

Zynq UltraScale+ MPSoC Product Tables and Product Selection Guide



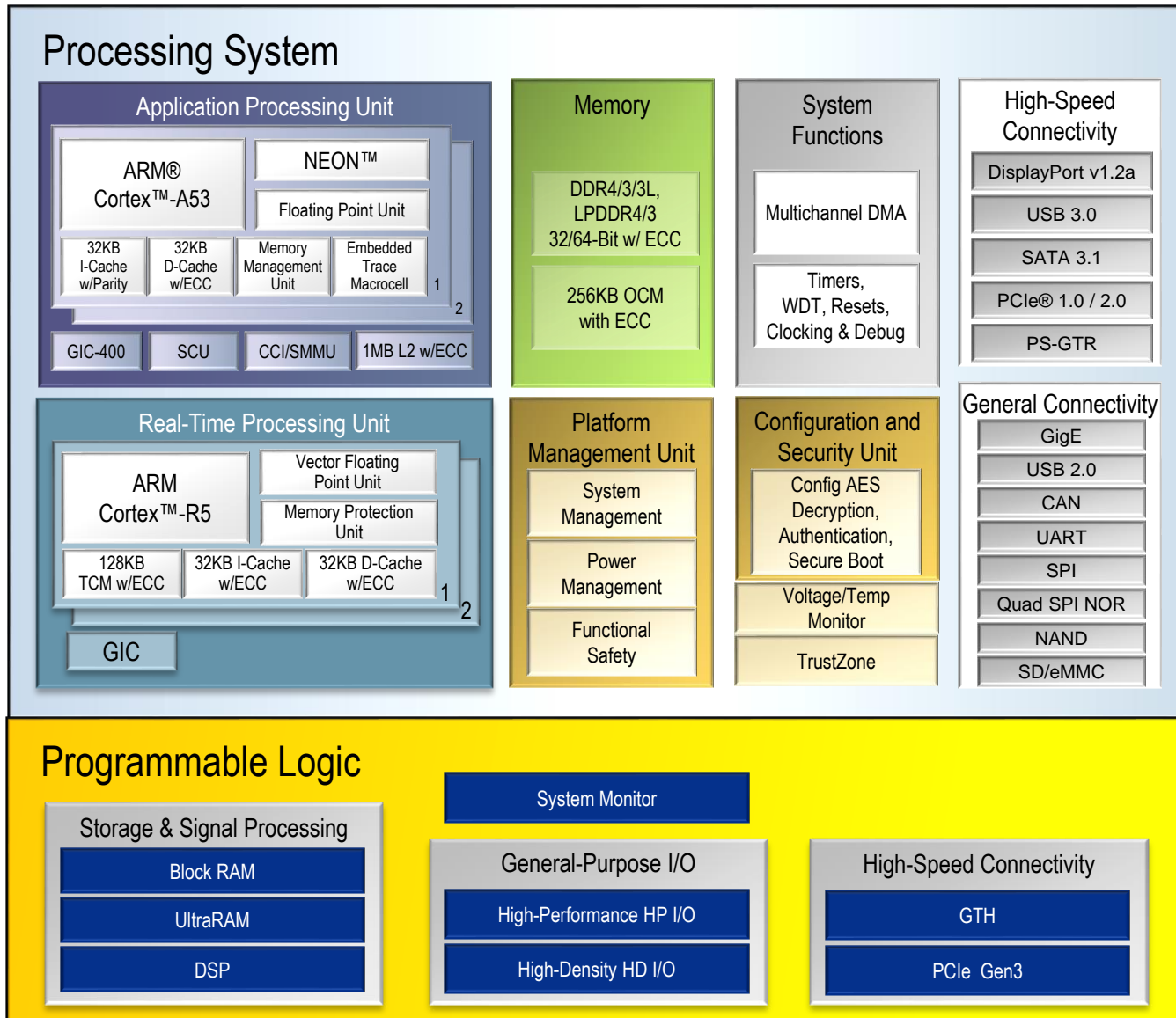
ZYNQ
UltraSCALE+

XILINX

Zynq® UltraScale+™ MPSoCs

	CG Devices	EG Devices	EV Devices
Application Processor	Dual-core ARM® Cortex™-A53 MPCore™ up to 1.3GHz	Quad-core ARM Cortex-A53 MPCore up to 1.5GHz	Quad-core ARM Cortex-A53 MPCore up to 1.5GHz
Real-Time Processor	Dual-core ARM Cortex-R5 MPCore up to 533MHz	Dual-core ARM Cortex-R5 MPCore up to 600MHz	Dual-core ARM Cortex-R5 MPCore up to 600MHz
Graphics Processor		Mali™-400 MP2	Mali™-400 MP2
Video Codec			H.264 / H.265
Programmable Logic	103K–600K System Logic Cells	103K–1143K System Logic Cells	192K–504K System Logic Cells
Applications	<ul style="list-style-type: none"> • Sensor Processing & Fusion • Motor Control • Low-cost Ultrasound • Traffic Engineering 	<ul style="list-style-type: none"> • Flight Navigation • Missile & Munitions • Military Construction • Secure Solutions • Networking • Cloud Computing Security • Data Center • Machine Vision • Medical Endoscopy 	<ul style="list-style-type: none"> • Situational Awareness • Surveillance/Reconnaissance • Smart Vision • Image Manipulation • Graphic Overlay • Human Machine Interface • Automotive ADAS • Video Processing • Interactive Display

