

## Features

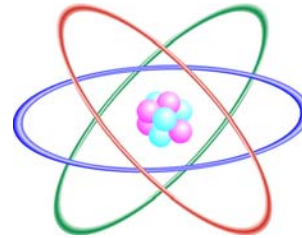
- FFTs and IFFTs up to 64K-points
- Fixed and variable transform lengths available
- **New!** Radix-2/3/4 Length Option
- Optional fixed and user defined windows
- User definable input and output precision
- User defined scaling

## Benefits

- Rapid delivery via verified firm macro
- Synthesized to your target library and performance requirements
- Fully verified functionality and timing
- Compiled RTL simulation model included
- High density, low power

## Applications

- OFDM modems
- Digital excision filtering
- Antenna beamsteering
- Instrumentation
- Real-time signal analysis



## **Atomic FFT Family** **Fixed and Variable Length FFT/IFFT**

**The Athena Group delivers the same small, power efficient fast Fourier transform (FFT) cores used in our application level solutions, ready to use for your SoC application.** Performing FFTs using fixed-function accelerators is required for many of today's advanced communications and signal processing SoCs. Athena's family of Atomic FFT blocks enable your application to realize the power, performance, and area advantages of Athena's patent pending arithmetic technology in your FFT intensive application.

Athena's Atomic FFT family includes both variable length and fixed length transforms. Besides  $2^N$  transform lengths, the new FFT-V43K offers  $3 \times 2^N$  lengths. All Atomic FFT cores can perform both forward and inverse transforms and have flexible scaling. Data windowing options include fixed windows and run-time programmable window buffers. Windowing, data precision, and maximum transform size for variable length transforms may be specified at time-of-order. Athena also offers double buffering for higher throughput applications. For the highest throughput applications see Athena's Atomic Fusion FFT family product brief. Athena's Atomic FFT family is summarized in Table 1.

**Table 1: Atomic FFT Product Family**

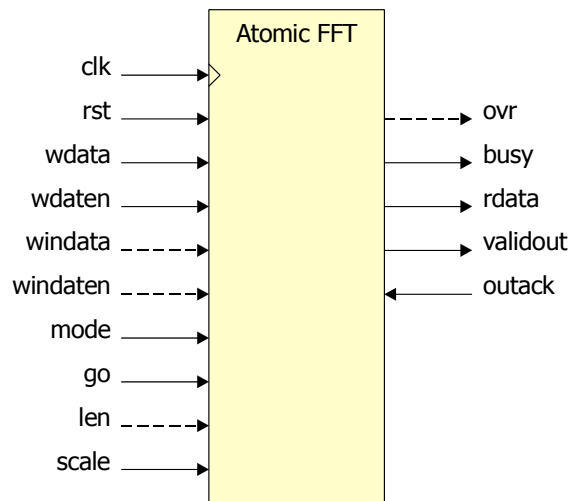
| Model                   | Length                    | Comments                              |
|-------------------------|---------------------------|---------------------------------------|
| FFT-V43K<br><b>New!</b> | 16,32,48,64,...,3K,4K     | Variable length, radix-2/3/4          |
| FFT-V4K                 | 16,32,64,...,4K           | Variable length                       |
| FFT-V4KD                | 16,32,64,...,4K           | Variable Length, Double buffering     |
| FFT-V64K                | 16,32,64,...,64K          | Long transform, Variable length       |
| FFT-F512                | 16, 32, 64, 128, 256, 512 | Fixed length defined at time of order |

**Table 1: Atomic FFT Product Family**

| Model     | Length                    | Comments  |
|-----------|---------------------------|---|
| FFT-F512D | 16, 32, 64, 128, 256, 512 | Fixed length defined at time of order, Double buffering |

**Product Description**

Athena’s Atomic FFT functions use a flow-through architecture with dedicated unidirectional write and read ports. Atomic FFT functions may be easily integrated with other processor blocks to form a system-level solution, or may be added to your microprocessor-based design as a function specific accelerator.



**Figure 1: Atomic FFT Block Interface**

Each Atomic DSP core package is delivered as a firm core optimized to any customer-specified library. The package includes the core, verification suites, timing and simulation models, and documentation.

Athena’s IP cores are designed for efficient implementation and rapid delivery. The company's proprietary, wholly automated implementation and verification methodology produces synchronous, testable IP cores of the highest quality. All Athena IP cores achieve a score of 95% or better on the OpenMore scale of IP reusability.

**About The Athena Group, Inc.**

Based in Gainesville, Florida, Athena innovates breakthrough technologies that achieve the optimum balance of power, performance, and silicon area in a wide range of applications such as wireless, satellite, and secure communications. Athena provides patented semiconductor intellectual property (IP) solutions, with products ranging from the market-leading TeraFire® security cores, to Atomic DSP™ cores, and Atomic SDR™ software defined radio cores.

Athena was founded in 1986 and is privately held.



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