UltraScale+ FPGAs
Product Tables and Product Selection Guide

ARTIX UltraSCALE+ KINTEX UltraSCALE+ VIRTEX UltraSCALE+

AMD
XILINX

Device Name			AU7P	AU10P	AU15P	AU20P	AU25P
System Logic Cells (K)			82	96	170	238	308
CLB Flip-Flops (K)			75	88	156	218	282
CLB LUTs (K)			37	44	78	109	141
Dist. RAM (Mb)			1.1	1.0	2.5	3.2	4.7
Total Block RAM (Mb)			3.8	3.5	5.1	7.0	10.5
36K Block RAM Blocks			108	100	144	200	300
UltraRAM (Mb)			–	–	–	–	–
Clock Management Tiles (CMTs)			2	3	3	3	4
DSP Slices			216	400	576	900	1,200
PCI Express®			1x Gen3x4	1x Gen4x8(1)	1x Gen4x8(1)	1x Gen3x8	1x Gen3x8
AMS - System Monitor			1	1	1	1	1
Max. Single-Ended HD I/Os			144	72	72	72	96
Max. Single-Ended HP I/Os			104	156	156	156	208
GTH Transceivers(2)			4	12	12	–	–
GTY Transceivers(2)			–	–	–	12	12
Extended			-1 -2				
Industrial			-1 -2 -1L				
Package	Dim. (mm)	Ball Pitch (mm)	HD I/O, HP I/O, GTH, GTY				
UBVA292	10.5x8.5	0.5	72, 58, 4, 0				
UBVA368	11.5x9.5	0.5		24, 104, 8, 0	24, 104, 8, 0		
SBVB484	19x19	0.8		48, 156, 12, 0	48, 156, 12, 0		
SBVC484	19x19	0.8	144, 104, 4, 0				
SFVB784	23x23	0.8				72, 156, 0, 12	96, 208, 0, 12
FFVB676	27x27	1.0		72, 156, 12, 0	72, 156, 12, 0	72, 156, 0, 12	72, 208, 0, 12

Notes:
1. PCIe Gen4 is available in AU10P and AU15P in the FFVB676 package. AU10P and AU15P in other packages support Gen3x8.
2. GTH and GTY data rates are package dependent:
- Maximum 12.5Gb/s in UBVA292, UBVA368, SBVB484, SBVC484, SFVB784
- Maximum 16.3Gb/s in FFVB676.

Kintex® UltraScale+™ FPGAs

	Device Name	KU3P	KU5P	KU9P	KU11P	KU13P	KU15P	KU19P
Logic	System Logic Cells (K)	356	475	600	653	747	1,143	1,843
	CLB Flip-Flops (K)	325	434	548	597	683	1,045	1,685
	CLB LUTs (K)	163	217	274	299	341	523	842
Memory	Max. Distributed RAM (Mb)	4.7	6.1	8.8	9.1	11.3	9.8	11.6
	Total Block RAM (Mb)	12.7	16.9	32.1	21.1	26.2	34.6	60.8
	UltraRAM (Mb)	13.5	18.0	0	22.5	31.5	36.0	81.0
Clocking	Clock Mgmt Tiles (CMTs)	4	4	4	8	4	11	9
Integrated IP	DSP Slices	1,368	1,824	2,520	2,928	3,528	1,968	1,080
	PCIE4 (PCIe® Gen3 x16)	1	1	0	4	0	5	0
	PCIE4C (PCIe® Gen3 x16 / Gen4 x8 /CCIX)	0	0	0	0	0	0	3
	150G Interlaken	0	0	0	1	0	4	0
	100G Ethernet w/ KR4 RS-FEC	0	1	0	2	0	4	1
I/O	Max. Single-Ended HD I/Os	96	96	96	96	96	96	72
	Max. Single-Ended HP I/Os	208	208	208	416	208	572	468
	GTH 16.3Gb/s Transceivers	0	0	28	32	28	44	0
	GTY 32.75Gb/s Transceivers	16	16	0	20	0	32	32
Speed Grades	Extended[1]	-1 -2 -2L -3	-1 -2 -2L -3	-1 -2 -2L -3	-1 -2 -2L -3	-1 -2 -2L -3	-1 -2 -2L -3	-1 -2 -2L -3
	Industrial	-1 -1L -2	-1 -1L -2	-1 -1L -2	-1 -1L -2	-1 -1L -2	-1 -1L -2	-1 -1L -2

