

■ Introduction

This is a tool for auto-generation of Reed-Solomon encoder / decoder, which is widely used in the error correction of various storage and communication systems. Using this tool, RTL for our IP (Si2520) can be generated.

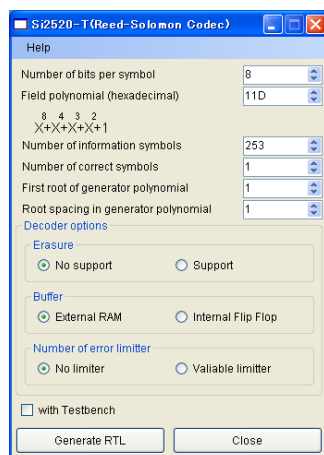
With Si2520-T, one can flexibly generate various RTLs by different Reed-Solomon parameters, switch on/off erasure correction, external RAM and limitation of number of correctable symbols. This will strongly facilitate such works as optimization of Reed-Solomon parameters for customers.

■ Features

- RTL generation corresponding to our IP (Si2520)
- High-speed encoding / decoding
- Support shortened codes
- Number of bits per symbol (m) : 3 to 12 bits
- Number of symbols in a codeword (n) : 3 to 2^m-1 symbols
- Number of information symbols (k) : 1 to 2^m-3 symbols
- Number of correctable symbols (t) : 1 to $2^{m-1}-1$ symbols
- Primitive polynomial configurable
- Generator polynomial configurable $g(x) = \prod_{i=0}^{2t-1} (x + \alpha^{s+i})$
- Support erasure correction
- No external RAM option
- Available limitation of number of correctable symbols
- Support continuous encoding / decoding due to pipeline (except the case of $n < 4t+2$)
- Fully synchronous design using a single clock
- ASIC friendly design
- Generate test bench and test pattern
- Output format : Verilog-RTL source code

■ Operating System Supported

- Microsoft Windows XP / Vista / 7



Verilog-RTL
Source Code

Test Bench

Test Pattern

■ Interface

- Encoder

	Name	Description
Input	ICLK	Clock
	IXRST	Asynchronous reset
	IDATA[m-1:0]	Information symbol
	IDEN	Information symbol enable
Output	ORDY	Ready to input inform. symbol
	ODATA[m-1:0]	Code symbol
	ODEN	Code symbol enable

- Decoder

	Name	Description
Input	ICLK	Clock
	IXRST	Asynchronous reset
	IDATA[m-1:0]	Code symbol
	IDEN	Code symbol enable
	IERS	Erasure position (*1)
	ILMT[h-1:0]	Correctable symbol limitation (*3)
	IRAMRD[m-1:0]	External RAM read data (*2)
Output	ORDY	Ready to input code symbol
	ODATA[m-1:0]	Decoded symbol
	ODEN	Decoded symbol enable
	OFAIL	Decoding fail flag
	OERRNUM[h-1:0]	Number of corrected symbols
	OEND	Decoding end flag
	ORAMWA[a-1:0]	External RAM write address (*2)
	ORAMWE	External RAM write enable (*2)
	ORAMWD[m-1:0]	External RAM write data (*2)
	ORAMRA[a-1:0]	External RAM read address (*2)
ORAMRE	External RAM read enable (*2)	

*1 : Only when erasure correction is used

*2 : Only when external RAM is used

*3 : Only when correctable symbol limitation is used

■ Applications

- Communications (support various standards with RS code)
- Hard disk drive, Optical disc drive, Solid state drive

The content might change without a previous notice due to the improvement.

Please contact us for further works such as IP customization and peripheral circuit design.

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