



**A PROCESSOR AND METHOD FOR PERFORMING A FAST FOURIER
TRANSFORM AND/OR AN INVERSE FAST FOURIER TRANSFORM OF A
COMPLEX INPUT SIGNAL**

ABSTRACT

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A processor for performing a Fast Fourier Transform and/or an Inverse Fast
Fourier Transform of a complex input signal comprises a first stage for passing
the input signal to a second stage when a Fast Fourier Transform procedure is
to be performed and for swapping the real and imaginary components of the
10 complex input signal before passing the signal to the second stage if an Inverse
Fast Fourier Transform procedure is to be performed. The second stage has
first and second radix-4 butterfly elements. A third stage is arranged to switch
between first and second operating modes, the second operating mode being
for processing a complex conjugate symmetrical input signal. A fourth stage
15 has a plurality of processing units, one or more of the processing units
comprising a radix-2 pipelined Fast Fourier Transform processor. The first and
second radix-4 butterfly elements are arranged to perform a butterfly operation
on the complex input signal to generate and deliver one or more components of
a processed signal to the fourth stage. The fourth stage is arranged to process
20 the processed signal received from the first stage according to a Fast Fourier
Transform processing procedure to produce an output signal. There is also
disclosed a method for performing a Fast Fourier Transform and/or Inverse Fast
Fourier Transform of a complex input signal.

25 **Figure for publication – Figure 1a**

