system_wrapper.v

AUTHORS

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DATES

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INFORMATION

Brief

System wrapper for pl and ps for arria10soc board.

License MIT

system_wrapper

```
module system_wrapper #(
parameter
FPGA_TECHNOLOGY
 =
103,
parameter
FPGA_FAMILY
 =
1,
parameter
SPEED_GRADE
```

```
 =
2,
parameter
DEV_PACKAGE
 =
3,
parameter
DELAY_REFCLK_FREQUENCY
 =
200,
parameter
ADC_INIT_DELAY
 =
23,
parameter
DAC_INIT_DELAY
 =
0
) ( input sys_clk, input sys_resetn, input hps_ddr_ref_clk, output [ 0:0] hp
```

System wrapper for pl and ps for arria10soc board.

Parameters

FPGA_TECHNOLOGY parameter	Type of FPGA, such as Ultrascale, Arria 10. 103 is for Arria 10.
FPGA_FAMILY parameter	Sub type of fpga, such as GX, SX, etc. 1 is for SX
SPEED_GRADE parameter	Number that corresponds to the ships recommeneded speed. 2 is for 2.
DEV_PACKAGE parameter	Specify a number that is equal to the manufactures package. 3 is for FBGA.
DELAY_REFCLK_FREQUENCY parameter	Reference clock frequency used for ad_data_in instances
ADC_INIT_DELAY parameter	Initial Delay for the ADC
DAC_INIT_DELAY parameter	Initial Delay for the DAC

Ports

sys_clk	Input clock for all clocks
sys_resetn	Input reset for all resets
hps_ddr_ref_clk	DDR port
hps_ddr_clk_p	DDR port
hps_ddr_clk_n	DDR port
hps_ddr_a	DDR port
hps_ddr_ba	DDR port
hps_ddr_bg	DDR port
hps_ddr_cke	DDR port
hps_ddr_cs_n	DDR port
hps_ddr_odt	DDR port
hps_ddr_reset_n	DDR port
hps_ddr_act_n	DDR port

hps_ddr_par	DDR port
hps_ddr_alert_n	DDR port
hps_ddr_dqs_p	DDR port
hps_ddr_dqs_n	DDR port
hps_ddr_dq	DDR port
hps_ddr_dbi_n	DDR port
hps_ddr_rzq	DDR port
hps_eth_rxclk	Ethernet Device
hps_eth_rxctl	Ethernet Device
hps_eth_rxd	Ethernet Device
hps_eth_txclk	Ethernet Device
hps_eth_txctl	Ethernet Device
hps_eth_txd	Ethernet Device
hps_eth_mdc	Ethernet Device
hps_eth_mdio	Ethernet Device
hps_sdio_clk	SD card interface
hps_sdio_cmd	SD card interface
hps_sdio_d	SD card interface
hps_usb_clk	USB interface
hps_usb_dir	USB interface
hps_usb_nxt	USB interface
hps_usb_stp	USB interface
hps_usb_d	USB interface
hps_uart_rx	UART interface
hps_uart_tx	UART interface
hps_i2c_sda	i2c interface
hps_i2c_scl	i2c interface
hps_gpio	GPIO interface
gpio_bd_i	fmcomms2-3 gpio
gpio_bd_o	fmcomms2-3 gpio
rx_clk_in	fmcomms2-3 receive clock in
rx_frame_in_p	fmcomms2-3 receive frame
rx_frame_in_n	fmcomms2-3 receive frame
rx_data_in_p	fmcomms2-3 receive lvds data
rx_data_in_n	fmcomms2-3 receive lvds data
tx_clk_out_p	fmcomms2-3 transmit clock
tx_clk_out_n	fmcomms2-3 transmit clock
tx_frame_out_p	fmcomms2-3 transmit frame
tx_frame_out_n	fmcomms2-3 transmit frame
tx_data_out_p	fmcomms2-3 transmit lvds data
tx_data_out_n	fmcomms2-3 transmit lvds data
enable	fmcomms2-3 enable

txnrx	fmcomms2-3 txnrx select
gpio_resetb	fmcomms2-3 gpio reset
gpio_sync	fmcomms2-3 gpio sync
gpio_en_agc	fmcomms2-3 gpio enable agc
gpio_ctl	fmcomms2-3 control
gpio_status	fmcomms2-3 status
spi_csn	fmcomms2-3 spi select
spi_clk	fmcomms2-3 spi clk
spi_mosi	fmcomms2-3 spi output
spi_miso	fmcomms2-3 spi input

