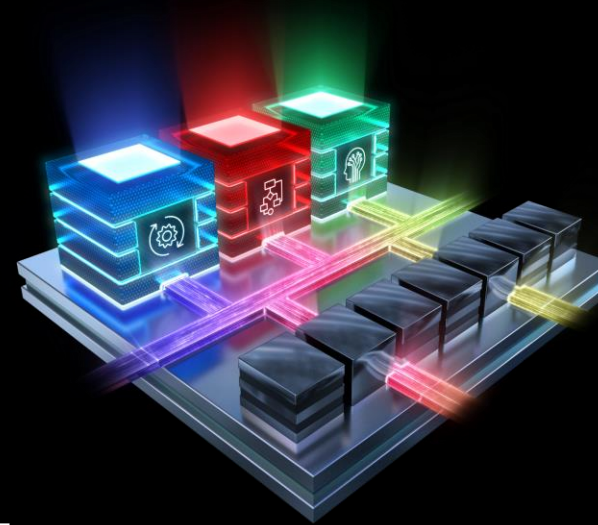




Versal® ACAP Premium Series Product Selection Guide



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
Intelligent Engines	DDR Bus Width	128	128	192	256	192	256	256	256	256	256	256
	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
Scalar Engines	AI Engine Data Memory (Mb)	-	-	-	-	-	-	118	-	-	-	118
	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										
Serial Transceivers	Connectivity	Ethernet (x2); UART (x2); CAN-FD (x2); USB 2.0 (x1); SPI (x2); I2C (x2)										
	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⁾
Integrated Protocol IP	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)
	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
Ordering Information	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
Ordering Information	400G High-Speed Crypto Engine	1	1	3	1	4	2	2	2	3	4	4
	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							

Notes:

- 16 GTYP transceivers are dedicated to the CPM5 for PCI Express use.
- GTM transceivers can operate at data rates up to 112Gb/s by combining two transceivers together. The VP1402 device in the VSVD2197 package can run 64 GTM transceivers at 112Gb/s.
- 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.

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® Premium Series – Packaging

		VP1002	VP1052	VP1102	VP1202	VP1402	VP1502	VP2502	VP1552	VP1702	VP1802	VP2802
Package	Package Dimensions (mm)	Ball Pitch (mm)	XPIO DDR Only, XPIO DDR+PL HDIO, MIO GTY, GTM (112G)	XPIO DDR Only, XPIO DDR+PL HDIO, MIO GTYP, GTM (112G)								
NFVI1369	35x35	0.92	138, 24 0, 78 8, 24 (12)	138, 24 0, 78 8, 36 (18)								
VFVF1760 ⁽¹⁾	40x40	0.92	192, 132 0, 78 8, 24 (12)	192, 132 0, 78 8, 36 (18)	132, 192 22, 78 8, 40 (20)	132, 192 22, 78 8, 40 (20)						
VSVC2021	45x45	0.92	192, 186 0, 78 20, 24 (12)	192, 186 0, 78 20, 48 (24)								
VSVC2197 ⁽¹⁾	45x45	0.92			132, 516 0, 78 28, 20 (10)							
VSVD2197	45x45	0.92				0, 54 0, 78 8, 96 (64) ⁽³⁾						
VSVA2785 ⁽²⁾	50x50	0.92			180, 306 44, 78 8, 64 (32)	132, 570 0, 78 28, 20 (10)	180, 306 44, 78 8, 80 (40)	132, 570 0, 78 28, 56 (28)	132, 570 0, 78 68, 16 (8)			
VSVA3340	55x55	0.92				180, 306 44, 78 8, 96 (48)	132, 354 0, 78 28, 60 (30)		132, 354 0, 78 68, 20 (10)	132, 354 0, 78 28, 88 (44)		
VSVB3340	55x55	0.92						132, 570 0, 78 28, 60 (30)				
LSVC4072	65x65	1.0									132, 570 0, 78 28, 140 (70)	
VSVA5601	70x70	0.92						132, 570 0, 78 28, 60 (30)		132, 570 0, 78 28, 100 (50)	132, 570 0, 78 28, 140 (70)	132, 570 0, 78 28, 140 (70)

Notes:

