ALTERA

Cyclone III low-cost FPGAs

Unlimited possibilities

Your design ideas have the potential to prosper.
But, in the end, they are only as good as your
ability to execute. Cyclone® III FPGAs deliver the
value you need for cost-sensitive applications—
the ability to produce more, sooner, and for less.
With Cyclone III FPGAs, your potential for great
design is unlimited. Watch your great ideas take
root and grow.

Unlimited possibilities

Altera® Cyclone III low-cost FPGAs deliver an unprecedented combination of low power, high functionality, and low cost. Manufactured using the Taiwan Semiconductor Manufacturing Company's (TSMC's) 65-nm low-power (LP) process technology, these devices consume very low power, often for a lower total cost than ASICs. Cyclone III FPGAs are part of our complete design solutions portfolio, ideal for your cost-sensitive, high-volume applications.

With Cyclone III FPGAs, your great ideas will quickly turn into revenue. Your possibilities are unlimited.

Cyclone III ™

We deliver what you need— every time

industry's first
low-cost
65-nm FPGA

We know you're pressed to go to market in a hurry with premium quality, cutting-edge products. We're also aware that the days of deep pockets are over. At Altera, you drive our product definition. We listen to you carefully to uncover your design and business challenges, making you the inspiration for our next-generation products. And we'll keep on listening—from product definition through design to delivery. We defined, designed, and are delivering Cyclone III FPGAs with the ideal features for your needs—nothing more, nothing less.

After product definition, Altera uses a very rigorous product design process, working hand in hand with our foundry partner TSMC. We validate functionality with dozens of test chips to ensure quality and on-time delivery so you can design with confidence.
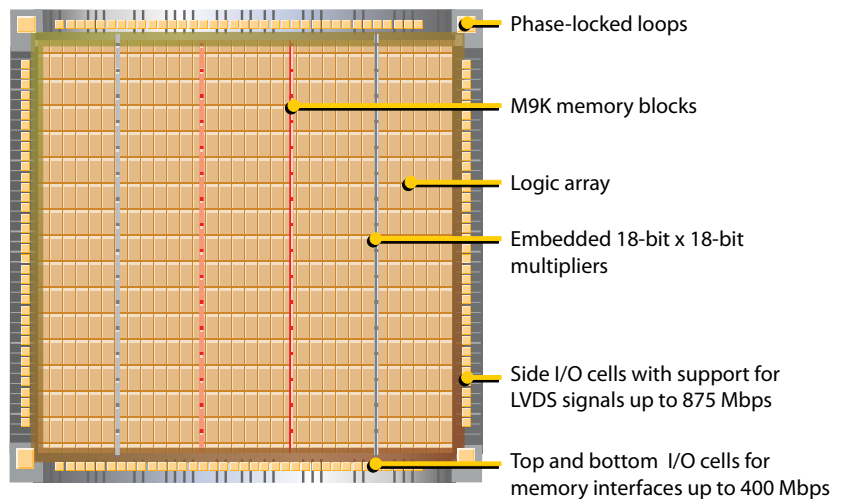
The FPGA advantage gets you to market first

You're in a race and anything you can do to be more efficient is going to positively impact your bottom line. FPGAs give you the flexibility you need because they are reprogrammable. Even after your product is in the market, you can make updates on the fly and adapt to market changes fast. You can use Cyclone III FPGAs as the heart of your system. If you already have an ASIC in your system, you can use Cyclone III FPGAs to coprocess and enhance your current product with added features. Or, you can offload functionality from the ASIC onto the Cyclone III FPGA. You can use our devices for typical ASSP functions and not be locked into keeping that functionality in the future. The real benefit: shorter development time and low cost. You'll cut your time from a year or more to just weeks. You can continuously introduce feature enhancements and respond to customer needs or competitor threats. The risk is next to none.

Features and benefits

You can turn ideas into revenue faster than ever because we deliver numerous features and benefits that help you lower your system and development costs. Flexibility enables you to keep up with fast-evolving standards easily. Scalable digital signal processing (DSP) performance and embedded memory let you increase or enhance feature sets. All of this with the lowest power consumption of any FPGA available today. To top it off, we're the lowest-cost FPGA solution around. Choose Altera to win.

Cyclone III floorplan

- Phase-locked loops
- M9K memory blocks
- Logic array
- Embedded 18-bit x 18-bit multipliers
- Side I/O cells with support for LVDS signals up to 875 Mbps
- Top and bottom I/O cells for memory interfaces up to 400 Mbps

Lowest-power 65-nm FPGAs

- Manufactured using a low-power 65-nm process technology.
- Core static power as low as 35 mW at 25°C junction temperature.
- Support for hot-socketing operation so unused I/O banks can be turned off when there's no current.
- Low-power benefits include: system thermal management, elimination or reduction in cooling system costs, and extended battery life for portable applications.

Cost optimized for the best value anywhere

- Staggered I/O ring to reduce die size and board space.
- Selection of low-cost packages.
- Support for low-cost serial flash and commodity parallel flash configuration devices.
- Cyclone series FPGAs are built from the ground up for low cost.

