

Versal™ ACAP Prime Series Product Selection Guide



Industry's First Adaptive Compute Acceleration Platform (ACAP)

| | | | 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 SRAM Capacity (Mb) | | 54 | 78 | 137 | 178 | 191 | 111 | 198 | 264 | 282 |
| | DDR Memory Controllers | | 1 | 2 | 4 | 3 | 4 | 3 | 3 | 4 | 3 |
| Intelligent Engines | DDR Bus Widths | | 64 | 128 | 256 | 192 | 256 | 192 | 192 | 256 | 192 |
| | 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 ⁽¹⁾ 32G | | 0 | 24 | 24 | 44 | 44 | 0 | 0 | 0 | 0 |
| | GTYP ⁽¹⁾ 32G | | 8 | 0 | 0 | 0 | 0 | 32 ⁽²⁾ | 8 | 28 ⁽²⁾ | 8 |
| | GTM ⁽³⁾ 56G | | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 16 | 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 |
| Package | Package Dimensions (mm) | Ball Pitch (mm) | XPIO, HDIO, MIO GTY, GTM | XPIO, HDIO, MIO GTY, GTM | XPIO, HDIO, MIO GTY, GTM | XPIO, HDIO, MIO GTY, GTM | XPIO, HDIO, MIO GTY, GTM | XPIO, HDIO, MIO GTY, GTM | XPIO, HDIO, MIO GTY, GTM | XPIO, HDIO, MIO GTY, GTM | XPIO, HDIO, MIO GTY, GTM |
| SFVA784 | 23x23 | 0.8 | 216, 22, 78 8, 0 | | | | | | | | |
| VFVB1024 | 31x31 | 0.92 | | 216, 22, 78 16, 0 | 324, 22, 78 16, 0 | | | | | | |
| VFVB1369 | 35x35 | 0.92 | | 216, 22, 78 24, 0 | 324, 22, 78 24, 0 | 378, 22, 78 16, 0 | | | | | |
| VFVF1369 | 35x35 | 0.92 | | 324, 22, 78 8, 0 | 648 ⁽⁵⁾ , 22, 78 8, 0 | | | | | | |
| VFVC1596 | 37.5x37.5 | 0.92 | | 432, 22, 78 24, 0 | 648 ⁽⁵⁾ , 22, 78 24, 0 | | | | | | |
| VFVC1760 | 40x40 | 0.92 | | | | 378 ⁽⁴⁾ , 44, 78 44, 0 | 378 ⁽⁴⁾ , 44, 78 44, 0 | | | | |
| VSVD1760 | 40x40 | 0.92 | | 324 ⁽⁴⁾ , 0, 78 16, 0 | 648 ^(5,6) , 0, 78 16, 0 | | 648, 0, 78 24, 0 | | | | |
| VFVF1760 | 42.5x42.5 | 0.92 | | | | | | 486, 22, 78 8, 40 | | 486, 22, 78 8, 40 | |
| VSVA2197 | 45x45 | 0.92 | | | | 486, 44, 78 44, 0 | 648, 44, 78 44, 0 | | | | |
| VSVC2197 | 45x45 | 0.92 | | | | | | 486, 44, 78 32, 0 | | 648, 0, 78 28, 20 | |

1. GTY and GTYP transceivers operate at data rates up to 32.75Gb/s.
2. 16 GTYP transceivers are dedicated to the CPM for PCI Express use.

3. GTM transceivers operate at data rates up to 58Gb/s.
4. LPDDR4 supported in 162 I/O only.

5. 168 XPIO are dedicated for DDR memory interfaces.
6. LPDDR4 supported in 324 I/O only.

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 | 15,980 | 15,980 | 15,980 | 15,980 | 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 | 2,505 | 2,505 | 2,505 | 2,505 |
| I/O | Transceiver Bandwidth | Tb/s | 0.52 | 1.57 | 1.57 | 2.88 | 2.88 | 2.10 | 7.95 | 4.15 | 11.66 |
| | Sensor I/O Bandwidth | Gb/s | 0 | 0 | 1536 | 0 | 0 | 0 | 0 | 0 | 0 |

Versal Prime Series: Figures of Merit

All parameters listed are maximum values. Verify all data in this document with the device data sheets or product guides found at: www.xilinx.com.

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 | | | | | | | | | | | | | | | | | | | | | | ■ |

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

Legend
 ■ Device
 — Migration Path

Versal™ ACAP Ordering Information



Device Name

Device Attributes

Package Definition

| | | | | | | | | | | | |
|--|-------------------------------|--|---|---|--|--|---|--|---|---|------------------|
| XC | V | M | 1802 | -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.