INSTANTIANTED MODULES

inst_system_pl_wrapper

```
system_pl_wrapper #(
                                                                                .
FPGA_TECHNOLOGY(FPGA_TECHNOLOGY),
                                                                                .
FPGA_FAMILY(FPGA_FAMILY),
                                                                                .
SPEED_GRADE(SPEED_GRADE),
                                                                                .
DEV_PACKAGE(DEV_PACKAGE),
                                                                                .
ADC_INIT_DELAY(ADC_INIT_DELAY),
                                                                                .
DAC_INIT_DELAY(DAC_INIT_DELAY),
                                                                                .
DELAY_REFCLK_FREQUENCY(DELAY_REFCLK_FREQUENCY)
) inst_system_pl_wrapper ( .axi_aclk(s_axi_clk), .axi_aresetn(s_axi_aresetn
```

Module instance of system_pl_wrapper for the fmcomms2-3 device.

inst_system_ps_wrapper

```
system_ps_wrapper inst_system_ps_wrapper (
                                                                                .
s_axi_clk_clk(s_axi_clk),
                                                                                .
s_axi_aresetn_reset_n(s_axi_aresetn),
                                                                                .
m_axi_awaddr(w_axi_awaddr),
                                                                                .
m_axi_awprot(w_axi_awprot),
                                                                                .
m_axi_awvalid(w_axi_awvalid),
                                                                                .
m_axi_awready(w_axi_awready),
                                                                                .
m_axi_wdata(w_axi_wdata),
                                                                                .
m_axi_wstrb(w_axi_wstrb),
```

```
.m_axi_wvalid(w_axi_wvalid),
.m_axi_wready(w_axi_wready),
.m_axi_bresp(w_axi_bresp),
.m_axi_bvalid(w_axi_bvalid),
.m_axi_bready(w_axi_bready),
.m_axi_araddr(w_axi_araddr),
.m_axi_arprot(w_axi_arprot),
.m_axi_arvalid(w_axi_arvalid),
.m_axi_arready(w_axi_arready),
.m_axi_rdata(w_axi_rdata),
.m_axi_rresp(w_axi_rresp),
.m_axi_rvalid(w_axi_rvalid),
.m_axi_rready(w_axi_rready),
.sys_delay_clk_clk(s_delay_clk),
.sys_clk_clk(sys_clk),
.sys_gpio_bd_in_port(gpio_i[31:0]),
.sys_gpio_bd_out_port(gpio_o[31:0]),
.sys_gpio_in_export(gpio_i[63:32]),
.sys_gpio_out_export(gpio_o[63:32]),
.sys_hps_rstn_reset_n
(sys_resetn),
.sys_rstn_reset_n
(sys_resetn_s),
.sys_hps_io_hps_io_phery_emac0_TX_CLK
(hps_eth_txclk),
.sys_hps_io_hps_io_phery_emac0_TXD0
(hps_eth_txd[0]),
.sys_hps_io_hps_io_phery_emac0_TXD1
(hps_eth_txd[1]),
.sys_hps_io_hps_io_phery_emac0_TXD2
(hps_eth_txd[2]),
.sys_hps_io_hps_io_phery_emac0_TXD3
(hps_eth_txd[3]),
```

```
sys_hps_io_hps_io_phery_emac0_RX_CTL
(
hps_eth_rxctl),
sys_hps_io_hps_io_phery_emac0_TX_CTL
(
hps_eth_txctl),
sys_hps_io_hps_io_phery_emac0_RX_CLK
(
hps_eth_rxclk),