Zynq® UltraScale+™ MPSoCs: CG Block Diagram

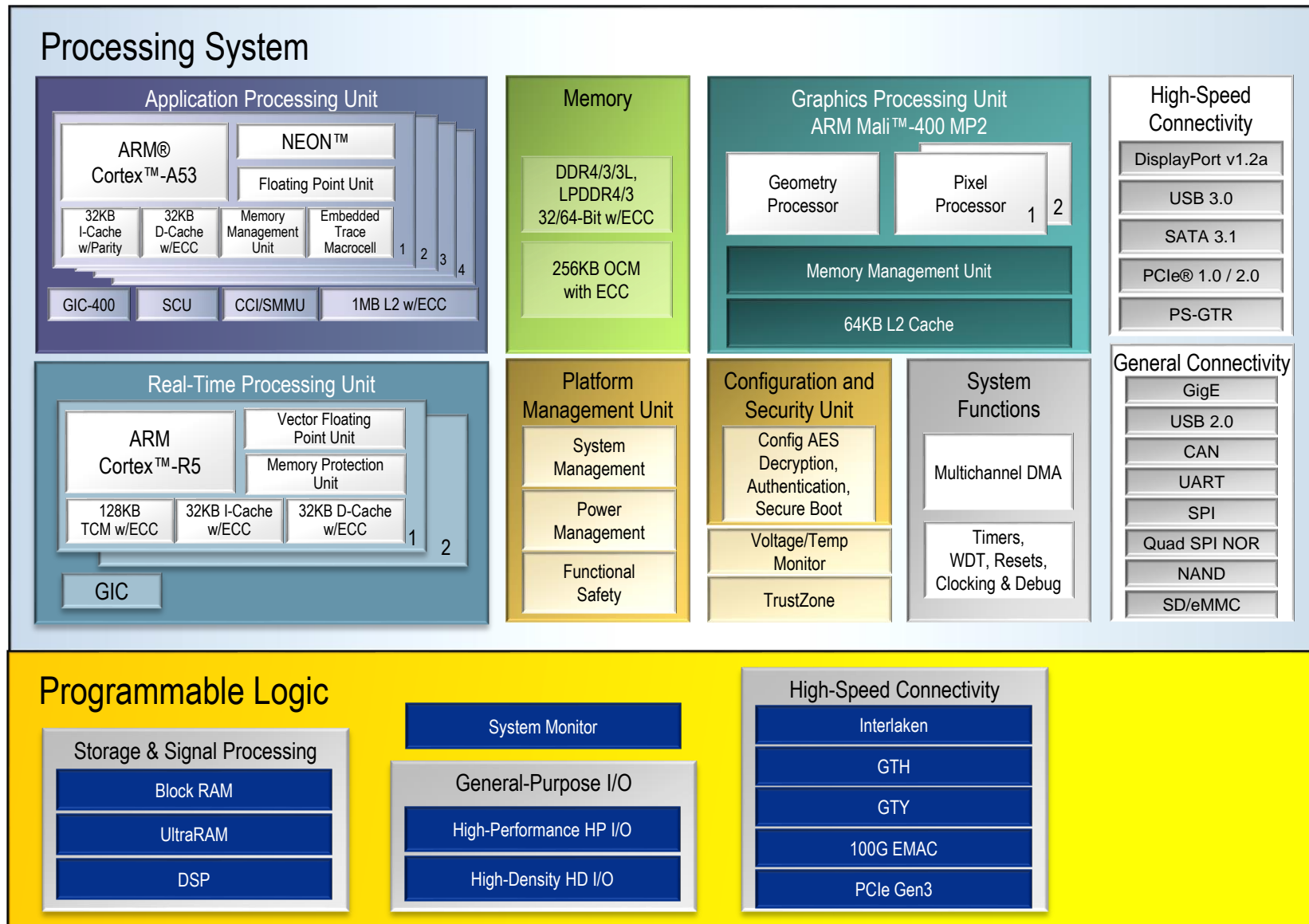


Zynq® UltraScale+™ MPSoCs: CG Devices

		Device Name ⁽¹⁾	ZU2CG	ZU3CG	ZU4CG	ZU5CG	ZU6CG	ZU7CG	ZU9CG
Processing System (PS)	Application Processor Unit	Processor Core	Dual-core ARM® Cortex™-A53 MPCore™ up to 1.3GHz						
		Memory w/ECC	L1 Cache 32KB I / D per core, L2 Cache 1MB, on-chip Memory 256KB						
	Real-Time Processor Unit	Processor Core	Dual-core ARM Cortex-R5 MPCore up to 533MHz						
		Memory w/ECC	L1 Cache 32KB I / D per core, Tightly Coupled Memory 128KB per core						
	External Memory	Dynamic Memory Interface	x32/x64: DDR4, LPDDR4, DDR3, DDR3L, LPDDR3 with ECC						
		Static Memory Interfaces	NAND, 2x Quad-SPI						
	Connectivity	High-Speed Connectivity	PCIe® Gen2 x4, 2x USB3.0, SATA 3.1, DisplayPort, 4x Tri-mode Gigabit Ethernet						
		General Connectivity	2xUSB 2.0, 2x SD/SDIO, 2x UART, 2x CAN 2.0B, 2x I2C, 2x SPI, 4x 32b GPIO						
	Integrated Block Functionality	Power Management	Full / Low / PL / Battery Power Domains						
		Security	RSA, AES, and SHA						
AMS - System Monitor		10-bit, 1MSPS – Temperature and Voltage Monitor							
PS to PL Interface		12 x 32/64/128b AXI Ports							
Programmable Logic (PL)	Programmable Functionality	System Logic Cells (K)	103	154	192	256	469	504	600
		CLB Flip-Flops (K)	94	141	176	234	429	461	548
		CLB LUTs (K)	47	71	88	117	215	230	274
	Memory	Max. Distributed RAM (Mb)	1.2	1.8	2.6	3.5	6.9	6.2	8.8
		Total Block RAM (Mb)	5.3	7.6	4.5	5.1	25.1	11.0	32.1
		UltraRAM (Mb)	-	-	13.5	18.0	-	27.0	-
	Clocking	Clock Management Tiles (CMTs)	3	3	4	4	4	8	4
	Integrated IP	DSP Slices	240	360	728	1,248	1,973	1,728	2,520
		PCI Express® Gen 3x16	-	-	2	2	-	2	-
		150G Interlaken	-	-	-	-	-	-	-
		100G Ethernet MAC/PCS w/RS-FEC	-	-	-	-	-	-	-
		AMS - System Monitor	1	1	1	1	1	1	1
	Transceivers	GTH 16.3Gb/s Transceivers	-	-	16	16	24	24	24
		GTY 32.75Gb/s Transceivers	-	-	-	-	-	-	-
	Speed Grades	Extended ⁽²⁾						-1 -2 -2L	
Industrial							-1 -1L -2		

