Test Signal Generator

VLSI-Design Module - Presentation

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Overview

- General Description
- Serial Communication
- Test Components
  - PWM Generator
  - Noise Generator
  - Pattern Generator

General Description

Features

- Serially configurable
- Single pulse with variable duty cycle and frequency (PWM)
- Digital noise based on pseudo random binary sequences of different length
- Configurable data sequences at selectable speed (pattern generator)
- Internal/External triggering of generators
- External Time Base for selectable base frequency

General Description

Component

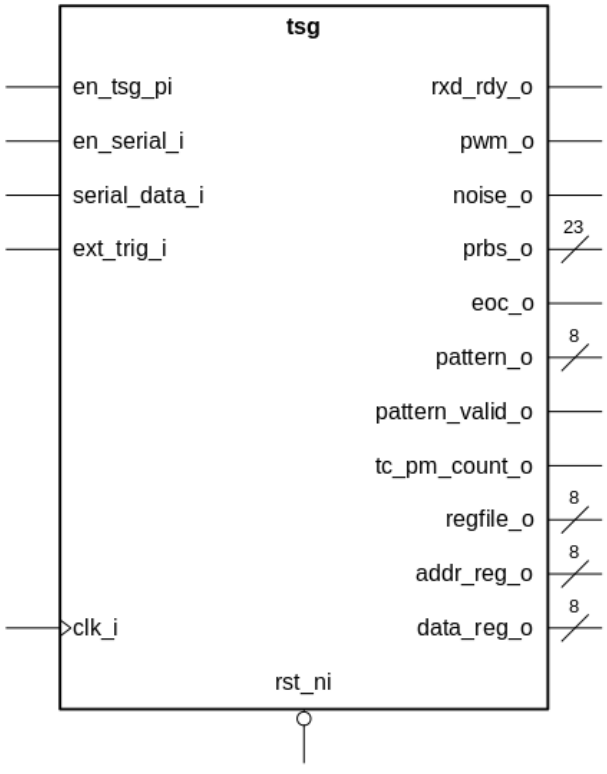

Figure 1: TSG Component

General Description

Component Breakup

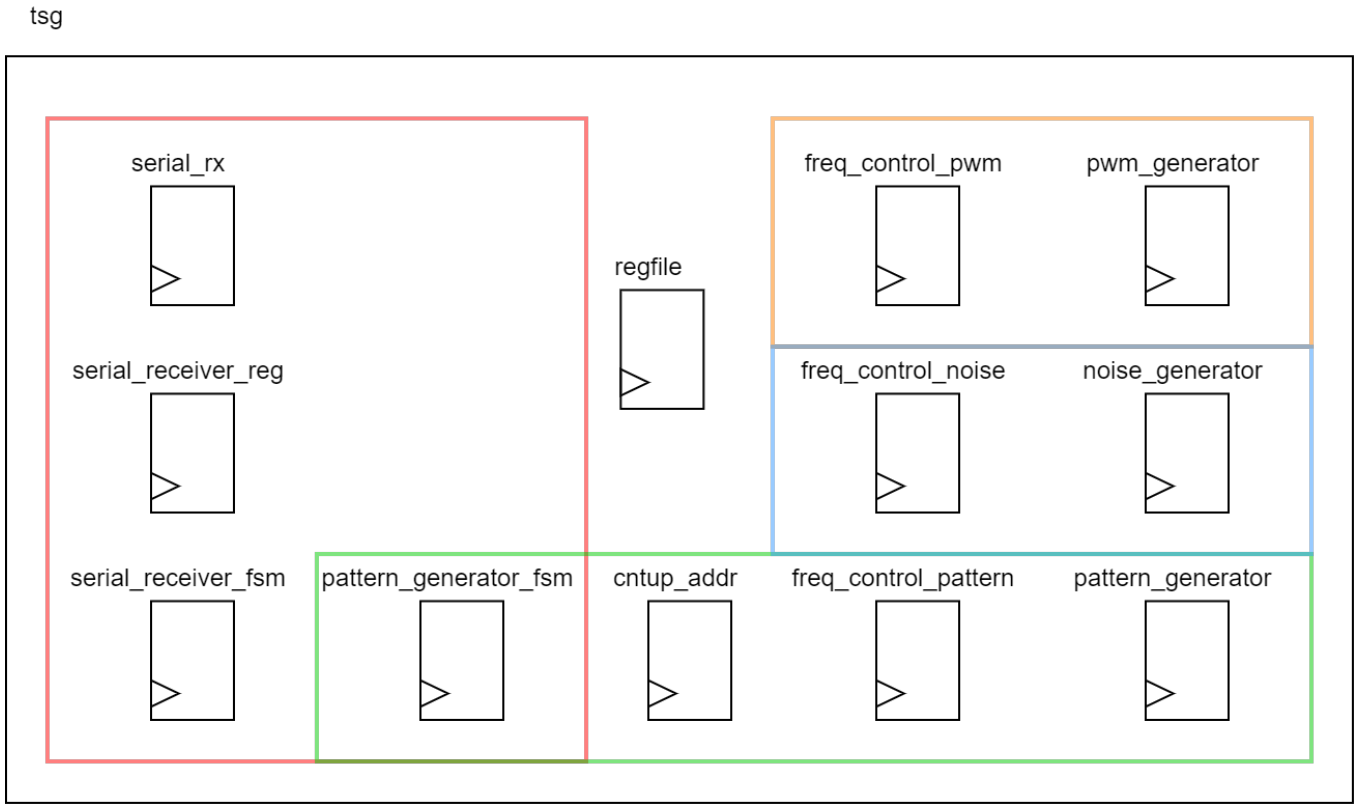

Figure 2: Breakup Drawing of TSG

General Description

Register File

Address	Name	Bit7 .. 0
0x00		
0x01	system control	x
0x02		
0x03		
0x04	pwm pulse width	x x x x x x x x
0x05	pwm period	x x x x x x x x
0x06	pwm control	x x
0x07		
0x08	noise prbsg length	x x x x x x x x
0x09	noise period	x x x x x x x x
0x0A		
0x0B	noise control	x x
0x0C	pattern length	x x x x x x x x
0x0D		
0x0E	pattern period	x x x x x x x x
0x0F	pattern control	x x x

