altera
An Intel Company

Power & Cost-optimized Devices

Most comprehensive portfolio of power and cost-optimized FPGAs and SoCs with advanced no-cost tools.

Targeting Cost-Sensitive Applications

Low Static Power for Battery-Operated Devices

Minimal Power Supplies Reduces TCO

High Integration Reduces Overall BOM & Board Real Estate

Small Packages Ease PCB Design

Supporting High I/O counts & Multiple Standards & Voltages for Easy Design Integration

ML & AI-Ready Using Highly Efficient Models with Quantization-Aware Training

Altera Power and Cost-optimized Device Families

Altera's Power and Cost-Optimized portfolio is designed to balance performance, power efficiency, form factor, simplicity, and cost for FPGA designs. Our MAX®, Cyclone®, and Agilex™ 3 FPGA families deliver exceptional value across a wide range of applications, including edge-focused artificial intelligence/machine learning (AI/ML). These devices are optimized for cost, low power consumption, and high integration, ensuring you have the flexibility and performance you need. With our advanced no-cost Quartus® Prime design tools, Altera FPGAs and SoCs are equipped to meet your design challenges.

Tailored Solutions for Every Need

Cyclone 10 LP: Altera's most power-friendly and medium logic density solution, the Cyclone 10 LP family is optimized for applications requiring abundant logic elements and I/Os at an affordable price and small form factor.

MAX 10: Offering a compact, single-supply solution, the MAX 10 family provides unmatched ease of use and versatility, making it ideal for adaptable, all-in-one designs.

Cyclone V: A value-packed device, Cyclone V offers high performance with an advanced fabric and several variants tailored for applications with a high mix of features, including an embedded Hard Processor Subsystem (HPS) and transceivers.

Agilex 3: The newest addition to our power and cost-optimized portfolio, Agilex 3 delivers high value in a small form factor, setting a new standard for performance and efficiency, and featuring our latest DSP/AI enhancements.

Whatever your needs, Altera has a device that fits your budget, power targets, and board size requirements. Discover how our power-efficient, cost-effective, and high-performance FPGAs can enhance your designs.

Reasons to Choose Altera® Power and Cost-optimized FPGAs

Device Variety	**No Cost, Easy to Use, & Reliable Software**
IP Library, Ready to Use Solutions, & Examples	**Longevity, Quality**
Broad Ecosystem	**Complete Portfolio**

Agilex 3 — Advanced high performance in the cost-optimized space
- 25k–135k Logic Elements (LE): 345 MHz AI-infused fabric, advanced security
- Dual Arm A55 core, 12.5G XCVR, LPDDR4, PCIe 3.0, 10GbE, MIPI

Upgraded Performance Brings high performance to the power and cost-optimized space with Altera's industry-leading HyperFlex Gen 2 technology as well as 12.5G XCVR I/Os	**Built for AI and ML** With an FPGA logic fabric infused with AI tensor blocks, the devices provide new levels of AI and DSP capabilities
Embedded Dual Processors Dual A55 arm with advanced caching and a comprehensive set of hardened peripherals	**Enhanced Security** State-of-the-art security module with encryption, authentication, and tamper protection

Altera's newest addition to our power and cost-optimized portfolio, delivering high value in a small form factor.

Cyclone V — Cost-optimized performance family with a broad mix of features
- 25k–300k LE: 6 densities in 10 different packages
- Dual Arm A9, 6G XCVR, DDR3, PCIe 2.0

High Functionality and Value Higher bandwidth, performance, and resource efficiency using an ALM (an 8-input-based LUT) architecture	**Abundant and Versatile I/Os** High count of I/Os that support a variety of voltage levels and requirements making it easy to connect to other interfaces
Embedded Dual Cortex A9 ARM Processors Increased system performance for cost-sensitive applications	**Hardened IPs** Increased performance, ease of design, reduced logic, lower TCO and power via hardened IP blocks including transceivers, DDR3 Memory controller, and PCIe 2.0 endpoint/root port x4
Variable Precision DSP Blocks DSP and AI with optimized performance and resource usage	

These value-packed devices with high performance offer an advanced fabric, and several variants tuned for applications with a high mix of features, including HPS and Transceivers.