Notes:
1. For full part number details, see the Ordering Information section in [DS891, Zynq UltraScale+ MPSoC Overview](#).
2.-2L (Tj = 0°C to 110°C). For more details, see the Ordering Information section in [DS891, Zynq UltraScale+ MPSoC Overview](#).

Zynq® UltraScale+™ MPSoCs: EG Block Diagram



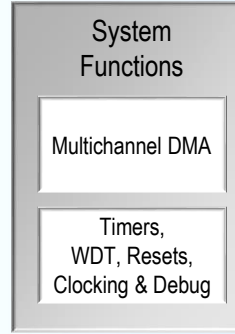
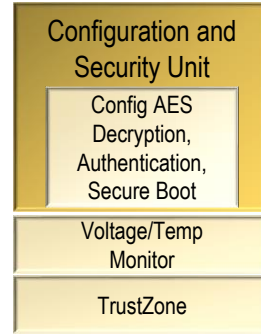
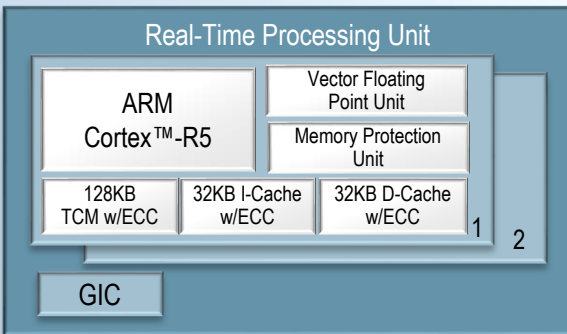
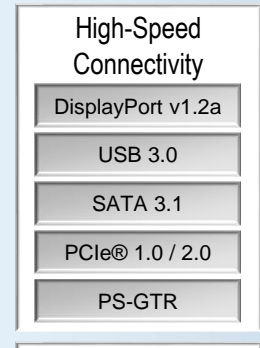
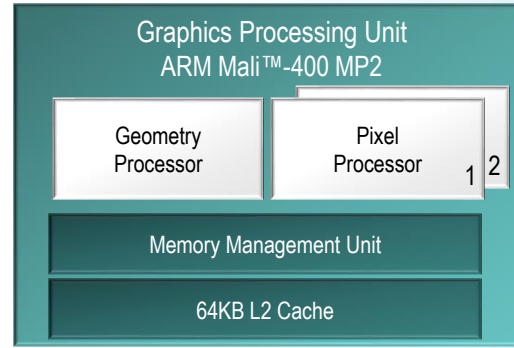
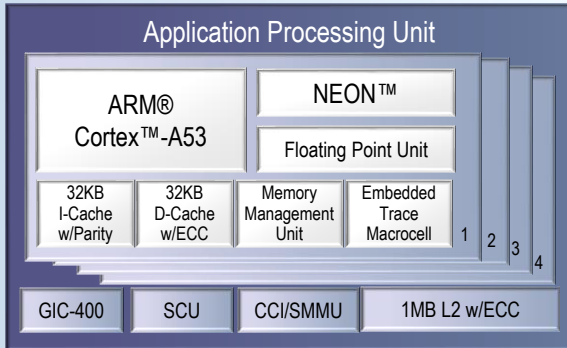
Zynq® UltraScale+™ MPSoCs: EG Devices

