

Versal™ ACAP AI Core Series Product Selection Guide



Industry's First Adaptive Compute Acceleration Platform (ACAP)

Versal™ AI Core Series – Resources

			VC1352	VC1502	VC1702	VC1802	VC1902
Intelligent Engines	AI Engines		128	248	304	300	400
	AI Engine Data Memory Blocks (#)		1024	1984	2432	2400	3200
	AI Engine Data Memory (Mb)		32	62	76	75	100
Adaptable Engines	DSP Engines		928	1,312	1,312	1,600	1,968
	System Logic Cells (K)		540	797	981	1,586	1,968
	LUTs		246,784	364,544	448,512	725,000	899,840
Memory	Distributed RAM (Mb)		8	11	14	22	27
	Total Block RAM (Mb)		16	19	34	28	34
	UltraRAM (Mb)		59	61	130	91	130
	Total SRAM Capacity (Mb)		115	91	178	141	191
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					
Foundational Platform	Connectivity	Ethernet (x2); UART (x2); CAN-FD (x2); USB 2.0 (x1); SPI (x2); I2C (x2)					
	NoC Master / NoC Slave Ports		10	14	21	28	28
	DDR Bus Width		128	128	192	256	256
	DDR Memory Controllers		2	2	3	4	4
	CCIX & PCIe® w/DMA (CPM)		–	1 x Gen4x16, CCIX	1 x Gen4x16, CCIX	1 x Gen4x16, CCIX	1 x Gen4x16, CCIX
	PCI Express®		1 x Gen4x8	4 x Gen4x8	4 x Gen4x8	4 x Gen4x8	4 x Gen4x8
	100G Multirate Ethernet MAC		1	4	4	4	4
Platform Management Controller	Boot, Security, Safety, Monitoring, and High-Speed Debug						
Package	Package Dimensions (mm)	Ball Pitch (mm)	XPIO, HDIO, MIO, GTYP ⁽¹⁾	XPIO, HDIO, MIO, GTY ⁽¹⁾	XPIO, HDIO, MIO, GTYP ⁽¹⁾	XPIO, HDIO, MIO, GTY ⁽¹⁾	XPIO, HDIO, MIO, GTY ⁽¹⁾
VBVA1024	31x31	0.92	378, 22, 78, 8	378, 22, 78, 8			
VSVE1369	35x35	0.92	378, 44, 78, 8				
VSVG1369	35x35	0.92		378, 44, 78, 24	378, 44, 78, 24		
VSVA1596	37.5x37.5	0.92		378 ⁽²⁾ , 44, 78, 32	378 ⁽²⁾ , 44, 78, 32		
VIVA1596	40x40	0.92				378 ⁽²⁾ , 44, 78, 32	378 ⁽²⁾ , 44, 78, 32
VSVD1760	40x40	0.92				648, 0, 78, 24	648 ⁽³⁾ , 0, 78, 24
VSVA2197	45x45	0.92		378, 44, 78, 44	486, 44, 78, 44	648, 44, 78, 44	648 ⁽³⁾ , 44, 78, 44

Notes:

1. GTY and GTYP transceivers operate at data rates up to 32.75Gb/s
2. LPDDR4 is supported in 324 I/O only.
3. 186 XPIO are dedicated for DDR memory interfaces.

