

		Defense-Grade FPGAs													
		Virtex-5Q FPGAs													
Part Number		XQ5VLX30T	XQ5VLX85	XQ5VLX110	XQ5VLX110T	XQ5VLX155T	XQ5VLX220T	XQ5VLX330T	XQ5VSX50T	XQ5VSX95T	XQ5VSX240T	XQ5VFX70T	XQ5VFX100T	XQ5VFX130T	XQ5VLX200T
Logic Resources	Slices <sup>(2)</sup>	4,800	12,960	17,280	17,280	24,320	34,560	51,840	8,160	14,720	37,440	11,200	16,000	20,480	30,720
	Logic Cells <sup>(2)</sup>	30,720	82,944	110,592	110,592	155,648	221,184	331,776	52,224	94,208	239,616	71,680	102,400	131,072	196,608
	CLB Flip-Flops	19,200	51,840	69,120	69,120	97,280	138,240	207,360	32,640	58,880	149,670	44,880	64,000	81,920	122,880
Memory Resources	Maximum Distributed RAM (Kbits)	320	840	1,120	1,120	1,640	2,280	3,420	780	1,520	4,200	820	1,240	1,580	2,280
	Block RAM/FIFO w/ECC (36Kbits each)	36	96	128	148	212	212	324	132	244	516	148	228	298	456
	Total Block RAM (Kbits)	1,296	3,456	4,608	5,328	7,632	7,632	11,664	4,752	8,784	18,576	5,328	8,208	10,728	16,416
Clock Resources	Digital Clock Manager (DCM)	4	12	12	12	12	12	12	12	12	12	12	12	12	12
	Phase Locked Loop/PMCD	2	6	6	6	6	6	6	6	6	6	6	6	6	6
I/O Resources	Maximum Single-Ended Pins	360	560	800	680	680	680	960	480	640	960	640	680	840	960
	Maximum Differential I/O Pairs	180	280	400	340	340	340	480	240	320	480	320	340	420	480
	DSP48E Slices	32	48	64	64	128	128	192	288	640	1,056	128	256	320	384
Embedded Hard IP Resources	PowerPC <sup>®</sup> 440 Processor Blocks	-	-	-	-	-	-	-	-	-	-	1	2	2	2
	PCI Express <sup>®</sup> Interface Blocks	1	-	-	1	1	1	1	1	1	1	3	3	3	4
	10/100/100 Ethernet MAC Blockset	4	-	-	4	4	4	4	4	4	4	4	4	6	8
	RocketIO <sup>™</sup> GTP Low-Power Transceivers	8	-	-	16	16	16	24	12	16	24	-	-	-	-
	RocketIO <sup>™</sup> GTX High-Speed Transceivers	-	-	-	-	-	-	-	-	-	-	16	16	20	24
Configuration	Configuration Memory (Mbits)	9.4	21.9	29.1	31.2	43.1	55.2	82.7	20	35.8	79.7	27.1	39.4	49.3	70.9
	Speed Grades	-1, -2	-1, -2	-1, -2	-1, -2	-1, -2	-1	-1	-1, -2	-1	-1	-1, -2	-1, -2	-1, -2	-1
Miscellaneous	Manufacturing Grades	I	I	I	I	I	I	I	I	I	I	I	I	I	I
	Package <sup>(7)</sup>	Area													
	EF676	27 x 27 mm	440	440											
	EF1153	35 x 35 mm		800											
	FF323	19 x 19 mm	172 (4)												
	EF665	27 x 27 mm							360 (8)			360 (8)			
	EF1136	35 x 35 mm			640 (16)	640 (16)				640 (16)		640 (16)	640 (16)		
	EF1738	42.5 x 42.5 mm					680 (16)	960 (24)					680 (16)	840 (20)	
	FF1738	42.5 x 42.5 mm									960 (24)				960 (24)

Notes: 1. A single Virtex-5Q CLB comprises two slices, with each containing four 6-input LUTs and four Flip-Flops (twice the number found in a Virtex-4 slice), for a total of eight 6-LUTs and eight Flip-Flops per CLB; 2. Virtex-5 logic cell ratings reflect the increased logic capacity offered by the new 6-input LUT architecture; 3. Digitally Controlled Impedance (DCI) is available on I/Os of all devices; 4. I/O standards supported: HT, LVDS, LVDSEXT, RSDS, BLVDS, ULVDS, LVPECL, LVC MOS33, LVC MOS25, LVC MOS18, LVC MOS15, LVTTTL, PCI33, PCI66, PCI-X, GTL, GTL+, HSTL I (1.2V, 1.5V, 1.8V), HSTL II (1.5V, 1.8V), HSTL III (1.5V, 1.8V), HSTL IV (1.5V, 1.8V), SSTL2 I, SSTL2 II, SSTL18 I, SSTL18 II; 5. One system monitor block included in all devices; 6. Available I/O for each device-package combination: number of SelectIO pins (number of RocketIO transceivers).

