| Flash/AES Scrubbing Grades | Part | suffix | low price | min pkg size mm | user pin cnt | K LUTs | K Logic Cells | LC/\$ | n nagna | PLL/DLL | SERDES | so/l | small RAM | med. RAM | large RAM | CLBs | highest volume pricing | LUTs per dollar | LC per Mult | I/Os per RAM | ram BITS | M confg BITS | confg BITS / LUT input | |
|----------------------------------|--|-------------------------------------|------------------------|--------------------|-----------------|-----------------------------|-----------------------------|-------------------------|---------|--------------------------|---------|-----------------------|--------------------|------------------------|-------------------|-------------------------|------------------------------|--------------------|--------------------------|-----------------------------|-------------------------|---------------------|---------------------------|---|
| Altera | APEX20K EP20K30E | ETC144-3 | (100+) \$20 | | | 16bits 1,200 | 1,200 | 67 | | | | 128 | | 128x16 12 | | 10x 120 | | | | 9.7 10.7 | | | | |
| | EP20K60E EP20K100E EP20K160E | ETC144-3 EFC144-3 ETC144-3 | \$37 \$50 \$118 | | | 2,560 4,160 6,400 | 2,560 4,160 6,400 | 69 83 54 | | | | 204 252 316 | | 16 26 40 | | 256 416 640 | | | | 12.8 9.7 7.9 | 53,248 | | | |
| Altera | EP20K200E MAX II | EQC208-3 180nm | \$120 | | .5 - 3.3 | 8,320 16bits | 8,320 | 69 45 | | | | 382 | | 52 | flash | 832 10x | (250,000 |)+) | | 7.3 | | | | |
| F A | EPM570, -Z | ZM68I3 GT100C5 | \$6 \$13 | 6 | 76 | 0.24 0.57 | 0.24 0.57 | 40 43 | | | | 80 160 | | | | 24 57 | 1.50 2.30 | 248 | | | 8,192 8,192 | | | |
| F A | EPM2210 | F256C5ES F256C5 | \$30 \$41 | 17 | | 2.21 | 1.27 2.21 | 42 54 | | | | 212 272 | | 100.00 | | 127 221 | 7.00 | | | - | 8,192 8,192 | | | |
| | EP1C3 EP1C4 | T100C8 F324C8 | (1+) \$11 \$19 | | | 16bits 2,910 4,000 | 2,910 4,000 | 299 272 208 | | 1 2 | | 104 301 | | 128x36 13 17 | | 10x 291 400 | 4.00 7.50 | 728 | | 8.9 8.0 17.7 | 59,904 | | | |
| | EP1C6 EP1C12 | T144C8 Q240C8 | \$18 \$36 | | | 5,980 12,060 | 5,980 12,060 | 342 340 | | 2 | | 185 249 | | 20 52 | | 598 1,206 | 7.50 12.00 | 797 1005 | | 9.3 4.8 | 92,160 239,616 | | | |
| Altera | EP1C20 Stratix | F324C8 130nm | \$60 (1+) | | | 20,060 16bits | 20,060 | 103 | | | 3.18750 | | | 64 128x36 | 4Kx14 | 2,006 10x | 20.00 | 1003 | 440 | 4.7 7.03 | | | 35.3 | |
| Altera | EP1S10 Cyclone II EP2C5 | F484C7N 90nm T144C8 | \$205 (1+) \$13 | | 335 | 21.1 16bits 4,608 | 4,608 | 103 366 360 | 18x | 24 6 (18 13 2 | | 158 | 94 | 60 128x36 26 | 1 | 1057 16x 288 | | | 583 354 | 7.03 4.82 6.08 | | 4 | 35.3 | |
| | EP2C8 EP2C15 | T144C8 F256C8 | \$19 \$40 | | 152 | 8,256 14,448 | 8,256 14,448 | 430 362 | | 18 2 26 4 | | 182 | | 36 52 | | 516 903 | | | 459 556 | 5.06 | | İ | | |
| | EP2C20 EP2C35 | F256C8 F484C8N | \$43 \$91 | | | 18,752 33,216 | 18,752 33,216 | | | 26 4 35 4 | | 315 475 | | 52 105 | | 1,172 2,076 | 22.00 | 1510 | 721 949 | 6.06 4.52 | 0.240 0.484 | | | Altium NB2: EP2C35F672C8 |
| Altere | EP2C50 EP2C70 | F484C8 F672C8N | \$160 \$235 | | | 50,528 68,416 | 50,528 68,416 1/2 ALM | 316 291 82 | • | 86 4 150 4 | | 450 622 | 2.40 | 129 250 | 4174.4 | 3,158 4,276 | | | 588 456 163 | 3.49 2.49 | | | 54.9 | • |
| Altera M Altera | Stratix II EP2S15 Cyclone III | 90nm F484C5N 65nm | (1+) \$190 (1+) | 23 | | 16-32bits 15.6 16bits | 15.6 | 82 504 | | 48 6 48DSP | | 365 | 2x18 104 | 128x36 78 256x36 | 0 | 16x 780 16x | | | 163 332 | 4.68 4.68 3.84 | 0.419 | 5 | 54.9 54.9 59.9 | |
| , moru | EP3C5 EP3C10 | E144C8 E144C8 | \$13 \$19 | 8 | 106 106 | 5.14 10.32 | 5.14 10.32 | 401 538 | | 23 2 23 2 | | 182 182 | | 46 46 | | 321 645 | 4.00 5.00 | | 223 449 | 3.96 3.96 | 0.424 0.424 | 2.8 2.8 | 115.7 57.6 | |
| | EP3C16 EP3C25 | E144C8 E144C8NES | \$27 \$40 | 14 | 156 | 15.41 24.62 | 15.41 24.62 | 577 623 | | 56 4 66 4 | | 346 215 | | 56 66 | | 963 1,539 | | | 275 373 | 6.18 3.26 | 0.608 | 3.9 5.5 | | Altium NB2: EP3C40F780C8N |
| | EP3C40 EP3C55 EP3C80 | F324C8 F484C8 F780C8 | \$81 \$142 \$246 | | 195 | 39.60 55.86 81.26 | 39.60 55.86 81.26 | 395 | | 126 4 156 4 244 4 | | 535 377 429 | | 126 260 305 | | 2,475 3,491 5,079 | | | 314 358 333 | 4.25 1.45 1.41 | 1.161 2.396 2.811 | 9.1 14.2 19.0 | 50.1 52.8 49.8 | |
| Altera | EP3C120 Arria | F484C7ES | | 23 | 283 | 119.09 16-32bits | 119.09 1/2 ALM | | 2 | 288 4 | | 531 | 2x18 | 432 128x36 | 4Kx14 | 7,443 16x | | | 414 208 | 1.23 2.17 | 3.981 | 27.2 | 48.7 | |
| | EP1AGX20 EP1AGX35 | CF484C6 CF484C6N | \$84 \$123 | | | 8,632 13,408 | 17,264 26,816 | | | 40 4 56 4 | 8 | 341 341 | 166 197 | 118 140 | 1 | | | | 216 239 | 2.89 2.44 | | | | |
| | EP1AGX50 EP1AGX60 | | | | | 20,064 | 40,128 48,080 | | - | 104 8 128 8 | 12 | 514 514 | 313 326 | 242 252 | 2 | | | | 193 188 | 2.12 | 2.475 2.529 | | | |
| Altera | Stratix III EP3SL/SE50 | 65nm F780C4 | | 1.1v (| | 36,088 ALMs 23.8 | 72,176 1/2.65 AI 62.9 | 165 | 18x | 176 8 <18DSP 216 4 | | 538 3 480 | 478 2x20 928 | 400 256x36 108 | 4 2K*72 6 | 10x 2375 | | | 205 150 146 | 1.35 3.82 4.44 | | 22 | 149.5 | Indust: 40, 100 Junation tamp |
| | EP3SL70 Cyclone IV | F484C4N 40nm | \$354 \$586 (1+) | 23 | | 33.8 16bits | 89.4 | 153 516 | 2 | 288 4 | | 480 | 1,318 | 150 | 6 | 3375 16x | | | 155 374 | 3.20 4.64 | 3.111 | | | Indust:-40100 Junction temp small RAM is 20x5LUT blocks |
| | EP4CE6 EP4CE10 | E22C8N E22C8N | \$13 \$22 | 11 | 94 94 | 6.27 10.32 | 6.27 10.32 | 499 460 | | 15 2 23 2 | | 182 182 | | 30 46 | | 392 645 | 3.00 | 2091 | 418 449 | 6.07 3.96 | 0.276 0.424 | | | |
