AMD Versal™ RF Series Product Selection Guide

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AMD Versal™ RF Series – Resources & Packages

			VR1602	VR1652	VR1902	VR1952
RF	14-bit RF-ADC	# of ADCs	16	4	16	8
		Max Rate (GSPS)	8	32	8	32
	14-bit RF-DAC	# of DACs	16	8	16	16
		Max Rate (GSPS)	16	16	16	16
	LDPC Decoder		4	4	6	6
	1 GSPS Channelizer		224	224	96	96
	FFT/iFFT		28	28	36	36
	Poly Block		–	–	24(1)	24(1)
AI Engine	AI Engine (AIE) Tiles		126	126	120	120
	AIE Data Memory (Mb)		32	32	30	30
Programmable Logic	System Logic Cells		1,205,400	1,205,400	2,473,800	2,473,800
	LUTs		551,040	551,040	1,130,880	1,130,880
	DSP Engines		2,256	2,256	3,976	3,976
	NoC Master / NoC Slave Ports		16	16	36	36
	Distributed RAM (Mb)		17	17	35	35
Memory	Total Block RAM (Mb)		39	39	80	80
	UltraRAM (Mb)		100	100	74	74
	Total PL Memory (Mb)		156	156	189	189
	DDR Memory Controllers (DDRMC5e)		5	5	5	5
	DDR Bus Width		160	160	160	160
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	GTYP Transceivers		12	12	–	–
	GTM Transceivers (56G (112G))		8 (4)	8 (4)	–	–
	GTM2 Transceivers (56G (112G))		–	–	20 (10)	20 (10)
Integrated Protocol IP	PCIe® (PL PCIE5)		1 x Gen5x4	1 x Gen5x4	1 x Gen5x4	1 x Gen5x4
	100G Multirate Ethernet MAC		2	2	2	2
	600G Ethernet MAC		–	–	3	3
Platform	Platform Mgmt Controller		Boot, Security, Safety, Monitoring, and High-Speed Debug			
Ordering Information	Extended Temp[1]		-1MSE, -1LSE, -2MSE, -2MLE, -2LSE, -2LLE			
	Industrial Temp[1]		-1MSI, -1MLI, -1LSI, -1LLI, -2MSI, -2MLI, -2LLI, -2HSI			

Notes:

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

1. Each poly block can be also configured as 16 channelizers. Two poly blocks can be combined to form an arbitrary resampler.
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™ RF Series – Packaging

			VR1602	VR1652	VR1902	VR1952
Package	Package Dimensions (mm)	Ball Pitch (mm)	X5IO DDR Only, X5IO DDR+PL, X5IO PL Only HDIO, MIO GTYP, GTM (112G) RF-ADC (8G), RF-ADC (32G), RF-DAC (16G)		X5IO DDR Only, X5IO DDR+PL, X5IO PL Only HDIO, MIO GTM2 (112G) RF-ADC (8G), RF-ADC (32G), RF-DAC (16G)	
VSVG1596	37.5 x 37.5	0.92	144, 208, 0 22, 78 4, 4 (2) 12, 0, 8	144, 208, 0 22, 78 4, 4 (2) 0, 4, 8		
VSVA2488	47.5 x 47.5	0.92	144, 304, 0 22, 78 12, 8 (4) 16, 0, 16	144, 304, 0 22, 78 12, 8 (4) 0, 4, 8	144, 304, 0 22, 78 20 (10) 16, 0, 16	144, 304, 0 22, 78 20 (10) 0, 8, 16

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AMD Versal™ RF Series – Figures of Merit

