

# Pinout

## Document Index

FPGA Pinout.....	1
Live Probes (J12). <i>Debugging pins</i> :.....	4
Raspberry Pi 4 Interface.....	4
MIKROBUS.....	6
ETHERNET ( <i>GPIO &amp; MSS Pins</i> ).....	7
MIPI Connector.....	9
7 Segment Display.....	10
SD CARD ( <i>MSS Pins</i> ).....	11

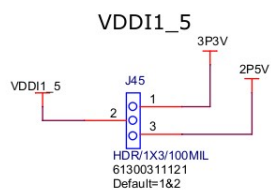
## FPGA Pinout

Pin Name	Pin Number	Direction	Voltage	FPGA bank
CLK_50MHz	R18	In	1.8V	0
LED1 <sub>(LOW LEVEL ACTIVE)</sub>	T18	Out	1.8V	0
LED2 <sub>(LOW LEVEL ACTIVE)</sub>	V17	Out	1.8V	0
LED3 <sub>(LOW LEVEL ACTIVE)</sub>	U20	Out	1.8V	0
LED4 <sub>(LOW LEVEL ACTIVE)</sub>	U21	Out	1.8V	0
LED5 <sub>(LOW LEVEL ACTIVE)</sub>	AA18	Out	1.8V	0
LED6 <sub>(LOW LEVEL ACTIVE)</sub>	V16	Out	1.8V	0
LED7 <sub>(LOW LEVEL ACTIVE)**</sub>	U15	Out	1.8V	0
SWITCH1 <sub>(LOW LEVEL ACTIVE)</sub>	T19	In	1.8V	0
SWITCH2 <sub>(LOW LEVEL ACTIVE)</sub>	U18	In	1.8V	0
DIP1 <sub>(LOW LEVEL ACTIVE)</sub>	U17	In	1.8V	0
DIP2 <sub>(LOW LEVEL ACTIVE)</sub>	Y16	In	1.8V	0
DIP3 <sub>(LOW LEVEL ACTIVE)</sub>	R17	In	1.8V	0
DIP4 <sub>(LOW LEVEL ACTIVE)</sub>	AA15	In	1.8V	0
DIP5 <sub>(LOW LEVEL ACTIVE)</sub>	AA20	In	1.8V	0
DIP6 <sub>(LOW LEVEL ACTIVE)</sub>	Y20	In	1.8V	0
DIP7 <sub>(LOW LEVEL ACTIVE)</sub>	V21	In	1.8V	0
DIP8 <sub>(LOW LEVEL ACTIVE)</sub>	AA19	In	1.8V	0
IO1	V18	Out	1.8V	0
IO2	W20	Out	1.8V	0
IO3	Y19	Out	1.8V	0

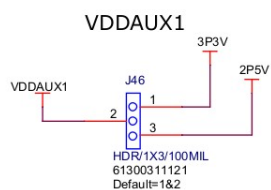
IO4	T17	Out	1.8V	0
IO5	W16	Out	1.8V	0
IO6	AA17	Out	1.8V	0
IO7	V15	Out	1.8V	0
IO8	Y15	Out	1.8V	0
UART_TX	W21	Out	1.8V	0
UART_RX	Y21	In	1.8V	0
RPI_GPIO3	E18		2.5V/3.3V (J45)*	1
RPI_GPIO5	F18		2.5V/3.3V (J45)*	1
RPI_GPIO7	E12		2.5V/3.3V (J45)*	1
RPI_GPIO8	A20		2.5V/3.3V (J45)*	1
RPI_GPIO10	B21		2.5V/3.3V (J45)*	1
RPI_GPIO11	G18		2.5V/3.3V (J45)*	1
RPI_GPIO12	E10		2.5V/3.3V (J45)*	1
RPI_GPIO13	F21		2.5V/3.3V (J45)*	1
RPI_GPIO15	F20		2.5V/3.3V (J45)*	1
RPI_GPIO16	E21		2.5V/3.3V (J45)*	1
RPI_GPIO18	F19		2.5V/3.3V (J45)*	1
RPI_GPIO22	A19		2.5V/3.3V (J45)*	1
RPI_GPIO29	D17		2.5V/3.3V (J45)*	1
RPI_GPIO31	D18		2.5V/3.3V (J45)*	1
RPI_GPIO32	B20		2.5V/3.3V (J45)*	1
RPI_GPIO33	A15		2.5V/3.3V (J45)*	1
RPI_GPIO35	B19		2.5V/3.3V (J45)*	1
RPI_GPIO36	B15		2.5V/3.3V (J45)*	1
RPI_GPIO37	B17		2.5V/3.3V (J45)*	1
RPI_GPIO38	B14		2.5V/3.3V (J45)*	1
RPI_GPIO40	E13		2.5V/3.3V (J45)*	1
MIKROBUS_AN	G12		2.5V/3.3V (J45)*	1
MIKROBUS_RST <sub>(PULL-UP)</sub>	B16		2.5V/3.3V (J45)*	1
MIKROBUS_CS <sub>(PULL-UP)</sub>	C16		2.5V/3.3V (J45)*	1
MIKROBUS_SCK	E17		2.5V/3.3V (J45)*	1
MIKROBUS_MISO	A18		2.5V/3.3V (J45)*	1
MIKROBUS_MOSI	E11		2.5V/3.3V (J45)*	1
MIKROBUS_PWM	D13		2.5V/3.3V (J45)*	1
MIKROBUS_INT <sub>(PULL-UP)</sub>	G17		2.5V/3.3V (J45)*	1