		Device Name ⁽¹⁾	ZU2EG	ZU3EG	ZU4EG	ZU5EG	ZU6EG	ZU7EG	ZU9EG	ZU11EG	ZU15EG	ZU17EG	ZU19EG	
Processing System (PS)	Application	Processor Core	Quad-core ARM® Cortex™-A53 MPCore™ up to 1.5GHz											
	Processor Unit	Memory w/ECC	L1 Cache 32KB I / D per core, L2 Cache 1MB, on-chip Memory 256KB											
	Real-Time	Processor Core	Dual-core ARM Cortex-R5 MPCore™ up to 600MHz											
	Processor Unit	Memory w/ECC	L1 Cache 32KB I / D per core, Tightly Coupled Memory 128KB per core											
	Graphic & Video	Graphics Processing Unit	Mali™-400 MP2 up to 667MHz											
	Acceleration	Memory	L2 Cache 64KB											
	External Memory	Dynamic Memory Interface	x32/x64: DDR4, LPDDR4, DDR3, DDR3L, LPDDR3 with ECC											
		Static Memory Interfaces	NAND, 2x Quad-SPI											
	Connectivity	High-Speed Connectivity	PCIe® Gen2 x4, 2x USB3.0, SATA 3.1, DisplayPort, 4x Tri-mode Gigabit Ethernet											
		General Connectivity	2xUSB 2.0, 2x SD/SDIO, 2x UART, 2x CAN 2.0B, 2x I2C, 2x SPI, 4x 32b GPIO											
Integrated Block Functionality	Power Management	Full / Low / PL / Battery Power Domains												
	Security	RSA, AES, and SHA												
	AMS - System Monitor	10-bit, 1MSPS – Temperature and Voltage Monitor												
PS to PL Interface	12 x 32/64/128b AXI Ports													
Programmable Logic (PL)	Programmable Functionality	System Logic Cells (K)	103	154	192	256	469	504	600	653	747	926	1,143	
		CLB Flip-Flops (K)	94	141	176	234	429	461	548	597	682	847	1,045	
		CLB LUTs (K)	47	71	88	117	215	230	274	299	341	423	523	
	Memory	Max. Distributed RAM (Mb)	1.2	1.8	2.6	3.5	6.9	6.2	8.8	9.1	11.3	8.0	9.8	
		Total Block RAM (Mb)	5.3	7.6	4.5	5.1	25.1	11.0	32.1	21.1	26.2	28.0	34.6	
		UltraRAM (Mb)	-	-	13.5	18.0	-	27.0	-	22.5	31.5	28.7	36.0	
	Clocking	Clock Management Tiles (CMTs)	3	3	4	4	4	8	4	8	4	11	11	
	Integrated IP	DSP Slices	240	360	728	1,248	1,973	1,728	2,520	2,928	3,528	1,590	1,968	
		PCI Express® Gen 3x16	-	-	2	2	-	2	-	4	-	4	5	
		150G Interlaken	-	-	-	-	-	-	-	1	-	2	4	
		100G Ethernet MAC/PCS w/RS-FEC	-	-	-	-	-	-	-	2	-	2	4	
		AMS - System Monitor	1	1	1	1	1	1	1	1	1	1	1	
	Transceivers	GTH 16.3Gb/s Transceivers	-	-	16	16	24	24	24	32	24	44	44	
		GTY 32.75Gb/s Transceivers	-	-	-	-	-	-	-	16	-	28	28	
	Speed Grades	Extended ⁽²⁾	-1 -2 -2L			-1 -2 -2L -3				-1 -2 -2L -3				
		Industrial	-1 -1L -2											

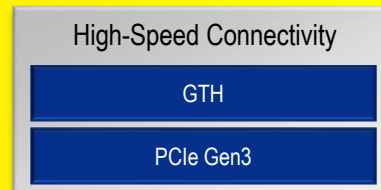
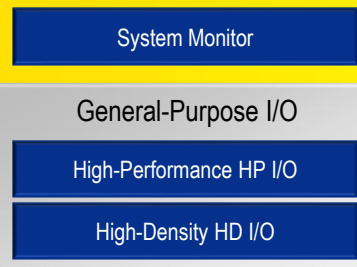
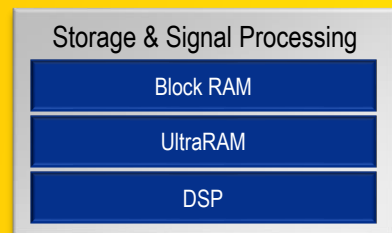
Notes:
1. For full part number details, see the Ordering Information section in [DS891, Zynq UltraScale+ MPSoC Overview](#).
2.-2LE (Tj = 0°C to 110°C). For more details, see the Ordering Information section in [DS891, Zynq UltraScale+ MPSoC Overview](#).

Zynq® UltraScale+™ MPSoCs: EV Block Diagram

Processing System



Programmable Logic



Zynq® UltraScale+™ MPSoCs: EV Devices

	Device Name ⁽¹⁾	ZU4EV	ZU5EV	ZU7EV	
Processing System (PS)	Application	Processor Core Quad-core ARM® Cortex™-A53 MPCore™ up to 1.5GHz			
	Processor Unit	Memory w/ECC L1 Cache 32KB I / D per core, L2 Cache 1MB, on-chip Memory 256KB			
	Real-Time	Processor Core Dual-core ARM Cortex-R5 MPCore™ up to 600MHz			
	Processor Unit	Memory w/ECC L1 Cache 32KB I / D per core, Tightly Coupled Memory 128KB per core			
	Graphic & Video Acceleration	Graphics Processing Unit	Mali™-400 MP2 up to 667MHz		
		Memory	L2 Cache 64KB		
	External Memory	Dynamic Memory Interface	x32/x64: DDR4, LPDDR4, DDR3, DDR3L, LPDDR3 with ECC		
		Static Memory Interfaces	NAND, 2x Quad-SPI		
	Connectivity	High-Speed Connectivity	PCIe® Gen2 x4, 2x USB3.0, SATA 3.1, DisplayPort, 4x Tri-mode Gigabit Ethernet		
		General Connectivity	2xUSB 2.0, 2x SD/SDIO, 2x UART, 2x CAN 2.0B, 2x I2C, 2x SPI, 4x 32b GPIO		
Integrated Block Functionality	Power Management	Full / Low / PL / Battery Power Domains			
	Security	RSA, AES, and SHA			
	AMS - System Monitor	10-bit, 1MSPS – Temperature and Voltage Monitor			
PS to PL Interface		12 x 32/64/128b AXI Ports			
Programmable Logic (PL)	Programmable Functionality	System Logic Cells (K)	192	256	504
		CLB Flip-Flops (K)	176	234	461
		CLB LUTs (K)	88	117	230
	Memory	Max. Distributed RAM (Mb)	2.6	3.5	6.2
		Total Block RAM (Mb)	4.5	5.1	11.0
		UltraRAM (Mb)	13.5	18.0	27.0
	Clocking	Clock Management Tiles (CMTs)	4	4	8
		DSP Slices	728	1,248	1,728
	Integrated IP	Video Codec Unit (VCU)	1	1	1
		PCI Express® Gen 3x16	2	2	2
		150G Interlaken	-	-	-
		100G Ethernet MAC/PCS w/RS-FEC	-	-	-
		AMS - System Monitor	1	1	1
	Transceivers	GTH 16.3Gb/s Transceivers	16	16	24
		GTY 32.75Gb/s Transceivers	-	-	-
	Speed Grades	Extended ⁽²⁾		-1 -2 -2L -3	
		Industrial		-1 -1L -2	