| | EP4CE15 EP4CE22 | E22C9LN E22C7N | \$23 \$44 | 14 | 72 | 15.41 22.32 | 15.41 22.32 | 503 | | 56 4 66 3 | | 346 153 | | 56 66 | | 963 1,395 | | | 275 338 | 6.18 2.32 | 0.608 | 3.8 7.6 | 53.4 78.3 | |
| | EP4CE40 EP4CE55 | F23C8N F29C7N F23C7N | \$42 \$97 \$144 | 23 | 331 | 28.85 39.60 55.86 | 28.85 39.60 55.86 | 687 408 387 | | 66 4 116 4 154 4 | | 535 535 377 | | 66 123 254 | | 1,803 2,475 3,491 | | | 437 341 363 | 8.11 4.35 1.48 | 0.608 1.134 2.341 | 7.6 | 60.6 | |
| | EP4CE75 EP4CE115 | F23C7N F23C8N | | 23 | 295 | 75.41 114.48 | 75.41 114.48 | | 2 | 200 4 266 4 | | 429 531 | | 298 423 | | 4,713 7,155 | | | 377 430 | 1.44 1.26 | 2.746 3.898 | 24.5 47.6 | 72.1 95.4 | |
| | EP4CGX15 EP4CGX22 | F22C8N | \$24 \$51 | 14 | 72 | 14.40 21.28 | 14.40 21.28 | 418 | | 0 4 40 3 | 4 | 72 150 | 1 | 58 82 | | 1,330 | 6.00 | 2400 | 532 | 1.24 | 0.756 | 3.8 7.6 | 56.8 80.4 | |
| | EP4CGX30 EP4CGX50 EP4CGX75 | BF14C7N CF23C7N DF27C7N | \$79 \$162 \$199 | 23 | 290 | 29.44 49.89 73.92 | 29.44 49.89 73.92 | 373 309 372 | • | 80 4 140 4 198 8 | 8 | 150 310 310 | 1 1 1 | 117 272 451 | | 1,840 3,118 4,620 | | | 368 356 373 | 1.28 1.14 0.69 | 1.078 2.507 4.156 | 7.6 24.5 24.5 | 55.4 110.2 68.8 | |
| | EP4CGX110 EP4CGX150 | DF31C7N DF27C7N | \$279 | 23 | 270 | 109.42 | 109.42 149.76 | 393 | 3 | 280 8 360 8 | 8 8 | 475 475 | 1 1 | 596 703 | | 6,839 9,360 | | | | 0.80 | 5.493 6.479 | 47.6 | | |
| Altera | Arria II EP2AGX45 | 40nm CU17C6N | (1+) \$300 | 17 | 156 | ALMs 18.05 | 1/2.38 AI 43.0 | 143 | | (18DSP 232 4 | 3.75Gh: | z 3 364 | 2x20 903 | 256x36 319 | | 10x 1,805 | | | 185 185 | 1.14 1.14 | | | | half of CLBs can be MLABs small RAM is 20x5LUT blocks |
| Altera F I F A | MAX V 5M40Z 5M80Z | 180nm E64C5N E64C5N | (1+) \$1 \$2 | 5 | | 16bits 0.04 0.08 | 0.04 | 44 47 | | IP IP | | 54 79 | | | flash | 10x 4 | (250,000 |)+) | | | flash 8,192 8,192 | | | internal oscillator, flash, LUT RAM |
| F A | | E64C5N T144C5N | \$4 \$5 | 5 | 52 | 0.16 0.24 | 0.16 0.24 | | | IP IP | | 79 114 | | | | 16 24 | | | | | 8,192 8,192 | | | |
| F A | | T100C5N T144C5N F256C5N | \$8 \$11 \$20 | 17 | 114 | 0.57 1.27 2.21 | 0.57 1.27 2.21 | 76 115 111 | | IP IP | | 159 271 271 | | | | 57 127 221 | | | | | 8,192 8,192 8,192 | | | |
| Altera | 5M2210Z Cyclone V 5CEBA/CSEBA/ | 28nm 256FBGA | (1+) | 1.1v c | ore | ALMs 9.4 | 1/2.65 AI 25.0 | 762 u | | | 3,5 Gbp | | nem ct | 256x40 166 | PCI ex | 10x 943 | | | 386 500 | 1.27 1.83 | 10^6 bits | | #### | 840 Mbps LVDS |
| A I | 5CGXBC3 | 484FPGA 484UBGA | 60 62 | 15 19 | 112 227 | 11.9 15.1 | 31.0 40.0 | 520 | 2 - | 102 4 168 8 | 3,0 | 208 326 | 1 2 | 138 | 1 | 1,170 1,509 | | | 304 238 | 1.62 | 1.413 2.253 | | | dual ARM A9 @800Mhz, 512K cache |
| A I | 5CEBA4 5CGXBC4 | 256FBGA 484BGA | 94 | 19 | 240 | 18.5 18.9 | 48.0 50.0 | | • | | 6,0 | 336 | 2 | | 1 | 1,811 | | | 364 357 | 1.15 | 2.499 | | | ALM equivlent to 2 5LUTs or single 6LL |
| A I A I | 5CEBA/CGXBC/ 5CSEBA/CSXFC 5CSEBA/CSXFC | 484BGA 484UBGA 484UBGA | 97 140 | 19 | 227 | 29.1 32.1 41.5 | 76.5 85.0 110.0 | 869 873 788 | 2 ′ | 300 6 174 9 224 9 | | 240 469 469 | 2 2 | 372 388 502 | | 2,887 3,208 4,151 | | | 255 488 491 | 0.97 1.23 0.95 | 3.809 3.973 5.140 | | | DDR3 at 400 Mhz dual ARM A9 @800Mhz, 512K cache dual ARM A9 @800Mhz, 512K cache |
| A I | 5CEBA/CGXFC/ | 484UBGA 55nm | 159 | 19 | 230 | 56.5 | 149.5 | | - 3 | 312 7 | | 480 | 2 | 636 256x36 | KB flas | 5,642 10x | (250,000 |)+) | 479 305 | 0.77 | 6.513 | | | 9x9,18x18,27x27 multiply support internal oscillator, flash, 12bit A2D, AES |
| FA Y A | 10M02 10M04 | DCV36C8G SCU169C8G | \$4 \$10 | 8.00 | 112 | 2.00 4.00 | 2.00 4.00 | | | 16 2 20 2 | 1 : | 160 246 | | 12 21 | 12 156 | 200 400 | 1.50 | 1333 | 125 200 | 13.3 11.7 | 0.111 0.194 | | | 600Mbps DDR, 800Mbps LVDS no accumulator on multiplier |
| FA Y A FA Y A | 10M16 | SCU169C8G SCU169C8G SCE144C8G | \$11 \$27 \$40 | 11 | 130 | 8.00 16.00 25.00 | 8.00 16.00 25.00 | 585 | | 24 2 45 4 55 4 | 1 | 250 320 E 380 E | | 42 61 75 | 172 296 400 | 1,600 2,500 | | | 333 356 455 | 6.0 5.2 5.1 | | | | |
| FA Y A | 10M40 | SCE144C8G SCE144C8G | \$52 \$58 | 17 | 178 | 40.00 50.00 | 40.00 50.00 | | - | 125 4 144 4 | 2 | 500 C | DDR | 140 182 | 736 736 | 4,000 5,000 | | | 320 347 | 3.6 | 1.290 | | | |
| Altera | Cyclone X LP 10CL006 | 20nm YU256C8G | (1+) \$7 | 1.2, 1 | .2 - 3.3 176 | 4LUT 6.27 | 6.27 | 1,144 893 | 18x | (18 15 2 | | 176 | | 256x36 30 | | 10x | (250,000 |)+) | ##### 418 | 3.39 5.87 | 10^6 bits 0.276 | | | no accumulator, plain 4LUT+Dff |
| | 10CL010 10CL016 10CL025 | YU256I7G YM164I7G YU256I7G | \$9 \$14 \$20 | 8 | 71 | 10.32 15.41 24.62 | 10.32 15.41 24.62 | 1,102 | | 23 2 56 4 66 4 | | 176 340 325 | | 46 56 66 | | | | | 449 275 373 | 3.83 6.07 4.92 | 0.424 0.516 0.608 | | | |
| | 10CL025 10CL040 10CL055 | YU484I7G YU484I7G | \$20 \$29 \$46 | 19 | 325 | 39.60 55.86 | 39.60 55.86 | 1,359 | , | 126 4 156 4 | | 325 325 321 | | 126 260 | | | | | 373 314 358 | 2.58 1.23 | 1.161 2.396 | | | |
| | 10CL080 10CL120 | YU484I7G YF484I7G | \$71 \$108 | 19 23 | 289 277 | 81.26 119.09 | | 1,140 1,101 | 2 | 244 4 288 4 | | 423 525 | | 305 432 | | | | | 333 414 | 1.39 | 2.811 3.981 | | | |
| Gowin | Arora GW2A-18 GW2AR-18 | 55nm MG196 QN88 | (1+) | 1.0 - 3 8 10 | 114 | 16bits 20,736 20,736 | 20736 20736 | ##### | 18x | 48 4+4 48 4+4 | | 319 384 | | 1Kx18 46 | flash 42M | 8X 2,592 2,592 | | | | 6.54 6.93 | 0.848 | | | LUT RAM, 9x9-18x18-36x36 mults, 1% package determines pSRAM & flash 64Mb pSRAM or 128Mb SDRAM |
