



# **LIF-MD6000 Raspberry Pi Board**

## **Evaluation Board User Guide**

FPGA-EB-02005 Version 1.1

January 2018

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## 1. Introduction

This document describes the Lattice Semiconductor LIF-MD6000 Raspberry Pi Camera Link board (RPI-CL-EVN) that is part of the two inputs to one output MIPI® Camera Serial Interface (CSI-2) camera aggregator bridge solution. This solution aggregates the data from two image sensors and outputs it to a single MIPI® CSI-2 output. The Raspberry Pi Camera Link board allows the Raspberry Pi camera modules to interface to the CrossLink™ LIF-MD6000 Master Link board. The Raspberry Pi camera module is attached to this board via a ribbon cable to the 15-pin connector.

The CrossLink: LIF-MD6000 Raspberry Pi Boards kit (LIFMD-RPI-EVN) consists of two LIF-MD6000 Raspberry Pi Camera Link Boards (RPI-CL-EVN) and one LIF-MD6000 Raspberry Pi AP Link Board (RPI-APL-EVN).

For the latest information about this board, visit

[www.latticesemi.com/en/Products/DevelopmentBoardsAndKits/CrossLinkLIFMD6000RaspberryPiBoards](http://www.latticesemi.com/en/Products/DevelopmentBoardsAndKits/CrossLinkLIFMD6000RaspberryPiBoards)

For details about the CrossLink FPGA, refer to FPGA-DS-02007, [CrossLink Family Data Sheet](#).

The content of this user guide includes descriptions of connectors, schematics, and bill of materials of the LIF-MD6000 Raspberry Pi Camera Link board. Refer to [Appendix A](#) and [Appendix B](#) for the schematics and BOM.

[Figure 1.1](#) shows the top view of the Raspberry Pi Camera Link board, and [Figure 1.2](#) shows the bottom view of the board.