Notes:
1. For full part number details, see the Ordering Information section in [DS891, Zynq UltraScale+ MPSoC Overview](#).
2. -2LE (Tj = 0°C to 110°C). For more details, see the Ordering Information section in [DS891, Zynq UltraScale+ MPSoC Overview](#).

Zynq® UltraScale+™ MPSoCs

PS I/Os⁽¹⁾, 3.3V High-Density (HD) I/O, 1.8V High-Performance (HP) I/Os
 PS-GTR 6Gb/s, GTH 16.3Gb/s, GTY 32.75Gb/s

Pkg Footprint ^(2,3)	Dimensions (mm)	ZU2	ZU3	ZU4	ZU5	ZU6	ZU7	ZU9	ZU11	ZU15	ZU17	ZU19
A484 ⁽⁴⁾	19x19	170, 24, 58 4, 0, 0	170, 24, 58 4, 0, 0									
A625 ⁽⁴⁾	21x21	170, 24, 156 4, 0, 0	170, 24, 156 4, 0, 0									
C784 ^(4,5)	23x23	214, 96, 156 4, 0, 0	214, 96, 156 4, 0, 0	214, 96, 156 4, 4, 0	214, 96, 156 4, 4, 0							
B900	31x31			214, 48, 156 4, 16, 0	214, 48, 156 4, 16, 0		214, 48, 156 4, 16, 0					
C900	31x31					214, 48, 156 4, 16, 0		214, 48, 156 4, 16, 0		214, 48, 156 4, 16, 0		
B1156	35x35					214, 120, 208 4, 24, 0		214, 120, 208 4, 24, 0		214, 120, 208 4, 24, 0		
C1156	35x35						214, 48, 312 4, 20, 0		214, 48, 312 4, 20, 0			
B1517	40x40								214, 72, 416 4, 16, 0		214, 72, 572 4, 16, 0	214, 72, 572 4, 16, 0
F1517	40x40						214, 48, 416 4, 24, 0		214, 48, 416 4, 32, 0			
C1760	42.5x42.5								214, 96, 416 4, 32, 16		214, 96, 416 4, 32, 16	214, 96, 416 4, 32, 16
D1760	42.5x42.5										214, 48, 260 4, 44, 28	214, 48, 260 4, 44, 28
E1924	45x45										214, 96, 572 4, 44, 0	214, 96, 572 4, 44, 0

Notes:

1. PS I/O is a combination of PS MIO and PS DDRIO.
2. Packages with the same last letter and number sequence, e.g., A484, are footprint compatible with all other UltraScale devices with the same sequence.
3. For full part number details, see the Ordering Information section in [DS891](#), *Zynq UltraScale+ MPSoC Overview*.
4. These packages are only offered in 0.8mm ballpitch. All other packages are offered in 1.0mm ball pitch.
5. GTH transceivers in the C784 package support data rates up to 12.5Gb/s.

Important: Verify all data in this document with the device data sheets found at www.xilinx.com

Zynq® UltraScale+™ MPSoC Device Migration Table

The Zynq UltraScale+ family provides footprint compatibility to enable users to migrate designs from one device to another. Any two packages with the same footprint identifier code (last letter and number sequence) are footprint compatible.

Pkg	mm	Zynq® UltraScale+™																				
		CG Devices							EG Devices										EV Devices			
		ZU2CG	ZU3CG	ZU4CG	ZU5CG	ZU6CG	ZU7CG	ZU9CG	ZU2EG	ZU3EG	ZU4EG	ZU5EG	ZU6EG	ZU7EG	ZU9EG	ZU11EG	ZU15EG	ZU17EG	ZU19EG	ZU4EV	ZU5EV	ZU7EV
A484	19	■	■						■	■												
A625	21	■	■						■	■												
C784	23	■	■	■	■				■	■	■	■								■	■	
B900	31			■	■		■			■	■		■							■	■	■
C900	31				■		■				■		■		■		■					
B1156	35				■		■				■		■		■		■					
C1156	35					■						■		■								■
B1517	40													■		■	■					
F1517	40					■							■		■							■
C1760	42.5													■		■	■					
D1760	42.5																■	■				
E1924	45																■	■				

