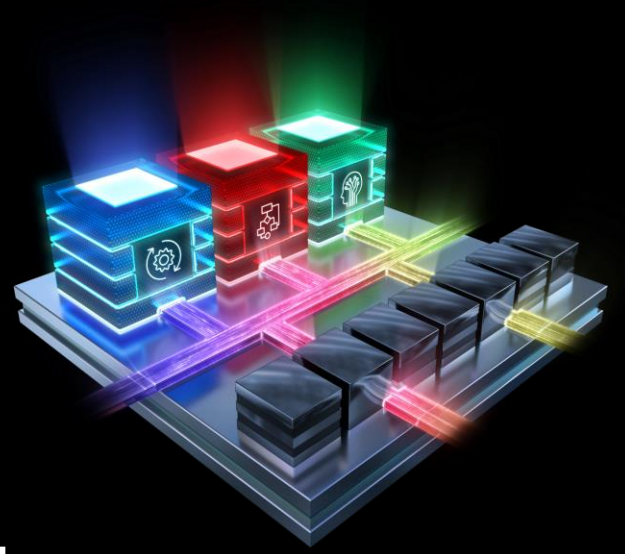
AMD

Versal® ACAP Prime Series Product Selection Guide



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	0	24	24	44	44	0	0	0	0
	GTYP Transceivers	8	0	0	0	0	32(1)	8	28(1)	8
	GTM Transceivers (56Gb/s)	0	0	0	0	0	0	40	20	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
Ordering Information	Extended Temp[2]	-1MSE, -1LSE, -2MSE, -2MLE, -2LSE, -2LLE					-1MSE, -1LSE, -2MSE, -2MLE, -2LSE, -2LLE, -3HSE			
	Industrial Temp[2]	-1MSI, -1MLI, -1LSI, -1LLI, -2MSI, -2MLI, -2LLI, -2HSI					-1MSI, -1MLI, -1LSI, -1LLI, -2MSI, -2MLI			

Notes:
1. 16 GTYP transceivers are dedicated to the CPM 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.

Versal® Prime Series – Packaging

			VM1102	VM1302	VM1402	VM1502	VM1802	VM2202	VM2302	VM2502	VM2902
Package	Package Dimensions (mm)	Ball Pitch (mm)	XPIO DDR Only, XPIO DDR+PL HDIO, MIO GTY, GTYP, GTM								
SFVA784	23x23	0.8	132, 84 22, 78 0, 8, 0								
NBVB1024	31x31	0.92		132, 84 22, 78 16, 0, 0	132, 192 22, 78 16, 0, 0						
NFVB1369	35x35	0.92				132, 246 22, 78 16, 0, 0					
NSVF1369	35x35	0.92		168, 156 22, 78 8, 0, 0	168, 480 22, 78 8, 0, 0						
NSVH1369	35x35	0.92						132, 192 44, 78 0, 32, 0			
VFVC1596	37.5x37.5	0.92		168, 264 22, 78 24, 0, 0	168, 480 22, 78 24, 0, 0						
VFVC1760(1)	40x40	0.92				132, 246 44, 78 44, 0, 0	132, 246 44, 78 44, 0, 0				
VSVD1760(2,3)	40x40	0.92		168, 156 0, 78 16, 0, 0	168, 480 0, 78 16, 0, 0		186, 462 0, 78 24, 0, 0				
VFVF1760(4)	40x40	0.92							180, 306 22, 78 0, 8, 40		180, 306 22, 78 0, 8, 40
VSVI1760	40x40	0.92								132, 516, 0, 78 0, 16, 0	
VSVA2197	45x45	0.92				192, 294 44, 78 44, 0, 0	186, 462 44, 78 44, 0, 0				

Notes:
1. Devices in VFVC1760 support peak LPDDR4 in 162 I/O only. The remaining 216 I/O support limited data rates. See the associated data sheet.
2. VM1302 in VSVD1760 supports peak LPDDR4 in 162 I/O only. The remaining 162 I/O support limited data rates. See the associated data sheet.
3. VM1402 in VSVD1760 supports peak LPDDR4 in 324 I/O only. The remaining 324 I/O support limited data rates. See the associated data sheet.
4. Some packages are compatible with Versal Premium series devices.

