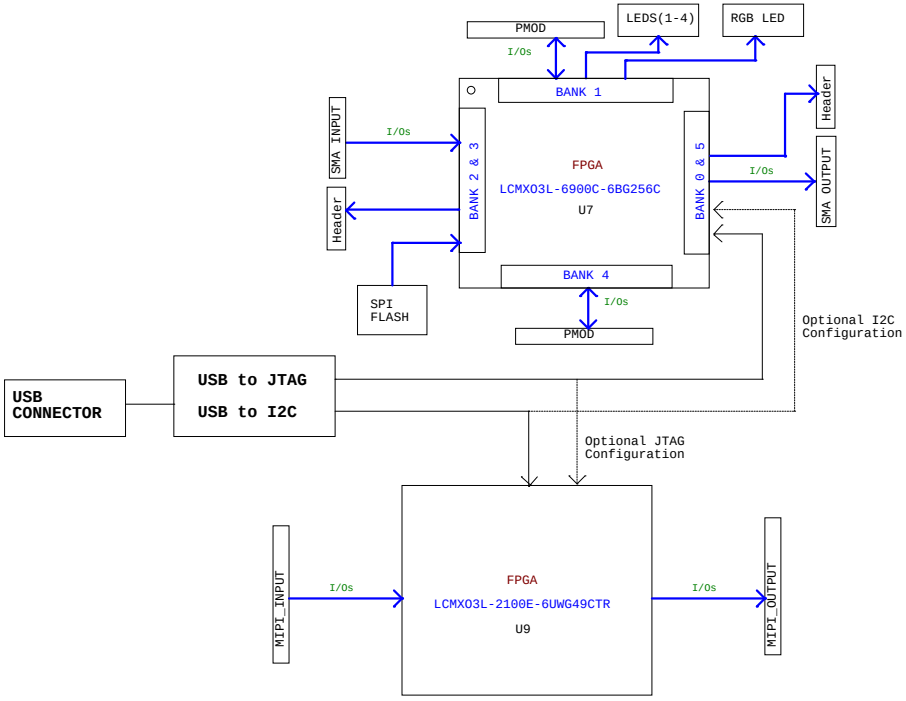
XO3L Breakout Board Revision B

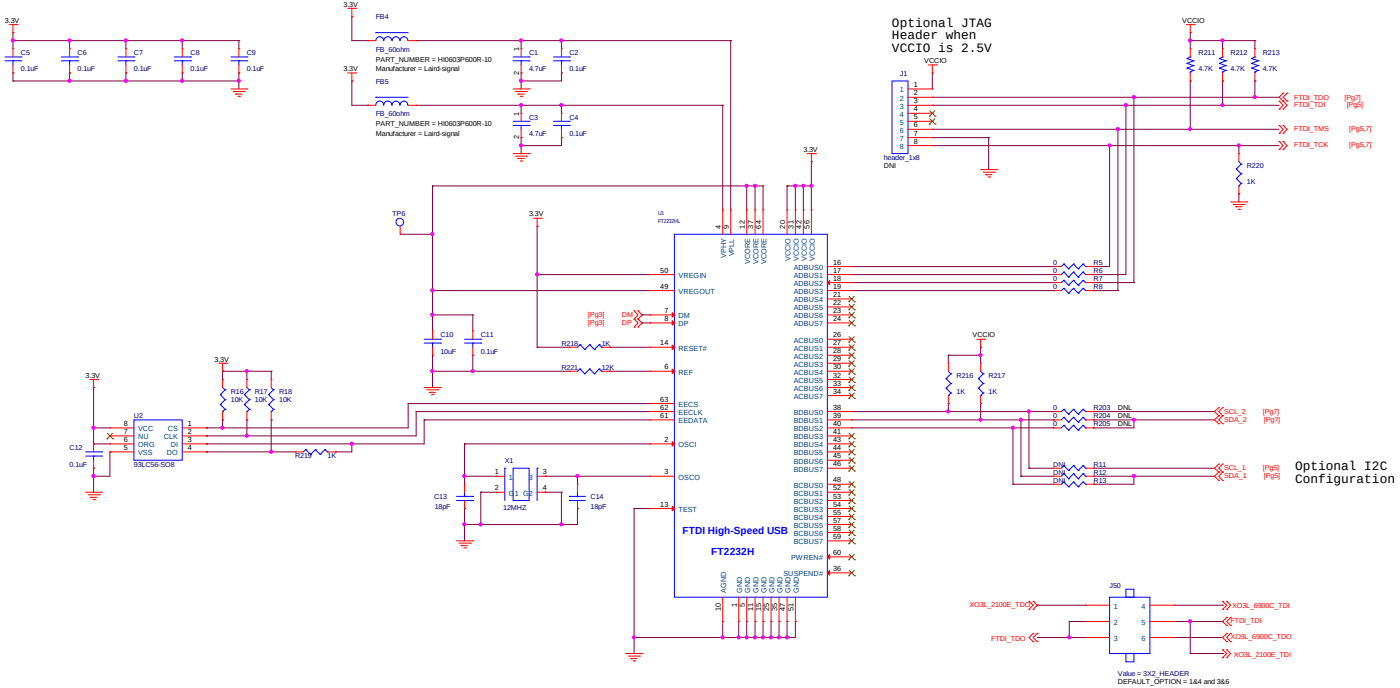
May, 2014



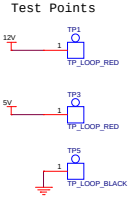
LATTICE SEMICONDUCTOR

Lattice Semiconductor Applications
Email: techsupport@latticesemi.com

Title: Block Diagram			
Size: C	Project: MachXO3L DSI Breakout Board	Schematic Rev: B	
		Board Rev: B	
Date: May, 2014	Sheet: 1 of 7		

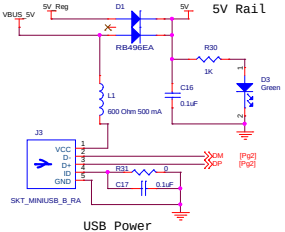

Optional JTAG Header when VCCIO is 2.5V
Optional I2C Configuration