Complete system integration

- 1.7 times the density to 120,000 logic elements (LEs) and over 3.5 times the embedded memory to 4 Mbits over Cyclone II FPGAs.
- 260-MHz multiplier performance with the highest multiplier-to-logic ratio in the industry.
- Robust clock management and synthesis with dynamically reconfigurable and flexible phase-locked loops (PLLs).
- Improved signal integrity with adjustable I/O slew rates.
- Support for high-speed external memory interfaces including DDR, DDR2, SDR SDRAM, and QDRII SRAM with an autocalibrating PHY for fast timing closure.
- Support for I/O standards including LVTTL, LVCMOS, SSTL, High-Speed Transceiver Logic (HSTL), PCI Express, LVPECL, LVDS, mini-LVDS, reduced swing differential signaling (RSDS), and point-to-point differential signaling (PPDS).

Forging ahead in new applications

Due to their unprecedented combination of low power, high functionality, and low cost, you can use Cyclone III FPGAs in an ever-expanding list of high-volume applications—many of which were previously exclusive to ASICs and ASSPs. These are just a few of the many application areas where we can help you prosper.

Video and image processing

Game, set, match point. You'll catch all the action clearly in both standard-definition and high-definition transmissions. Our devices are a perfect fit for DSP, video system I/O, video compression encoding and decoding, and other video and image processing tasks. Drive these cost-sensitive applications and others with the parallel processing capability of DSP-rich and memory-rich Cyclone III FPGAs. The ball keeps moving faster. With us, you'll stay a step ahead.

Displays

Picture perfect. That's what you want to achieve, whether it's liquid crystal displays, plasma display panels, plasma low-profile, or liquid crystal on silicon. Of course, you have to reach your goals faster and cheaper than the competition. And there's a lot of competition to beat. We help you create a single platform that can be used for multiple product lines and image resolutions. You'll be able to deliver the latest feature set in no time. Get to volume first using display-optimized features to seamlessly integrate designs, rapidly update products, and lower costs in your system so you're crystal clear.

Wireless

Connecting on the go shapes our world. People keep moving farther, faster, in no time, and so does the wireless technology that makes it all possible. In areas such as digital intermediate frequency (IF) and baseband modems, you can achieve high-bandwidth parallel processing. Lower your cost and power consumption with Cyclone III DSP-rich and memory-rich FPGAs. Make the world a better connected place.

Get started now. Download your free Quartus II Web Edition software to design with Cyclone III FPGAs today.

The complete answer for your design challenges

Your creative energy can bring about the next blockbuster product. Altera's suite of complete, easy-to-use, free tools and support assure you of a smooth and successful design process. We give you a complete answer for your design challenges. With Altera, you can focus your creative energy on the leading edge— exactly where you belong.

Maximize productivity with Quartus II design software

Quartus® II software is the industry leader in performance and productivity for low-power, low-cost FPGA designs. Automatic system-level integration and industry-leading compile times will help you close timing faster. You will also benefit from our automated power analysis and optimization features. Quartus II software makes designing easy and fast, so you can move more of your designs to production sooner.

Intellectual property

Altera and its partners provide off-the-shelf intellectual property (IP) cores. You can use these pre-optimized cores easily, reducing design and test time.

Nios II embedded processor

Get the performance you need with the right feature set and keep costs down. With the versatility of our Nios® II soft-core embedded processor, you can build an exact-fit processor, customized for your application in minutes. A Nios II processor implemented in a Cyclone III FPGA allows you to choose the exact set of CPUs, peripherals, and interfaces that you need ,and to remotely upgrade in the field. You can address changing requirements to stay competitive. You can also increase performance without changing your board design—accelerating only functions that need it and combining many functions onto one chip. With the Nios II embedded processor, you'll lower overall cost, design complexity, and power consumption. Assemble an exact-fit processor system every time with the world's most versatile processor.

Low-cost development kits and free reference designs

The Cyclone III FPGA Starter Kit is available today to get your next design up and running in hardware as quickly as possible. Whether your're designing for communications, embedded systems hardware or software, or vertical market areas such as video and image processing, display, wireless, or another high-volume, cost-sensitive application, Altera and partner development kits give you everything you need to create and implement your design right out of the box.

Device features that deliver functionality.

Cyclone III device overview

Device	LEs	M9K Memory Blocks	Total Memory (Mbits)	Multipliers	PLLs	Total Global Clocks	Maximum User I/O Pins
EP3C5	5,136	46	0.4	23	2	10	182
EP3C10	10,320	46	0.4	23	2	10	182
EP3C16	15,408	56	0.5	56	4	20	346
EP3C25	24,624	66	0.6	66	4	20	215
EP3C40	39,600	126	1.1	126	4	20	535
EP3C55	55,856	260	2.3	156	4	20	377
EP3C80	81,264	305	2.7	244	4	20	428
EP3C120	119,088	432	3.9	288	4	20	531

A selection of low-cost packages and user I/O pin counts.

Cyclone III package overview[1]

Device	E144	Q240	F256	F324	F484	F780	U256	U484
EP3C5	94		182				182	
EP3C10	94		182				182	
EP3C16	84	160	168		346		168	346
EP3C25	82	148	156	215			156	
EP3C40		128		195	331	535		331
EP3C55					327	377		217
EP3C80					295	429		295
EP3C120					283	531		

[1] For more information on packages, see *Cyclone FPGA Series Package and I/O Matrix* at **www.altera.com/selectorguides.**

Now's the time to prosper.

Go ahead and catapult your great design ideas into
unstoppable growth—your possibilities are unlimited.

Turn ideas into revenue.

www.altera.com/cyclone3

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