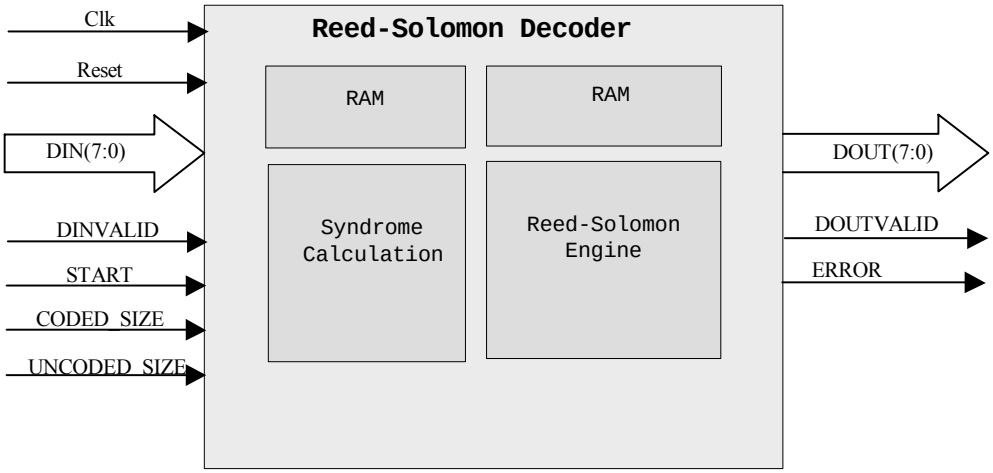
Product Brief

Reed-Solomon Decoder

WiMax 802.16 Reed-Solomon Decoder



IP Core Name

R3RSD-WIMAX
Reed-Solomon Decoder optimized for WiMax 802.16 applications

Features

- Reed-Solomon decoder targeted for 802.16 WiMax Fixed Wireless
- Silicon proven
- Optimized for N=255, K=239 & T=8
- Supports high-speed (>800 Mbps) operation at 100 MHz
- Support for shortened codes
- Low latency design
- Outputs number of corrected errors
- Synchronous single phase design
- Convenient external interface
- Area efficient design as decoder is optimized for 802.16d

Deliverables

- Synthesizable RTL source code in VHDL or Verilog
- Comprehensive verification test bench and vectors
- Integration documentation

Overview

The Reed-Solomon decoder is targeted towards 802.16 which requires codeword length N =255 and message length K = 239. The decoder can correct up to T = 8 symbol errors.

Programmable support for code shortening is provided through input ports (CODED_SIZE, UNCODED_SIZE) which are used to specify the coded and uncoded block sizes.

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The core has extremely low latency and is highly pipelined allowing it to operate at high clock speeds i.e >100 MHz.

The design is targeted for use in ASICs and FPGAs.

Performance

The Reed-Solomon core easily exceeds the maximum specified throughput of 72 Mbps for 802.16.

Maximum clock speed depends on the application process but typically is at least 200MHz for a 0.18 micron ASIC process.

ASIC implementation (0.18 TSMC process)		
IP Core Name	**Clock Speed**	**Gates (2-input NAND Eq.)**
R3RSD-WIMAX	100 MHz	30k gates – includes memory

FPGA Implementation			
Clock Speed	**Device**	**Slices**	**Block RAM's**
80 MHz	XC2V500-6	2350	2

Other Products

RAD3 has a library of IP targeted towards 802.11a,g, 802.16 and other standards. This includes OFDM Modems, Viterbi decoders, N-point FFT's, FIR filters and AES encryption cores. Please see RAD3's product section for further details.

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