



Reference Design Datasheet

## Description

QR Decomposition reference design is a complete linear equations system solution solver. The input of the design is a system matrix A [NxM] and input vector. The system matrix A is decomposed to Q and R matrices using the Gram-Schmidt method, and the solution of the system is calculated by completing backward substitution.

The reference design is fully parameterizable over system dimensions N and M, as well as the processing vector size which defines the parallelization ratio of the dot product engine. This design implements parallel dot product engine using single-precision multiply-add blocks that perform most of the floating-point calculations. The design allows very efficient scheduling of decomposition subroutines, to maximize the IP throughput.

## **Features**

- Linear Equation System Solver
- Highly parameterizable and scalable QRD IP
- Floating point hardware demonstration
- Designed with Simulink®/Advanced DSP Builder

## **Applications**

- Radar and Sonar STAP Algorithm
- Scientific Computing
- Adaptive Filtering

For more information and benchmarking:

www.altera.com/literature/wp/wp-01187-bdti-altera-fp-dsp-design-flow.pdf www.altera.com/literature/wp/wp-01192-bdti-altera-fp-dsp-energy-efficiency.pdf

For additional information, please contact us at mil@altera.com or contact your local Altera sales representative.

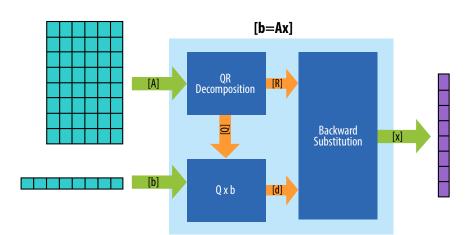


Figure 1: QR Decomposition Reference Design Block Diagram



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