

Flexible FPGAs for military communications designs

Enabling your core-to-edge applications for net-centric warfare

Soldier and command center communications requires underlying technology that is reliable, flexible, performance-driven, resource-dense, secure, and optimized for size, weight, and power (SWaP).

Altera's FPGAs are ideal for military communications solutions that bridge the application space from battlefield to the network core. For your most power-sensitive applications, choose our Cyclone® III FPGAs. For low-power serial-izer/deserializer (SERDES) applications that need to meet SWaP requirements, look to our Arria® II GX FPGAs. Our latest Stratix® IV FPGA family provides the highest performance with transceivers, up to 11.3 Gbps, while still keeping power low through Programmable Power Technology.

Supporting military net-centric warfare applications

- Lowest power for tactical, ad-hoc, and on-the-move mobile users
- Ease of use to ensure interoperability between current and future systems
- Anti-tamper features enabling secure and high-assurance communications
- Extensive resources for high levels of design integration and advanced waveforms

Devices covering the core to edge

Altera® FPGAs provide the ability to handle high data rate processing, which benefits the backbone of a battlespace network and the tactical basestation. Applications on the core can take advantage of Altera's FPGA power/performance balance. The reprogrammability of FPGAs support the multiple waveforms that each system on the edge will use to communicate with the core network.

The core: For high-bandwidth military designs such as secure communication networks and intelligence applications, develop with our 40-nm Stratix IV FPGAs, the market's lowest power high-density, high-performance FPGAs. With 11.3-Gbps transceivers, Stratix IV GT FPGAs are ideal for high-bandwidth serial interface applications. The devices are architected with advanced design security features including a 256-bit advanced encryption standard (AES) algorithm (FIPS-197 certified).

The edge: For low-power military communications applications such as handheld radios and cryptographic modules, design with Cyclone III FPGAs, which meet SWaP criteria through high functionality and integration capabilities. The Cyclone architecture, rich in logic, memory, and digital signal processing (DSP) capabilities, will equip you to enhance system integration in your designs.

If you need to interface to specific SERDES protocols or to meet specific bandwidth requirements, Arria II GX FPGAs can connect custom logic to mainstream protocols including PCI Express, Serial RapidIO®, and Gigabit Ethernet at a very low total cost of ownership and low power.

For a productive design environment, Quartus II software provides:

- 3X faster compile times, with an additional 70 percent compile time reduction through incremental compilation
- Team-based design
- Accurate power consumption estimation
- Reduced power consumption and development costs through PowerPlay power analysis tools



Complete soldier radio waveform and mobile user objective waveform in less than 250 milliwatts and 529 mm².

Altera FPGAs: key performance advantages

Core network services (CNS)	Top-level design requirements	Altera devices
Inline network encryptors Network gateways Black core IP routing Fixed and on-the-move (OTM) C2 stations	<ul style="list-style-type: none"> Abundant DSP resources for multi-channel processing High density for concurrent multi-waveform processing High-speed serial communications Balance of power/performance Industrial or military-grade temperature High-speed memory interfaces for high-bandwidth packet processing and routing 	Stratix series FPGAs <ul style="list-style-type: none"> Up to 748 GMACS of DSP performance Up to 680K LEs Up to 11.3-Gbps transceivers Support for key protocols including PCIe, Ethernet, Serial RapidIO, GPON, CPRI, OBSAI, HyperTransport™ 3.0, SERDES Frammer Interface Level 5, Interlaken 1,067-Mbps external DDR3 Up to 22.4 Mbits of embedded memory Dedicated cyclical redundancy check (CRC) ensures data integrity <hr/> Arria II GX FPGAs <ul style="list-style-type: none"> Lowest power 3.75-Gbps transceiver device 16K to 260K LEs Up to 16 high-speed serial interfaces Support for SDR, DDR, DDR2, and DDR3 memory interfaces Support for PCI Express, XAUI, Serial RapidIO, Gigabit Ethernet, Fibre Channel, SDI, SerialLite II, CPRI, and OBSAI
Edge-of-the-network applications	Top-level design requirements	Altera devices
Multichannel radios Inline media encryptors Handhelds Small form fit Manpacks Sensors Munitions	<ul style="list-style-type: none"> Abundant DSP resources for next-generation waveform processing Abundant memory resources for LUT-based functions and buffering Small package sizes for reduced footprint Lowest static power Industrial-grade temperature for remote placement Anti-tamper and high-assurance support 	Cyclone series FPGAs <ul style="list-style-type: none"> Up to 200K LEs Up to 8.2 Mbits of embedded memory 0.5-mm MBGA packages, bare die, and MCM support Low cost, no obsolescence risk Less than 0.25-Watt typical static power Dedicated CRC ensuring data integrity 256-bit AES encryption key Security features for anti-tamper

Enabling the warfighter to leverage the Global Information Grid (GIG)

With our commitment to delivering COTS custom logic solutions to the military and aerospace markets, you can be assured that the devices you select will address your unique concerns. We offer:

- Military-grade temperature support (-55° C to 125° C) for select Stratix series FPGAs as well as HardCopy series ASICs
- Design security with volatile and non-volatile embedded encryption keys
- Security features for anti-tamper for select Cyclone series FPGAs
- Ability to operate in rugged environments
- Extended life cycle to reduce your obsolescence risk
- Raw-die procurement for applications requiring multi-chip module (MCM) integration, for SWaP savings
- ITAR technical support
- Leaded packaging

Want to dig deeper?

For more information about Altera FPGAs for military communications designs, contact your local FAE or sales representative, or visit www.altera.com/military.

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