| Gowin | GW2AR-18 GW2A-55 Littlebee | PG484 55nm | (1+) | 15 | 319 | 54,720 16bits | 54720 | ##### N | 13 18× | 40 6+4 | | 608 | | 140 1Kx18 | | 2,592 6,840 8X | | | | 8.35 4.34 15.2 | 2.580 | l | | LUT RAM, 9x9-18x18-36x36 mults, 1% |
| F F | GW1NZ-1 GW1NSR-2 | CS16 CS36 | | 1.80 | 11 | 1152 1728 | 1152 1728 | | | 1+0 | 0 | 25 95 | | 4 | 64Kb 1Mb | 144 216 | | | | 6.3 | 0.074 | | | many variations with flash and/or PSRA osc, usb2.0, A2D |

| ES | bu | T | | | 9. | - F | _ | | | 9 | | l l s | | RAM | RAM | RAM | | | ъ | | | γs | | BITS | |
|------------------|------------|--------|--|---------------------------------|----------------------------|-------------------------|----------------|----------------------------|-------------------------------|---------------------------|-------------|-------------------------|-------------------|------------|--------------------|------------------------|-----------------------|------------------------------|--------------------|--------------------------|-----------------------------|-------------------------------|-------------------|------------------|--|
| Flash/AES | Scrubbing | srades | art | ıuffix | ow price | min pkg size mm | user pin | (LUTs | K Logic Cells | .c/\$ | nults | PLL/DLL | so, | mall R. | ned. R/ | arge R/ | CLBs | highest volume pricing | LUTs per dollar | C per | I/Os per RAM | am BITS | M confg BITS | onfg B LUT in | |
| F F | | | GW1NSR-2C GW1NNR-4 | CS36 MG81 | | 2.50 4.50 | 30 | 1728 4068 | 1728 4068 | 1 | 10 | 1+2 | 95 70 | <u> </u> | | 1Mb 256Kb | 216 509 | | | 254 | 23.8 7.0 | 0.074 0.184 | | | osc, usb2.0, A2D, 60MHz cortex M3, 32 64Mb pSRAM/SDRAM |
| F | | (| W1NSR-4C W1NR-9 | MG81 QN88 | | 4.50 | 70 | 4068 8640 | 4068 8640 | 1 | | 5 2+2 0 2+4 | 70 120 | | 26 | 256Kb 608Kb | 509 1,080 | | | 254 432 | 7.0 4.6 | 0.184 | Corte | x-M3 | 64Mb pSRAM/SDRAM 64Mb pSRAM/SDRAM |
| F | | (| GW1N-1 GW1N-2 GW1N-4 | CS30 CS72 CS72 | | 2.40 3.60 3.60 | 57 | 1152 2304 4606 | 1152 2304 4606 | | | 1+0 6 2+2 6 2+2 | 119 207 207 | | 10 | 96Kb 256Kb 256Kb | 144 288 576 | | | 144 288 | 29.8 20.7 20.7 | 0.074 0.184 0.184 | | | osc, i3c, spi, DDR, IO gearing osc, i3c, spi, DDR, IO gearing osc, i3c, spi, DDR, IO gearing |
| F F | | (| GW1NRF-LV4B GW1N-6 | CS72 CM64 | | 3.60 4.10 | 57 | 4606 6912 | 4606 6912 | 1 | 10 | 6 2+2 6 2+4 | 207 | | 10 | 256Kb 608Kb | 576 864 | | | 288 266 | 20.7 | | 32bit | ARC uf | F osc, i3c, spi, DDR, IO gearing osc, i3c, spi, DDR, IO gearing |
| F Latt | ice | _ | W1N-9 MachXO | CM64 130nm | | 4.10 1.2 - 3 | 3.3 | 8640 16bits | 8640 | 90 | 20 | 5 2+4 | 273 | | 26 256x36 | 608Kb flash | 1,080 8X | | | 332 | 10.5 151 | 0.479 | | | osc, i3c, spi, DDR, IO gearing ua idle mode, onchip flash |
| F | 1 | A L | CMXO256 CMXO640 CMXO1200 | 3TN100C 3TN100C 3T100C4 | \$5 \$9 \$13 | 8 8 8 | 101 | 256 640 1,200 | 256 640 1,200 | 49 69 95 | | 0 0 | 78 159 211 | | 0 | | 32 80 150 | 2.50 | 343 | | 211 | 0 0 9,216 | | | Auto:-40125 Junction temp |
| F Latt | 1 | ۱ L | CMXO2280 MachXO2 | 3FT324C 65nm | \$16 | 8 1.2 - 3 | 101 | 2,280 16bits | 2,280 | 144 146 | I2C.S | 2 PI,timer | 271 | LUT rar | 3 512x18 | flash | 285 8X | 3.50 5.00 | 456 | | 90.3 | 27,648 10^6 bits | | | ua idle mode, onchip flash & clk |
| F F | l I | L | CMXO2-256 CMXO2-640 | 4SG32C 4TG100C | \$3 \$6 | 4.00 8.00 | 22 79 | 0.256 0.640 | 256 640 | 91 109 | | 4 0 4 0 | 56 80 | | 0 | 0 24 | 32 80 | 0.75 | 341 | | 40.0 | 0.018 | | | , <u>-</u> |
| F | | L | CMXO2-1200 CMXO2-2000 | 1UW25ITR 4TG100C | \$7 \$10 | 3.10 | 29 | 1.280 2.112 | 1,280 2,112 | 174 207 | | 1 1 | 108 207 | | 8 | 64 80 | 160 264 | 2.00 | 640 | | 15.4 25.9 | 0.065 | | | |
| F Latt | ice | L | .CMXO2-4000 .CMXO2-7000 MachXO3 | csBGA132 4TG144C | \$11 \$14 | | 115 | 4.320 6.864 16bits | 4,320 6,864 | 406 475 551 | | 1 2 1 2 | 279 335 | I I IT ran | 10 26 512x18 | 256 | 540 858 8X | | | | 27.9 12.9 24.5 | 0.092 0.240 10^6 bits | | | PLL idle mode, 1ms boot, LVDS, DDR |
| F | I | L | CMXO3L-640 CMXO3L-1300 | 5MG121I 5UWG36C | \$3 \$3 | 6.00 | 100 | 0.640 | 640 1,300 | 188 | | 5 1 | 100 206 | LOTTAL | 7 | 64 64 | 80 | 1.00 | 640 | | 14 | 0.065 0.065 | | | 2X I2C, 1X: SPI, timer, oscillator LF version has flash & 1ms boot |
| F F | | Į | CMXO3L-2100 CMXO3L-4300 | 5BG324C 5UWG81C | \$4 \$5 | 3.20 3.80 | 60 | 2.112 4.320 | 2,112 4,320 | 571 873 | | 5 1 | 269 325 | | 8 10 | 96 | 264 540 | | | | 34 33 | 0.074 0.092 | | | MachXO3D-4300 & 9400 w/hw security |
| F | | Ī | CMXO3L-6900 CMXO3L-9400 | 5BG256C 5BG256C | \$11 \$12 | 9.00 | 206 | 9.400 | 6,864 9,400 | 754 | | 5 2 | 325 384 | LUT | 26 48 | 448 | 858 1,175 | | | | 13 8 | 0.240 0.442 | | | Facility and the book and the |
| F F | ice | L | MachXO3D CMXO3L-6900 CMXO3L-9400 | | (1+) \$11 \$12 | 1.2 - 3 10.0 10.0 | 58 | 16bits 6.864 9.400 | 6,864 9,400 | 687 621 754 | | 5 2 5 2 | 206 383 | LU1 rar | 512x18 10 46 | 1,122 | 8X 858 1,175 | | | | 21.9 21 8 | 10^6 bits 0.092 0.424 | | | For the secure hardware market |
| Latt | | N | MachXO5-NX FMXO5 | | | 1.2 - 3 | 3.3 | 16bits 25.00 | 25.00 | 313 | | I PLL | | LUT rar | 512x36 80 | 16K*3 | 8X 3,125 | | | | 22.3 | | | | 2 ATD, 450MHz & 128KHz osc, I2C, SF |
| Latt A | ice | | atticeECP/EC FEC1E | 3TN100C | (1+) \$7 | 1.2, 1 14 | .2 - 3.3 | 16bits 1,536 | 1,536 | 313 216 | |) 2 | 112 | | 256x36 2 | | 8X 192 | | | 653 | 16.6 56.0 | 10^6 bits 0.018 | | | EC6EC40 also |
