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## **RF Engines' Mixed Radix cores, adaptable for next generation 3GPP LTE base station applications**

### *World leader in Mixed Radix FFTs*

**Newport, UK – 2 April 2007** - The next generation of mobile phone technology, 3GPP LTE (3G Partnership Programme Long Term Evolution) uses OFDM as the modulation technique and requires variable length FFTs to construct the sub-carrier signals on the fly as required. Most FFTs are readily available as lengths that are based on 'power-of-two' (i.e. producing lengths of 2, 4, 8... 64, 128, 256... etc), which by the nature of their design, severely limit the transform combinations that can be achieved. In order to achieve the precise lengths of FFT required for OFDM based systems, mixed radix FFTs need to be available. These are achieved by using combinations of prime length Discrete Fourier Transforms (i.e. radices of 2, 3, 5, 7, 11, 13 etc). In this way, FFTs of any conceivable length can be 'built'. By way of example, an FFT requiring 720 points can be most efficiently derived through 'combining' 4 sets of '2', 2 sets of '3' and 1 set of '5'.

However, the building of a highly efficient design requires a lot more than the simple combination of these different length DFTs. The efficiency is achieved through a variety of techniques including complex resource-sharing, twiddle-less DFT combination, efficient twiddle factor generation and efficient complex data re-ordering between radices.

RF Engines Limited (RFEL), the supplier of high performance FPGA-based solutions, is a world leader in the creation of mixed radix cores and have implemented numerous designs for applications in communications and defence systems.

John Summers, RFEL's CEO, explained, "Mixed Radix FFT designs are very difficult particularly where a highly efficient design is required. We've been specialising in FFT technologies for a number of years now and have highly efficient mixed radix solutions available that already have been successfully tested by some of the world's leading basestation manufacturers."

The exact specifications for 3GPP LTE have yet to be ratified, but it's been clear for sometime that mixed radix FFTs will form a fundamental element of the design, and so putting RFEL in a leadership position of being able to provide solutions immediately from its portfolio of licensable IP.

### **RF Engines**

RF Engines Limited (RFEL) is a UK-based electronic systems designer, providing high specification signal processing solutions for FPGAs, as well as receiver and complete product solutions for the homeland security, defence, communications and instrumentation markets. Applications include communications base stations, satellite communications systems, test and measurement instrumentation, and bespoke wideband receivers/transceivers.

**Further Information**

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