Footprint compatible with 20nm UltraScale Devices with same footprint identifier	Footprint[2, 3]	Dimensions (mm)	HD I/O, HP I/O, GTH 16.3Gb/s, GTY 32.75Gb/s						
			KU3P	KU5P	KU9P	KU11P	KU13P	KU15P	KU19P
	B784[4]	23x23[5]	96, 208, 0, 16	96, 208, 0, 16					
	A676[4]	27x27	48, 208, 0, 16	48, 208, 0, 16					
	B676	27x27	72, 208, 0, 16	72, 208, 0, 16					
	D900[4]	31x31	96, 208, 0, 16	96, 208, 0, 16		96, 312, 16, 0			
	E900	31x31			96, 208, 28, 0		96, 208, 28, 0		
	A1156[4]	35x35				48, 416, 20, 8		48, 468, 20, 8	
	E1517	40x40				96, 416, 32, 20		96, 416, 32, 24	
	A1760	42.5x42.5						96, 416, 44, 32	
	E1760	42.5x42.5						96, 572, 32, 24	
	J1760	42.5x42.5							72, 468, 0, 32
	B2104	47.5x47.5							72, 468, 0, 32

1. -2LE (Tj = 0°C to 110°C). For more details, see the Ordering Information section in DS890, UltraScale Architecture and Product Overview.
2. Maximum achievable performance is device and package dependent; consult the associated data sheet for details.
3. For full part number details, see the Ordering Information section in DS890, *UltraScale Architecture and Product* Overview.
4. GTY transceiver line rates are package limited: B784 to 12.5Gb/s; A676, D900, and A1156 to 16.3Gb/s. Refer to data sheet for details.
5. The B784 package is only offered in 0.8mm ball pitch. All other packages are 1.0mm ball pitch.

Virtex® UltraScale+™ FPGAs

	Foundation							58G PAM4		
Device Name	VU3P	VU5P	VU7P	VU9P	VU11P	VU13P	VU19P	VU23P	VU27P	VU29P
System Logic Cells (K)	862	1,314	1,724	2,586	2,835	3,780	8,938	2,252	2,835	3,780
CLB Flip-Flops (K)	788	1,201	1,576	2,364	2,592	3,456	8,172	2,059	2,592	3,456
CLB LUTs (K)	394	601	788	1,182	1,296	1,728	4,086	1,030	1,296	1,728
Max. Dist. RAM (Mb)	12.0	18.3	24.1	36.1	36.2	48.3	58.4	14.2	36.2	48.3
Total Block RAM (Mb)	25.3	36.0	50.6	75.9	70.9	94.5	75.9	74.3	70.9	94.5
UltraRAM (Mb)	90.0	132.2	180.0	270.0	270.0	360.0	90.0	99.0	270.0	360.0
DSP Slices	2,280	3,474	4,560	6,840	9,216	12,288	3,840	1,320	9,216	12,288
Peak INT8 DSP (TOP/s)	7.1	10.8	14.2	21.3	28.7	38.3	10.4	4.1	28.7	38.3
PCIe® Gen3 x16	2	4	4	6	3	4	0	0	1	1
PCIe Gen3 x16/Gen4 x8 / CCIX[1]	–	–	–	–	–	–	8	4	–	–
150G Interlaken	3	4	6	9	6	8	0	0	8	8
100G Ethernet w/ KR4 RS-FEC	3	4	6	9	9	12	0	2	15	15
Max. Single-Ended HP I/Os	520	832	832	832	624	832	1,976	572	676	676
Max. Single-Ended HD I/Os	0	0	0	0	0	0	96	72	0	0
GTY 32.75Gb/s Transceivers	40	80	80	120	96	128	80	34	32	32
GTM 58Gb/s PAM4 Transceivers	–	–	–	–	–	–	–	4	48	48
100G / 50G KP4 FEC	–	–	–	–	–	–	–	2 / 4	24 / 48	24 / 48
Extended[2]	-1 -2 -2L -3	-1 -2 -2L -3	-1 -2 -2L -3	-1 -2 -2L -3	-1 -2 -2L -3	-1 -2 -2L -3	-1 -2	-1 -2 -2L -3	-1 -2 -2L -3	-1 -2 -2L -3
Industrial	-1 -2	-1 -2	-1 -2	-1 -2	-1 -2	-1 -2	–	-1, -2	-1 -2	-1 -2