| A A | | L | FEC3E FEC6E | 4TN100C 3TN144C | \$12 \$18 | 14 17 | 195 | 3,072 6,144 | 3,072 6,144 | 257 343 | (| 0 2 | 160 224 224 | | 10 10 | | 384 768 | | | 204 | 26.7 | 0.055 | | | |
| A A | | L | FECP6E FEC10E FECP10E | 3TN144C 3FN484C 3FN484C | \$19 \$32 \$331 | 17 17 17 | 195 | 6,144 10,240 10,240 | 6,144 10,240 10,240 | 322 324 31 | 20 |) 4 | 288 288 | | 30 30 | | 768 1,280 1,280 | | | 384 512 | 9.6 9.6 | 0.092 0.276 0.276 | | | |
| A A | | L | FEC15E FECP15E | 3FN256C 3FN484C | \$40 \$44 | 17 17 | 195 195 | 15,360 15,360 | 15,360 15,360 | 384 347 | 24 | 0 4 4 4 | 352 352 | | 38 38 | | 1,920 1,920 | | | 640 | 9.3 9.3 | 0.350 0.350 | | | |
| A | | | FEC20E FECP20E | 3FN484C 3FN484C | \$53 \$56 | 23 | 360 | 19,712 19,712 | 19,712 | 374 352 | 28 | | 400 400 | | 46 46 | | 2,464 2,464 | | | 704 | 8.7 | 0.424 | | | |
| A A Latt | ioo | _ | FEC33E FECP33E atticeECP2 | 3FN484C 3FN484C 90nm | \$80 \$84 (1+) | 23 | | 32,768 32,768 16bits | 32,768 32,768 | 410 390 507 | 32 | 0 4 2 4 BDSP 3.12 | 496 496 | | 58 58 512x36 | | 4,096 4,096 8X | | | 1024 664 | 8.6 8.6 14.1 | 0.535 0.535 10^6 bits | | | Altium NB2: LFECP33E-3FN672C DDR2 support |
| A Y | ΥI | L | FE2-6E FE2-12E | 5TN144C 5TN144C | \$10 \$21 | 17 | 90 | 6,048 12,096 | 6,048 12,096 | 590 590 | 12 | 2 2 | 190 297 | | 3 | | 756 1,512 | | | 504 504 | 63.3 | 0.055 0.221 | | | Indust:-40100 Junction temp |
| Α ' | Y I Y I | L | FE2-20E FE2-35E | 6FN256C 5FN672CES | \$39 \$80 | 17 23 | 331 | 21,168 32,256 | 21,168 32,256 | 539 404 | 3: | 2 2 | 402 450 | | 15 18 | | 2,646 4,032 | | | 756 1008 | 26.8 25.0 | 0.276 0.332 | | | |
| A . | ΥI | L | FE2-50E FE2-70SE atticeECP5 | 5FN484C 5FN672C | \$105 \$147 | 23 | | 47,952 68,112 16bits | 47,952 68,112 | 456 463 2316 | 8 | | 500 588 | | 21 60 512x36 | | 5,994 8,514 8X | 23.95 25K+ | 2002 | 666 774 636 | 9.8 3.03 | 0.387 1.106 10^6 bits | | | DDD0 DDD0 0 LDDDD (4000 |
| Latt | ice | L | FE5U-12F FE5U-25F | 40nm 6BG381C 6BG381C | (1+) \$7 \$9 | 10 | 118 | 12,000 24,288 | 12,000 24,288 | 1,846 | 28 | 3 2 | 197 197 | | 32 56 | | 1,500 3,036 | 3.92 7.51 | 3065 3235 | 429 867 | 6.16 3.52 | 0.590 | | | DDR2, DDR3 & LPDDR support (1066, DSP: 36x36, 2X 18x18, 4X 9x9 |
| 7 | | | FE5U-45F FE5U-85F | 6BG381C 6BG381C | \$16 \$30 | 10 | 118 | 44,000 84,000 | 44,000 84,000 | | 7: | 2 4 | 245 365 | | 108 | | 5,500 10,500 | 12.34 23.63 | 3566 | 611 538 | 2.27 | 1.991 3.834 | | | DSP: ALU & Booleans SERDES: 85mw per channel |
| \exists | | | FE5UM-25F FE5UM-45F | 6BG381C 6BG381C | \$13 \$24 | 10 10 | 118 | 24,000 44,000 | 24,000 44,000 | | 28 72 | 2 4 4 | 197 245 | | 56 108 | | 3,000 5,500 | | | 857 611 | 3.52 2.27 | 1.032 1.991 | | | |
| Latt | ice | Ī | FE5UM-85F atticeXP | 8BG381I | | | .2 - 3.3 | | 84,000 | 257 | 150 | | | | 208 256x36 | | 10,500 8X | | | 538 | 1.75 14.5 | 3.834 | | | ua idle mode, onchip flash |
| Ħ | | L | FXP3 FXP6 FXP10 | 3TN100C 3Q208CES 3F256CES | \$14 \$24 \$37 | 14 17 17 | 188 | 3,072 5,760 9,728 | 3,072 5,760 9,728 | 213 235 266 | | 2 2 4 | 136 188 244 | | 8 24 | | 384 720 1,216 | 15.00 | 649 | | 22.7 23.5 10.2 | 55,296 73,728 221,184 | | | |
| Ħ | | Ī | FXP15 FXP20 | 3FN256C 3F388C | \$56 \$67 | 17 | 188 | 15,456 19,712 | 15,456 19,712 | 278 295 | | 4 | 300 340 | | 36 44 | | 1,932 2,464 | 15.00 | 049 | | 8.3 7.7 | 331,776 | | | |
| Latt | ice Y I | Į | atticeXP2 FXP2-5 | 90nm 5TN144C | | | .2 - 3.3 | 16bits 5,000 | 5,000 | 443 379 | 18x18 | | 172 | | 512x36 | flash | 8X 625 | | | 810 417 | | | 1.27 | | ua idle mode, onchip flash Indust:-40100 Junction temp |
| F ' | ΥI | L | FXP2-8 FXP2-17 | 5TN144C 5QN208C | \$17 \$36 | 17 | 201 | 8,000 17,000 | 8,000 17,000 | 473 474 | 20 |) 4 | 201 358 | | 12 15 | | 1,000 2,125 | 12.00 | 1417 | 500 850 | 16.8 23.9 | 0.221 | 1.99 3.54 | 48.0 | |
| | ΥI | L | FXP2-30 FXP2-40 | 5FTN256 5FN484C 40nm | \$65 \$90 | 17 23 | | 29,000 40,000 16bits | 29,000 40,000 | 445 446 678 | 3: 16x16 | 2 4 | 472 540 | | 21 48 256×16 | 16Kx1 | 3,625 5,000 | 5K+ | | 1036 1250 | 22.5 11.3 | 0.387 0.885 10^6 bits | 5.79 8.03 | 44.7 | |
| F | i | i | E CE40LP384 CE40LP/UL640 | SG32 CM36 | \$1.51 \$1.41 | 2.5 | 25 | 384 640 | 384 640 | 254 | 100.10 | | 37 63 | | 14 | | 48 80 | 1.10 | 582 | | 4.5 | 0.057 | 0.1 | 41.0 | D LM series has I2C, SPI & no boot flash now LatticeSemi |
| F | i | i i | CE40LP/UL1K CE40LM2K | CM36 CM36 | \$1.46 \$4.55 | 1.4 1.7 | 10 | 1,280 2,000 | 1,280 2,000 | 877 440 | | 1 | 95 35 | | 14 20 | | 160 250 | 1.10 | 1164 | | 6.8 | 0.057 | 1.1 0.5 | 213.2 68.2 | 2 |
| F | i | i | CE40LP/LM/HX CE40LP/HX8K CE5LP1K | CM121 CM121 UWG20 | \$5.03 \$7.07 \$2.95 | 5.0 5.0 2.1 | 93 | 3,520 7,680 1,100 | 3,520 7,680 1,100 | 1,086 | <u> </u> | 2 2 1 | 137 178 26 | | 20 32 16 | | 960 138 | 4.49 5.38 2.41 | | 550 | 6.9 5.6 1.6 | 0.082 0.131 0.066 | 1.1 | | |
| F F | 1 | I | CE5LP1K CE5LP2K CE5LP4K | | | 2.1 2.1 2.1 | 12 | 2,048 3,520 | 2,048 3,520 | | | 1 1 1 1 | 26 26 26 | | 20 20 | | 256 440 | 2.41 | 430 | 512 880 | 1.6 1.3 1.3 | 0.082 0.082 | | | 2 I2C, 2 SPI, 48M & 10K OSC 2 I2C, 2 SPI, 48M & 10K OSC 2 I2C, 2 SPI, 48M & 10K OSC |
| \exists | | l l | CE40UP3K CE40UP5K | 30WLCSP 30WLCSP | \$4.35 \$5.45 | 2.3 2.3 | 21 | 2,800 5,280 | 2,800 5,280 | 644 969 | | 1 1 3 1 | 21 39 | | 20 30 | 4 | 350 660 | 3.44 4.42 | 814 1195 | 700 660 | 1.1 | 1.130 1.171 | | | large RAM is single port large RAM is single port |
