intrinsity™
the Faster processor company SM

PRODUCT BRIEF

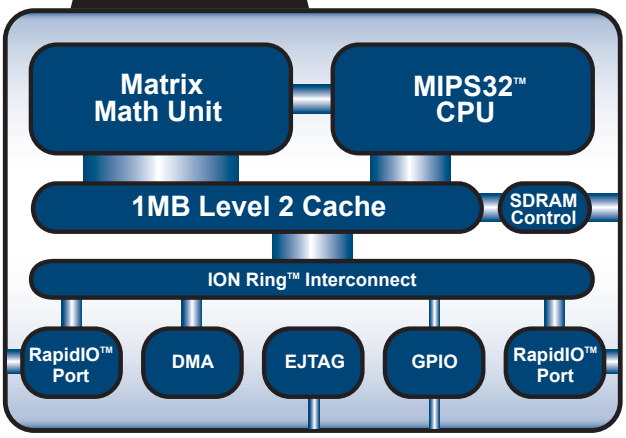
2 GHz FastMATH™ and 1 GHz FastMATH-LP™

Adaptive Signal Processor™ Products

KEY BENEFITS

- Unprecedented matrix and vector math performance enables implementation of time-critical signal processing algorithms in software
- Time-to-market improved since the complex and time-consuming task of designing and debugging custom hardware-based algorithm solutions is eliminated
- Programmable system architecture enables easy upgrades to comply with emerging standards
- Software-based system solutions give OEMs the opportunity to provide differentiating features
- MIPS® instruction set with broad tools and system software support

BLOCK DIAGRAM



FEATURES

The first Adaptive Signal Processor™ products, integrating a native matrix/vector math unit, a high-performance RISC CPU, and high-bandwidth I/O architected to solve today's real-time, math-intensive, and adaptive signal processing problems.

2 GHz FastMATH processor (13.5W typ) for maximum performance
1 GHz FastMATH-LP processor (5.5W typ) for maximum performance per watt

Matrix and Vector Math Processing Unit
- Single-instruction, multiple-data (SIMD) architecture
- 4 x 4 array of 32-bit processing elements each with local register file
- Fixed-point matrix, vector, and scalar data types
- Single-cycle full matrix load from L2 cache (zero-cycle latency, two-cycle throughput)
- 64 GOPS (peak) at 2 GHz
- 551,000 radix-4 1024-point 16-bit FFTs/sec at 2 GHz
- 32 GMACs/sec at 2 GHz

On-chip MIPS32™ CPU
- Dual-issue core (scalar CPU + matrix math unit)
- Dual 16 Kbyte L1 caches
- Zero load-to-use penalty
- MMU with 16 dual-entry fully associative TLB

DDR Memory Controller
- Directly supports up to 1 GB of SDRAM with a 64-bit wide bus
- Speeds up to DDR-400 with ECC protection

Large L2 Cache
- 1 Mbyte on-chip L2 cache
- 4-way set-associative architecture
- Parity protection
- Configurable as cache or SRAM in 256 Kbyte increments with no speed penalty

Dual RapidIO™ Ports
- Fully compliant with the industry standard RapidIO specification
- 8-bit at 500 MHz clock rate
- Aggregate throughput 4 Gbytes/s
- Memory mapped and messaging protocols
- Leverages an expanding infrastructure of RapidIO support devices

General Purpose I/O & Memory Interface
- Glueless interface to boot ROM, flash, SRAM, fast peripherals, ASICs, and FPGAs
- 8-bit or 32-bit wide bus operates up to 66 MHz
- Supports multiplexed or non-multiplexed operation

DMA Unit
- Sophisticated two-channel DMA
- Memory-resident descriptor-based
- Features for multiprocessor interlocking and global shared memory operation
- Multiple transfer styles supported, including striding

EJTAG Debug Interface
- Industry standard rev 2.6 support

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TARGET APPLICATIONS

Wireless Infrastructure
- Cellular basestations
- Coverage and capacity enhancing applications such as multi-user detection (MUD) and smart antenna systems
- Point-to-point & point-to-multipoint fixed wireless

