 78 24, 0		
VSVH1760	40x40	0.92					186, 300, 0 44, 78 0, 32	186, 300, 0 44, 78 0, 32
VSVA2197	45x45	0.92	192, 294, 0 22, 78 32, 0	192, 294, 0 44, 78 44, 0	186, 462, 0 44, 78 44, 0	186, 462, 0 44, 78 44, 0		

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AMD Versal™ AI Core Series – Figures of Merit

			VC1502	VC1702	VC1802	VC1902	VC2602	VC2802
AI Engine	AI Engine Peak Perf – INT8	TOPS	66	101	100	133	101	202
	AI Engine Peak Perf – INT8x16	TOPS	33	51	50	67	51	101
	AI Engine Peak Perf – INT16	TOPS	16	25	25	33	25	51
	AI Engine Peak Perf – CINT16	Complex TOPS	4.1	6.3	6.2	8.3	6.3	12.6
	AI Engine Peak Perf – FP32	TFLOPs	4.1	6.3	6.2	8.3	8.3	16.6
	AI Engine Peak SRAM Bandwidth	Tb/s	264	405	399	532	202	405
Programmable Logic	DSP Engine Peak Perf – INT8	TOPS	7.1	9.1	11.0	13.6	6.8	9.1
	DSP Engine Peak Perf – INT24	TOPS	2.4	3.0	3.7	4.5	2.3	3.0
	DSP Engine Peak Perf – CINT18	Complex TOPS	1.0	1.3	1.6	1.9	1.0	1.3
	DSP Engine Peak Perf – FP32	TFLOPs	1.7	2.1	2.6	3.2	1.6	2.1
Processing System	Arm® Cortex-A72 Performance	DMIPs	18,942	18,942	18,942	18,942	19,516	19,516
	Arm Cortex-R5F Performance	DMIPs	2,672	2,672	2,672	2,672	2,672	2,672
Memory	Total Bandwidth - Block RAM	Tb/s	122	137	115	139	69	86
	Total Bandwidth - Ultra RAM	Tb/s	41	49	35	49	24	28
	Total Bandwidth - Accelerator RAM	Tb/s	0.0	0.0	0.0	0.0	0.0	0.0
	Total SRAM Bandwidth	Tb/s	164	186	150	188	92	114
I/O	Transceiver Bandwidth	Tb/s	1.81	2.48	2.48	2.48	2.10	2.10
	Sensor I/O Bandwidth	Gb/s	941	941	1,478	1,478	960	960
Platform	DDR4 Memory Bandwidth	GB/s	76.8	76.8	102.4	102.4	76.8	76.8
	LPDDR4 Memory Bandwidth	GB/s	102.4	102.4	136.5	136.5	102.4	102.4
	NoC Cross-sectional Bandwidth	Tb/s	1.7	1.7	2.2	2.2	1.7	1.7

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AMD Versal™ Portfolio Inter-Series Migration

Package Name	Footprint	Versal AI Edge Series							Versal AI Core Series						Versal Prime Series									Versal Premium Series											
		VE2002	VE2102	VE2202	VE2302	VE1752	VE2602	VE2802	VC1502	VC1702	VC1802	VC1902	VC2602	VC2802	VM1102	VM1302	VM1402	VM1502	VM1802	VM2202	VM2302	VM2502	VM2902	VP1002	VP1052	VP1102	VP1202	VP1402	VP1502	VP2502	VP1552	VP1702	VP1802	VP2802	VP1902
SFVA784	A784	■	■	■	■										■																				
NSVG1369	G1369					■			■	■																									
NSVH1369	H1369						■	■					■	■	■					■															
VSVA1596[1]	A1596[2]					■			■	■	■																								
VIVA1596[1]	A1596[2]										■	■																							
VSVD1760	D1760										■	■					■	■	■																
VFVF1760	F1760																				■		■	■	■	■	■	■							
VSVH1760	H1760						■	■					■	■																					
VSVA2197	A2197					■			■	■	■	■							■	■															

Versal™ Portfolio Migration Legend
■ Device
— Migration Path

Package Name	Footprint	Versal AI Edge Series Gen 2						Versal Prime Series Gen 2			
		2VE3304	2VE3358	2VE3504	2VE3558	2VE3804	2VE3858	2VM3358	2VM3558	2VM3654	2VM3858
SFVA1089	A1089	■	■					■			
SFVA1440	A1440[2]		■		■			■	■		
SSVA1440	A1440[2]	■	■	■	■						
SSVA2112	A2112			■	■	■	■		■	■	■

Notes:
1. VSVA1596 package dimensions are 37.5x37.5 mm, VIVA1596 package dimensions are 40x40 mm with 1.25 mm overhang.
2. Packages with the same last letter and number sequence, e.g., A1440, are footprint compatible with all other Versal devices with the same sequence.