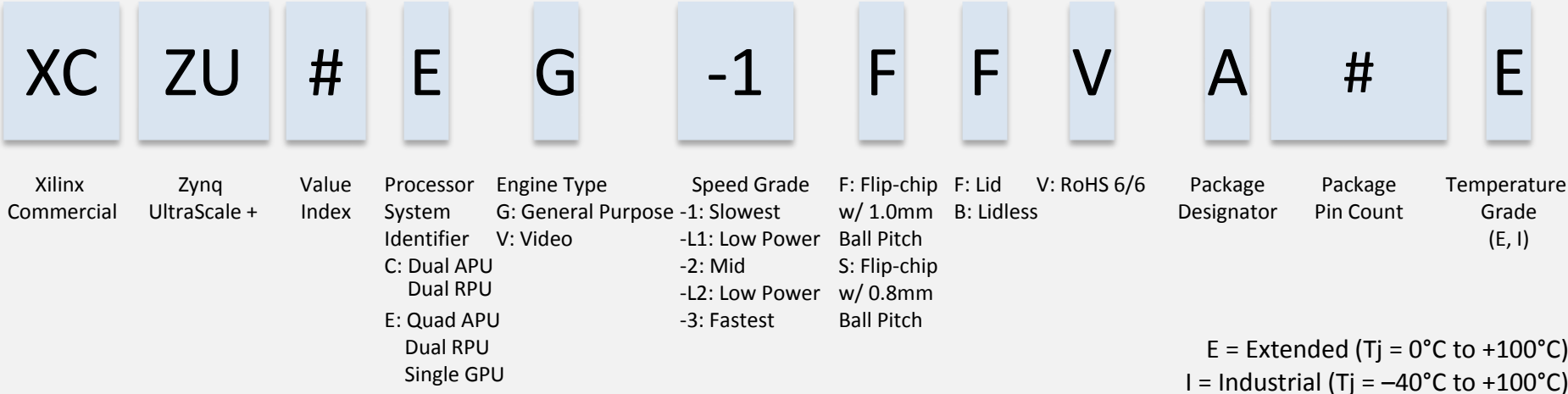
Zynq® UltraScale+™ MPSoC Speed Grades

Speed Grade		Device Name ⁽¹⁾																				
		ZU2		ZU3		ZU4			ZU5			ZU6		ZU7			ZU9		ZU11	ZU15	ZU17	ZU19
		CG	EG	CG	EG	CG	EG	EV	CG	EG	EV	CG	EG	CG	EG	EV	CG	EG	EG	EG	EG	EG
Extended ⁽²⁾	-1	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	-2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	-2L	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	-3	–	–	–	–	–	•	•	–	•	•	–	•	–	•	•	–	•	•	•	•	•
Industrial	-1	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	-1L	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	-2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Notes:
 1. For full part number details, see the Ordering Information section in [DS891, Zynq UltraScale+ MPSoC Overview](#).
 2. -2LE (Tj = 0°C to 110°C). For more details, see the Ordering Information section in [DS891, Zynq UltraScale+ MPSoC Overview](#).

- :: available
- :: not offered

Zynq® UltraScale+™ MPSoC Ordering Information



E = Extended (Tj = 0°C to +100°C)
I = Industrial (Tj = -40°C to +100°C)

Note: -L2E (Tj = 0°C to +110°C). Refer to [DS891](#), Zynq UltraScale+ MPSoC Overview for additional information.

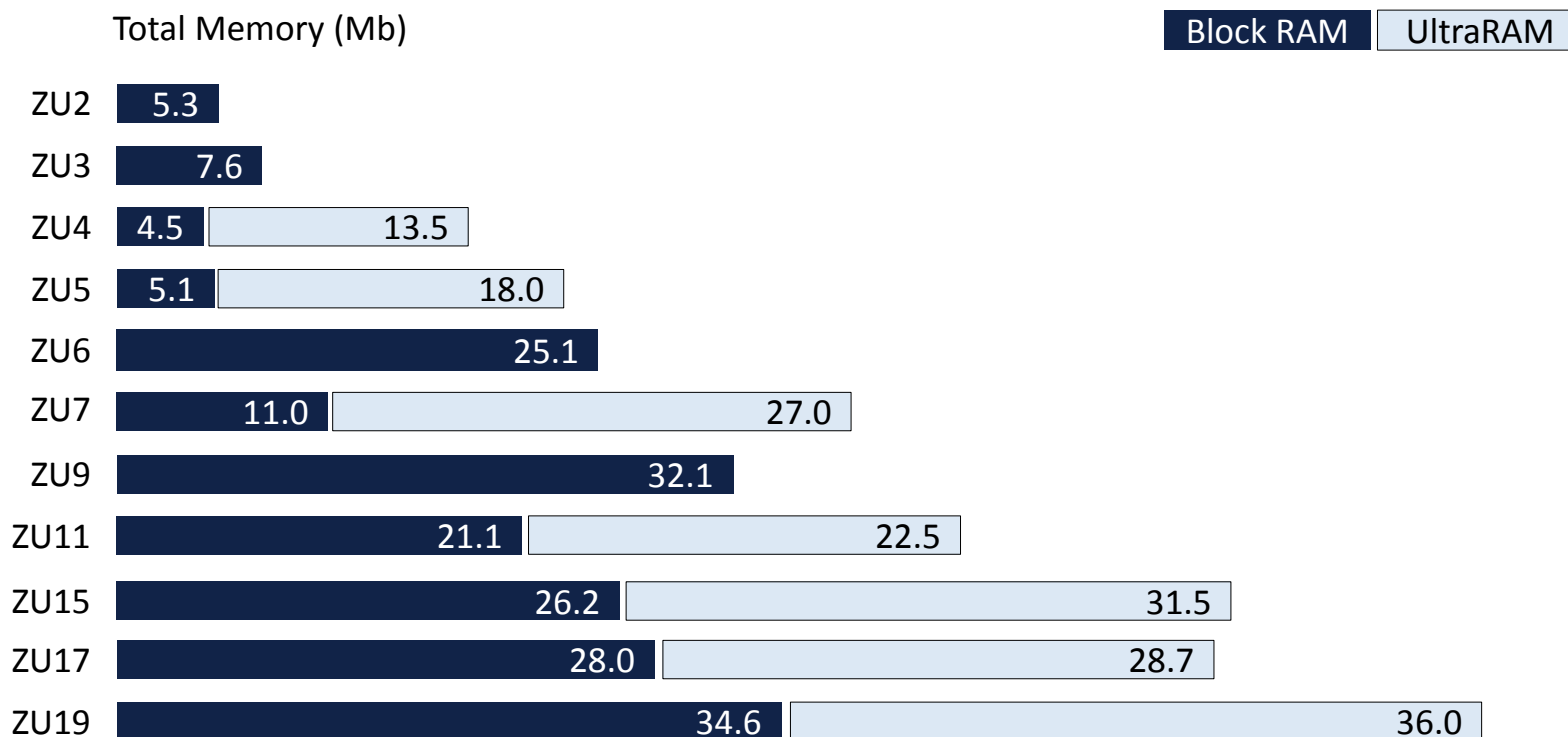
Important: Verify all data in this document with the device data sheets found at www.xilinx.com