Serial Communication

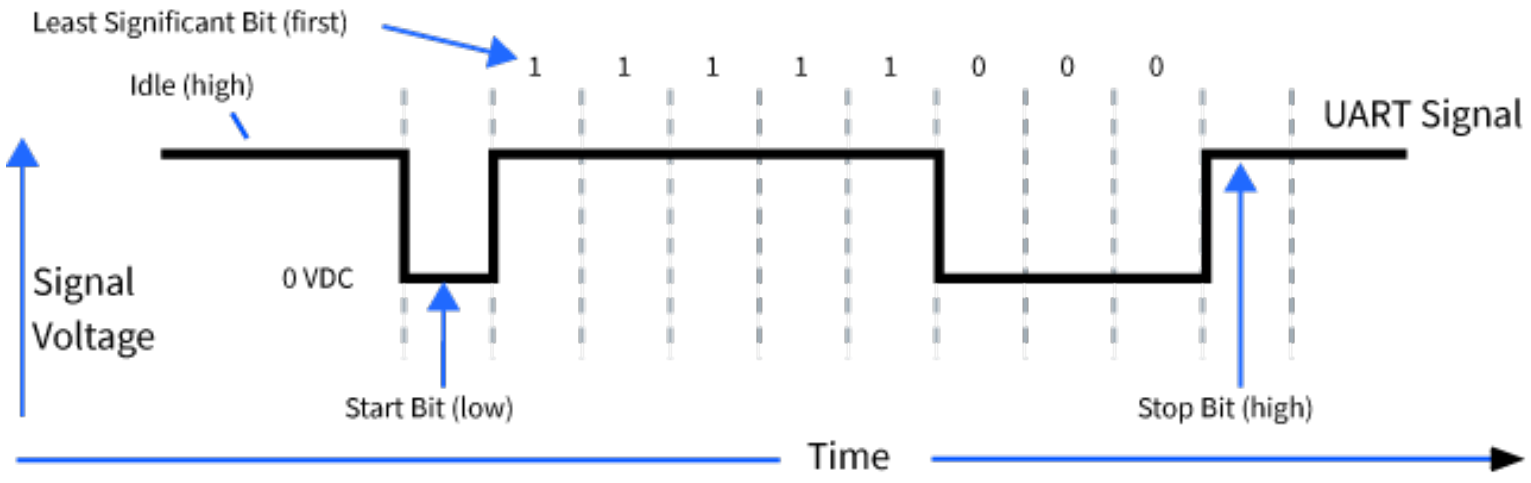

Figure 3: UART [1]