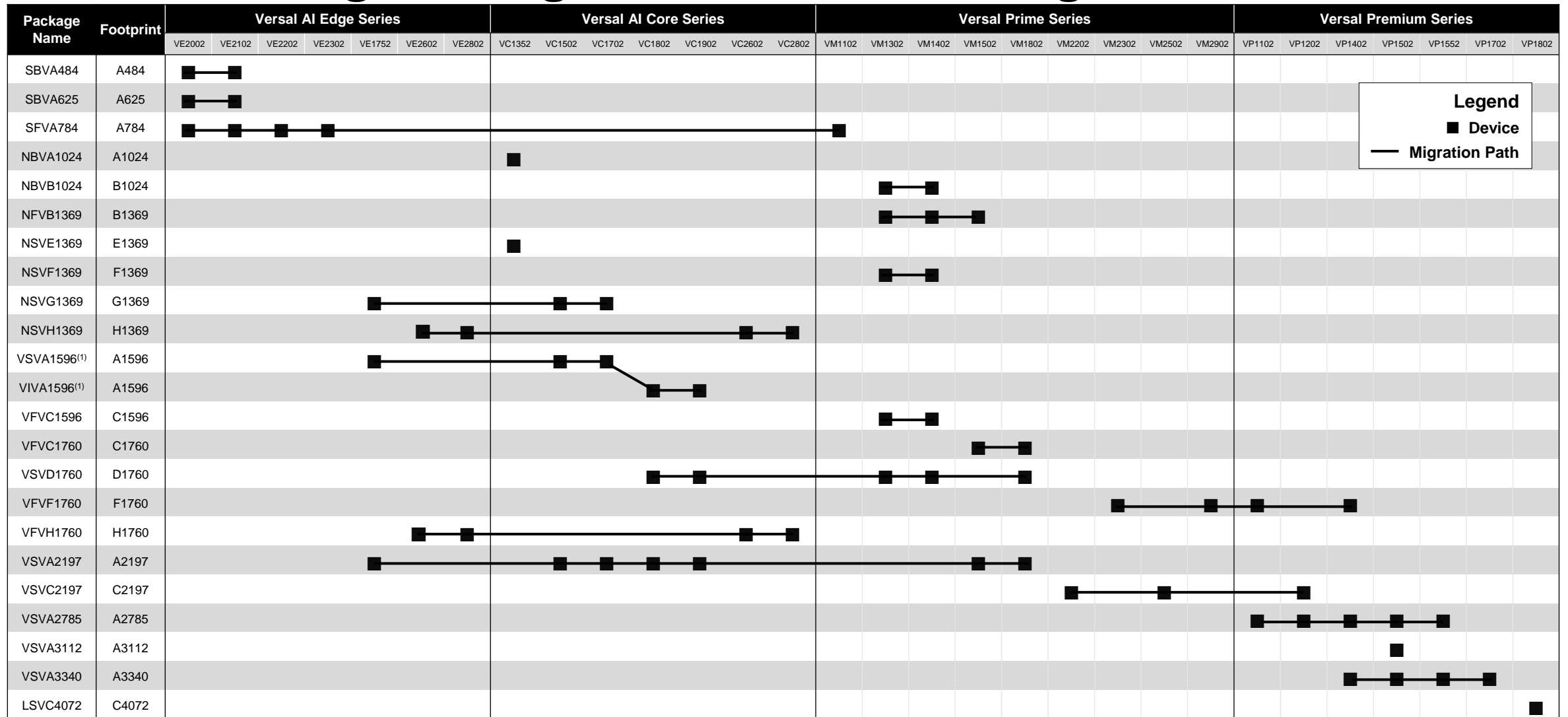
- Some packages are footprint compatible with Versal Prime series devices.
- VP1202, VP1502, and VP1552 in VSVA2785 support peak LPDDR4 data rates in 486 I/O only. The remaining 216 I/O support limited data rates. See the associated data sheet.
- GTM transceivers can operate at data rates up to 112Gb/s by combining two transceivers together. The VP1402 device in the VSVD2197 package can run 64 GTM transceivers at 112Gb/s.