MIKROBUS_RX	E14		2.5V/3.3V (J45)*	1
MIKROBUS_TX	E15		2.5V/3.3V (J45)*	1
MIKROBUS_SCL <sub>(PULL-UP)</sub>	D11		2.5V/3.3V (J45)*	1
MIKROBUS_SDA <sub>(PULL-UP)</sub>	D12		2.5V/3.3V (J45)*	1
ETH_MDC <sub>(PULL-UP)</sub>	D15	Out	2.5V/3.3V (J45)*	1
ETH_MDIO <sub>(PULL-UP)</sub>	D16	Out	2.5V/3.3V (J45)*	1
ETH_MDINTB <sub>(PULL-UP)</sub>	A13	Out	2.5V/3.3V (J45)*	1
ETH_RESETn <sub>(PULL-UP)</sub>	A14	Out	2.5V/3.3V (J45)*	1
ETH_RXLOS	A17	Out	2.5V/3.3V (J45)*	1
ETH_TXDISn <sub>(PULL-UP)</sub>	E20	Out	2.5V/3.3V (J45)*	1
GPIO_MIPI_RX_N0	B11	Out	2.5V/3.3V (J45)*	1
GPIO_MIPI_RX_P0	C11	Out	2.5V/3.3V (J45)*	1
GPIO_MIPI_RX_N1	A10	Out	2.5V/3.3V (J45)*	1
GPIO_MIPI_RX_P1	B10	Out	2.5V/3.3V (J45)*	1
GPIO_MIPI_RX_CKN	B12	Out	2.5V/3.3V (J45)*	1
GPIO_MIPI_RX_CKP	A12	Out	2.5V/3.3V (J45)*	1
CAM_EN	Y14	In	1.8V	0
CAM_I2C_SDA <sub>(PULL-UP)</sub>	T20	In	1.8V	0
CAM_I2C_SCL <sub>(PULL-UP)</sub>	T21	In	1.8V	0
CAM_GPIO	Y17	In	1.8V	0

\*



VDDI1\_5 and VDDAUX1  
2.5V for MIPI and Ethernet PHY operation  
3.3V for RPI and MikroBus operation

