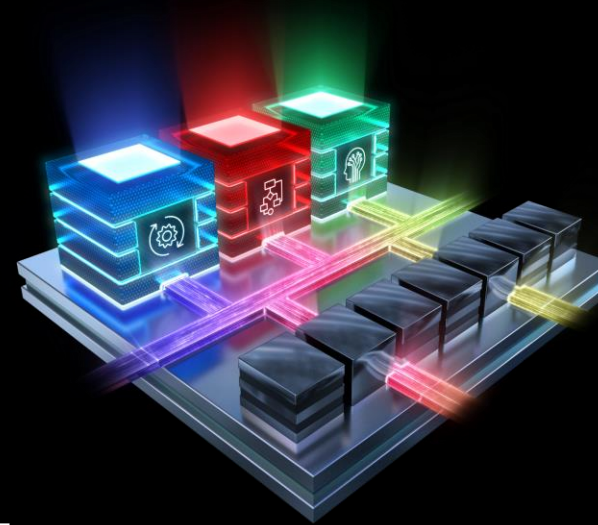




# Versal® ACAP HBM Series Product Selection Guide



# Versal® HBM Series – Resources & Packages

			VH1522	VH1542	VH1582	VH1742	VH1782
Adaptable Engines	System Logic Cells (K)		3,837	3,837	3,837	5,631	5,631
	LUTs		1,753,984	1,753,984	1,753,984	2,574,208	2,574,208
	NoC Master / NoC Slave Ports		52	52	52	76	76
	Distributed RAM (Mb)		54	54	54	79	79
Memory	Total Block RAM (Mb)		89	89	89	132	132
	UltraRAM (Mb)		366	366	366	541	541
	Total PL Memory (Mb)		509	509	509	752	752
	HBM DRAM (GB)		8	16	32	16	32
	DDR Memory Controllers		4	4	4	4	4
	DDR Bus Width		256	256	256	256	256
Intelligent Engines	DSP Engines		7,392	7,392	7,392	10,848	10,848
Scalar Engines	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				
	Connectivity		Ethernet (x2); UART (x2); CAN-FD (x2); USB 2.0 (x1); SPI (x2); I2C (x2)				
Serial Transceivers	GTYP Transceivers (32.75Gb/s)		68 <sup>(1)</sup>	68 <sup>(1)</sup>	68 <sup>(1)</sup>	68 <sup>(1)</sup>	68 <sup>(1)</sup>
	GTM Transceivers <sup>(2)</sup> (56G (112G))		20 (10)	20 (10)	20 (10)	60 (30)	60 (30)
Integrated Protocol IP	CCIX & PCIe® w/DMA (CPM5)		2 x Gen5x8, CCIX	2 x Gen5x8, CCIX	2 x Gen5x8, CCIX	2 x Gen5x8, CCIX	2 x Gen5x8, CCIX
	PCI Express (PLPCIEx5)		8 x Gen5x4	8 x Gen5x4	8 x Gen5x4	8 x Gen5x4	8 x Gen5x4
	100G Multirate Ethernet MAC		4	4	4	6	6
	600G Ethernet MAC		1	1	1	3	3
	600G Interlaken		0	0	0	1	1
	400G High-Speed Crypto Engines		2	2	2	3	3
Ordering Information	Extended Temp		-1MSE, -1LSE, -2MSE, -2MLE, -2LSE, -2LLE, -3HSE				
	Industrial Temp		-				
Package Footprint	Package Dimensions (mm)	Ball Pitch (mm)	XPIO DDR Only, XPIO DDR+PL HDIO, MIO GTYP, GTM (112G)				
VSVA3697	57.5x57.5	0.92	132, 570 0, 78 68, 20 (10)	132, 570 0, 78 68, 20 (10)	132, 570 0, 78 68, 20 (10)		
LSVA4737	70x70	1.0		132, 570 0, 78 68, 20 (10)	132, 570 0, 78 68, 20 (10)	132, 570 0, 78 68, 60 (30)	132, 570 0, 78 68, 60 (30)

- Notes:
- 16 GTYP transceivers are dedicated to CPM5 for PCI Express use.
  - GTM transceivers can operate at data rates up to 112Gb/s by combining two transceivers together.

# Versal® HBM Series – Figures of Merit

			VH1522	VH1542	VH1582	VH1742	VH1782
Adaptable Engines	Adaptable Engine Peak Perf – INT4	TOPs	218	218	218	320	320
	Adaptable Engine Peak Perf – INT8	TOPs	56	56	56	82	82
	NoC Cross-sectional Bandwidth	Tb/s	2.2	2.2	2.2	2.2	2.2
Memory	Total Bandwidth - Block RAM	Tb/s	366	366	366	539	539
	Total Bandwidth - Ultra RAM	Tb/s	138	138	138	205	205
	Total PL Memory Bandwidth	Tb/s	504	504	504	743	743
	DDR4 Memory Bandwidth	GB/s	102.4	102.4	102.4	102.4	102.4
	LPDDR4 Memory Bandwidth	GB/s	136.5	136.5	136.5	136.5	136.5
	HBM Bandwidth	GB/s	409.6	819.2	819.2	819.2	819.2
Intelligent Engines	DSP Engine Peak Perf – INT8	TOPs	51.0	51.0	51.0	74.9	74.9
	DSP Engine Peak Perf – INT24	TOPs	17.0	17.0	17.0	25.0	25.0
	DSP Engine Peak Perf – CINT18	Complex TOPs	7.3	7.3	7.3	10.7	10.7
	DSP Engine Peak Perf – FP32	TFLOPs	11.9	11.9	11.9	17.5	17.5
Scalar Engines	Arm® Cortex-A72 Performance	DMIPs	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
I/O	Transceiver Bandwidth	Tb/s	6.71	6.71	6.71	11.22	11.22
Connectivity Throughput	PCIe® Gen5 Throughput	GT/s	1,536	1,536	1,536	1,536	1,536
	Interlaken Throughput	Gb/s	0	0	0	600	600
	Ethernet Throughput	Gb/s	1,000	1,000	1,000	2,400	2,400
	Cryptographic (AES-256) Throughput	Gb/s	800	800	800	1,200	1,200
Connectivity Ports	10G Ethernet Ports	#	16	16	16	24	24
	25G Ethernet Ports	#	16	16	16	24	24
	40G Ethernet Ports	#	4	4	4	6	6
	50G Ethernet Ports	#	8	8	8	12	12
	100G Ethernet Ports	#	10	10	10	24	24
	200G Ethernet Ports	#	3	3	3	9	9
	400G Ethernet Ports	#	1	1	1	3	3

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

# Versal® Premium to HBM Series Migration Table

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

**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). This is not applicable to the Versal HBM series.
2. All packages have Pb-free bumps.



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