FTDI High-Speed USB
FT2232H
JTAG Chain Options
2100 + 6900
2100 only
6900 only
LATTICE SEMICONDUCTOR
Lattice Semiconductor Applications
Email: techsupport@latticesemi.com
Title: USB to JTAG
Size: C
Project: MachXO3L DSI Breakout Board
Schematic Rev: B
Board Rev: B
Date: May, 2014
Sheet: 2 of 7

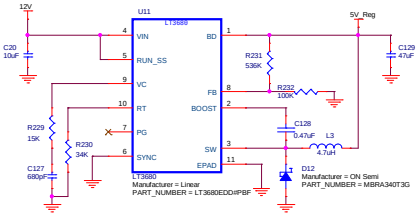
Test Points



12V Power Options
1) External 12V DC Supply
2) Signet Main Board Connector

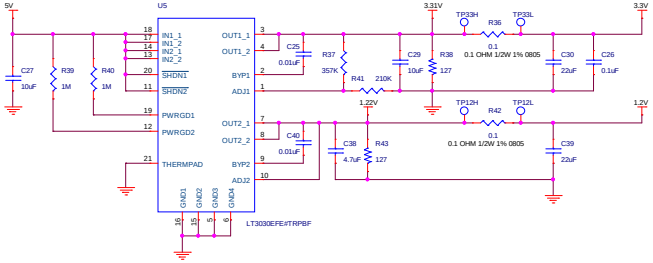
5V Power Options
1) Regulated 5V Supply
2) USB 5V