MAX 10
- Small, highly integrated, instant-on, single-chip solution
- 2k–50k LE: Dual image configuration, user flash, ADC, DDR3
- Single power supply capability

Instant-On, Embedded Dual Image Flash + Extra User Flash
Integrated flash for self-configuring instant-on, with dual image support, to simplify the board design and save board space. Alternatively, use the extra flash to store infrequent data logging or processor program code

Single Supply Option
In addition to saving the expense and board area of extra regulators, the single-supply voltage operation makes this ideal for supervisory functions that need to be functional first before all the other system voltage rails have been enabled

Integrated Dual Analog to Digital Converter
Up to two built-in analog-to-digital converters, with multichannel selection, are great for monitoring power supplies or analog sensors

Package Options
MAX® 10 FPGAs have a wide array of packages from tiny 3 x 3 mm² chip-scale packages to BGAs with 500 I/Os, and you can still get devices in Quad-Flat Pack (QFP) if you prefer a package with pins

MAX® 10 FPGAs offer a compact, single-supply solution with unmatched ease of use and versatility, making them ideal for adaptable, all-in-one designs.

Cyclone 10 LP: More cost-efficient with a high ratio of I/O to logic
- 6k–120k LE: Cost-optimized packaging with up to 525 I/Os
- Low-power process, only two power supplies

Most Cost Efficient
Low cost per I/O and LE with a wide range of device densities

Dual Power Supply Operation
Only two core voltage rails are required which reduces board cost and real estate

Small Form Factor Packages
Eases board design and reduces total cost of ownership

Very Low Power
Manufactured using a power-optimized fab process tuned for low static power and suitable for power-sensitive applications

Faster Arithmetic Functions with Embedded Multipliers
Hardened 18x18-bit multipliers increase performance and affordability for DSP and AI functions while reducing power and logic requirements

Altera's most power-friendly solution is optimized for applications that require an abundance of logic elements and I/Os at affordable prices and small form factors.
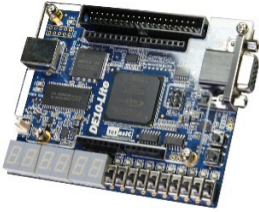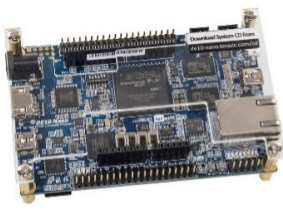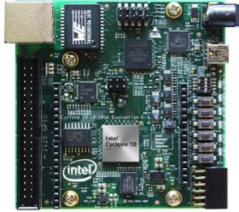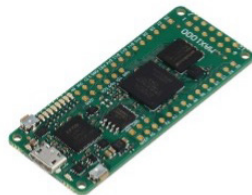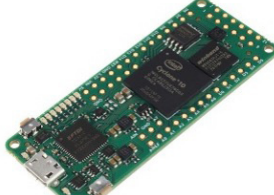
	MAX® 10	Cyclone® 10 LP	Cyclone® V	Agilex™ 3
FPGA Fabric	LUT-4	LUT-4	ALM	ALM + HyperFlex
Logic Elements	2K-50K	6K – 120K	25K – 300K	25K – 135K
Block RAM Size	9K	9K	10K	20K
Block RAM	108 – 1,638 Kb	270 – 3,888 Kb	1,760 – 12,200 Kb	1.27Mb – 6.89 Mb
General Purpose I/Os (Max.)	500	525	560	344
DSP/AI	18x18 Mult	18x18 Mult	Variable Precision	Variable Precision + Tensor Mode
Processors	Nios® V	Nios® V	Dual Cortex A9*	Dual Cortex A55*
Transceiver Speed	LVDS	LVDS	6.144 Gbps	12.5 Gbps
PCIe	-	-	2.0	3.0
Smallest Package	3 x 3 mm²	8 x 8 mm²	13 x 13 mm²	12 x 12 mm²
Required Voltages	1	2	2	4
User Flash	96Kb-5,888Kb	-	-	-
ADCs	2	-	-	-
Hitless RSU Updates	Yes	-	-	-

* Nios® V soft processors are available on these devices.

Abundance of Proven Kits, Boards, & SOMs for Immediate Purchase From Altera and Over 50 Board Partners

Whatever your functionality and requirements, there is likely a board that will be a match.

- Effortless development, Production-ready H/W, immediate deployment
- Faster time-to-market
- Versatile product design & application fit
- Minimize component supplier management

MAX® 10	Cyclone® V	Cyclone® 10	Agilex™ 3
MAX DE10-Lite	Cyclone DE10-Nano	Cyclone 10 LP	Atum A3 Nano
MAX1000	CY5000	CYC1000	AXC3000

Contact Altera For A Complete List Of Boards Available

Learn More

- MAX® 10 FPGAs: Product Page | Device Overview & Technical Documents | Kits | Partner Boards
- Cyclone® 10 LP FPGAs: Product Page | Device Overview & Technical Documents | Kit | Partner Board
- Cyclone® V FPGAs and SoCs: Product Page | Device Overview & Technical Documents | Kits | Partner Boards
- Agilex™ 3 FPGAs and SoCs: Product Page | Device Overview & Technical Documents | Kit | Partner Boards
- Contact an Altera sales representative

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