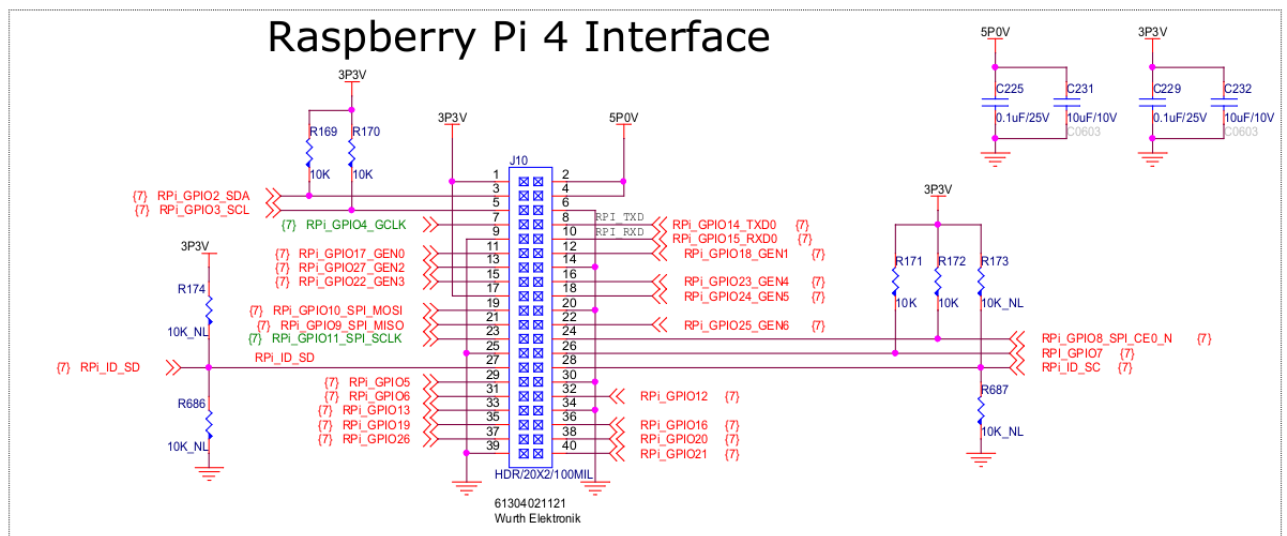


\*\* LED8 controlled by MSS with 3.3V

## Live Probes (J12). Debugging pins:

Pin	Name	Function
1	LPRB_B (C20)	Live Probe B
2	LPRB_A (C21)	Live Probe A
3	GND	
4	GND	