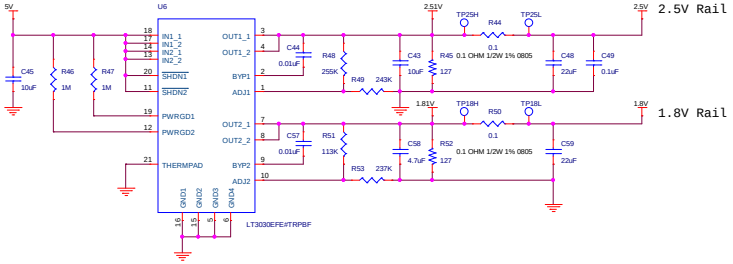


VCCIO Select
- 3.3V Default
- 2.5V Optional

Current Sense TP



Current Sense TP



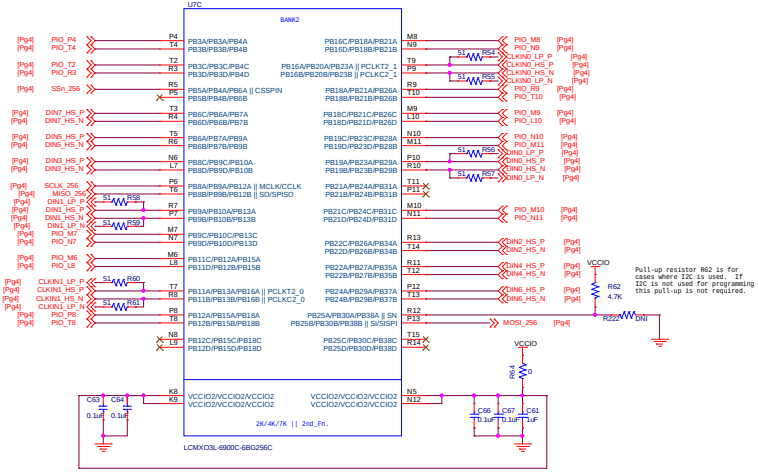
LATTICE SEMICONDUCTOR

Lattice Semiconductor Applications
Email: techsupport@latticesemi.com

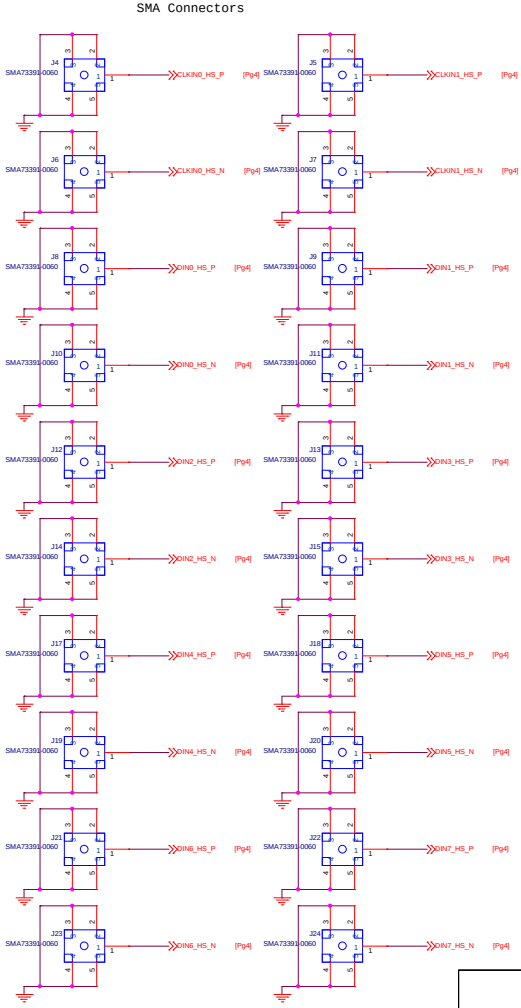
Title: Board Power			
Size: C	Project: MachXO3L DSI Breakout Board	Schematic Rev: B	
Date: May, 2014	Sheet: 3 of 7	Board Rev: B	

MIPI RX Termination

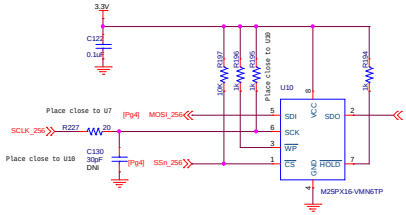
Place resistors as close to the bank 2 pins on XO3 as possible.
Arrange them so they do not influence the *HS* trace path.
Match trace length for all P and N signals. Match lengths between HS signals, match lengths between LP signals.