Versal® Prime Series – Figures of Merit

			VM1102	VM1302	VM1402	VM1502	VM1802	VM2202	VM2302	VM2502	VM2902
Adaptable Engines	Adaptable Engine Peak Perf – INT1	TOPs	157	336	591	469	941	544	753	941	1067
	Adaptable Engine Peak Perf – INT2	TOPs	72	154	271	215	431	250	345	431	489
	Adaptable Engine Peak Perf – INT4	TOPs	19	40	70	56	112	65	89	112	127
	Adaptable Engine Peak Perf – INT8	TOPs	5	10	18	14	29	17	23	29	33
	NoC Cross-sectional Bandwidth	Tb/s	0.6	0.6	1.1	1.7	2.2	1.7	1.7	2.2	1.7
Memory	Total Bandwidth – Block RAM	Tb/s	22	72	166	137	139	86	202	193	285
	Total Bandwidth – UltraRAM	Tb/s	16	19	30	49	49	28	48	72	69
	Total SRAM Bandwidth	Tb/s	39	91	196	186	188	114	250	265	354
	DDR4 Memory Bandwidth	GB/s	25.6	51.2	102.4	76.8	102.4	76.8	76.8	102.4	76.8
	LPDDR4 Memory Bandwidth	GB/s	34.1	68.3	136.5	102.4	136.5	102.4	102.4	136.5	102.4
Intelligent Engines	DSP Engine Peak Perf – INT8	TOPs	3.2	5.9	11.7	9.1	13.6	9.1	13.1	27.5	18.4
	DSP Engine Peak Perf – INT24	TOPs	1.1	2.0	3.9	3.0	4.5	3.0	4.4	9.2	6.1
	DSP Engine Peak Perf – CINT18	Complex TOPs	0.5	0.8	1.7	1.3	1.9	1.3	1.9	3.9	2.6
	DSP Engine Peak Perf – FP32	TFLOPs	0.7	1.4	2.7	2.1	3.2	2.1	3.1	6.4	4.3
Scalar Engines	Arm Cortex-A72 Performance	DMIPs	18,942	18,942	18,942	18,942	18,942	19,516	19,516	19,516	19,516
	Arm Cortex-R5F Performance	DMIPs	2,672	2,672	2,672	2,672	2,672	2,672	2,672	2,672	2,672
I/O	Transceiver Bandwidth	Tb/s	0.51	1.35	1.35	2.48	2.48	2.10	7.75	1.05	11.36
	Sensor I/O Bandwidth	Gb/s	269	845	1,536	941	1,478	614	979	1,651	979

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

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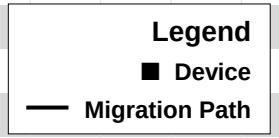
Versal® ACAP Migration Table

Package Name	Footprint	Versal AI Edge Series							Versal AI Core Series							Versal Prime Series									Versal Premium Series						
		VE2002	VE2102	VE2202	VE2302	VE1752	VE2602	VE2802	VC1352	VC1502	VC1702	VC1802	VC1902	VC2602	VC2802	VM1102	VM1302	VM1402	VM1502	VM1802	VM2202	VM2302	VM2502	VM2902	VP1102	VP1202	VP1402	VP1502	VP1552	VP1702	VP1802
SBVA484	A484	■	■																												
SBVA625	A625	■	■																												
SFVA784	A784	■	■	■	■											■															
NBVA1024	A1024								■																						
NBVB1024	B1024																■	■													
NFVB1369	B1369																		■												
NSVE1369	E1369								■																						
NSVF1369	F1369																■	■													
NSVG1369	G1369					■				■	■																				
NSVH1369	H1369						■	■						■	■						■										
VSVA1596(1)	A1596					■				■	■																				
VIVA1596(1)	A1596											■	■																		
VFVC1596	C1596																■	■													
VFVC1760	C1760																		■	■											
VSVD1760	D1760											■	■				■	■		■											
VFVF1760	F1760																					■	■		■		■				
VFVH1760	H1760						■	■						■	■																
VSVI1760	I1760																						■								
VSVA2197	A2197					■				■	■	■	■						■	■											
VSVD2197	D2197																										■				
VSVA2785	A2785																								■	■	■	■	■		
VSVA3112	A3112																											■			
VSVA3340	A3340																										■	■	■	■	
LSVC4072	C4072																														■
VSVA5601	A5601																													■	■



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
Device Grade XC: Commercial XA: Automotive XQ: Defense	**Architecture** Versal	**Series Name** E: AI Edge C: AI Core M: Prime P: Premium H: HBM	**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, w/LSC N: 0.92mm, no LSC 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.

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