UltraScale Devices with same footprint identifier / Footprint compatible with 20nm

Footprint[3,4, 5]	Dim. (mm)	HP I/O, GTY						HP I/O, HD I/O, GTY	HP I/O, HD I/O, GTY, GTM		
		VU3P	VU5P	VU7P	VU9P	VU11P	VU13P	VU19P	VU23P	VU27P	VU29P
A1365[4]	35x35								364, 0, 34[8], 4		
C1517	40x40	520, 40									
J1760	42.5x42.5								572, 72, 34, 4		
F1924[6]	45x45					624, 64					
A2104	47.5x47.5		832, 52	832, 52	832, 52						
	52.5x52.5[7]						832, 52				
B2104	47.5x47.5		702, 76	702, 76	702, 76	572, 76					
	52.5x52.5[7]						702, 76				
C2104	47.5x47.5		416, 80	416, 80	416, 104	416, 96					
	52.5x52.5[7]						416, 104				
D2104	47.5x47.5				676, 76	572, 76					
	52.5x52.5[7]						676, 76			676, 16, 30	676, 16, 30
H2104	47.5x47.5										
A2577	52.5x52.5				448, 120	448, 96	448, 128			448, 32, 48	448, 32, 48
A3824	65x65							1976, 96,48			
B3824	65x65							1664, 96, 80			

1. This block operates in compatibility mode for 16.0GT/s (Gen4) operation. See PG213.
2. -2LE (Tj = 0°C to 110°C). See Ordering Information in DS890.
3. For full part number details, see DS890, *UltraScale Architecture and Product Overview*.
4. All packages are 1.0mm ball pitch, with the exception of A1365, which is 0.92mm.
5. Consult UG583, *UltraScale Architecture PCB Design User Guide* for specific migration details.
6. The GTY transceiver line rate in the F1924 footprint is package limited to 16.3Gb/s. Refer to data sheet for details.
7. These 52.5x52.5mm packages have the same PCB ball footprint as the 47.5x47.5mm packages and are footprint compatible.
8. GTYs in quads 224-230 and 232 are limited to 16Gb/s.