sys_hps_io_hps_io_phery_emac0_RXD0
(
hps_eth_rxd[0]),
sys_hps_io_hps_io_phery_emac0_RXD1
(
hps_eth_rxd[1]),
sys_hps_io_hps_io_phery_emac0_RXD2
(
hps_eth_rxd[2]),
sys_hps_io_hps_io_phery_emac0_RXD3
(
hps_eth_rxd[3]),
sys_hps_io_hps_io_phery_emac0_MDIO
(
hps_eth_mdio),
sys_hps_io_hps_io_phery_emac0_MDC
(
hps_eth_mdc),
sys_hps_io_hps_io_phery_sdmmc_CMD
(
hps_sdio_cmd),
sys_hps_io_hps_io_phery_sdmmc_D0
(
hps_sdio_d[0]),
sys_hps_io_hps_io_phery_sdmmc_D1
(
hps_sdio_d[1]),
sys_hps_io_hps_io_phery_sdmmc_D2
(
hps_sdio_d[2]),
sys_hps_io_hps_io_phery_sdmmc_D3
(
hps_sdio_d[3]),
sys_hps_io_hps_io_phery_sdmmc_D4
(
hps_sdio_d[4]),
sys_hps_io_hps_io_phery_sdmmc_D5
(
hps_sdio_d[5]),
sys_hps_io_hps_io_phery_sdmmc_D6
```

```
                                                                    (
hps_sdio_d[6]),
                                                                    .
sys_hps_io_hps_io_phery_sdmmc_D7                                    (
hps_sdio_d[7]),
                                                                    .
sys_hps_io_hps_io_phery_sdmmc_CCLK                                  (
hps_sdio_clk),
                                                                    .
sys_hps_io_hps_io_phery_usb0_DATA0                                  (
hps_usb_d[0]),
                                                                    .
sys_hps_io_hps_io_phery_usb0_DATA1                                  (
hps_usb_d[1]),
                                                                    .
sys_hps_io_hps_io_phery_usb0_DATA2                                  (
hps_usb_d[2]),
                                                                    .
sys_hps_io_hps_io_phery_usb0_DATA3                                  (
hps_usb_d[3]),
                                                                    .
sys_hps_io_hps_io_phery_usb0_DATA4                                  (
hps_usb_d[4]),
                                                                    .
sys_hps_io_hps_io_phery_usb0_DATA5                                  (
hps_usb_d[5]),
                                                                    .
sys_hps_io_hps_io_phery_usb0_DATA6                                  (
hps_usb_d[6]),
                                                                    .
sys_hps_io_hps_io_phery_usb0_DATA7                                  (
hps_usb_d[7]),
                                                                    .
sys_hps_io_hps_io_phery_usb0_CLK                                    (
hps_usb_clk),
                                                                    .
sys_hps_io_hps_io_phery_usb0_STP                                    (
hps_usb_stp),
                                                                    .
sys_hps_io_hps_io_phery_usb0_DIR                                    (
hps_usb_dir),
                                                                    .
sys_hps_io_hps_io_phery_usb0_NXT                                    (
hps_usb_nxt),
                                                                    .
sys_hps_io_hps_io_phery_uart1_RX                                    (