			VP1002	VP1052	VP1102	VP1202	VP1402	VP1502	VP2502	VP1552	VP1702	VP1802	VP2802
Memory	Adaptable Engine Peak Perf – INT4	TOPs	47	67	89	112	127	214	212	218	316	418	416
	Adaptable Engine Peak Perf – INT8	TOPs	12	17	23	29	33	55	55	56	81	107	107
	NoC Cross-sectional Bandwidth	Tb/s	1.1	1.1	1.7	2.2	1.7	2.2	2.2	2.2	2.2	2.2	2.2
	Total Bandwidth - Block RAM	Tb/s	77	108	202	193	285	366	366	366	539	712	712
	Total Bandwidth - Ultra RAM	Tb/s	37	52	48	72	69	138	138	138	205	271	271
	Total PL Memory Bandwidth	Tb/s	114	160	250	265	354	504	504	504	743	982	982
	DDR4 Memory Bandwidth	GB/s	51.2	51.2	76.8	102.4	76.8	102.4	102.4	102.4	102.4	102.4	102.4
LPDDR4 Memory Bandwidth	GB/s	68.3	68.3	102.4	136.5	102.4	136.5	136.5	136.5	136.5	136.5	136.5	
Intelligent Engines	AI Engine Peak Perf – INT8x4	TOPs	-	-	-	-	-	-	157	-	-	-	157
	AI Engine Peak Perf – INT8	TOPs	-	-	-	-	-	-	157	-	-	-	157
	AI Engine Peak Perf – INT8x16	TOPs	-	-	-	-	-	-	79	-	-	-	79
	AI Engine Peak Perf – INT16	TOPs	-	-	-	-	-	-	39	-	-	-	39
	AI Engine Peak Perf – CINT16	Complex TOPs	-	-	-	-	-	-	10	-	-	-	10
	AI Engine Peak Perf – FP32	TFLOPs	-	-	-	-	-	-	10	-	-	-	10
	AI Engine Peak SRAM Bandwidth	Tb/s	-	-	-	-	-	-	628	-	-	-	628
	DSP Engine Peak Perf – INT8	TOPs	7.9	10.8	13.1	27.5	18.4	51.3	51.0	51.0	75.2	99.0	98.7
	DSP Engine Peak Perf – INT24	TOPs	2.6	3.6	4.4	9.2	6.1	17.1	17.0	17.0	25.1	33.0	32.9
	DSP Engine Peak Perf – CINT18	Complex TOPs	1.1	1.5	1.9	3.9	2.6	7.3	7.3	7.3	10.7	14.1	14.1
DSP Engine Peak Perf – FP32	TFLOPs	1.8	2.5	3.1	6.4	4.3	12.0	11.9	11.9	17.5	23.1	23.0	
Scalar Engines	Arm® Cortex-A72 Performance	DMIPs	18,942	18,942	19,516	19,516	19,516	19,516	19,516	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	2,672	2,672
I/O	Transceiver Bandwidth	Tb/s	3.84	6.54	7.75	4.09	14.86	8.60	8.60	6.71	13.12	17.63	17.63
	Sensor I/O Bandwidth	Gb/s	595	595	979	1,824	979	1,824	1,824	1,824	1,824	1,824	1,824
Connectivity Throughput	PCIe Throughput	GT/s	384	384	256	768	256	768	768	1536	768	768	768
	Interlaken Throughput	Gb/s	600	1,200	1,200	0	1,800	600	600	0	1,200	1,800	1,800
	Ethernet Throughput	Gb/s	1,500	2,300	3,000	800	4,400	2,200	2,200	1,000	3,600	5,000	5,000
	Crypto (AES-256) Throughput	Gb/s	400	400	1,200	400	1,600	800	800	800	1,200	1,600	1600
Connectivity Ports	10G Ethernet Ports	#	12	20	24	8	24	16	16	16	24	32	32
	25G Ethernet Ports	#	12	20	24	8	24	16	16	16	24	32	32
	40G Ethernet Ports	#	3	5	6	2	6	4	4	4	6	8	8
	50G Ethernet Ports	#	6	10	12	4	12	8	8	8	12	16	16
	100G Ethernet Ports	#	15	23	48	8	72	22	22	10	36	50	50
	200G Ethernet Ports	#	6	9	21	3	33	9	9	3	15	21	21
	400G Ethernet Ports	#	2	3	7	1	11	3	3	1	5	7	7

Versal® Premium Figures of Merit



Versal® AI Edge through Premium Series Migration Table



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

Versal® Premium to HBM Series Migration

Package Name	Footprint	Versal Premium Series										Versal HBM Series					
		VP1002	VP1052	VP1102	VP1202	VP1402	VP1502	VP2502	VP1552	VP1702	VP1802	VP2802	VH1522	VH1542	VH1582	VH1742	VH1782
NFVI1369	I1369	■	■														
VFVF1760	F1760	■	■	■	—	■											
VSVC2021	C2021	■	■														
VSVC2197	C2197				■												
VSVD2197	D2197					■											
VSVA2785	A2785			■	■	■	■	■	■	■							
VSVA3340	A3340					■	■	■	■	■	■						
VSVB3340	B3340						■										
VSVA3697	A3697												■	■	■		
LSVC4072	C4072										■						
LSVA4737	A4737													■	■	■	■
VSVA5601	A5601							■	■	■	■						

Legend

■ Device

— Migration Path

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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