## Manufacturing Grades

<http://www.xilinx.com/products/milaero/rpt003.pdf>

Grade	Description	Temperature
V	QPro Xilinx V-Grade Flow* Military Ceramic	Tc = -55C to +125C
H	QPro Flip-Chip Radiation Tolerant Ceramic	Tj = -55C to +125C
B	SMD Radiation Tolerant and Non-RT SMD Military Ceramic	Tc = -55C to +125C
N	Military Plastic	Tj = -55C to +125C
M	Military Ceramic or Plastic	Tj = -55C to +125C (Plastic), Tc = -55C to +125C (Ceramic)
I	Industrial Plastic	Tj = -40C to +100C

		Defense-Grade FPGAs												
		Virtex-4Q FPGAs								Virtex-II Pro XQ FPGAs		Virtex-II XQ FPGAs		
Part Number		XQ4VLX25	XQ4VLX40	XQ4VLX60	XQ4VLX100	XQ4VLX160	XQ4VXS55	XQ4VFX60	XQ4VFX100	XQ2VP40	XQ2VP70	XQ2V1000	XQ2V3000	XQ2V6000
Core Voltage		1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.5V	1.5V	1.5V	1.5V	1.5V
Logic Resources	Slices <sup>(1)</sup>	10,752	18,432	26,624	49,152	67,584	24,576	25,280	42,176	19,392	33,088	5,120	14,336	33,792
	Logic Cells	24,192	41,472	59,904	110,592	152,064	55,296	56,880	94,896	44,632	74,448	11,520	32,256	76,032
	CLB Flip-Flops	21,504	36,864	53,248	98,304	135,168	49,152	50,560	84,352	38,784	66,176	10,240	28,672	67,584
Memory Resources	Maximum Distributed RAM (Kbits)	168	288	416	768	1,056	384	395	659	606	1,034	160	448	1,056
	Block RAM/FIFO w/ECC (36Kbits each)	72	96	160	240	288	320	232	376	192	328	40	96	144
	Total Block RAM (Kbits)	1,296	1,728	2,880	4,320	5,184	5,760	4,176	6,768	3,456	5,904	720	1,728	2,592
Clock Resources	Digital Clock Manager (DCM)	8	8	8	12	12	8	12	12	8	8	8	12	12
I/O Resources	Maximum Single-Ended I/Os	448	640	640	960	960	640	576	768	804	996	432	720	1,104
	Maximum Differential I/O Pairs	224	320	320	480	480	320	228	384	396	492	216	360	552
	Digitally Controlled Impedance	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Embedded Hard IP Resources	DSP Slices	48	64	64	96	96	512	128	160	-	-	-	-	-
	18 x 18 Multipliers	-	-	-	-	-	-	-	-	192	328	40	96	144
	RocketIO™ Transceivers	-	-	-	-	-	-	16	20	8 or 12	20	-	-	-
	PowerPC® Processor Blocks	-	-	-	-	-	2	2	2	2	-	-	-	-
Miscellaneous	Speed Grades	-10	-10	-10	-10	-10	-10	-10	-10	-5	-5	-4	-4	-4
	Configuration Memory (Mbits)	4.8	12.3	17.7	30.7	40.3	22.7	21.0	33.0	15.5	25.6	4.1	10.5	21.9
	Manufacturing Grades	M	I, M	M	I	I	M	I, M	I	N	N	N	M, N, B	M
	Packages	SF363, FF668	FF668	FF668, FF1148, EF668	FF1148	FF1148	FF1148	EF672, FFG1152*	FF1152	FF1152, FG676	FF1704	FG456, BG575	CG717, BG728	CF1144

Notes: 1. Each slice comprises two 4-input logic function generators (LUTs), two storage elements, wide-function multiplexers, and carry logic.

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Grade	Description	Temperature
V	QPro Xilinx V-Grade Flow* Military Ceramic	Tc = -55C to +125C
H	QPro Flip-Chip Radiation Tolerant Ceramic	Tj = -55C to +125C
B	SMD Radiation Tolerant and Non-RT SMD Military Ceramic	Tc = -55C to +125C
N	Military Plastic	Tj = -55C to +125C
M	Military Ceramic or Plastic	Tj = -55C to +125C (Plastic), Tc = -55C to +125C (Ceramic)
I	Industrial Plastic	Tj = -40C to +100C