hps_uart_rx),
                                                                    .
sys_hps_io_hps_io_phery_uart1_TX                                    (
hps_uart_tx),
```

```
.sys_hps_io_hps_io_phery_i2c1_SDA(hps_i2c_sda),
.sys_hps_io_hps_io_phery_i2c1_SCL(hps_i2c_scl),
.sys_hps_io_hps_io_gpio_gpio1_io5(hps_gpio[0]),
.sys_hps_io_hps_io_gpio_gpio1_io14(hps_gpio[1]),
.sys_hps_io_hps_io_gpio_gpio1_io16(hps_gpio[2]),
.sys_hps_io_hps_io_gpio_gpio1_io17(hps_gpio[3]),
.sys_hps_out_rstn_reset_n(sys_hps_resetn),
.sys_hps_fpga_irq1_irq({32{1'b0}}),
.sys_hps_dma_data_awid(0),
.sys_hps_dma_data_awaddr(adc_hp0_axi_awaddr),
.sys_hps_dma_data_awlen(adc_hp0_axi_awlen),
.sys_hps_dma_data_awsize(adc_hp0_axi_awsize),
.sys_hps_dma_data_awburst(adc_hp0_axi_awburst),
.sys_hps_dma_data_awlock(0),
.sys_hps_dma_data_awcache(adc_hp0_axi_awcache),
.sys_hps_dma_data_awprot(adc_hp0_axi_awprot),
.sys_hps_dma_data_awvalid(adc_hp0_axi_awvalid),
.sys_hps_dma_data_awready(adc_hp0_axi_awready),
.sys_hps_dma_data_awuser(0),
.sys_hps_dma_data_wid(0),
.sys_hps_dma_data_wdata(adc_hp0_axi_wdata),
.sys_hps_dma_data_wstrb(adc_hp0_axi_wstrb),
.sys_hps_dma_data_wlast(adc_hp0_axi_wlast),
.sys_hps_dma_data_wvalid(adc_hp0_axi_wvalid),
.sys_hps_dma_data_wready(adc_hp0_axi_wready),
```

```
sys_hps_dma_data_bid(),
sys_hps_dma_data_bresp(adc_hp0_axi_bresp),
sys_hps_dma_data_bvalid(adc_hp0_axi_bvalid),
sys_hps_dma_data_bready(adc_hp0_axi_bready),
sys_hps_dma_data_arid(0),
sys_hps_dma_data_araddr(dac_hp1_axi_araddr),
sys_hps_dma_data_arlen(dac_hp1_axi_arlen),
sys_hps_dma_data_arsize(dac_hp1_axi_arsize),
sys_hps_dma_data_arburst(dac_hp1_axi_arburst),
sys_hps_dma_data_arlock(0),
sys_hps_dma_data_arcache(dac_hp1_axi_arcache),
sys_hps_dma_data_arprot(dac_hp1_axi_arprot),
sys_hps_dma_data_arvalid(dac_hp1_axi_arvalid),
sys_hps_dma_data_arready(dac_hp1_axi_arready),
sys_hps_dma_data_aruser(0),
sys_hps_dma_data_rid(),
sys_hps_dma_data_rdata(dac_hp1_axi_rdata),
sys_hps_dma_data_rresp(dac_hp1_axi_rresp),
sys_hps_dma_data_rlast(dac_hp1_axi_rlast),
sys_hps_dma_data_rvalid(dac_hp1_axi_rvalid),
sys_hps_dma_data_rready(dac_hp1_axi_rready),
sys_hps_ddr_mem_ck(hps_ddr_clk_p),
sys_hps_ddr_mem_ck_n(hps_ddr_clk_n),
sys_hps_ddr_mem_a(hps_ddr_a),
sys_hps_ddr_mem_act_n(hps_ddr_act_n),
sys_hps_ddr_mem_ba(hps_ddr_ba),
sys_hps_ddr_mem_bg(hps_ddr_bg),
sys_hps_ddr_mem_cke(hps_ddr_cke),
sys_hps_ddr_mem_cs_n(hps_ddr_cs_n),
sys_hps_ddr_mem_odt(hps_ddr_odt),
sys_hps_ddr_mem_reset_n(hps_ddr_reset_n),
sys_hps_ddr_mem_par(hps_ddr_par),
sys_hps_ddr_mem_alert_n(hps_ddr_alert_n),
```

```
.
sys_hps_ddr_mem_dqs(hps_ddr_dqs_p),
.
sys_hps_ddr_mem_dqs_n(hps_ddr_dqs_n),
.
sys_hps_ddr_mem_dq(hps_ddr_dq),
.
sys_hps_ddr_mem_dbi_n(hps_ddr_dbi_n),
.
sys_hps_ddr_oct_oct_rzqin(hps_ddr_rzq),
.
sys_hps_ddr_ref_clk_clk(hps_ddr_ref_clk),
.
sys_hps_ddr_rstn_reset_n(sys_resetn),
.
sys_spi_MISO(spi_miso),
.
sys_spi_MOSI(spi_mosi),
.
sys_spi_SCLK(spi_clk),
.
sys_spi_SS_n(spi_csn),
.
irq_irq({s_dac_dma_irq, s_adc_dma_irq, {2{1'b0}}})
)
```

Module instance of inst_system_ps_wrapper for the built in CPU.