			VR1602	VR1652	VR1902	VR1952
AI Engine	AI Engine Peak Perf – INT8	TOPS	41.9	41.9	39.9	39.9
	AI Engine Peak Perf – INT8x16	TOPS	21.0	21.0	20.0	20.0
	AI Engine Peak Perf – INT16	TOPS	10.5	10.5	10.0	10.0
	AI Engine Peak Perf – CINT16	Complex TOPS	2.6	2.6	2.5	2.5
	AI Engine Peak Perf – FP32	TFLOPS	2.6	2.6	2.5	2.5
	AI Engine Peak SRAM Bandwidth	Tb/s	168	168	160	160
Programmable Logic	DSP Engine Peak Perf – INT8	TOPS	15.6	15.6	27.4	27.4
	DSP Engine Peak Perf – INT24	TOPS	5.2	5.2	9.1	9.1
	DSP Engine Peak Perf – CINT18	Complex TOPS	2.2	2.2	3.9	3.9
	DSP Engine Peak Perf – FP32	TFLOPs	3.6	3.6	6.4	6.4
Processing System	Arm® Cortex-A72 Performance	DMIPs	18,942	18,942	18,942	18,942
	Arm Cortex-R5F Performance	DMIPs	2,672	2,672	2,672	2,672
Memory	Total Bandwidth - Block RAM	Tb/s	160	160	326	326
	Total Bandwidth - UltraRAM	Tb/s	38	38	28	28
	Total SRAM Bandwidth	Tb/s	198	198	354	354
I/O	Transceiver Bandwidth	Tb/s	1.98	1.98	5.42	5.42
	Sensor I/O Bandwidth	Gb/s	1,512	1,512	1,836	1,836
Platform	DDR5 Memory Bandwidth	GB/s	128.0	128.0	128.0	128.0
	LPDDR5X Memory Bandwidth	GB/s	170.7	170.7	170.7	170.7
	NoC Cross-Sectional Bandwidth	Tb/s	1.1	1.1	1.7	1.7

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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**

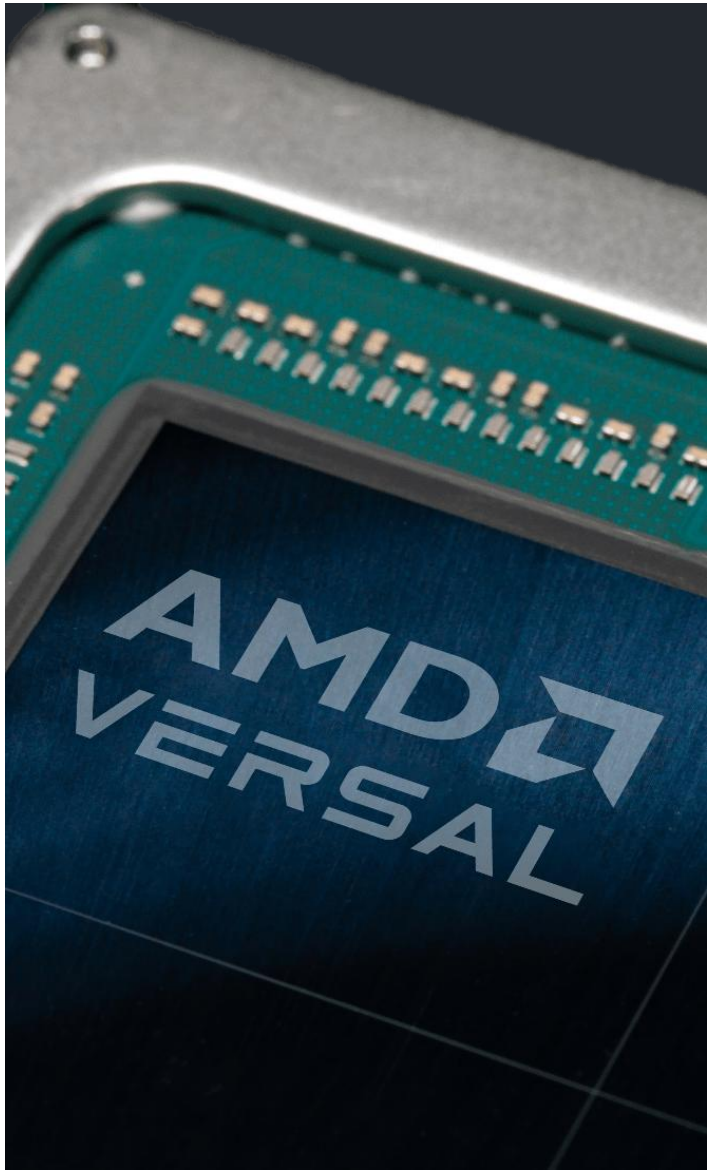
Note:

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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