| | | 4 | orgeFPGA | 400 | (OF :) | 1.8-5 2.0 | | 1,000 | logie cell | 170 | | | | 16::4 | 250.12 | | | 10K 0.37 | | | 04.0 | | | 77.0 | standby current of <20uA, under \$.50 ir 2DAC, comparators, macrocells |
| Xilii | ıx | > | C2S50E C2S100E | 180nm 7TQ144C 6TQ144C | (25+) \$14 \$16 | | | 16bits 1,536 2,400 | 1,728 2,700 | 124 | | | 182 202 | 16x1 | 256x16 8 10 | | 4x 384 600 | | | | 21.2 22.8 20.2 | 32,768 40,960 | 0.6 | 97.2 | Previous chips: XC2064, XC3K, XC4K, and 5K, 6K, 7K, and Spartan-1, Virtex-1 |
| Ħ | | > | (C2S150E (C2S200E | 6TQ144C 6PQ208C | \$16 \$27 | | | 3,456 4,704 | 3,888 5,292 | 238 198 | | | 265 289 | | 12 14 | | 864 1,176 | | | | 22.1 20.6 | 49,152 57,344 | 1.1 1.4 | 78.5 73.6 | 5 |
| H | Ī | | (C2S300E (C2S400E | 6PQ208C 6FT256C | \$42 \$66 | | | 6,144 9,600 | 6,912 10,800 | 164 | | | 329 410 | | 16 40 | | 1,536 2,400 | | | | 20.6 | 163,840 | 1.9 2.7 | 65.9 | 9 |
| Xilir | ıx | 5 | C2S600E Spartan-3 CC3S50 | 6FG456C 90nm 4VQ100C | \$162 (100+) \$8 | 1.2, 1 | .5 - 3.3 89 | 13,824 16bits 1.536 | 15,552 logic cell 1.728 | 96 338 205 | 18x18 | 1 2 | 514 124 | 16x1 | 72 512x36 | | 3,456 8x 192 | (250,000 | | 574 432 | 7.1 18.2 31.0 | 294,912 10^6 bits 0.074 | 0.4 | 53.2 | 622 Mbps LVDS |
| Ħ | | | (C3S50A/N (C3S100E | 4TQG144I 4VQ100C | \$12 \$10 | 17 8 | 144 | 1.408 1.920 | 1.584 2.160 | 131 219 | ; | 3 2 | 144 108 | | 3 | | 176 240 | 1.50 2.00 | 939 960 | 528 540 | 48.0 27.0 | 0.055 0.074 | 0.4 | 68.1 | stacked flash |
| H | 1 | | (C3S200 (C3S200A/N | 4VQG100C 4FT256C | \$11 \$19 | 16 17 | 63 195 | 3.840 3.584 | 4.320 4.032 | 385 214 | 1: | 2 4 | 173 248 | - | | 4.325 | 480 448 | 4.00 3.00 | 960 | 360 252 | 14.4 15.5 | 0.221 0.295 | 1.0 1.2 | 53.8 62.9 | 3 stacked flash |
| H | - | > | (C3S250E (C3S400 (C3S400A/N | 4PQ208C 4TQ144C 4FT256I | \$19 \$18 \$31 | 17 17 | 173 | 4.896 7.168 7.168 | 5.508 8.064 8.064 | 442 | 1: | 6 4 | 172 264 311 | | 12 16 | | 612 896 896 | 6.50 | 1103 | 459 504 403 | 14.3 16.5 19.4 | 0.221 0.295 0.295 | 1.4 1.7 1.9 | 49.0 | |
| Ħ | 1 |)) | (C3S500E (C3S700A/N | 4CP132C 5FGG400C | \$31 \$22 \$51 | 8 21 | 92 | 9.312 11.776 | 10.476 13.248 | | 20 |) | 232 372 | | 20 | | 1,164 1,472 | 6.00 | 1963 | 524 662 | 19.4 11.6 18.6 | 0.295 0.369 0.369 | 2.3 | 51.0 | |
| Ц | | þ | C3S1000 | 4FT256C | \$39 | 17 | | | | 446 | 2 | | 391 | | 24 | | 1,920 | 12.00 | | | | 0.442 | 3.2 | | |

| Flash/AES Scrubbing | ades | art | uffix | w price | nin pkg size mm | user pin | LUTs | K Logic Cells | .C/\$ | nults | PLL/DLL SERDES | , so | mall RAM | ned. RAM | arge RAM | CLBs | nighest rolume pricing | UTs per dollar | C per Mult | /Os per RAM | am BITS | M confg BITS | onfg BITS LUT input | |
|------------------------|----------|-----------------------------------|-------------------------------------|-----------------------------|--------------------|-----------------|----------------------------|----------------------------|-------------------------------|--------------------|-------------------|---------------------|------------------|---------------------|------------------|--------------------------|------------------------------|-------------------|--------------------------|----------------------|-----------------------------|-----------------------|------------------------|---|
| E S | <u>ق</u> | C3S1200E | 4FG400C | \$52 | 17 | 190 | 1 7.344 | 19.512 | 373 | 28 | <u> </u> | 304 | S | 28 | | 2,168 | 9.00 | 1927 | 697 | 10.9 | 0.516 | 3.8 | 47.9 | |
| | > | C3S1400A/N C3S1500 C3S1600E | 4FG320C 4FG320C | \$71 \$62 \$64 | 23 19 19 | 221 | 22.528 26.624 29.504 | 25.344 29.952 33.192 | 358 487 523 | 32 32 36 | 4 | 502 487 376 | | 32 32 36 | 1.730 | 2,816 3,328 3,688 | 9.00 | 2503 1479 | 792 936 922 | 15.7 15.2 10.4 | 0.590 0.590 0.664 | 4.8 5.2 6.0 | 46.2 43.4 45.0 | Altium NB2: XC3S1400AN-4FGG676C Altium NB2: XC3S1500-4FGG676C |
| Xilinx | > | C3SD1800A /irtex-II | 4CS484C | \$114 or100+) | 19 | 309 | 33.280 16bits | 37.440 logic cell | 329 43 | 84 18x18 | 8 | 519 | 16x1 | 84 512x36 | | 4,160 8x | 29.85 | 1115 | | 6.2 13.4 | 1.548 | 8.2 | 50.0 | Altium NB2: XC3SD1800-4FGG676C 840 Mbps LVDS |
| | > | C2V40 C2V80 | 4FG256C 4CS144C | \$27 \$28 | | | 512 1,024 | 576 1,152 | 22 | 4 | | 88 120 | | 4 8 | | 64 128 | 10.00 | 51 | 144 | 22.0 | 0.074 | 0.3 | 129.1 | |
| |)) | C2V250 C2V500 | 4FG256C 4FG256C | \$70 \$118 | | | 3,072 6,144 | 3,456 6,912 | 50 59 | 24 32 | 8 | 200 264 | | 24 32 | | 384 768 | | | 144 216 | 8.3 8.3 | 0.442 0.590 | 1.6 2.6 | 93.5 80.1 | |
| Xilinx | <u>\</u> | /irtex-II Pro C2VP2 | 130nm 5FG256C | \$62 | 1.2v c | core | 16bits 2,816 | logic cell 3,168 | 61 PP 51 0 | 12 | 4 4 | | 16x1 | 512x36 | | 8x 352 | | | 244 264 | 11.2 17.0 | 0.221 | 1.3 | 92.2 95.9 | 622 to 3125 Mbps SERDES |
| | > | C2VP7 | 5FG256CES 5FG456CES 5FG676CES | \$113 \$176 \$299 | | | 6,016 9,856 18,560 | 6,768 11,088 20,880 | 60 1 63 1 70 2 | 28 44 88 | | 396 | | 28 44 88 | | 752 1,232 2,320 | | | 242 252 237 | 9.0 6.4 | | 3.0 4.5 8.2 | 93.0 88.8 | |
| Xilinx |) \ | C2VP30 /irtex-4 | 5FG676C 90nm | \$508 (100+) | | .5 - 3.3 | 27,392 16bits | 30,816 logic cell | 61 2 110 PP | 136 | | 644 | 16x1 | 136 512x36 | | 3,424 8x | (25,000+ | -) | 227 393 | 4.7 6.07 | 2.507 | 11.3 | 80.3 79.3 | 622 to 11100 Mbps SERDES |
| | M > | C4VLX15 C4VLX25 | 10SF363C 10SF363C | \$105 \$235 | 17 | 240 | 12,288 21,504 | 13,824 24,192 | 131 103 | 32 48 | 8 | 320 448 | | 48 72 | | 1,536 2,688 | 39.99 | | 432 504 | 6.67 6.22 | 0.885 1.327 | 4.8 7.8 | 79.7 75.3 | 450MHz PowerPC core(s) Altium NB2: XC4VLX25-10FF668C |
