

Programmable logic users enjoy a wealth of choices when selecting CPLD and FPGA devices from Xilinx. A quick guide to the broadest line of product offerings in the industry follows.

Type of Logic Functions

All Xilinx devices are general-purpose in nature. Any family can implement any type of logic. There are, however, some features that make certain families more applicable than others for certain logic functions. These eight items should be interpreted as ‘soft’ suggestions, not as absolute, unequivocal choices.

- *For shortest pin-to-pin delays and fastest flip-flops:* Use XC7300, XC9500 or, if fan-in is sufficient, XC3100A, XC4000E/EX
- *For fastest state machines:* For encoded state machines, use XC7300, XC9500. For “one-hot” state machines, use XC3100A, XC4000E/EX, XC5200, XC8100
- *For fast counters/adders/subtractors/accumulators/comparators:* Use XC4000E/EX, XC5200 or XC7300. Use XC3100A for very fast, but short or simple counters.
- *For I/O -intensive applications with a high ratio of I/O to gates:* Use XC5200
- *For shortest design compilation time:* Use XC7300, XC9500, or XC8100
- *For lowest cost per gate, when on-chip RAM is not required:* Use XC5200, XC3100A
- *For pin-out compatibility within and between families, allowing easy migration to different device sizes in the same package (sometimes even between families), thus maintaining an existing pc-board layout:* Use XC4000E/EX, XC5200, XC8100, XC9500
- *For Digital Signal Processing (multiply-accumulate) applications:* Use XC4000E/EX

Specific Functions and Characteristics

Specific features/characteristics available only in the listed families. These are “hard” selection criteria.

1. *For on-chip RAM:* Use XC4000E, XC4000EX, or XC6200.
2. *For on-chip bidirectional bussing:* Use XC3000A, XC4000, XC5200, XC7300, XC9500, XC8100 (i.e. use any Xilinx family except XC2000). XC3000, XC4000 and XC5000 FPGA families have horizontal long lines that can be driven by internal 3-state drivers; XC8100 FPGAs use internal 3-state drivers on arbitrarily defined interconnects; XC7300 and XC9500 CPLD devices implement busses indirectly using their Universal Interconnect Matrix™.
3. *For on-chip crystal oscillator circuitry:* Use XC3000A, XC3100A.
4. *For very fast or partial reconfiguration, and for a dedicated microprocessor interface:* Use XC6200.
5. *For non-volatile single-chip solutions:* Use XC7300, XC9500, XC8100 or any HardWire™ device.
6. *For lowest possible static power consumption at 5 V:* Use XC3000A, XC8100 and, to a lesser extent, XC5200, XC4000E, XC4000EX.
7. *For JTAG boundary scan test support:* Use XC4000E, XC4000EX, XC5200, XC8100, XC9500 .
8. *For rail-to-rail output voltage swing at 5 V V_{CC} :* Use XC3000A, XC3100A, XC4000E, XC4000EX, XC5200, XC6200, XC8100 (in XC4000E/EX, rail-to-rail is a user-option).
9. *For 3.3-V operation:* Use XC3000L, XC4000L, XC4000XL, XC8100.
10. *For 5-V operation interfacing with 3.3 V devices:* Use XC7300, XC9500 or XC4000E/EX. (Any XC4000E/EX ‘totem-pole’ output drives 3.3 V inputs safely, and the TTL-like input threshold can be driven from 3.3 V logic.)
11. *For in-system programmability:* Use all Xilinx families except XC7300 and XC8100.
12. *For PCI-compatibility:* Use XC4000E/EX, XC3100A, XC3100L, XC7300, XC9500
13. *For hi-rel, military or mil temperature-range applications:* Use XC3100A, XC4003, XC4005, XC4010, XC4013.
14. *For battery-operated applications requiring low stand-by current:* Use XC3000A, XC4000E/EX, XC8100.
15. *For best protection against illegal copying of a design (design security):* Use XC8100, XC7300, XC9500 with security bit activated. *For powerdown battery-backed-up configuration:* Use XC3000A, XC3000L.

Selecting a Xilinx Product Family