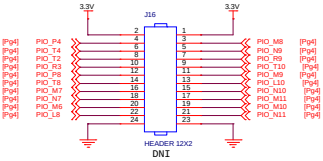
SMA Connectors

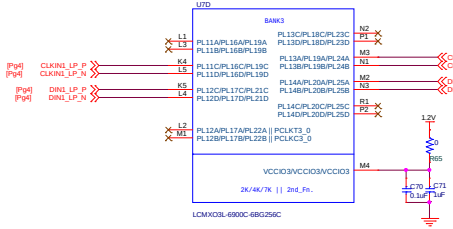


XO3L Configuration SPI Flash



IO Header



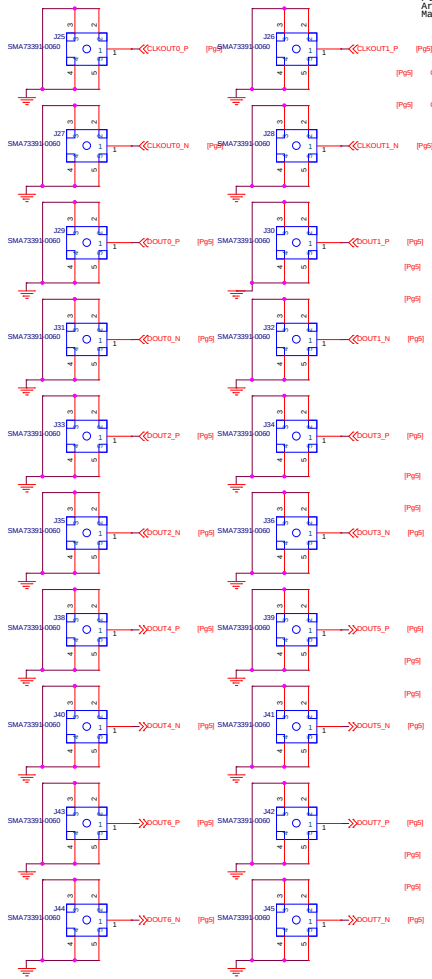


LATTICE SEMICONDUCTOR

Lattice Semiconductor Applications
Email: techsupport@latticesemi.com

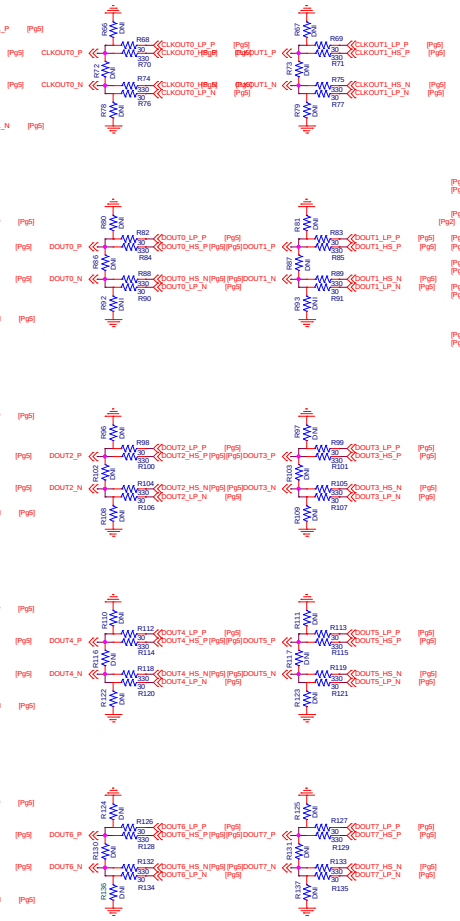
Title: DSI: SMA_INPUT			
Size: C	Project: MachXO3L DSI Breakout Board	Schematic Rev: B	
		Board Rev: B	
Date: May, 2014		Sheet: 4 of 7	