| A A Xilinx |)) | C4VSX25 C4VFX12 | 10FF668C 10SF363C | \$276 \$119 | 17 | 240 | 20,480 12,944 | 23,040 14,562 | 83 123 1 | 128 32 | 4 | 320 320 | DCI au | 128 36 | 10/100 | 2,560 1,618 | 59.99 29.99 | | 180 455 816 | 2.50 8.89 | 2.359 0.664 | 9.1 4.8 | 82.3 79.9 | 400 to 2200 Mbrs CEDDEC |
| A A Y |) | | 65nm 1FF323C 1FFG324C | \$226 \$250 | 19 | | 64bits 12.5 19.2 | 20.0 30.7 | 96 PP 88 123 | 25X18L 24 32 | 1 4 | | PCI exp 1 | 26 | 10/10C 2 4 | 1,560 | (1,000+) | 121 | 832 960 | 6.2 12.5 | 10^6 bits 0.958 1.180 | 6.3 8.4 | 78.5 77.7 67.8 | 100 to 3200 Mbps SERDES |
| A A | > | C5VLX50T | 1FFG676C 1FF665CES | \$453 \$473 | 19 | 440 | 28.8 20.5 | 46.1 32.8 | 102 69 1 | 48 64 | 6 12 | 560 | 1 | 48 | 4 | | 149.00 | 193 | 960 512 | 11.7 | 1.769 2.507 | 12.6 13.6 | 67.8 | 6.5 Gbps SERDES |
| Xilinx A |) | | 40nm 1FF484C | (1+) \$531 | 23 | | 2x32,64b 46.6 | logic cell 74.5 | 140 140 | 288 | 6 12/ | 360 | PCI exp | 156 | 10/100 | | (10K+) 50.00 | 931 | 259 259 | 2.31 2.31 | 5.751 | 26.2 | | 4.0Gbs PCI express |
| Xilinx A A | > | | 45nm 2CPG192C 2TQG144C | (1+) \$11 \$15 | 8 | | 2x32,64b 2.4 5.7 | logic cell 3.8 9.2 | 734 355 620 | 18x18D 4 16 | 1 | 120 200 | PCI exp | (2)256x3 8 32 | 6 | 4x 600 1,430 | (10K+) 3.00 | 800 | 960 572 | 4.3 15.0 6.3 | 10^6 bits 0.147 0.590 | 2.7 | | 622 to 3125 Mbps SERDES 2.0Gbs PCI express 1.05Gbs per differential pair |
| A A |)) | C6SLX16 | 2CPG196C 2FTG256C | \$21 \$32 | 8 | 180 | 9.1 15.0 | 14.6 24.0 | 696 746 | 32 | 2 | 232 264 | | 32 52 | | 2,278 3,750 | | | 456 632 | 7.3 5.1 | 0.590 0.590 0.958 | 3.7 6.4 | 56.9 60.5 | |
| A Y | M > | C6SLX45 C6SLX75 | 2CSG324C 2CSG484C | \$49 \$89 | 15 19 | 354 290 | 27.5 46.6 | 44.0 74.6 | 901 840 | 58 132 | 4 6 | 370 348 | | 116 172 | | 6,882 11,662 | | | 759 565 | 3.2 2.0 | 2.138 3.170 | 11.9 19.6 | 59.1 58.7 | |
| A Y I | M) | C6SLX150 | 2FG484C 2FG484C | \$111 \$159 | | 345 | 92.2 | 101.6 147.4 | 918 929 528 | 182 182 38 | 6 2 2 | 498 498 2 264 | 1 | 268 268 | | 15,882 23,038 | | | 558 810 | 1.9 | 4.940 4.940 0.958 | 26.5 33.8 | 56.6 52.2 | |
| A A Y | у М) | C6SLX45T | 2CSG324C 2CSG324C 2CSG484C | \$45 \$63 \$106 | 15 | 174 | 15.0 27.3 46.6 | 24.0 43.7 74.6 | 696 701 | 58 132 | 4 4 | 370 | 1 | 116 | | 3,750 6,822 11,662 | | | 632 753 565 | 5.1 3.2 2.0 | 2.138 3.170 | 6.4 11.9 19.6 | 60.5 59.6 58.7 | |
| A Y M |) | C6SLX100T | 2FGG484C 2FGG484C | \$129 \$180 | 19 | 296 | 63.3 92.2 | 101.3 147.4 | 786 819 | 182 182 | 6 8 | 396 | 1 | 268 268 | | 15,822 23,038 | | | 556 810 | 1.5 | 4.940 4.940 | 26.5 33.8 | 56.8 52.2 | |
| Xilinx A Y | > | | 28nm 1FTGB196C | (1+) \$15 | 8 | 86 | 2x32,64b 3.8 | 6.0 | 954 408 | 25x18[10 | 2 | 100 | G1 PCI | 5 | 1 | | (10K+) | | 526 600 | 7.4 20.0 | 0.184 | | | automotive grades: XA7SddT-xxxx DSP E1: ALU & Booleans |
| A Y A Y | > | C7S25 | 1FTGB196C 1FTGB196C 1CSGA324C | \$19 \$25 \$41 | 13 15 | 150 | 8.0 14.6 32.6 | 12.8 23.4 52.2 | 920 1265 | 20 80 120 | 3 | 100 150 250 | 1 | _ | 1 1 | 1,000 1,825 4,076 | | | 640 292 435 | 10.0 3.3 3.3 | 0.369 1.659 2.765 | | | block RAM ECC logic XADC: (2) 12-bit A2D, 17 inputs hdw FIFOs |
| A Y A Y | > | C7S75 | 1FGGA484C 1FGGA484C | \$62 \$84 | 23 | 338 | 48.0 64.0 | 76.8 102.4 | 1235 1215 | 140 160 | 8 | 400 400 | 1 | 90 | 1 | 6,000 8,000 | | | 549 640 | 3.3 4.4 3.3 | 3.318 4.424 | 31.3 | 70.0 | Indw FIFOs |
| Xilinx A Y | <u>/</u> | Artix-7 | 28nm 1CPG236C | (1+) \$22 | 1.0, 1 | .2 - 3.3 | 2x32,64b 8.0 | logic cell 12.8 | 893 593 | 25x18[40 | CM GD | P 3.75G | G1 PCI 1 | | XADC 1 | 8x 1,000 | (10K+) | | 365 320 | 4.5 7.5 | 10^6 bits 0.737 | | | GDP 3.75 Gbps SERDES block RAM ECC logic |
| A Y | > > | C7A25T | 1FTG256C 1CPG238C | \$26 \$25 | 10 | 106 | 10.4 14.6 | 16.6 23.4 | 916 | 45 80 | 3 4 | 1 150 | 1 | 45 | 1 | 1,825 | | | 370 292 | 3.3 | 0.922 1.659 | 7.4 | 65.5 | XADC: (2) 12-bit A2D, 17 inputs hdw FIFOs |
| A Y A Y A Y | M) | C7A50T | 1FTG256C 1FTG256C 1FGG484C | \$31 \$52 \$89 | 10 | 106 | 20.8 32.6 47.2 | 33.3 52.2 75.5 | 1084 1011 850 | 90 120 180 | 5 4 | 250 | 1 1 1 | 75 | 1 1 1 | 4,075 | | | 370 435 420 | 5.0 3.3 2.9 | 1.843 2.765 3.871 | 17.5 | 125.7 | DSP E1: ALU & Booleans |
| A Y I | | C7A100T | 1CSG324C 1FBG484C | \$109 \$194 | | 210 | 63.4 134.6 | 101.4 215.4 | 929 1112 | 240 740 | 6 8 | 300 | 1 | 135 | 1 | 7,925 16,825 | | | 423 291 | 2.2 | 4.977 | 31.3 74.2 | 69.2 75.2 | |
| Xilinx A Y | <u>}</u> | | 28nm 1FB484C | (1+) \$134 | 23 | | 2x32,64b 41.0 | logic cell 65.6 | 634 490 | 240 | 6 8 | | G2 PCI 1 | 135 | XADC 1 | 8x 5,125 | (10K+) | | 272 273 | 1.73 2.22 | 4.977 | 23.0 | 73.3 | GTX 10.3125 Gbps SERDES XADC: (2) 12-bit A2D, 17 inputs |
| A Y | 2 | Zyng-7000 | 1FB484C 28nm 1CLG225C | \$209 (1+) \$46 | | .2 - 3.3 | 101.4 2x32,64b 14.4 | 162.2 logic cell | 777 610 A9 | | | X/GTH 6 | G2 PCI | | 1 KB 768 | 12,675 8x 1,800 | (10K+) | | 270 318 349 | 1.23 1.92 | | 51.1 | | block RAM ECC logic (2) 800Mhz Cortex A9 per chip, boot 1s 512KB L2 cache, 256KB other uP RAM |
| A Y A Y A Y | > | C7Z012S | 1CLG225C 1CLG485C 1CLG400C | \$99 \$89 | 19 | 150 | 34.4 40.6 | 23.0 55.0 65.0 | 499 1 558 1 731 1 | 120 170 | 14 4 | 154 1 204 254 | 4 | 50 72 107 | 768 768 | 4,300 5,075 | | | 459 382 | 3.08 2.83 2.37 | 1.843 2.654 3.944 | 16.7 28.1 32.4 | | 512KB LZ Cacrie, 256KB otrief up KAM |