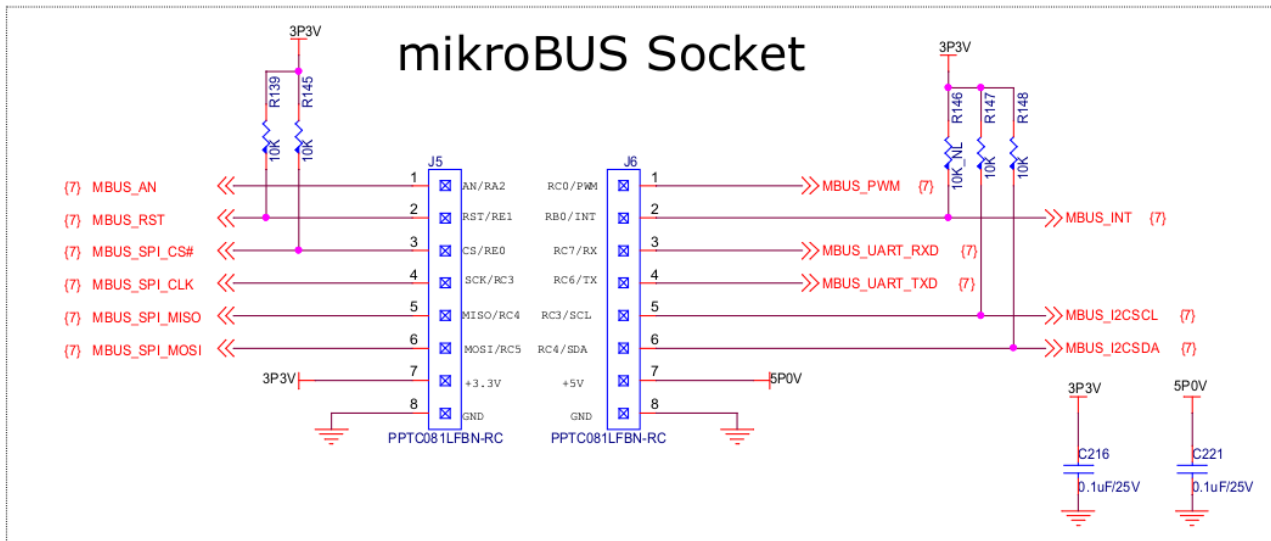
## Raspberry Pi 4 Interface



PIN CONNECTOR	PIN FPGA	TYPE PIN	VOLTAGE	BANK
1		SOURCE	3.3V	
2		SOURCE	5V	
3	E18	HSIO	2.5V/3.3V (J45)	1
4		SOURCE	5V	
5	F18	HSIO	2.5V/3.3V (J45)	1
6		SOURCE	GND	
7	E12	HSIO	2.5V/3.3V (J45)	1
8	A20	HSIO	2.5V/3.3V (J45)	1
9		SOURCE	GND	
10	B21	HSIO	2.5V/3.3V (J45)	1
11	G18	HSIO	2.5V/3.3V (J45)	1
12	E10	HSIO	2.5V/3.3V (J45)	1
13	F21	HSIO	2.5V/3.3V (J45)	1
14		SOURCE	GND	

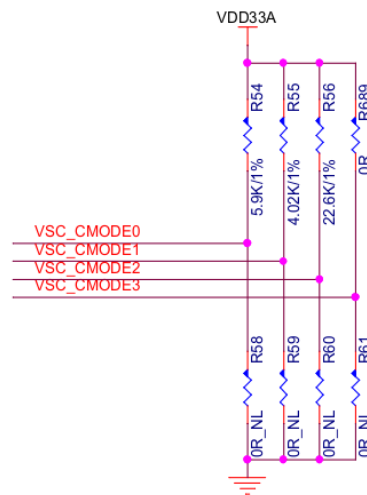
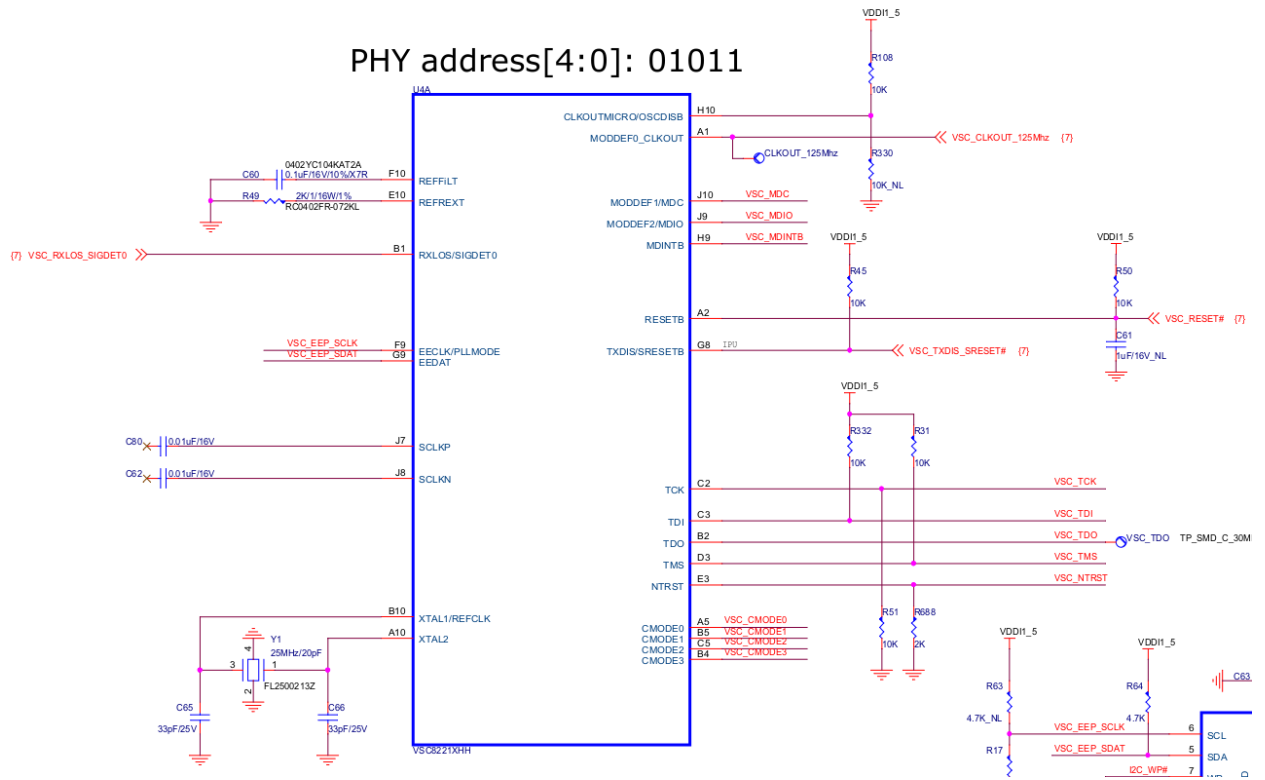
15	F20	HSIO	2.5V/3.3V (J45)	1
16	E21	HSIO	2.5V/3.3V (J45)	1
17		SOURCE	3.3V	
18	F19	HSIO	2.5V/3.3V (J45)	1
19	A4	MSS	3.3V	2
20		SOURCE	GND	
21	B4	MSS	3.3V	2
22	A19	HSIO	2.5V/3.3V (J45)	1
23	D6	MSS	3.3V	2
24	D5	MSS	3.3V	2
25		SOURCE	GND	
26	B2	MSS	3.3V	2
27	D1	MSS	3.3V	2
28	C2	MSS	3.3V	2
29	D17	HSIO	2.5V/3.3V (J45)	1
30		SOURCE	GND	
31	D18	HSIO	2.5V/3.3V (J45)	1
32	B20	HSIO	2.5V/3.3V (J45)	1
33	A15	HSIO	2.5V/3.3V (J45)	1
34		SOURCE	GND	
35	B19	HSIO	2.5V/3.3V (J45)	1
36	B15	HSIO	2.5V/3.3V (J45)	1
37	B17	HSIO	2.5V/3.3V (J45)	1
38	B14	HSIO	2.5V/3.3V (J45)	1
39		SOURCE	GND	
40	E13	HSIO	2.5V/3.3V (J45)	1