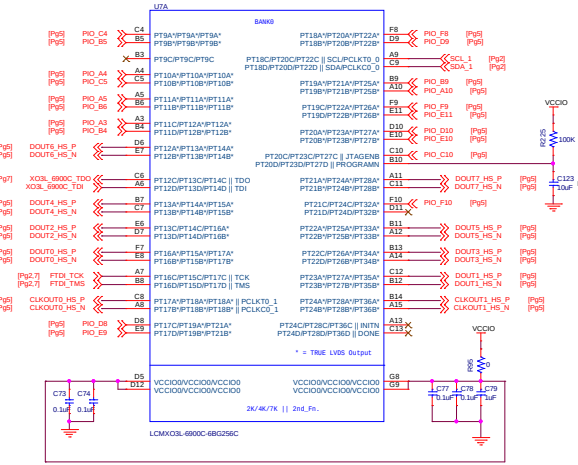
SMA Connectors

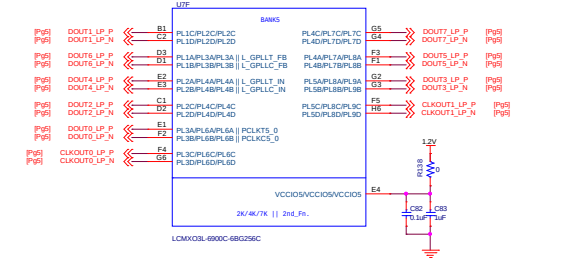


MIPI TX Termination

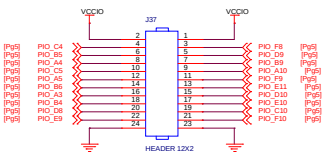
Place resistors as close to the bank 0 pins on XO3 as possible.
Arrange them so they do not influence the "HS" trace path.
Match trace length for all P and N signals. Match lengths between HS signals, match lengths between LP signals.