| A Y A Y | > | C7Z010 C7Z015 | 1CLG225C 1CLG485C | \$55 \$124 | 15 19 | 80 204 | 17.6 46.2 | 28.2 73.9 | 513 2 598 2 | 80 160 | 14 14 | 154 1 204 | 4 | 60 95 | 768 768 | 2,200 5,775 | 15.00 | 1173 | 352 462 | 2.57 2.15 | 2.212 3.502 | 16.7 28.1 | 88.7 | (2)12-bit A2D, 17 chnls DSP E1: ALU & Booleans |
| A Y I | M > | C7Z030 | 1CLG400C 1FBG484C | \$114 \$201 | 23 | 163 | 53.2 78.6 | 85.1 125.8 | 747 2 625 2 | 220 400 | 18 4 | 254 1 304 | 4 | | 768 768 | 6,650 9,825 | (1016.) | | 387 314 | 1.81 | 9.769 | 32.4 47.8 | 80.7 | 6.6, 10.3 or 12.5 Gbps SERDES 130 pins for Cortex A9 |
| Xilinx A I | | | 20nm 1FFVA1156C 1FBVA676I | (1+) \$944 \$1,130 | 27 | | 2x32,64b 145.4 203.1 | 318.2 444.3 | 393 337 393 | 1,152 1,700 | 8 12 | | G2 PCI 1 2 | 344 | XADC 1 | 8x 18,180 25,391 | (10K+) | | 261 276 261 | 0.96 0.91 0.96 | 12.681 | 128.1 128.1 | #### | GTH 16.3 Gbps SERDES XADC: (2) 12-bit A2D, 17 inputs |
| Xilinx A | | Zyng-US+ | 16nm 1SBVA484E | | .729 | 1.2-3.3 | | | 344 A5: 358 4 | | CMT | | | (2)512x3 | | | (10K+) | | 324 375 | 2.84 3.72 | | 120.1 | 89.8 | (4) 1.5GHz Cortex A53, (2) 600MHz R5 |
| Α Ι | M > | CZU2EG/CG CZU3EG/CG | 1SBVA484E 1SBVA484E | \$189 \$334 | 19 19 | 245 245 | 47.2 70.6 | 103.3 154.4 | 546 6 462 6 | 240 360 | 3 (| 462 | | 150 216 | | 5,904 8,820 | | | 431 429 | 3.08 2.14 | 7.963 | 44.5 44.5 | 86.4 | (2) Cortex A53 & no Mali for CG series DSP E2: ALU & Booleans, 10-bit A2D |
| A I | M D | | | \$780 \$1,235 \$1,968 | 23 | 414 | 87.8 117.1 230.4 | 192.2 256.2 504.0 | 246 6 207 6 256 6 | | 4 16 | 462 | 2 2 2 | 144 | 48 64 96 | 14,640 | | | 264 205 292 | 3.61 3.21 2.16 | | 61.3 61.3 154.5 | | 6, 16.3 or 32.75 Gbps SERDES 210 pins for Cortex A53 AMS system monitor |
| Xilinx A I | <u> </u> | KintexUS+ KCKU3P | 16nm 1FFVD900E | (1+) \$1,138 | .85, 1 23 | .2 - 3.3 | 2x32,64b 162.7 | sys logic 356.0 | 303 313 | 27x18[1,368 | MMCM 16 | 6 208 | G3 PCI 1 | (2)512x3 | 4Kx72 48 | 8x 20,340 | (10K+) | | 260 260 | 0.51 0.58 | 10^6 bits 27.427 | 123.4 | 81.2 | 10-bit A2D DSP E2: ALU & Booleans, 10-bit A2D |
| A Actel | F | CKU5P ProASICplus (fla | 1FFVA676E ash) | \$1,619 24+ | 27 2.5, 2 | 208 .5 - 3.3 | 217.0 tiles | 474.6 | 293 | 1,824 | 16 | 208 | 1 | 480 256x9 | 64 | | | | 260 | 0.43 | 36.569 | | 81.2 | 150G Interlaken |
| H | F | APA075 APA150 APA300 | FTQ100 FFG256 PQ208 | \$20 \$35 \$62 | 13 | 100 | 3,072 6,144 8,192 | 1,229 2,458 3,277 | 61 70 53 | | 2 2 2 | 158 242 290 | | 12 16 32 | | | | | | 13.2 15.1 9.1 | 36,864 | | | |
| Actel | _ | ProASIC3 (flash) | | | | .5 - 3.3 | tiles 260 | 104 | 134 AR | M7 & M | | | | 256x18 | 1Kb fla | ish | | | | 14.2 | | | | |
| F F | | A3P015 A3P020 | QN68 QN68 | \$4 | 8 8 | 49 49 | 384 520 | 154 208 | 41 | | | 49 49 | | 0 | 1 | | | | | | 0.000 0.000 | | | |
| F/A | ŀ | A3P/N030 A3P/N060 | FVQ100 FVQ100 | \$3 \$6 | 8 | 71 | 768 1,536 | 307 614 | 93 107 | | 1 | 96 422 | | 0 4 | 1 | | 1.50 | 512 | | 24.0 | 0.000 | | | |
| F/A F/A | <i>I</i> | A3P/N125 A3P/N250/L A3P400 | VQG1000 VQ100 1FGG144 | \$10 | 8 | 97 | 3,072 6,144 9,216 | 1,229 2,458 3,686 | 156 253 1 137 1 | | 1 1 | 133 157 194 | | 8 8 12 | 1 1 1 | | 3.95 | 1555 | | 16.6 19.6 16.2 | 0.037 0.037 0.055 | soft co | re Cor | tex M1 |
| | | A3P600/L A3PE600 | 1FG144 FFG256 | | 13 | 97 | 13,824 13,824 | 5,530 5,530 | 156 1+ 107 1+ | | 1 6 | 227 270 | | 24 | 1 | | 10.00 | 1382 | | 9.5 | 0.055 0.111 0.111 | | | |
| F/A I | M A | A3P1000/L A3PE1500 | FGG256 FG484 | \$54 \$138 | 13 27 | 97 280 | 24,576 38,400 | 9,830 15,360 | 181 <mark>1+</mark> 111 1+ | | 1 | 288 439 | | 32 60 | 1 | | | | | 9.0 7.3 | 0.147 0.276 | | _ | |
| Actel F | <u> </u> | GLOO (flash) | uCS36 | (24+) | 3 | | 260 | 104 | 143 AR | M7 & M | 1 soft co | 34 | | 256x18 | 1 | | 50K+ 0.69 | 377 | | 12.5 | | | | |
| F F | / / | AGL015 AGL020 AGL030 | V5QN68 uCS81 V5QN48 | \$1.46 | 8 4 5 | 52 | 384 520 768 | 154 208 307 | 210 | | | 49 52 81 | | 0 0 | 1 1 1 | | 1.07 | 718 | | | 0.000 | | | |
| F/A F/A | / / | AGL030 AGL060 AGL125 | FVQ100 V5VQ100 | \$4.66 | 5 | 66 66 | 1,536 3,072 | 614 1,229 | 132 144 | | 1 | 96 | | 4 8 | 1 | | 1.07 | | | 24.0 | 0.018 0.037 | | | |
| F/A F | ļ | AGL250 AGL600 | V2VQG100 V5FFG144 | \$15 | 5 | 66 | 6,144 13,824 | 2,458 5,530 | 159 1 92 1+ | | 1 | 143 227 | | 8 24 | 1 | | 3.70 | 1661 | | 17.9 9.5 | 0.037 | | | soft core Cortex M1 |

| _ | | | | | | | | | | | | | _ | | | | | | | | | | | |
|------------|---------------------|----------------------|-----------------|------------------|-----------|-------------|------------------|------------------|--------------------|----------|--------|----------------|----------|----------|------------|----------------|------------------------------|--------------------|----------------|------------|----------------|-----------------|---------------------------|---|
| /AES | Scrubbing Grades | | | price | pkg mm | niq | ي | ig. | -C/\$ | | اپر | SES | RAM | RAM | RAM | | is e is | ber . | ± | ber | BITS | ηfg | confg BITS / LUT input | |
| Flash | Scrul | Part | suffix | δ | nin p | user ont | X LUTS | K Logic Cells | -C/\$ | nults | PLUDLL | SERDES //Os | small | ned. | arge | CLBs | nighest /olume pricing | LUTs per dollar | -C per Mult | VOS P | am E | M confg BITS | ig E | |
| F | | AGLE600 | V5FFG256 | \$80 | 17 | 165 | 13,824 | 5,530 | 69 1+ | | 6 | 27 | 0 | 24 | 1 | | | | | 11.3 | 0.111 | | | ĺ |
| F | | AGL1000 | V5FFG144 | \$51 | 13 | 97 | 24,576 | 9,830 | 193 1+ | | 6 | 30 | 0 | 32 | 1 | | | | | 9.4 | 0.147 | | | |