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AMD Versal™ Device Ordering Information

Device Name					Device Attributes				Package Definition			
XC	2	V	E	3558	-1	M	S	E	S	B	V	A1440
Device Grade XC: Commercial XA: Automotive XQ: Defense	**Generation**[1] 2: Gen 2	**Architecture** Versal	**Series Name** E: AI Edge C: AI Core M: Prime P: Premium H: HBM R: RF	**Device Number** Digits 1-3: Value Identifier Digit 4: # of Primary Cores	**Speed Grade** -1: Slowest -2: Mid -3: Highest	**Voltage** L: Low M: Mid H: High	**Static Screen** S: Standard L: Low Static	**Temp Grade** E: 0 to 110°C[2] I: –40 to 110°C[2] Q: –40 to +125°C M: –55 to +125°C	**Ball Pitch** L: 1.0 mm V: 0.92 mm, w/LSC N: 0.92 mm, no LSC S: 0.8 mm J: 0.65 mm	**Lid** S: Lidless, w/Stiffener Ring F: Lidded B: Lidless, no Stiffener Ring H: Lidded Overhang I: Lidless, w/Stiffener Ring & Overhang M: Lidless, w/ Stiffener Ring, w/ Memory on Package	**RoHS6 Code** [3] V: Pb-free Ball Q: Eutectic Ball R: Ruggedized, Eutectic Ball	**Footprint**

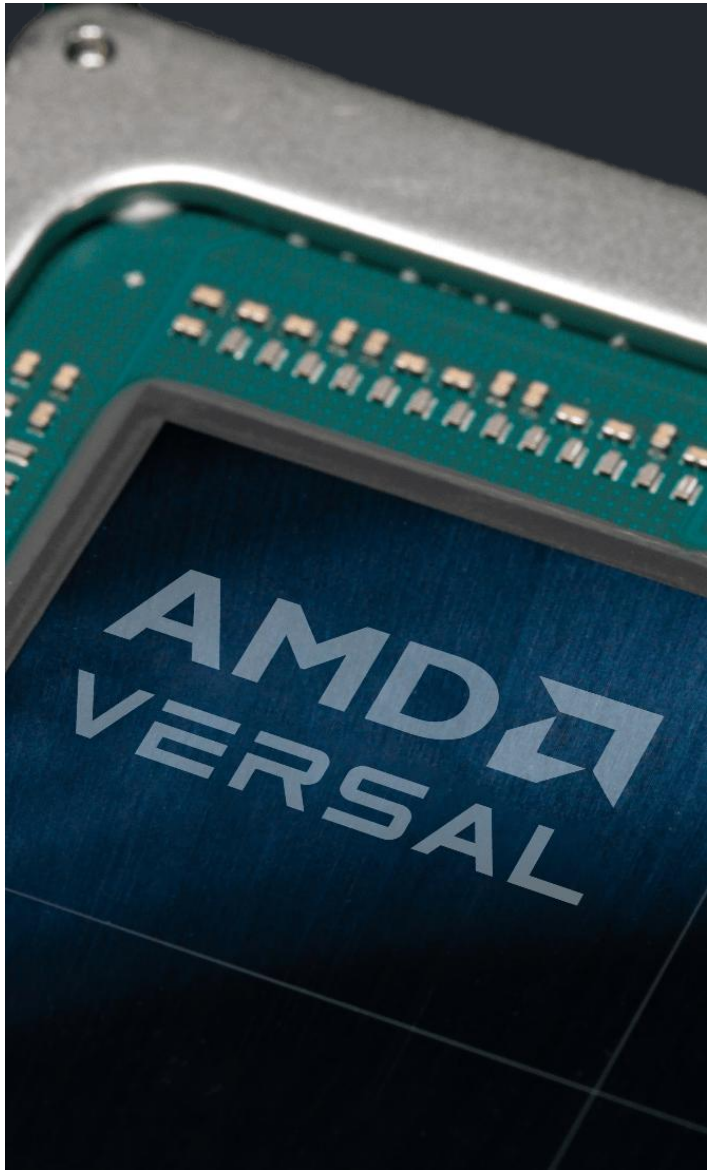
Note:

1. This character is only present in Versal AI Edge Series Gen 2, Prime Series Gen 2, and Premium Series Gen 2 devices.
2. Operation at 110°C Tj is limited to 3% of the device lifetime and can occur sequentially or at regular intervals as long as the total time does not exceed 3% of device lifetime—except -1E and -3E (standard 0–100°C).
3. All packages have Pb-free bumps.

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AMD Versal™ Adaptive SoC Portfolio



Prime Series	**Mid-Range Devices with Option for High-End Scalar Compute** • Gen 1: Broad range of capabilities incl. PCIe® Gen 5, DDR5/LPDDR5[1] • **Gen 2:** Adds up to 10X scalar compute[2], LPDDR5X, VCU	General-Purpose
Premium Series	**High-End Devices Maximizing Connectivity, Hard IP, & DSP** • Gen 1: 112G SerDes, PCIe Gen 5, DDR4, High-Speed Crypto, AIE • **Gen 2:** Adds 128G SerDes, PCIe Gen 6, CXL® 3.1, DDR5/LPDDR5X	General-Purpose
HBM Series	**Adds Integrated HBM Memory to Premium Series Capabilties** • 8, 16, or 32 GB of HBM2e per device • 6X memory bandwidth at up to 65% lower power[3]	Specialized
AI Edge Series	**End-to-End Acceleration for AI-Driven Embedded Systems** • Gen 1: PL for preprocessing, AIE-ML for high-perf. inference • **Gen 2:** Adds up to 10X scalar compute[2] for postprocessing, add'l FuSa	Specialized
AI Core Series	**High-Throughput DSP & AI in a Mid-Size Footprint** • AIE for strong DSP performance/watt & perf/area • AIE-ML for high-performance inference w/PCIe Gen 5, 100 GbE	Specialized
RF Series	**Integrated RF-ADC/RF-DACs w/New DSP Hard IP** • 16 GSPS RF-DACs, 8 GSPS or 32 GSPS RF-ADCs, AIE • FFT/iFFT, Channelizer, LDPC, Frac. Resampler, Polyphase Filters	Specialized

1. DDR5/LPDDR5 support is available in the VM2152 device. All other first-generation Versal Prime Series devices support DDR4/LPDDR4/LPDDR4X.
2. Pre-silicon estimated performance. See Endnotes VER-027.
3. See Endnotes VER-013.

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