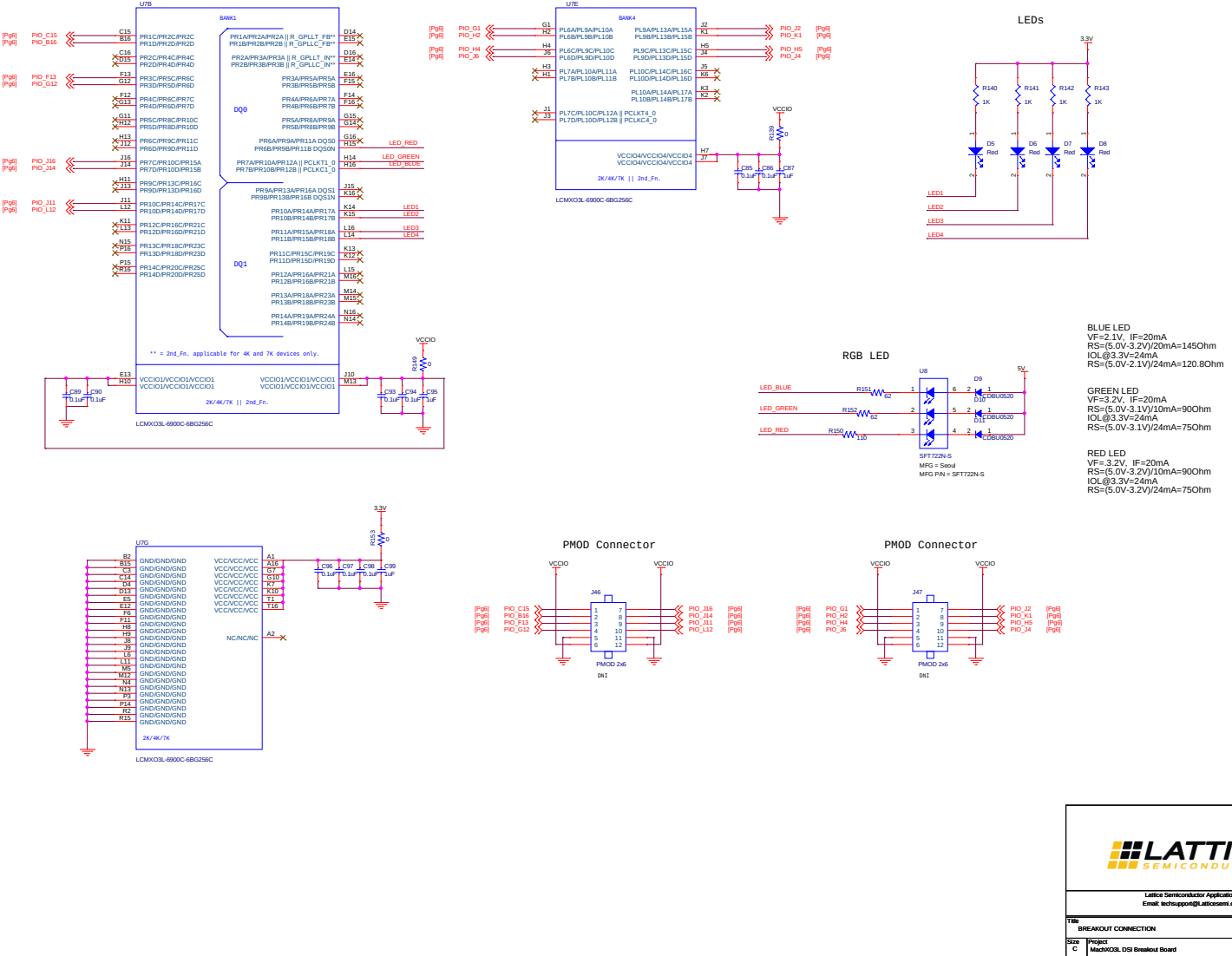


IO Header

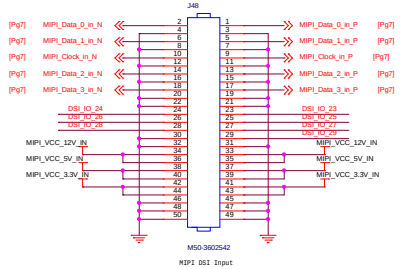


Lattice Semiconductor Applications
Email: techsupport@latticesemi.com

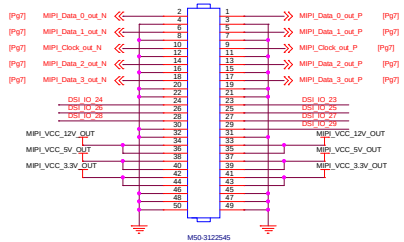
Title: DSI: SMA_OUTPUT			
Size: C	Project: MachXO3L DSI Breakout Board	Schematic Rev: B	
		Board Rev: B	
Date: May, 2014		Sheet: 5 of 7	

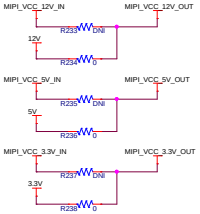

U7B
BANK1
LCMXO3L-6900C-6BG256C
U7E
BANK4
LCMXO3L-6900C-6BG256C
LEDs
3.3V
R140
R141
R142
R143
1K
D5
D6
D7
D8
Red
LED1
LED2
LED3
LED4
RGB LED
U8
5V
LED_BLUE
LED_GREEN
LED_RED
R151
R152
R150
82
110
D9
D10
D11
CDBU0520
SFT722N-S
MFG = Seoul
MFG P/N = SFT722N-S
BLUE LED
VF=2.1V, IF=20mA
RS=(5.0V-3.2V)/20mA=145Ohm
IOL@3.3V=24mA
RS=(5.0V-2.1V)/24mA=120.8Ohm
GREEN LED
VF=3.2V, IF=20mA
RS=(5.0V-3.1V)/10mA=90Ohm
IOL@3.3V=24mA
RS=(5.0V-3.1V)/24mA=75Ohm
RED LED
VF=.3.2V, IF=20mA
RS=(5.0V-3.2V)/10mA=90Ohm
IOL@3.3V=24mA
RS=(5.0V-3.2V)/24mA=75Ohm
U7G
LCMXO3L-6900C-6BG256C
PMOD Connector
J46
PMOD 2x6
DNI
PMOD Connector
J47
PMOD 2x6
DNI
LATTICE SEMICONDUCTOR
Lattice Semiconductor Applications
Email: techsupport@latticesemi.com
Title
BREAKOUT CONNECTION
Size C
Project
MachXO3L DSI Breakout Board
Schematic Rev B
Board Rev B
Date: May, 2014
Sheet 6 of 7