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Memory

Zynq[®] UltraScale+™ MPSoCs include block RAM and UltraRAM (high density, dual-port, synchronous memory block), which increase performance, device utilization, and power efficiency. These new features are designed to provide highly efficient solutions for applications that require heterogeneous processing.



Important: Verify all data in this document with the device data sheets found at www.xilinx.com

Transceiver Count and Bandwidth

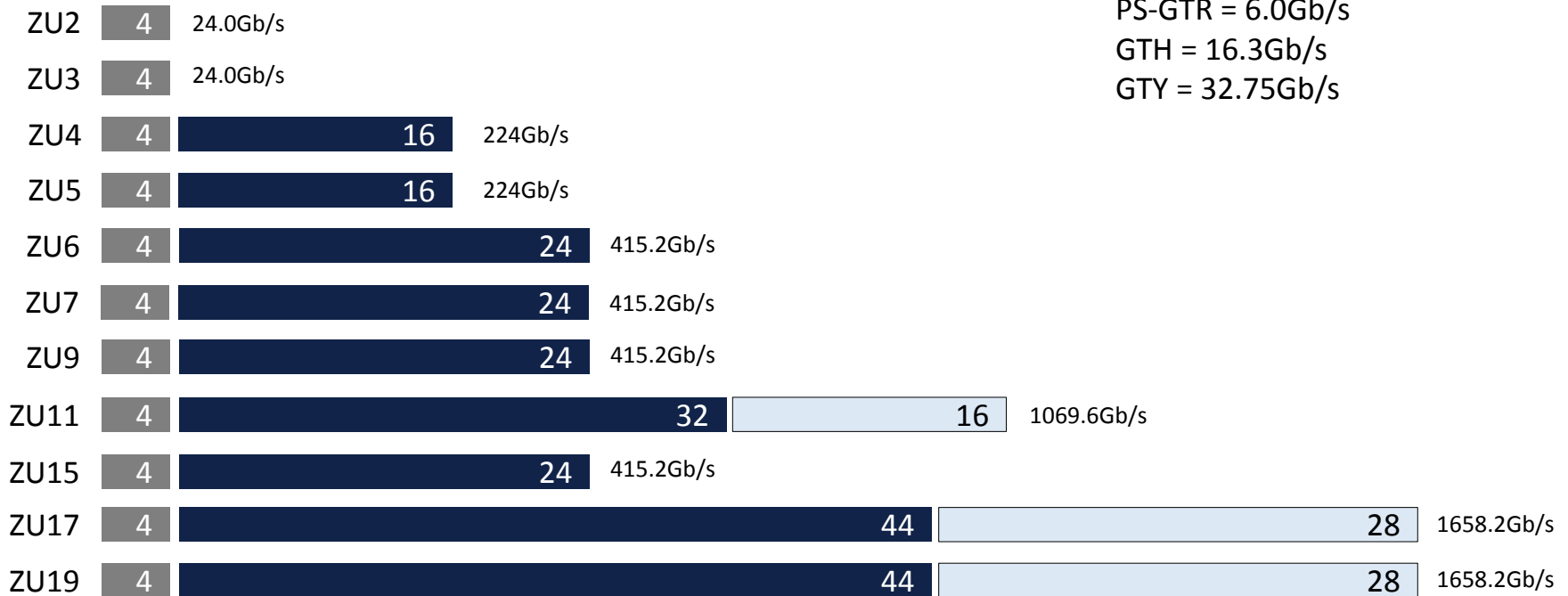


UltraScale™ architecture serial transceivers include the proven on-chip circuits required to provide optimal signal integrity in real world environments, at data rates up to 6.0Gb/s (PS-GTR), 16.3Gb/s (GTH), and 32.75Gb/s (GTY).