\*per ADQ0007

		Space-Grade QPro® FPGAs							
		Virtex-4QV FPGAs				Virtex-II XQR FPGAs	Virtex XQR FPGAs		
		Part Number	XQR4VLX200	XQR4VSX55	XQR4VFX60	XQR4VFX140	XQR2V3000	XQVR300	XQVR600
Logic Resources	Core Voltage	1.2V	1.2V	1.2V	1.2V	1.5V	2.5V	2.5V	
	Slices <sup>(1)</sup>	89,088	24,576	25,280	63,168	14,336	3,072	6,912	
	Logic Cells	200,448	55,296	56,880	142,128	32,256	6,912	15,552	
	CLB Flip-Flops	178,176	49,152	50,560	126,336	28,672	6,144	13,824	
Memory Resources	Maximum Distributed RAM (Kbits)	1,392	384	395	987	448	1,711	3,523	
	Block RAM/FIFO w/ECC (18Kbits each)	336	320	232	552	96	–	–	
	Total Block RAM (Kbits)	6,048	5,760	4,176	9,936	1,728	64	96	
Clock Resources	Digital Clock Manager (DCM)	12	8	12	20	12	4	4	
I/O Resources	Maximum Single-Ended I/Os	960	640	576	896	720	316	316	
	Maximum Differential I/O Pairs	480	320	224	448	360	–	–	
	Digitally Controlled Impedance	YES	YES	YES	YES	YES	–	–	
Embedded Hard IP Resources	DSP Slices	96	512	128	192	–	–	–	
	18 x 18 Multipliers	–	–	–	–	96	–	–	
	10/100/100 Ethernet MAC Blockset	–	–	4	4	–	–	–	
	PowerPC® Processor Blocks	–	–	2	2	–	–	–	
Miscellaneous	Speed Grades	-10	-10	-10	-10	-4	-4	-4	
	Configuration Memory (Mbits)	51.4	22.7	21.0	47.9	10.5	1.7	3.5	
	Manufacturing Grades	V	V	V	V	M, V	M, V, B	M, V, B	
	Total Ionizing Dose (krad)	300	300	300	300	200	100	100	
	SEL Immunity (MeV-cm <sup>2</sup> /mg)	>125	>125	>125	>125	>160	>125	>125	
Package <sup>(2)</sup>	Area	Available User I/Os							
CGA Packages (CG): ceramic column grid array (1.27 mm ball spacing)									
CG717 <sup>(3)</sup>	35 x 35 mm					516			
CFA Packages (CF): flip-chip ceramic column grid array (1.0 mm ball spacing)									
CF1144 <sup>(4)</sup>	35 x 35 mm			576					
CF1140 <sup>(5)</sup>	35 x 35 mm		640						
CF1509 <sup>(6)</sup>	40 x 40 mm	960			768				
CQFP Packages (CB): ceramic brazed quad flat pack (0.025 inch lead spacing)									
CB228	1.55 x 1.55 in						162	162	

Notes: 1. Each slice comprises two 4-input logic function generators (LUTs), two storage elements, wide-function multiplexers, and carry logic. 2. For information on DSCC SMD availability contact Xilinx. 3. The BG728 and CG717 packages are footprint / pin compatible. 4. The CF1144 and FF1152 packages are footprint / pin compatible. 5. The CF1140 and FF1148 packages are footprint / pin compatible. 6. For the XQR4VLX200, the CF1509 and FF1513 packages are footprint / pin compatible. For the XQR4VFX140, the CF1509 and the FF1517 are footprint / pin compatible.

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H	QPro Flip-Chip Radiation Tolerant Ceramic	Tj = -55C to +125C
B	SMD Radiation Tolerant and Non-RT SMD Military Ceramic	Tc = -55C to +125C
N	Military Plastic	Tj = -55C to +125C
M	Military Ceramic or Plastic	Tj = -55C to +125C (Plastic), Tc = -55C to +125C (Ceramic)
I	Industrial Plastic	Tj = -40C to +100C

Part Number	Defense-Grade Configuration PROMs				Space-Grade QPro Radiation Tolerant Configuration PROMs	
	XQ1701L	XQ17V16	XQ18VQ4	XQF32P	XQR1701L	XQR17V16
Core Voltage <sup>(1)</sup>	3.3V	3.3V	3.3V	3.3V	3.3V	3.3V
Storage Bits	1M	16M	4M	32M	1M	16M
Manufacturing Grades	M, N	M, N	N	M	M, V	M, V
Total Ionizing Dose (krad)	-	-	-	-	50	50
Packages	CC44, VQ44	CC44, VQ44	VQ44	VQ48	CC44	CC44
Package <sup>(2)</sup>	Area					
CC44	0.69 x 0.69 in					
VQ44	12 x 12 mm					
VQ48	20 x 20 mm					

Notes: 1. Xilinx configuration PROMs have adjustable I/O voltages for compatibility with all Xilinx FPGAs.  
2. The CC44 and PC44 packages are footprint/pin compatible. For information on DSCC qualification contact Xilinx.

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H	QPro Flip-Chip Radiation Tolerant Ceramic	Tj = -55C to +125C
B	SMD Radiation Tolerant and Non-RT SMD Military Ceramic	Tc = -55C to +125C
N	Military Plastic	Tj = -55C to +125C
M	Military Ceramic or Plastic	Tj = -55C to +125C (Plastic), Tc = -55C to +125C (Ceramic)
I	Industrial Plastic	Tj = -40C to +100C

\*per ADQ0007