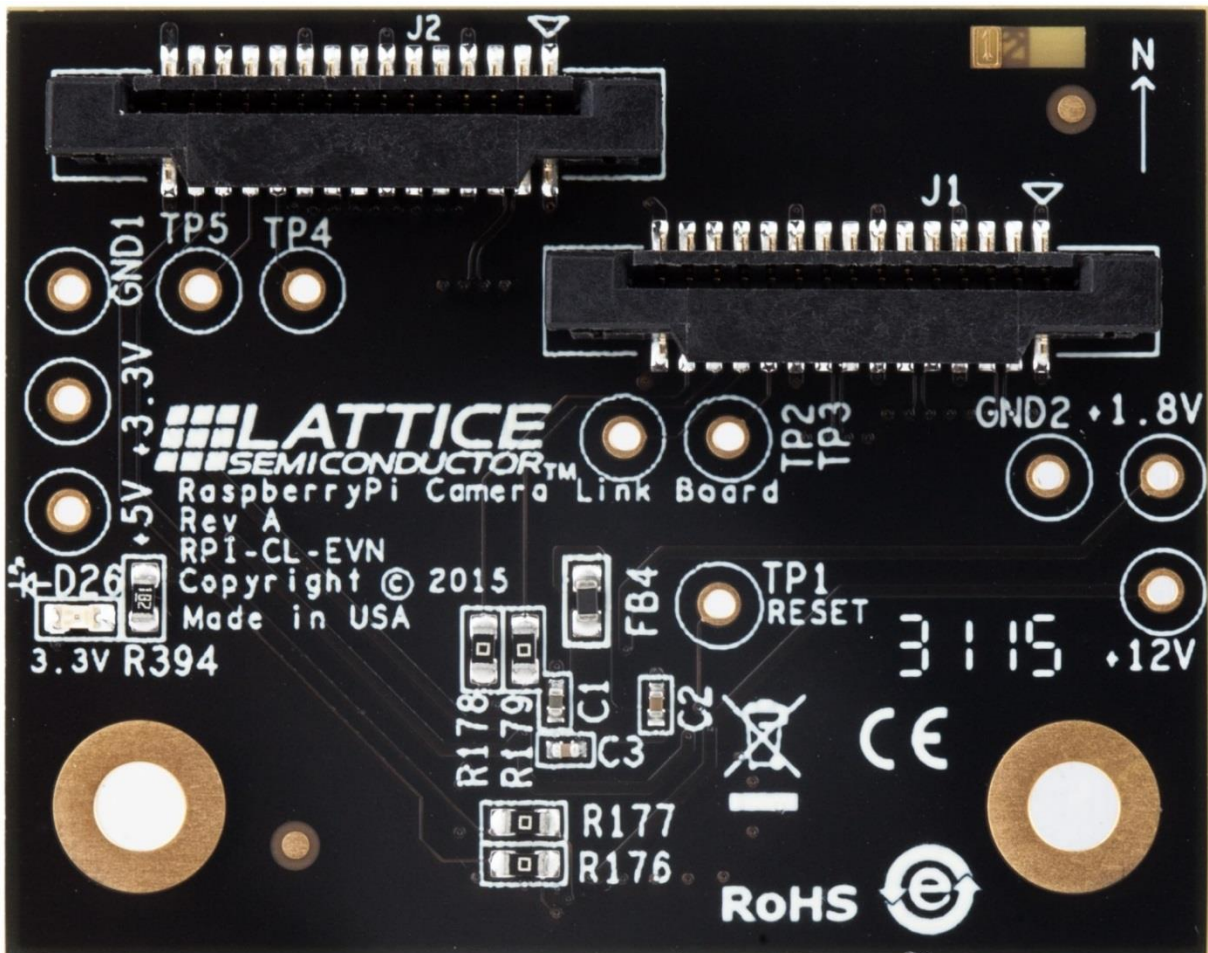


Figure 1.1. Top View of Raspberry Pi Camera Link Board

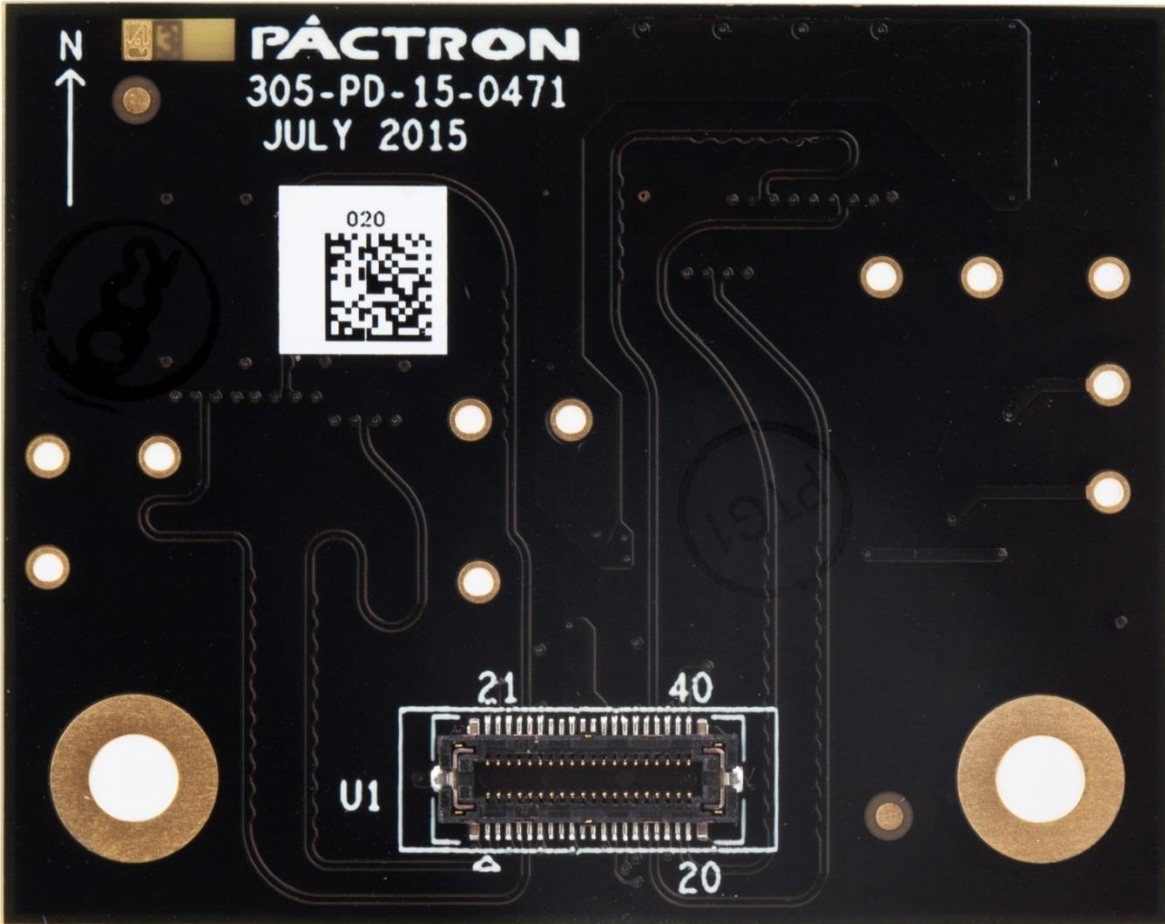


Figure 1.2. Bottom View of Raspberry Pi Camera Link Board

## 2. Headers and Test Connections

Figure 1.1 and Figure 1.2 show the top and bottom views of the Raspberry Pi Camera Link board. The connectors on the board provide an interface between LIF-MD6000 Master Link board and Raspberry Pi camera modules. Table 2.1 lists the headers and test connectors.

**Table 2.1. Headers and Test Connectors**

Part	Description	Setting
J1	15-pin connector to interface to Raspberry Pi camera module	—
J2	15-pin connector to interface to Raspberry Pi camera module	—
U1	40-pin connector to interface to CrossLink Master Link board	—

**Table 2.2. J1 and J2 Connector Description**

Pin	J1	J2
1	GND	GND
2	CH0_DATA0_N	CH2_DATA0_N
3	CH0_DATA0_P	CH2_DATA0_P
4	GND	GND
5	CH0_DATA1_N	CH2_DATA1_N
6	CH0_DATA1_P	CH2_DATA1_P
7	GND	GND
8	CH0_DCK_N	CH2_DCK_N
9	CH0_DCK_P	CH2_DCK_P
10	GND	GND
11	GPIO1	GPIO1
12	GPIO2	GPIO2
13	SCL1	SCL2
14	SDA1	SDA2
15	3V3_AP	3V3_AP

**Table 2.3. U1 Connector Description**

Pin	Name
1	CH0_DCK_P
2	CH0_DCK_N
3	GND
4	CH0_DATA0_P
5	CH0_DATA0_N
6	GND
7	CH0_DATA2_P
8	CH0_DATA2_N
9	GND
10	SN
11	SCLK