Virtex® UltraScale+™ FPGAs

	HBM (4GB)	HBM (8GB)			HBM (16GB)		
Device Name	VU31P	VU33P	VU35P	VU37P	VU45P	VU47P	VU57P
System Logic Cells (K)	962	962	1,907	2,852	1,907	2,852	2,852
CLB Flip-Flops (K)	879	879	1,743	2,607	1,743	2,607	2,607
CLB LUTs (K)	440	440	872	1,304	872	1,304	1,304
Max. Dist. RAM (Mb)	12.5	12.5	24.6	36.7	24.6	36.7	36.7
Total Block RAM (Mb)	23.6	23.6	47.3	70.9	47.3	70.9	70.9
UltraRAM (Mb)	90.0	90.0	180.0	270.0	180.0	270.0	270.0
HBM DRAM (GB)	4	8	8	8	16	16	16
HBM AXI Interfaces	16	32	32	32	32	32	32
Clock Mgmt Tiles (CMTs)	4	4	8	12	8	12	12
DSP Slices	2,880	2,880	5,952	9,024	5,952	9,024	9,024
Peak INT8 DSP (TOP/s)	8.9	8.9	18.6	28.1	18.6	28.1	28.1
PCIe® Gen3 x16	0	0	1	2	1	2	0
PCIe Gen3 x16/Gen4 x8 / CCIX[1]	4	4	4	4	4	4	4
150G Interlaken	0	0	2	4	2	4	4
100G Ethernet w/ KR4 RS-FEC	2	2	5	8	5	8	10
Max. Single-Ended HP I/Os	208	208	416	624	416	624	624
GTY 32.75Gb/s Transceivers	32	32	64	96	64	96	32
GTM 58Gb/s PAM4 Transceivers	–	–	–	–	–	–	32
100G / 50G KP4 FEC	–	–	–	–	–	–	16/32
Extended[2]	-1 -2 -2L -3	-1 -2 -2L -3	-1 -2 -2L -3	-1 -2 -2L -3	-1 -2 -2L -3	-1 -2 -2L -3	-1 -2 -2L -3
Industrial	–	–	–	–	–	–	–

Footprint[3, 4, 5, 6]	Dim. (mm)	HP I/O, GTY						HP I/O, GTY, GTM
		VU31P	VU33P	VU35P	VU37P	VU45P	VU47P	VU57P
H1924	45x45	208, 32						
H2104	47.5x47.5		208, 32	416, 64		416, 64		
H2892	55x55			416, 64	624, 96	416, 64	624, 96	
K2892	55x55							624, 32, 32

1. This block operates in compatibility mode for 16.0GT/s (Gen4) operation. See PG213.
2. -2LE (Tj = 0°C to 110°C). See Ordering Information in DS890.
3. For full part number details, see DS890, *UltraScale Architecture and Product Overview.*
4. All packages are 1.0mm ball pitch.
5. Consult UG583, *UltraScale Architecture PCB Design User Guide* for specific migration details.
6. Footprint compatible with 20nm UltraScale Devices with same footprint identifier.

UltraScale Architecture Migration Table

Footprint	Artix® UltraScale+™				
	AU7P	AU10P	AU15P	AU20P	AU25P
A292	■				
A368		■	■		
B484		■	■		
C484	■				
A784					
B784				■	■
A676					
B676		■	■	■	■
A900					
D900					
E900					
A1156					
A1365					
A1517					
C1517					
D1517					
E1517					
A1760					
B1760					
E1760					
J1760					
D1924					
F1924					
H1924					
A2104					
B2104					
C2104					
D2104					
H2104					
B2377					
A2577					
A2892					
H2892					
K2892					
A3824					
B3824					

Footprint	Kintex® UltraScale™						
	KU025	KU035	KU040	KU060	KU085	KU095	KU115
A292							
A368							
B484							
C484							
A784		■	■				
B784							
A676		■	■				
B676							
A900		■	■				
D900							
E900							
A1156	■	■	■	■		■	
A1365							
A1517				■	■		■
C1517						■	
D1517							■
E1517							
A1760							
B1760					■	■	■
E1760							
J1760							
D1924							■
F1924					■		■
H1924							
A2104							■
B2104						■	■
C2104							
D2104							
H2104							
B2377							
A2577							
A2892							
H2892							
K2892							
A3824							
B3824							

Footprint	Kintex UltraScale+					
	KU3P	KU5P	KU9P	KU11P	KU13P	KU15P
A292						
A368						
B484						
C484						
A784						
B784	■	■				
A676	■	■				
B676	■	■				
A900						
D900	■	■		■		
E900			■		■	
A1156				■		■
A1365						
A1517						
C1517						
D1517						
E1517				■		■
A1760						■
B1760						
E1760						■
J1760						
D1924						
F1924						
H1924						
A2104						
B2104						
C2104						
D2104						
H2104						
B2377						
A2577						
A2892						
H2892						
K2892						
A3824						
B3824						