Total Transceiver Count and Bandwidth

PS-GTR GTH GTY

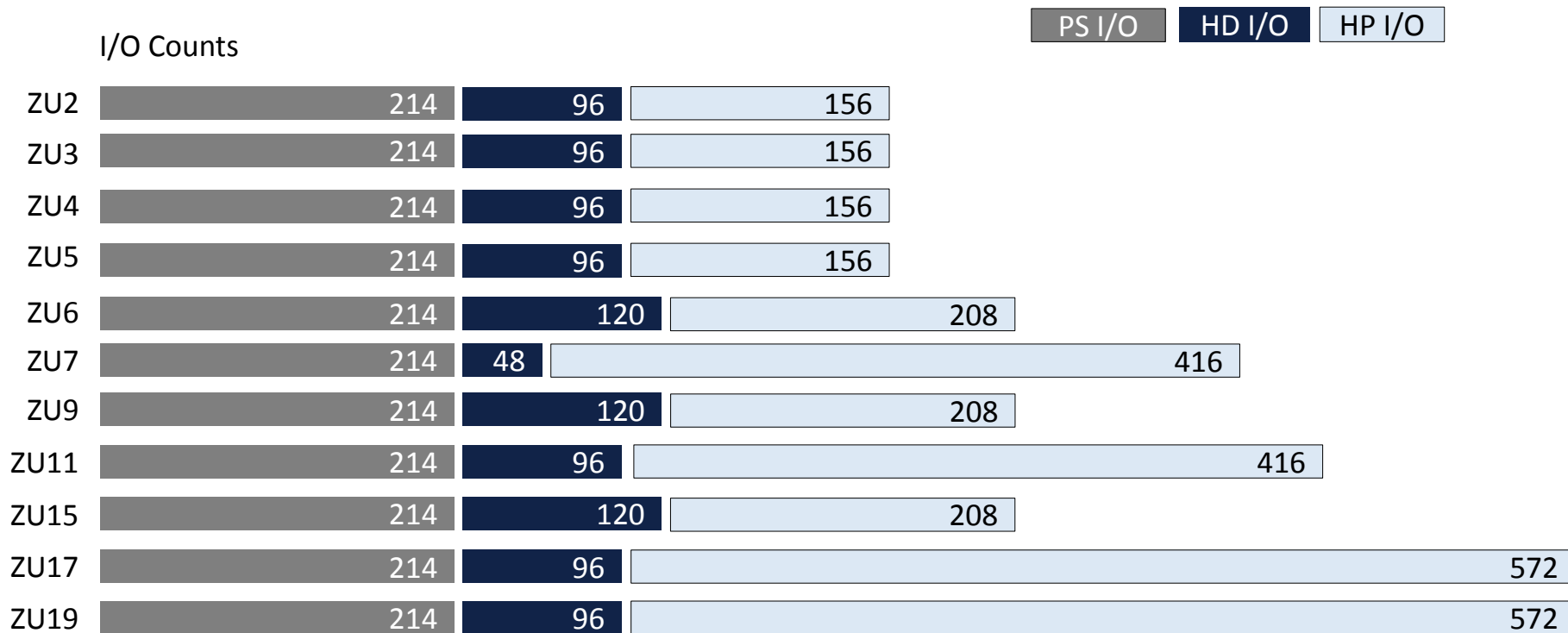
PS-GTR = 6.0Gb/s
 GTH = 16.3Gb/s
 GTY = 32.75Gb/s



Important: Verify all data in this document with the device data sheets found at www.xilinx.com

I/O Count

The I/Os are classified as PS I/O, high-density (HD) I/O, and high-performance (HP) I/O. The PS I/Os are composed of multi-use I/O (MIO) and DDR I/O, which support 1.8V to 3.3V standards. The HD I/Os are reduced-feature I/Os, providing voltage support from 1.2V to 3.3V. The HP I/Os are optimized for highest performance operation, from 1.0V to 1.8V.



Notes:

1. The PS I/O count is composed of 78 I/Os, which are used to communicate to external components, referred to as multi-use I/O (MIO) and an additional 136 I/Os, which are used to communicate to DDRs, referred to as DDR I/O.

Important: Verify all data in this document with the device data sheets found at www.xilinx.com

References



[DS890](#), *UltraScale™ Architecture and Product Overview*

[DS891](#), *Zynq® UltraScale+™ MPSoC Overview*

[DS925](#), *Zynq UltraScale+ MPSoC Data Sheet: DC and AC Switching Characteristics*

[UG1075](#), *Zynq UltraScale+ MPSoC Packaging and Pinouts*

[UG1085](#), *Zynq UltraScale+ MPSoC Technical Reference Manual*

[UG1087](#), *Zynq UltraScale+ MPSoC Register Reference*

[UG1137](#), *Zynq UltraScale+ MPSoC: Software Developers Guide*

[UG1169](#), *Zynq UltraScale+ MPSoC QEMU: User Guide*

[UG1186](#), *Zynq UltraScale+ MPSoC OpenAMP: Getting Started Guide*

[UG571](#), *UltraScale Architecture SelectIO™ Resources User Guide*

[UG572](#), *UltraScale Architecture Clocking Resources User Guide*

[UG573](#), *UltraScale Architecture Memory Resources User Guide*

[UG574](#), *UltraScale Architecture Configurable Logic Block User Guide*

[UG576](#), *UltraScale Architecture GTH Transceivers User Guide*

[UG578](#), *UltraScale Architecture GTY Transceivers User Guide*

[UG579](#), *UltraScale Architecture DSP Slice User Guide*

[UG580](#), *UltraScale Architecture System Monitor User Guide*

[UG583](#), *UltraScale Architecture PCB and Pin Planning User Guide*

[PG150](#), *LogiCORE™ IP UltraScale Architecture-Based FPGAs Memory Interface Solutions*

[PG182](#), *UltraScale FPGAs Transceivers Wizard Product Guide*