Engineering

SUNPLUS

Sequence Detector

Design

Preliminary

2015.03.20

Version 1.0

0.1 Target

Implement the sequence detector design that can detect four consistency data according to the configuration mode and output the flag.

- Support increment mode that can detect four consistency increment data
- Support decrement mode that can detect four consistency decrement data
- Support steadiness mode that can detect four consistency same data

0.2 Specification

- File Name: SEQ_DETECTOR.v
- Module Name: SEQ_DETECTOR
- I/O Port

Port Name	Width	Attribute	Description
RST_B	1	I	**System Reset** Low active, when this pin is asserted, all flip-flops must be reset to their default value
SYSCLK	1	I	**System Clock** Free running clock, all registers must be synchronrous with SYSCLK
IN_VALID	1	I	**Input Valid** High active,the input signal MODE and DATA_IN will only be valid when IN_VALID == 1. When IN_VALID ==0, the input MODE and DATA_IN should be ignored, and the state should be the same with when IN_VALID ==1
MODE	2	I	**Detect Mode** This signal determins the detecting mode – 00: Increment detecting mode, which four consistency increasement data like 1, 2, 3, 4 or 15, 0, 1, 2 can set OUT_VALID to logic 1 – 01: Decrement detecting mode, which four consistency decrement data like 5, 4, 3, 2, or 0, 15, 14, 13, can set OUT_VALID to logic 1 – 10: Steadiness detecting mode, which four consistency same data like 0, 0, 0, 0 can set OUT_VALID to logic 1 – 11: Same to IN_VALID == 0
DATA_IN	4	I	**Input Data** It will only be valid when IN_VALID == 1 and MODE != 2'b11

OUT_VALID	1	O	**Output Valid** High active, it will be asserted when 4 consistency data has been received according to the detecting mode
DATA_OUT	4	O	**Output Data** When OUT_VALID is asserted, DATA_OUT should equal to DATA_IN, otherwise it should equal to 0

0.3 Requirement

- Synchronous with posedge clock
- Asynchronous Reset
- Use Melay FSM
- Match HE Coding Style
- No error with HE vcheck

0.4 Waveform

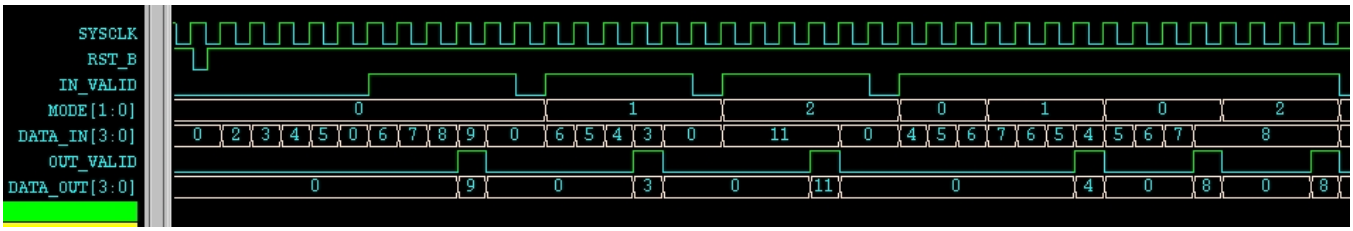

Figure 0.4.1: Waveform a

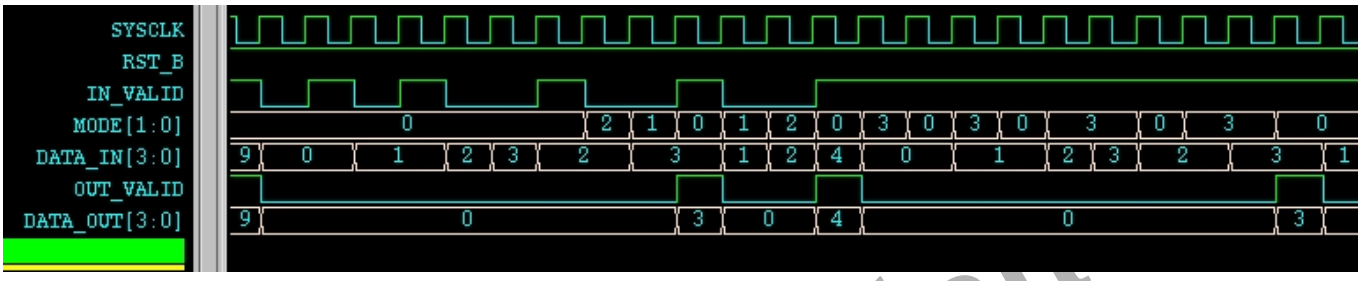

Figure 0.4.2: Waveform b