Leading the way in DSP price, power, and performance

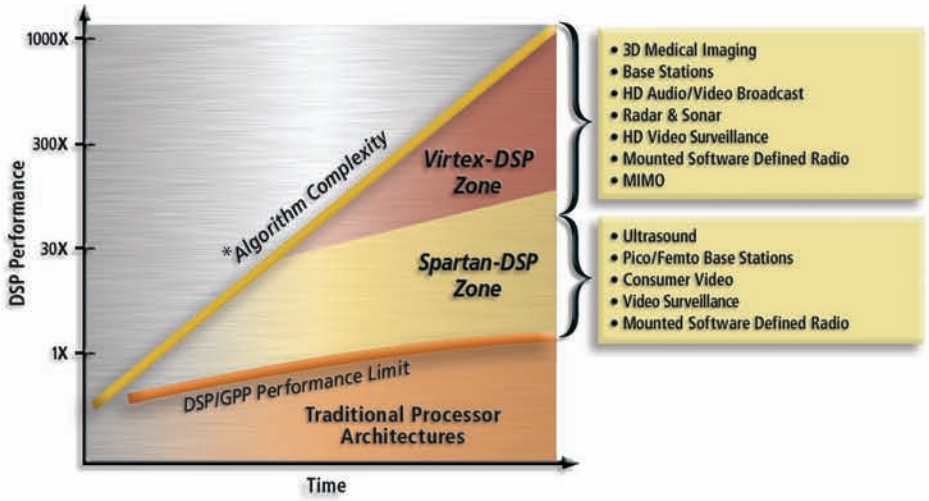
XtremeDSP™

XILINX®

A Breakthrough in DSP Price &

Addressing the performance gap at every price point

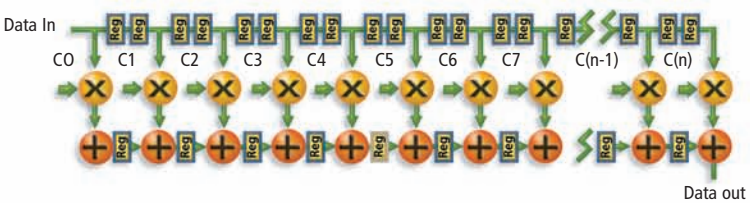
With the addition of the new Spartan-DSP series, the XtremeDSP Portfolio delivers 20 GMACS for under $30. The Portfolio fills the performance gap created by the growth in algorithmic complexity and limitations of traditional sequential processors in signal processing applications.



* Algorithm Complexity: As demand for processing power is rapidly increasing, sequential processing cannot support the algorithmic complexities within the required response times; to overcome these architectural limitations, parallel processing offered by XtremeDSP devices is essential

The industry-proven highest performance DSP

- Over 350 billion multiply-accumulate operations per second (GMACS)
- Parallelism with distributed memory enables sample rate to equal the clock rate—up to 550 Mega Samples per Second in the Virtex™-5 SXT devices and 250 Mega Samples per Second in the Spartan™-3A DSP devices (slow speed grade)
- High internal memory bandwidth—1.5 to 19.3 Gbps (not including distributed memory)
- Abundant on-chip memory—1.8 to 10.3 Mbits



Exploit the parallelism of FPGA logic/memory resources and array of XtremeDSP slices

"Today, FPGAs play an increasing role in a wide range of DSP applications. We expect this trend to continue over the next several years."

BDTi

Excerpted from "FPGAs for DSP, 2nd Edition"
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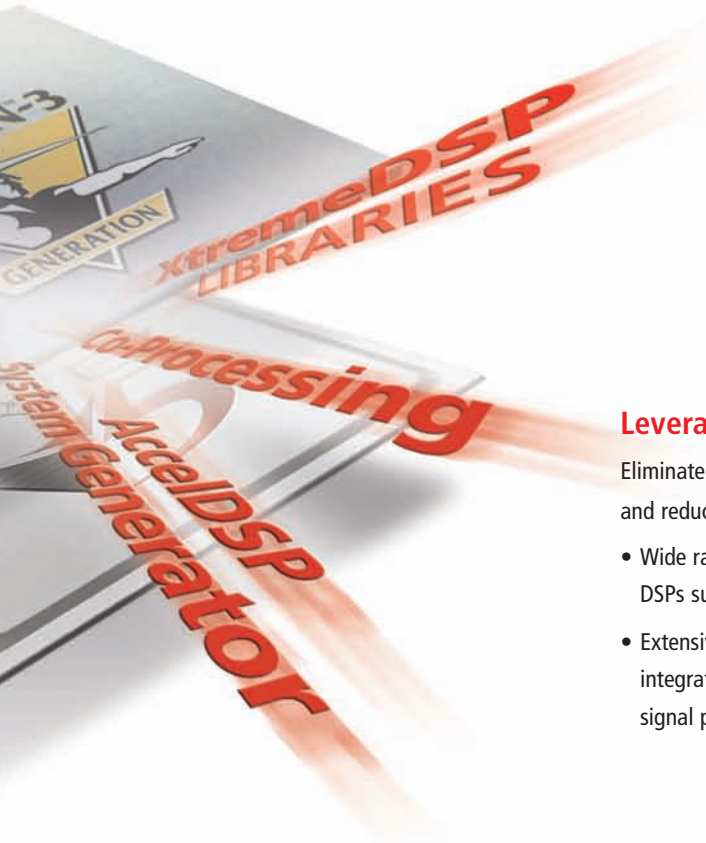
See *www.BDTI.com* for more details

Performance



Jump start your design

- Rapidly develop DSP functions that meet your specific requirements with tools such as FFT and FIR compilers
- Focus on your system-level design by leveraging field-proven library elements including H.264, Viterbi, Reed Solomon, CFR and more
- Implement your designs rapidly through a market-specific reference design with integrated IP and software

