Designing military DSP applications

Radar, electronic warfare, secure communications, electro-optics, intelligence—an array of military applications can benefit from the digital signal processing (DSP) capabilities of programmable logic. Electronic sensors at the core of these systems continue to evolve, requiring more DSP functionality and integration.
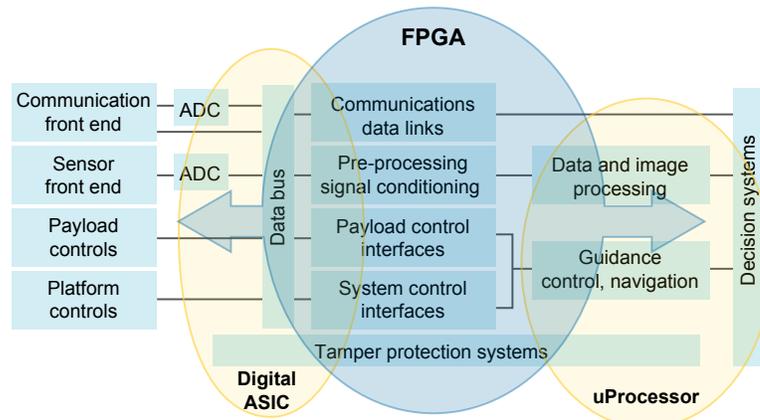
40-nm Stratix® IV FPGAs:
- More than 700-GMAC/s DSP performance
- 200 sustained GFLOPs for matrix multiplication

To enable your systems to perform operations in parallel on data streams, while also meeting power, weight, space, complexity, and cost challenges, design with Altera® programmable logic devices. Our devices meet a variety of price/performance requirements.

By doing the job of tens or even hundreds of stand-alone DSP processors, a single FPGA can substantially lower bill of material (BOM) costs as well as power consumption. We also offer a variety of intellectual property (IP) "building blocks" that can further accelerate your design cycle.

FPGA role expanding in military DSP applications

Military sensor solutions

Focus	Offering	Description
Silicon	• Stratix IV GX FPGAs • Arria® II GX FPGAs • HardCopy® IV ASICs • Cyclone® series FPGAs	Altera has a spectrum of devices capable of performing critical military DSP functions
Tools and IP	• DSP Builder Advanced Blockset • Extensive floating-point library • Floating-point optimization • Video and image processing IP • Embedded processing	End-to-end tool flow supports demanding military DSP requirements
Customer relationships	• Altera DSP technology investment focus • Altera military DSP support position	Altera has investment strategy for military DSP customers
Partnerships	• The MathWorks • Mentor Graphics® • Xtreme Data • SRC • Bittware	Altera is engaged with partners for system solution development

Technology for the long haul

As part of our enhanced commercial off-the-shelf (E-COTS) initiative, we deliver devices that meet your requirements for anti-tampering, end-of-life protection, military temperatures, rugged operating environments, single event upset (SEU) mitigation, and more.

We integrate customer feedback into next-generation products. We also have a long-term roadmap that you can map to your design proposals.

Design tools and resources

Altera offers the industry's most comprehensive portfolio of tools for implementing a high-performance DSP design in our FPGAs:

- DSP Builder—a MATLAB/Simulink-based system-level design tool in Quartus® II design software with utilities that automatically manage FPGA synthesis, compilation, programming, and debugging
- New DSP Builder Advanced Blockset—a timing-driven Simulink synthesis utility that automates a multi-channel design flow and performs datapath time division multiplexing
- SOPC Builder—a Quartus II software tool that lets you build and evaluate systems at the block level quickly and easily
- Floating-point library cores (single precision and double precision)—IEEE 754-compliant cores for functions including matrix multiplication, logarithm, exponential, inverse, and inverse SQRT calculations

- Video and Image Processing Suite MegaCore® functions— building blocks for functions including gamma correction, frame buffer, deinterlacer, scaler, chroma resampler, and alpha blending mixer
- Embedded processor portfolio, including a DO-254-compliant version of the Nios® II soft-core processor, the ARM Cortex-M1 processor, and the Freescale V1 ColdFire processor

Customer support

Working with Altera, you'll have a customer support plan carried out by dedicated DSP technology and military specialists who can help with:

- Proposal generation
- Algorithm development
- Hardware/software development
- Test and integration
- Service and sustainment

Ready to get started?

To evaluate our device DSP capabilities, purchase a Stratix IV GX FPGA Development Kit (part number DK-DEV-4SGX230N-C2) at **www.altera.com/devkits**.

Want to dig deeper?

For more information about how Altera's military DSP solutions can help you with your designs, contact your local Altera sales representative or FAE, or visit **www.altera.com/military**.

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