Imaging
- Medical (ultrasound, CT, MRI, x-ray, nuclear)
- Machine vision
- Radar/sonar
- Satellite imaging
- High-end hard-copy imaging

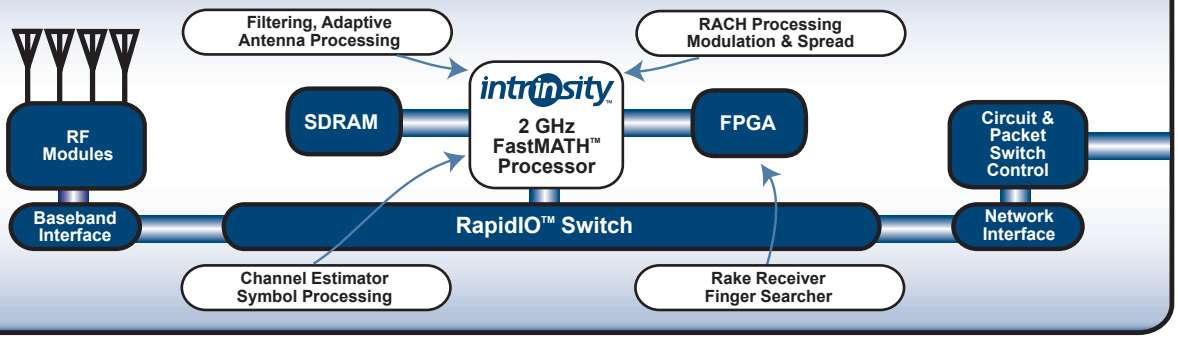
Military Signal Processing

THE FastMATH ADVANTAGE

- ASIC/FPGA performance with the flexibility and time-to-market advantages of an embedded processor
- The FastMATH-LP device offers the highest performance per watt of any infrastruture-class embedded processor
- Large on-chip caches are ideal for high-speed access to large data sets such as matrixes
- Dual 8-bit RapidIO Port interfaces offer high bandwidth with low pin-count, facilitating easy system integration and flexible multiprocessor system configurations
- DMA reduces CPU burden by providing sophisticated queuing, striding, and alternate master synchronization

SYSTEM LEVEL EXAMPLE

WCDMA Basestation 64-User Modem Card with Smart Antenna Processing



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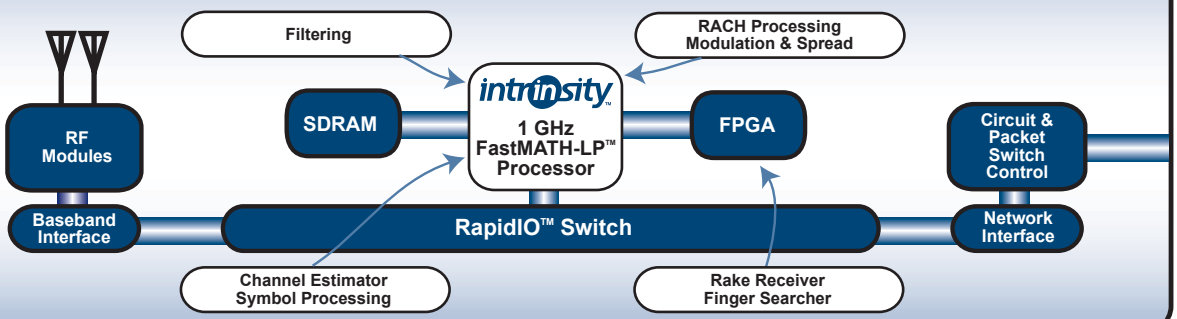

For more information please contact us at:
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AVAILABILITY

- FastMATH samples (2 GHz and 1.5 GHz) available today FastMATH-LP (1 GHz) samples available Q4/03
- Simulator, SDK, and evaluation platform with tools, firmware,and drivers available today
- Additional details and specifications available upon request

Visit our web site at: www.intrinsity.com

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