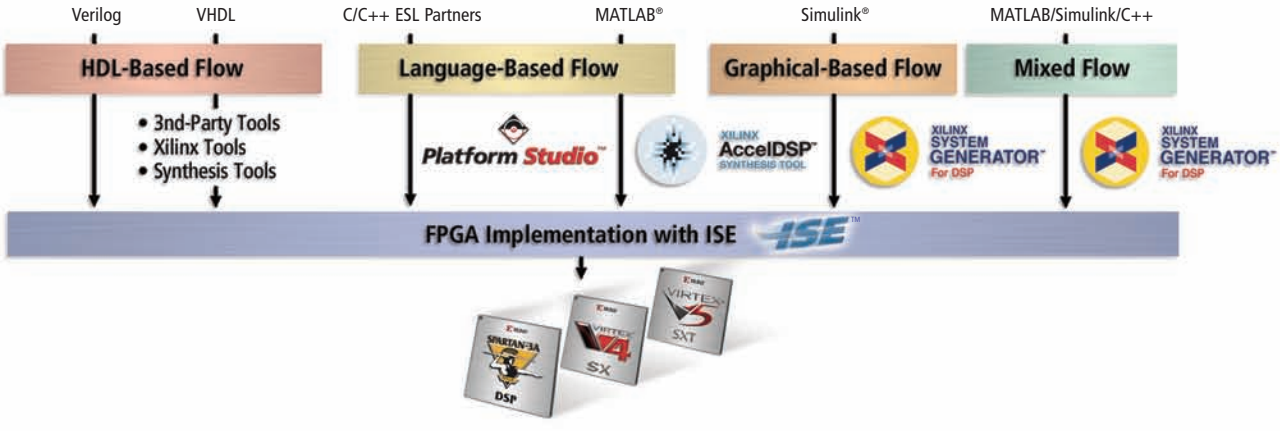
Leverage XtremeDSP as your co-processing engine

Eliminate your DSP performance bottlenecks. Offload your complex algorithms to XtremeDSP, and reduce your implementation risk:

- Wide range of interfaces to industry-standard DSPs such as EMIF, SRIO, PCI Express
- Extensive software tool chain support, and integration for industry-standard digital signal processors

Your Choice of Design Methodology

- Design tools that accommodate user preferences—system architect, DSP engineer, hardware/FPGA engineer
- Quick implementation of leading-edge algorithms and standards



Application Examples

Examples	Application Challenges	XtremeDSP Advantage
Security and surveillance	• DSP performance needed for object recognition, motion detection and advanced compression algorithms • Changing industry standards • Rapidly evolving technology such as automated scene analysis	• Xtreme DSP performance through DSP48 slices and parallelism • FPGA flexibility and scalability • Field upgradability—**Enabled by Spartan-DSP**
Software defined radio for mobile defense communicators	• Ability to process wideband waveforms • Multiple waveforms & partial reconfig	• Ability to process wideband waveforms through parallelism of DSP48 slices • On demand re-configurability for different protocols • Lower power due to a single device handling multiple waveforms—**Enabled by Spartan-DSP**
Wireless access	• Implementation of forward error correction block and unique algorithm • Lower MAC layer implementation	• Proven IP Cores for the Physical Layer, FEC, and Security—**Enabled by Spartan-DSP**
Wireless base station digital front end	• Lower power on per channel basis • Scalability to add more channels in the future	• Lowest cost per channel through integration • Savings in operational expenses due to lower power consumption • Ability to use low-cost power amplifiers with Crest Factor Reduction IP—**Enabled by Virtex-DSP**

XtremeDSP Device Portfolio

	Spartan-DSP		Virtex-DSP					
	Spartan-3A DSP		Virtex-4 SX			Virtex-5 SXT		
	3SD1800A	3SD3400A	4VSX25	4VSX35	4VSX55	5VSX35T	5VSX50T	5VSX95T
DSP Performance (GMACS)	21[1]	32[1]	64[2]	96[2]	256[2]	106[2]	158[2]	352[2]
Max Block RAM Memory Bandwidth (Gbps)	1,512[1]	2,268[1]	4,608[2]	6,912[2]	11,520[2]	6,653[2]	10,454[2]	19,325[2]
Max DSP Frequency (MHz)	250[1]	250[1]	500[2]	500[2]	500[2]	550[2]	550[2]	550[2]
XtremeDSP DSP48* Slices	84	126	128	192	512	192	288	640
Min Footprint (mm)	19x19	19x19	27x27	27x27	27x27	27x27	27x27	27x27
Distributed RAM (Kb)	260	373	160	240	384	520	780	1,520
Block RAM (Kb)	1,512	2,268	2,304	3,456	5,760	3,024	4,752	8,784
Logic Cells	37,440	53,712	23,040	34,560	55,296	34,816	52,224	94,208
High Speed Connectivity	227 x 622+ Mb/s LVDS pairs	213 x 622+ Mb/s LVDS pairs	120 x 1+ Gb/s LVDS pairs	224 x 1+ Gb/s LVDS pairs	360 x 1+ Gb/s LVDS pairs	180 x 1.25 Gb/s LVDS pairs, 8 x 3.2 Gb/s Transceivers	240 x 1.25 Gb/s LVDS pairs, 12 x 3.2 Gb/s Transceivers	320 x 1.25 Gb/s LVDS pairs 16 x 3.2 Gb/s Transceivers

[1] In Slow Speed Grade
[2] In Fast Speed Grade
* DSP48A, DSP48E, DSP48

TAKE THE NEXT STEP

Visit us online at ***www.xilinx.com/dsp*** to learn more and download your FREE evaluation copy of XtremeDSP software.

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Printed in U.S.A. PN 2024