Test Components

PWM Generator

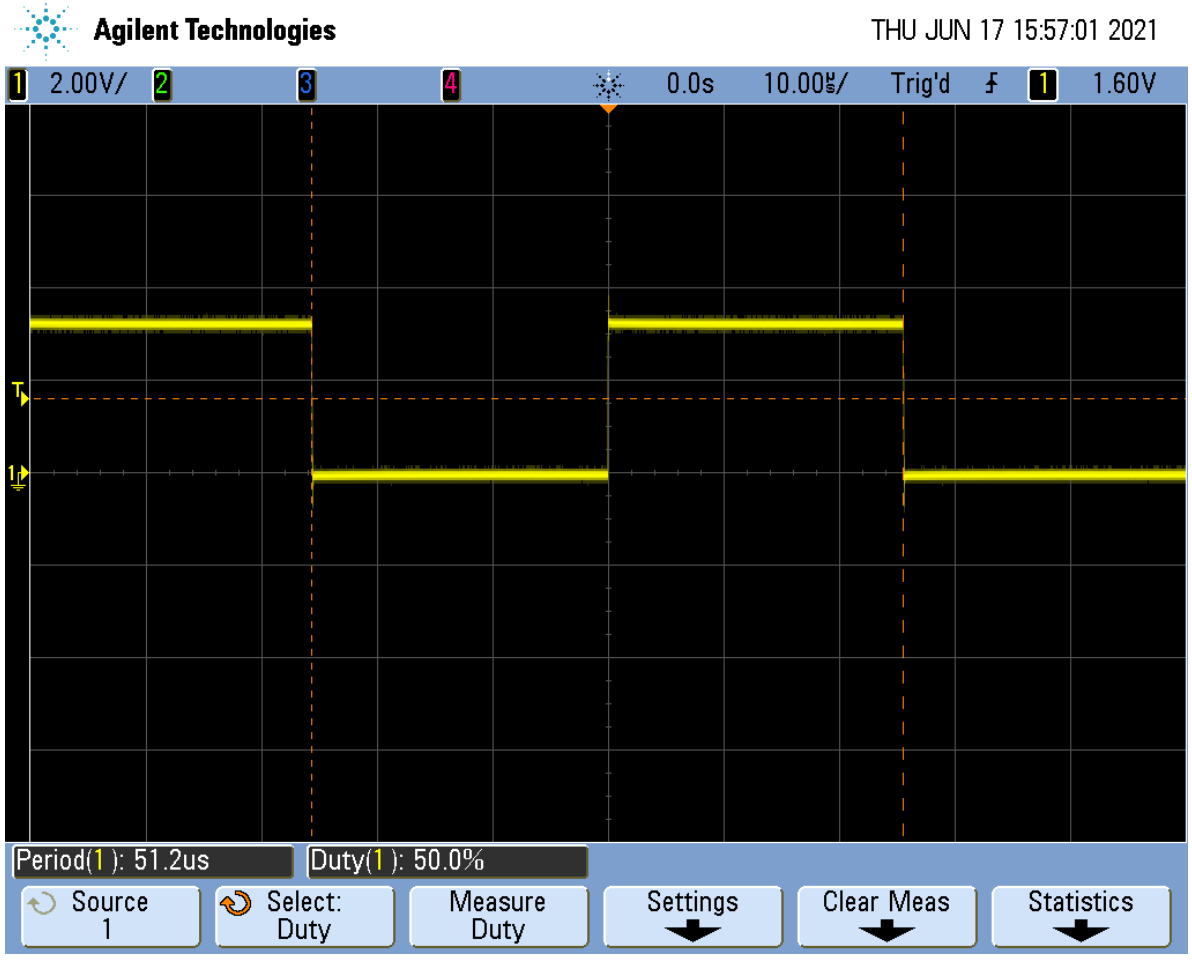

Figure 4: PWM with Duty Cycle 50%

Test Components

Noise Generator

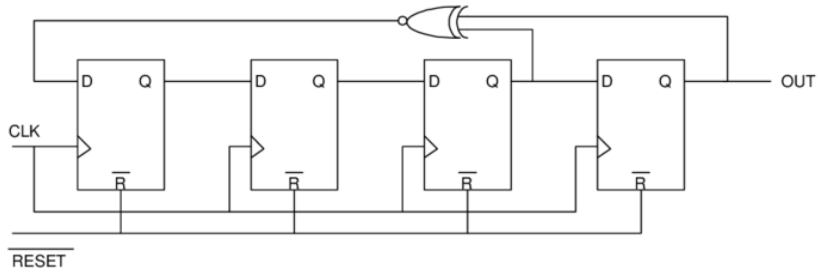

Figure 5: 4bit LFSR [2]

```
noise prbsg length
----------------------------------------
Bit 7 6 5 4 3 2 1 0 Meaning
----------------------------------------
              0 0 0 4-bit
              0 0 1 7-bit 8B/10B-encoded pattern
              0 1 0 15-bit ITU-T O.150
              0 1 1 17-bit OIF-CEI-P-02.0
              1 0 0 20-bit ITU-T O.150
              1 0 1 23-bit ITU-T O.150
```