# MIKROBUS



CONNECTOR	PIN	NAME	FPGA PIN	VOLTAGE	BANK
J5	1	MIKROBUS_AN	G12	2.5V/3.3V (J45)	1
J5	2	MIKROBUS_RST <sub>(PULL-UP: 3V3)</sub>	B16	2.5V/3.3V (J45)	1
J5	3	MIKROBUS_CS <sub>(PULL-UP: 3V3)</sub>	C16	2.5V/3.3V (J45)	1
J5	4	MIKROBUS_SCK	E17	2.5V/3.3V (J45)	1
J5	5	MIKROBUS_MISO	A18	2.5V/3.3V (J45)	1
J5	6	MIKROBUS_MOSI	E11	2.5V/3.3V (J45)	1
J5	7	3V3			
J5	8	GND			
J6	1	MIKROBUS_PWM	D13	2.5V/3.3V (J45)	1
J6	2	MIKROBUS_INT <sub>(PULL-UP: 3V3)</sub>	G17	2.5V/3.3V (J45)	1
J6	3	MIKROBUS_RX	E14	2.5V/3.3V (J45)	1
J6	4	MIKROBUS_TX	E15	2.5V/3.3V (J45)	1
J6	5	MIKROBUS_SCL <sub>(PULL-UP: 3V3)</sub>	D11	2.5V/3.3V (J45)	1
J6	6	MIKROBUS_SDA <sub>(PULL-UP: 3V3)</sub>	D12	2.5V/3.3V (J45)	1
J6	7	5V			
J6	8	GND			