Versal™ AI Core Series – Figures of Merit

			VC1352	VC1502	VC1702	VC1802	VC1902
Intelligent Engines	AI Engine Peak Perf – INT8	TOPs	43	83	101	100	133
	AI Engine Peak Perf – INT8x16	TOPs	21	41	51	50	67
	AI Engine Peak Perf – INT16	TOPs	11	21	25	25	33
	AI Engine Peak Perf – CINT16	Complex TOPs	3	5	6	6	8
	AI Engine Peak Perf – FP32	TFLOPs	3	5	6	6	8
	AI Engine Peak SRAM Bandwidth	Tb/s	170	330	405	399	532
	DSP Engine Peak Perf – INT8	TOPs	6.4	9.1	9.1	11.0	13.6
	DSP Engine Peak Perf – INT24	TOPs	2.1	3.0	3.0	3.7	4.5
	DSP Engine Peak Perf – CINT18	Complex TOPs	0.9	1.3	1.3	1.6	1.9
	DSP Engine Peak Perf – FP32	TFLOPs	1.5	2.1	2.1	2.6	3.2
Adaptable Engines	Adaptable Engine Peak Perf – INT1	TOPs	258	381	469	758	941
	Adaptable Engine Peak Perf – INT2	TOPs	118	175	215	347	431
	Adaptable Engine Peak Perf – INT4	TOPs	31	45	56	90	112
	Adaptable Engine Peak Perf – INT8	TOPs	8	12	14	23	29
Scalar Engines	Arm® Cortex-A72 Performance	DMIPs	15,980	15,980	15,980	15,980	15,980
	Arm Cortex-R5F Performance	DMIPs	2,505	2,505	2,505	2,505	2,505
Memory	Total Bandwidth - Block RAM	Tb/s	64	79	137	115	139
	Total Bandwidth - Ultra RAM	Tb/s	22	23	49	35	49
	Total Bandwidth - Accelerator RAM	Tb/s	0.4	0.0	0.0	0.0	0.0
	Total SRAM Bandwidth	Tb/s	86	102	186	150	188
I/O	Transceiver Bandwidth	Tb/s	0.26	1.44	2.88	1.44	1.44
	Sensor I/O Bandwidth	Gb/s	0	691	941	0	1,478
Platform Engines	DDR4 Memory Bandwidth	GB/s	51.2	51.2	76.8	102.4	102.4
	LPDDR4 Memory Bandwidth	GB/s	68.3	68.3	102.4	136.5	136.5
	NoC Cross-sectional Bandwidth	Tb/s	1.2	1.2	1.7	2.5	2.5

Versal AI Core Series: Figures of Merit

Versal™ ACAP Migration Table

Package Name	Footprint	Versal AI Core Series					Versal Prime Series								Versal Premium Series							
		VC1352	VC1502	VC1702	VC1802	VC1902	VM1102	VM1302	VM1402	VM1502	VM1802	VM2202	VM2302	VM2502	VM2902	VP1102	VP1202	VP1402	VP1502	VP1552	VP1702	VP1802
SFVA784	A784						■															
VBVA1024	A1024	■																				
VFVB1024	B1024							■	—	■												
VFVB1369	B1369							■	—	■	—	■										
VSVE1369	E1369	■																				
VSVF1369	F1369							■	—	■												
VSVG1369	G1369		■	—	■																	
VSVA1596	A1596 ⁽¹⁾		■	—	■																	
VIVA1596	A1596 ⁽¹⁾					■	—	■														
VFVC1596	C1596							■	—	■												
VFVC1760	C1760													■	—	■						
VSVD1760	D1760				■	—	■	—	■	—	■	—	■	—	■							
VFVF1760	F1760													■	—	■	—	■	—	■		
VSVA2197	A2197		■	—	■	—	■	—	■	—	■	—	■	—	■							
VSVC2197	C2197													■	—	■	—	■				
VSVA2785	A2785																					
VSVA3340	A3340																					
LSVC4072	C4072																					
LSVA3112	A3112																					
LSVB4737	B4737																					

Legend
 ■ Device
 — Migration Path

Note:
 1. VSVA1596 package dimensions are 37.5x37.5mm, VIVA1596 package dimensions are 40x40mm with 1.25mm overhang

Versal™ ACAP Ordering Information



Device Name			Device Attributes					Package Definition			
XC	V	C	1902	-1	M	S	E	V	S	V	D1760
Xilinx XC: Commercial XA: Automotive XQ: Defense	Architecture Versal	Series Name C: AI Core M: Prime P: Premium	Device Number Digits 1-3: Value Identifier Digit 4: # of Primary Cores	Speed Grade -1: Slowest -2: Mid -3: Highest	Voltage L: Low (0.7V) M: Mid (0.80V) H: High (0.88V)	Static Screen S: Standard L: Low Static	Temp Grade E: 0 to 110°C ⁽¹⁾ I: -40 to 110°C ⁽¹⁾ Q: -40 to +125°C M: -55 to +125°C	Ball Pitch V: 0.92mm S: 0.8mm L: 1.0mm	Lid S: Lidless, w/Stiffener Ring F: Lidded B: Lidless, no Stiffener Ring H: Lidded Overhang I: Lidless, w/Stiffener Ring & Overhang	RoHS6 Code ⁽²⁾ V: Pb-free Ball Q: Eutectic Ball R: Ruggedized, Eutectic Ball	Footprint

Note:

1. 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).
2. All packages have Pb-free bumps.