Footprint	Virtex® UltraScale						
	VU065	VU080	VU095	VU125	VU160	VU190	VU440
A292							
A368							
B484							
C484							
A784							
B784							
A676							
B676							
A900							
D900							
E900							
A1156							
A1365							
A1517							
C1517	■	■	■				
D1517		■	■	■			
E1517							
A1760							
B1760		■	■	■			
E1760							
J1760							
D1924							
F1924							
H1924							
A2104		■	■	■			
B2104		■	■	■	■	■	
C2104			■	■	■	■	
D2104							
H2104							
B2377							■
A2577						■	
A2892							■
H2892							
K2892							
A3824							
B3824							

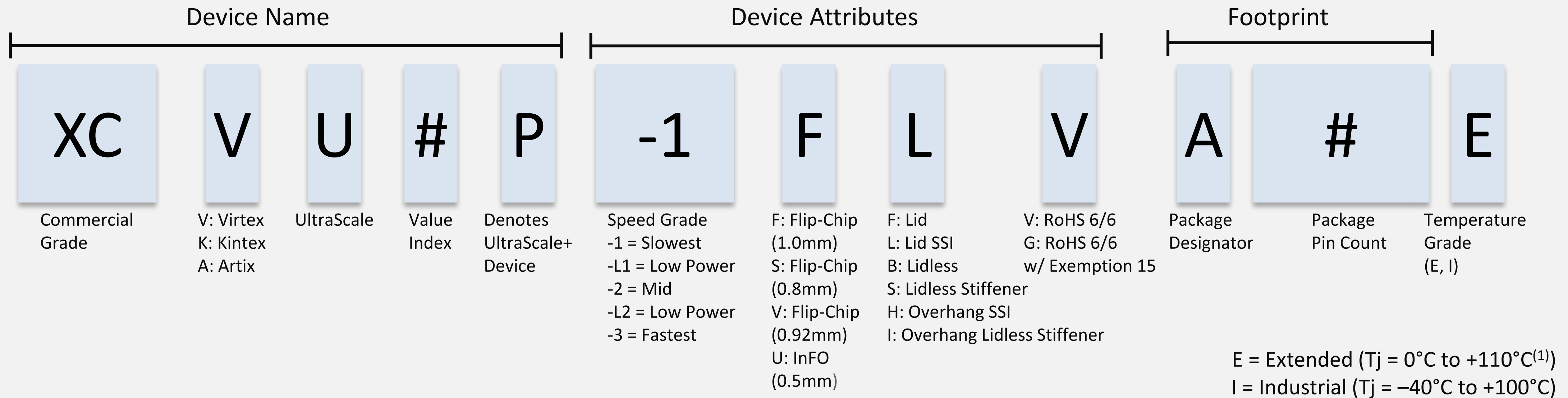
Footprint	Virtex UltraScale+																
	VU3P	VU5P	VU7P	VU9P	VU11P	VU13P	VU19P	VU23P	VU27P	VU29P	VU31P	VU33P	VU35P	VU37P	VU45P	VU47P	VU57P
A292																	
A368																	
B484																	
C484																	
A784																	
B784																	
A676																	
B676																	
A900																	
D900																	
E900																	
A1156																	
A1365								■									
A1517																	
C1517	■																
D1517																	
E1517																	
A1760																	
B1760																	
E1760																	
J1760								■									
D1924																	
F1924					■												
H1924											■						
A2104		■	■	■		■											
B2104		■	■	■	■	■											
C2104		■	■	■	■	■											
D2104				■	■	■			■	■							
H2104												■	■		■		
B2377																	
A2577				■	■	■			■	■							
A2892																	
H2892														■	■		
K2892																	■
A3824							■										
B3824							■										

Legend

■ Device

— Migration Path

UltraScale+ Device Ordering Information



Notes:
1. For more details on 110°C operation, see the Ordering Information section in DS890, *UltraScale Architecture and Product Overview*

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