

A 400-MHz Processor for the Efficient Conversion
of Rectangular to Polar Coordinates
for Digital Communications Applications

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A 400-MHz digital rectangular-to-polar coordinate converter has been implemented in 0.25- μm CMOS. The inputs to the chip are 14-bit in-phase and quadrature channels, and the outputs are 15-bit magnitude and phase channels. The phase and magnitude calculations have a maximum error of 0.00024 and 0.03, respectively. At a maximum frequency of 406 MHz, the circuit dissipates 470 mW of power at 2.5 V.