# ETHERNET (GPIO & MSS Pins)

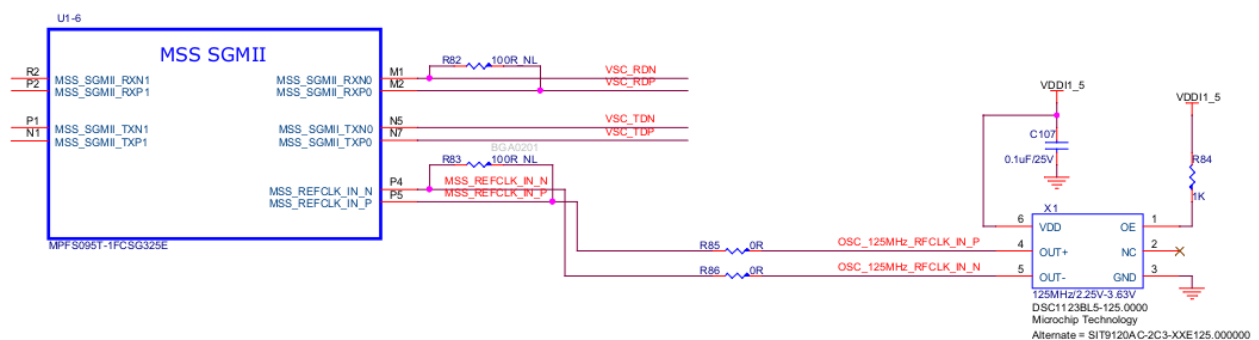


\*R58, R59, R60, R61 : NM → **CMODE: 2**

	bit 3	bit 2	bit 1	bit 0	Connection
CMODE 0	Phy address[3]	Phy address[2]	Phy address[1]	Phy address[0]	
	1	0	1	1	5.90k tied to VDD33A
CMODE1	SFP Mode Disable	PHY Address[4]	SiGDET pin direction	SerDes Line impedance	
	1	0	1	0	4.02k tied to VDD33A
CMODE 2	PHY Operating Mode[3]	PHY Operating Mode[2]	PHY Operating Mode[1]	PHY Operating Mode[0]	
	1	1	1	1	22.6k tied to VDD33A
CMODE3	LED Control[1]	SQE Enable	Reserved	Auto-negotiation Advertisement Control[1]	
	1	0	0	0	0k tied to VDD33A
	LED[2:0] = {Link/Activity, Link/Activity, Fault}				10/100/1000BASE-T HDX, FDX

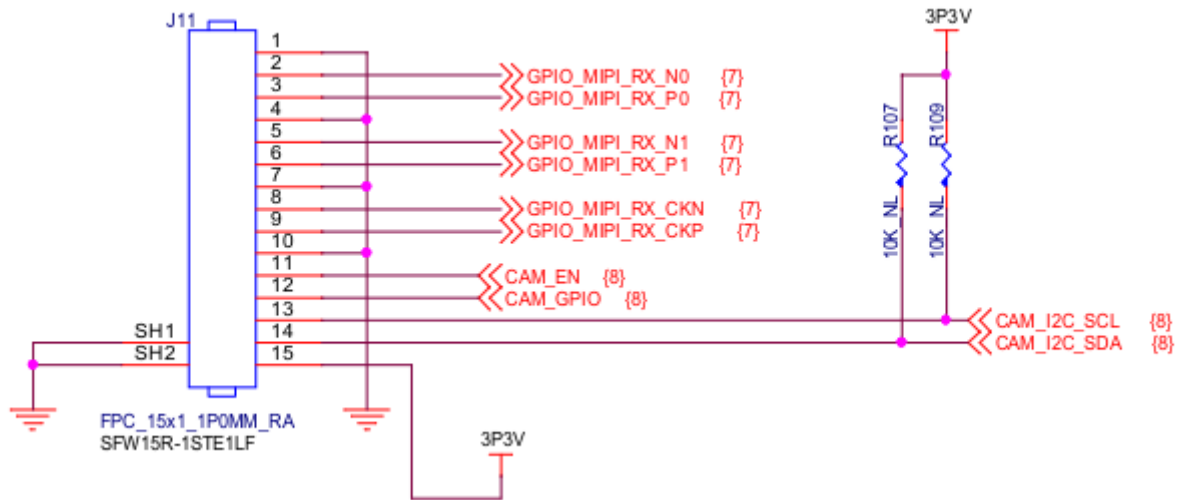
Name	FPGA Pin	Type	Voltage	Bank
ETH_MDC <sub>(PULL-UP)</sub>	D15	Out	2.5V/3.3V (J45)	1
ETH_MDIO <sub>(PULL-UP)</sub>	J9	Out	2.5V/3.3V (J45)	1
ETH_MDINTB <sub>(PULL-UP)</sub>	A13	Out	2.5V/3.3V (J45)	1
ETH_RESETn <sub>(PULL-UP)</sub>	A14	Out	2.5V/3.3V (J45)	1
ETH_RXLOS	A17	Out	2.5V/3.3V (J45)	1
ETH_TXDISn <sub>(PULL-UP)</sub>	E20	Out	2.5V/3.3V (J45)	1

