tb_cocotb_axi_lite.v

AUTHORS

JAY CONVERTINO

DATES

2025/04/30

INFORMATION

Brief

Test bench wrapper for cocotb

License MIT

tb_cocotb

```
module tb_cocotb #(
parameter
ADDRESS_WIDTH
 =
32,
parameter
BUS_WIDTH
 =
4,
parameter
CLOCK_SPEED
 =
100000000,
parameter
```

```
SELECT_WIDTH
  =
16,
parameter
DEFAULT_RATE_DIV
  =
0,
parameter
DEFAULT_CPOL
  =
0,
parameter
DEFAULT_CPHA
  =
0
) ( input aclk, input arstn, input s_axi_awvalid, input [ADDRESS_WIDTH-1:0]
```

AXI Lite based SPI Master device.

Parameters

ADDRESS_WIDTH parameter	Width of the uP address port, max 32 bit.
BUS_WIDTH parameter	Width of the uP bus data port(can not be less than 2 bytes, max tested is 4).
CLOCK_SPEED parameter	This is the aclk frequency in Hz, this is the the frequency used for the bus and is divided by the rate.
SELECT_WIDTH parameter	Bit width of the slave select, defaults to 16 to match altera spi ip.
DEFAULT_RATE_DIV parameter	Default divider value of the main clock to use for the spi data output clock rate. 0 is 2 (2^(X+1) X is the DEFAULT_RATE_DIV)
DEFAULT_CPOL parameter	Default clock polarity for the core (0 or 1).
DEFAULT_CPHA parameter	Default clock phase for the core (0 or 1).

Ports

aclk	Clock for all devices in the core
arstn	Negative reset
s_axi_awvalid	Axi Lite aw valid
s_axi_awaddr	Axi Lite aw addr
s_axi_awprot	Axi Lite aw prot
s_axi_awready	Axi Lite aw ready
s_axi_wvalid	Axi Lite w valid
s_axi_wdata	Axi Lite w data
s_axi_wstrb	Axi Lite w strb
s_axi_wready	Axi Lite w ready
s_axi_bvalid	Axi Lite b valid
s_axi_bresp	Axi Lite b resp
s_axi_bready	Axi Lite b ready
s_axi_arvalid	Axi Lite ar valid
s_axi_araddr	Axi Lite ar addr
s_axi_arprot	Axi Lite ar prot
s_axi_arready	Axi Lite ar ready

s_axi_rvalid	Axi Lite r valid
s_axi_rdata	Axi Lite r data
s_axi_rresp	Axi Lite r resp
s_axi_rready	Axi Lite r ready
irq	Interrupt when data is received
sclk	spi clock, should only drive output pins to devices.
mosi	transmit for master output
miso	receive for master input
ss_n	slave select output

INSTANTIATED MODULES

dut

```
axi_lite_spi_master #(
                                                                                .
ADDRESS_WIDTH(ADDRESS_WIDTH),
                                                                                .
BUS_WIDTH(BUS_WIDTH),
                                                                                .
CLOCK_SPEED(CLOCK_SPEED),
                                                                                .
SELECT_WIDTH(SELECT_WIDTH),
                                                                                .
DEFAULT_RATE_DIV(DEFAULT_RATE_DIV),
                                                                                .
DEFAULT_CPOL(DEFAULT_CPOL),
                                                                                .
DEFAULT_CPHA(DEFAULT_CPHA)
) dut ( .aclk(aclk), .arstn(arstn), .s_axi_awvalid(s_axi_awvalid), .s_axi_av
```

Device under test, axi_lite_spi_master