| Act | el le | IGLOO2 (flash) | 65nm | | | .2 - 3.3 | | 4LUTs | 823 | 18*18D | | | | 512x36 | KB flas | h | | | 696 | 10.3 | | typ | | 4LUTs, SERDES, DSP |
| F/A | | M2GL005 | TQ144 | \$9 | | | 6,060 | 6,060 | 648 | 11 | 2 | 0 20 | | 10 | 128 | | 7.00 | 866 | 551 | 20.9 | 0.197 | 2.37 | | 10/100/1000 ethernet, PCIe, 333Mhz D |
| F/A F/A | + | M2GL010 | TQ144 1FG484 | \$19 \$40 | | | 12,084 | 12,084 27,696 | 625 693 | 22 34 | 6 | 4 23 | | 21 31 | 256 256 | | | | 549 815 | 11.1 | 0.412 0.611 | 4.45 9.56 | | AES-256, rand num gen, SEI immune |
| F/A | + | M2GL025 M2GL050 | 1FG484I | \$40 \$52 | | | 27,696 56.340 | 56,340 | 1.073 | 72 | 6 | 8 37 | | | 256 | | | | 783 | 8.6 5.5 | 1.355 | 18.9 | | 64KB ECC SRAM SPI, 2 DMA |
| F/A | + | M2GL060 | 1FCS325I | \$52 | | | 56,520 | 56,520 | 1,073 | 72 | 6 | 4 38 | | | 256 | | | | 785 | 5.6 | 1.355 | 18.9 | | confg for fabric only |
| Act | al le | Fusion (flash) | 130nm | | | .5 - 3.3 | | 00,020 | | | - | | acanalog | | | flach | | | 700 | 11.9 | | 10.5 | 70.0 | comg for fabric only |
| F | M | A2F060 | TQG144 | \$20 | | | 1,536 | 614 | 31 1 | 1 | 1 | 1 10 | | | 64KBF/ | | | | | 12.8 | 0.037 | | | 100Mhz Cortex M3 |
| F | | AFS090 | FQNG108 | \$30 | | | 2,304 | 922 | 31 | 1 | | 5 9 | | | | | 5.00 | 461 | | 11.6 | 0.037 | | | |
| F | М | A2F200 | PQG208 | \$30 | | | 4,608 | 1,843 | 61 1 | 2 | | 16 | 1 24 | 8 | 256KBF | -/64KBR | | | | 20.1 | 0.037 | | | 100Mhz Cortex M3 |
| F | | AFS250 | FQNG180 | \$60 | | | 6,144 | 2,458 | 41 1 | 1 | | 6 13 | | | | | 3.95 | 1555 | | 16.8 | 0.037 | | | |
| F | | A2F500 | FGG256 | \$47 | | | 11,520 | 4,608 | 97 1 | 3 | _ | 20 | | | | -/64KBR | | | | 8.5 | 0.111 | | | 100Mhz Cortex M3 |
| F | | AFS600 | FFG256 | \$90 | | | 13,824 | 5,530 | 61 <mark>1+</mark> | 1 | | 10 21 | | | 2 | | | | | 8.8 | 0.111 | | | |
| F | | AFS1500 | FFG256 | \$270 | | | 38,400 | 15,360 | 57 1+ | 1 | | 10 31 | | | 4 | | | | | 5.3 | 0.276 | | | |
| Acto | el | SmartFusion2 | 65nm | | | .2 - 3.3 | | 4LUTs | 601 AR | | | | | | KB flasi | h | | | 696 | 10.3 | | typ | | 166Mhz Cortex M3, 4LUTs, SERDES, I |
| F/A F/A | + | M2S005 M2S010 | TQ144 TQ144 | \$11 \$22 | | | 6,060 12,084 | 6,060 12,084 | 539 1 554 1 | 11 22 | 2 | 0 20 | | 10 21 | 128 256 | | | | 551 549 | 20.9 | 0.197 0.412 | 2.37 4.45 | | 10/100/1000 ethernet, PCIe, 333Mhz D |
| F/A | | M2S025 | VFG400 | \$49 | | | 27,696 | 27,696 | 561 1 | 34 | 6 | 16 26 | | | 256 | | | | 815 | 8.6 | 0.412 | 9.56 | | AES-256, rand num gen, SEI immune uP ECC 64KB SRAM |
| F/A | + | M2S050 | VFG400 | \$90 | | | 56,340 | 56,340 | 628 1 | 72 | | 32 37 | | | 256 | | | | 783 | 5.5 | 1.355 | 18.9 | | 2 UART, 2 SPI, 2 I2C, 1 CAN, 1 USB, 2 |
| F/A | | M2S060 | 1FCS325I | \$78 | | | 56.520 | 56.520 | 725 | 72 | | 4 38 | | | 256 | | | | 785 | 5.6 | 1.355 | | | one or two DDR controllers |
| | ress | PSoC 3 | | * | | | MC | logic cell | 180 | | Ť | + - | - | | RAM | uP flash | | | | | | | | 051. ALUs |
| F | 1 | CY8C32xx | QFN48 | \$6 | 7 | | 96 | 192 | 31 1 | | Υ | - 6 | 2 | | 2KB | 16KB | | | | | | 1 | | , |
| F | | CY8C38xx | TQFP100 | \$21 | 16 | 72 | 192 | 384 | 18 1 | | Υ | - 6 | 2 | | 16KB | 64KB | | | | | | USB, 0 | CAN, F | FIR/IIR |
| Сур | ress | PSoC 4 | | | | 1.8-5 | MC | logic cell | ARI | M Corte | x M0 | | | uF | P RAM | uP flash | | | | | | 16-48N | ИНZ С | ortex M0, FIR/IIR, ALUs, 8X12-bit ATD |
| F | | CY8C40xx | QFN40 | \$1.00 | | | | | 1 | | Υ | 3 | | | 2KB | 16KB | | | | | | | | IR, 16MHz |
| F | | CY8C41xx | QFN40 | \$1.76 | | | | | 1 | | Υ | | | | 32KB | 256KB | | | | | | | | N, SPI, UART, no FIR/IIR, 24MHz |
| F | | CY8C42xx | QFN40 | \$2.52 | | | 64 | 128 | 51 1 | | Υ | 9 | | | 32KB | 256KB | | | | | | | | N, SPI, UART |
| F | | CY8C4xx7_BLE | QFN56 | \$4.62 | 3.65 | | 32 | 64 | 14 1 | | Υ | 3 | 6 | | 32KB | 256KB | | | | | | 4 | | N, SPI, UART, BlueToothLE |
| Сур | ress | PSoC 5LP | 051100 | | | 1.8-5 | | logic cell | M3 | | | | | ul | | uP flash | | | | | | | | ortex M3, FIR/IIR, LCDio, USB, 12-bit AT |
| F | | CY8C526x CY8C546x | QFN68 QFN68 | \$4.86 \$8.49 | | | 192 192 | 384 384 | 79 1 45 1 | | Y Y | 6 | | | 64KB | 256KB 256KB | | | | | | | | N, SPI, UART, no FIR/IIR |
| - | | CY8C566x.586x | QFN68 | \$11 | 16 | | 192 | 384 | 35 1 | | Y | - 6 | | | 64KB | 256KB | | | | | | | | N, SPI, UART N. SPI, UART |
| F | | CY8C588x | QFN68 | \$17 | | | 192 | 384 | 22 1 | | Y | 1 6 | | | 64KB | 256KB | | | | | | | | N, SPI, UART, CAN, 20-bit ATD, 0.1% vr |
| Cvn | ross | PSoC 6 | Qi 1100 | Ψ17 | 10 | 1.7-3.3 | | logic cell | | & M0 | • | + | | 116 | RAM | | | | | | | 4 | | x M4, 100MHz Cortex M0, FIR/IIR, LCDic |
| F | . 555 | CY8C60xx | + | | | 1.7 3.0 | 96 | 192 | 1 | | Υ | | | | 128KB | 512KB | | | | | | | |), no USB |
| F | | CY8C61xx | | | 3.70 | 78 | 96 | 192 | 1 | | Ÿ | 10 | 4 | | 288KB | 1MB | | | | | | | | ortex M0, USB |
| F | | CY8C62xx | | | 5.00 | _ | 96 | 192 | 2 | | Y | 10 | | | 288KB | 1MB | Ì | | | | i | Crypto | | |
| F | | CY8C63xx | | | 5.00 | 78 | 96 | 192 | 2 | | Υ | 7 | 8 | | 512KB | 2MB | | | | | | | | USB, TRNG, QSPI, I2S |
| Qui | cklogi | EOS-S3 | | | 1.8, 1 | .8 - 3.3 | wide tile | | M4 | 32x32 | 1 | 2bitA2D | | 512x18 | uP RAN | И | 1K+ | | | 4.5 | | 1 | | 512K RAM, SPI. I2S, I2C, A2D, DMA |
| Ш | | EOS3FLF512 | WRN42 | \$5.63 | 2.50 | 27 | 1,200 | 2.40 | 426 1 | 2 | | 2 3 | 6 | 8 | 512KB | | 3.24 | 741 | | 4.5 | 73,728 | J | | DSP engine: 5KB prog ram, 16KB data |