DSI Input Connector



DSI Output Connector



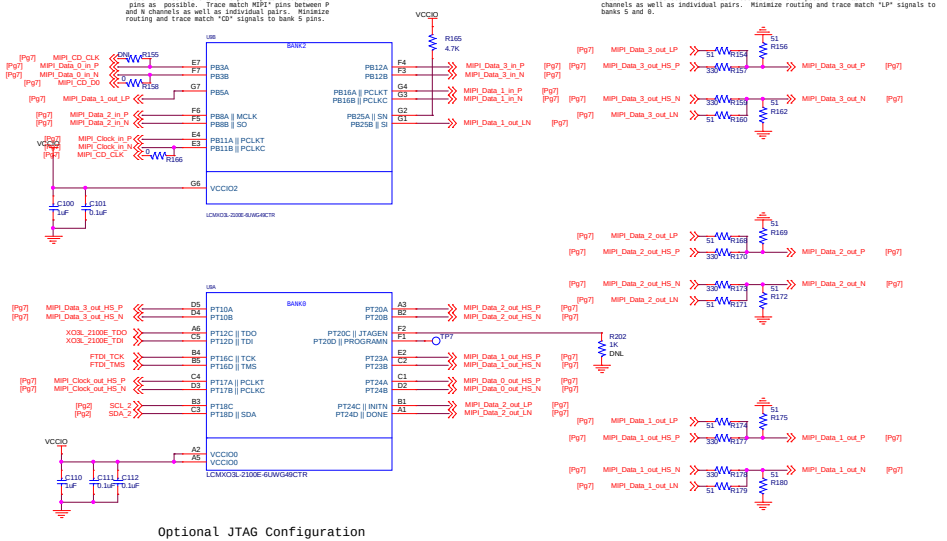


Place "CD" resistors and I2C pull up as close to bank 2 pins as possible. Trace match MIPI* pins between P and N channels as well as individual pairs. Minimize routing and trace match "CD" signals to bank 5 pins.

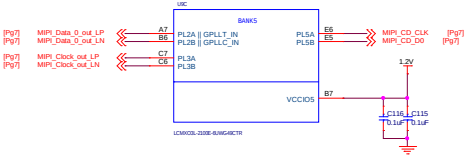
This resistor is for external pull up for cases where I2C is used. If I2C is not used for programming this signal is not needed.

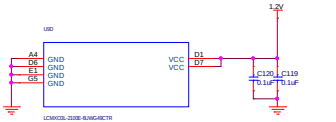
MIPI Tx Termination

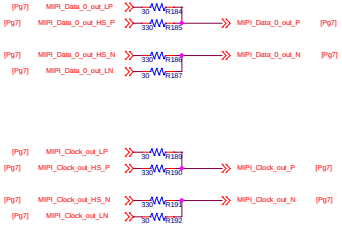
Place MIPI TX resistor network as close to bank 0 as possible. Trace match "HS" P & N channels as well as individual pairs. Minimize routing and trace match "LP" signals to banks 5 and 0.



Optional JTAG Configuration







Note: Most of the resistor size is 0603, except in Page 7, they are 0201.

LATTICE SEMICONDUCTOR

Lattice Semiconductor Applications
Email: techsupport@latticesemi.com

Title	X03 BOB + DSI : LCMXO3L-2100E-6WLCSP49		
Size C	Project MachXO3L DSI Breakout Board	Schematic Rev	B
		Board Rev	B
Date: May, 2014		Sheet 7 of 7	