... Other pins are MSS pins



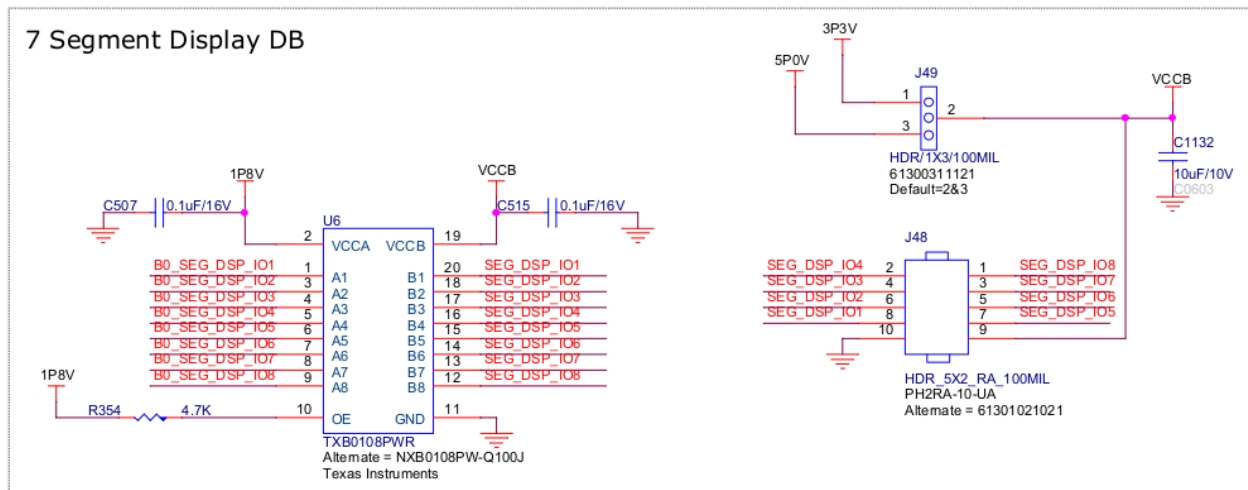


## MIPI Connector



Pin	Name	FPGA Pin	Type	Voltage	Bank
1	GND				
2	GPIO_MIPI_RX_N0	B11	Out	2.5V/3.3V (J45)	1
3	GPIO_MIPI_RX_P0	C11	Out	2.5V/3.3V (J45)	1
4	GND				
5	GPIO_MIPI_RX_N1	A10	Out	2.5V/3.3V (J45)	1
6	GPIO_MIPI_RX_P1	B10	Out	2.5V/3.3V (J45)	1
7	GND				
8	GPIO_MIPI_RX_CKN	B12	Out	2.5V/3.3V (J45)	1
9	GPIO_MIPI_RX_CKP	A12	Out	2.5V/3.3V (J45)	1
10	GND				
11	CAM_EN	Y14	In	1.8V	0
12	CAM_GPIO	Y17	In	1.8V	0
13	CAM_I2C_SDA <sub>(PULL-UP)</sub>	T20	In	1.8V	0
14	CAM_I2C_SCL <sub>(PULL-UP)</sub>	T21	In	1.8V	0
15	GND				

## 7 Segment Display



FPGA Output voltage: 1.8V → Pin voltage: 3V3 / 5V (J49)

Name	FPGA PIN	Type	Voltage	FPGA Bank
IO1	V18	Out	1.8V	0
IO2	W20	Out	1.8V	0
IO3	Y19	Out	1.8V	0
IO4	T17	Out	1.8V	0
IO5	W16	Out	1.8V	0
IO6	AA17	Out	1.8V	0
IO7	V15	Out	1.8V	0
IO8	Y15	Out	1.8V	0

SD CARD (MSS Pins)