Test Components

Noise Generator

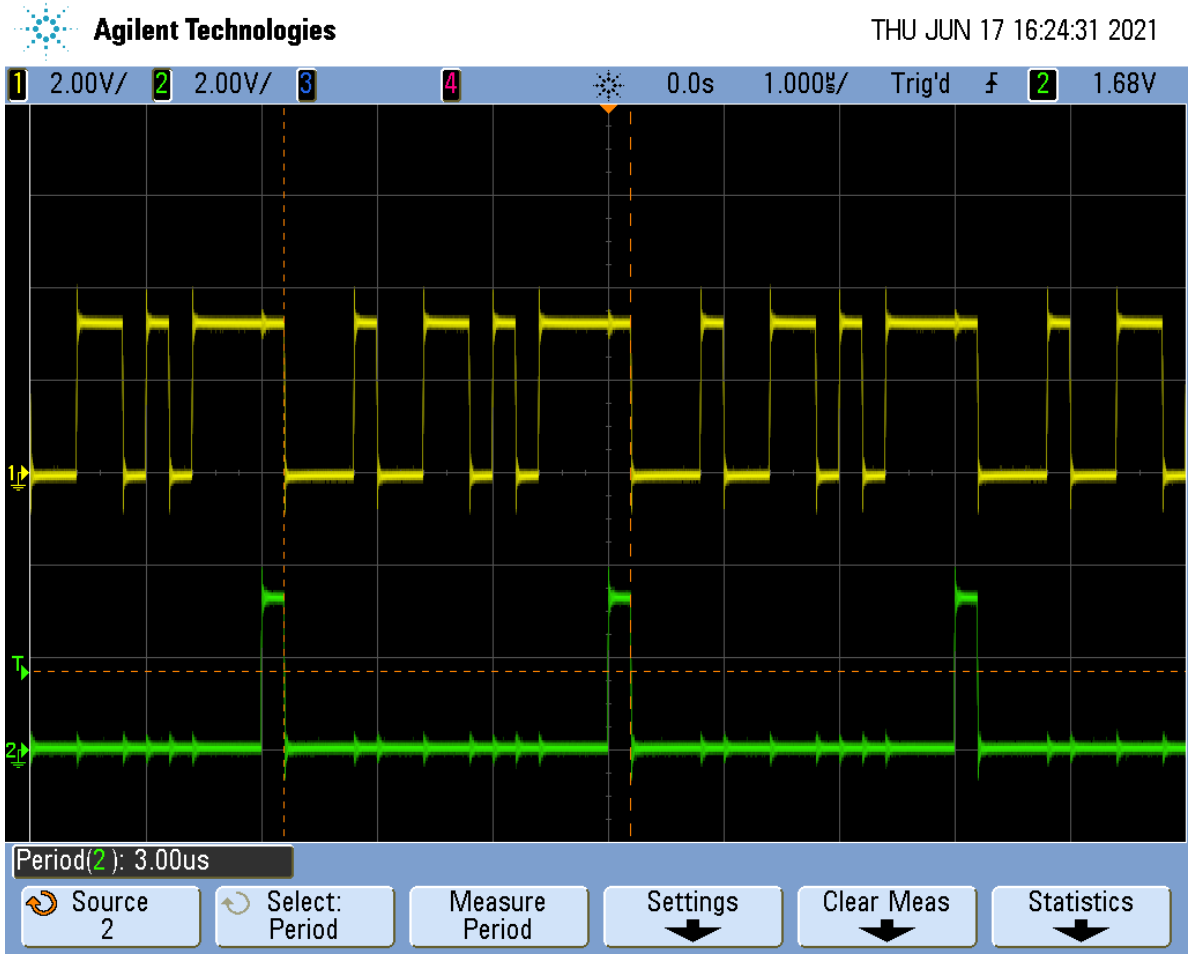

Figure 6: Noise Signal/EOC of 4bit LFSR

Test Components

Pattern Generator

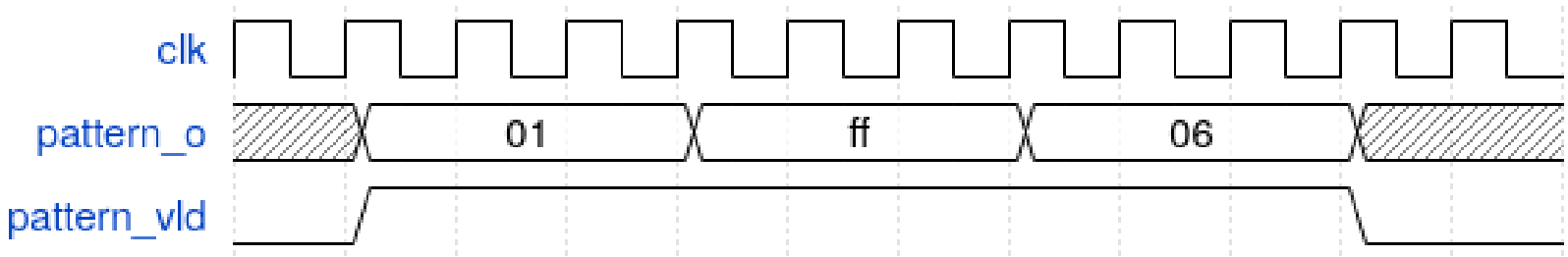

Figure 7: Pattern Generator Signals

```
pattern control
---------------------------
Bit 1 0 Meaning
---------------------------
    0 0 stop
    0 1 single burst
    1 0 continous run
    1 1 load data
```

Questions

Thank you for your attention !

Sources

1: Source - UART Drawing

2: Source - LFSR Drawing