**Table 2.3. U1 Connector Description (Continued)**

Pin	Name
12	PWR_12V
13	SDA1
14	SCL1
15	GND
16	CH2_DATA0_P
17	CH2_DATA0_N
18	GND
19	CH2_DCK_P
20	CH2_DCK_N
21	PWR_12-0V
22	RESETN
23	PWR_5-0V
24	CH0_DATA1_P
25	CH0_DATA1_N
26	PWR_3-3V
27	CH0_DATA3_P
28	CH0_DATA3_N
29	PWR_1-8V
30	MOSI
31	MISO
32	PWR_1-8V
33	GND
34	GND
35	PWR_3-3V
36	CH2_DATA1_P
37	CH2_DATA1_N
38	PWR_5-0V
39	SDA
40	SCL

### 3. Power Supply

Power is provided to the Raspberry Pi Camera Link board from the Crosslink Master Link board through U1 connector.


Table 3.1 lists the power status LED.

**Table 3.1. Power LED**

Voltage Rail	LEDs	Colour
3.3	D26	Green

## 4. Ordering Information

Table 4.1. Ordering Information

Description	Ordering Part Number	China RoHS Environment-Friendly Use Period (EFUP)
CrossLink: LIF-MD6000 Raspberry Pi Boards Kit includes one Raspberry Pi AP Link Board and two Raspberry Pi Camera Link Boards	LIFMD-RPI-EVN	

## References

For more information, refer to:

- FPGA-DS-02007, [CrossLink Family Data Sheet](#)
- UG117, [2:1 MIPI CSI-2 Image Sensor Aggregator Bridge Demo User Guide](#)

## Technical Support Assistance

Submit a technical support case through [www.latticesemi.com/techsupport](http://www.latticesemi.com/techsupport).



## Appendix A. Raspberry Pi Camera Link Board Schematics

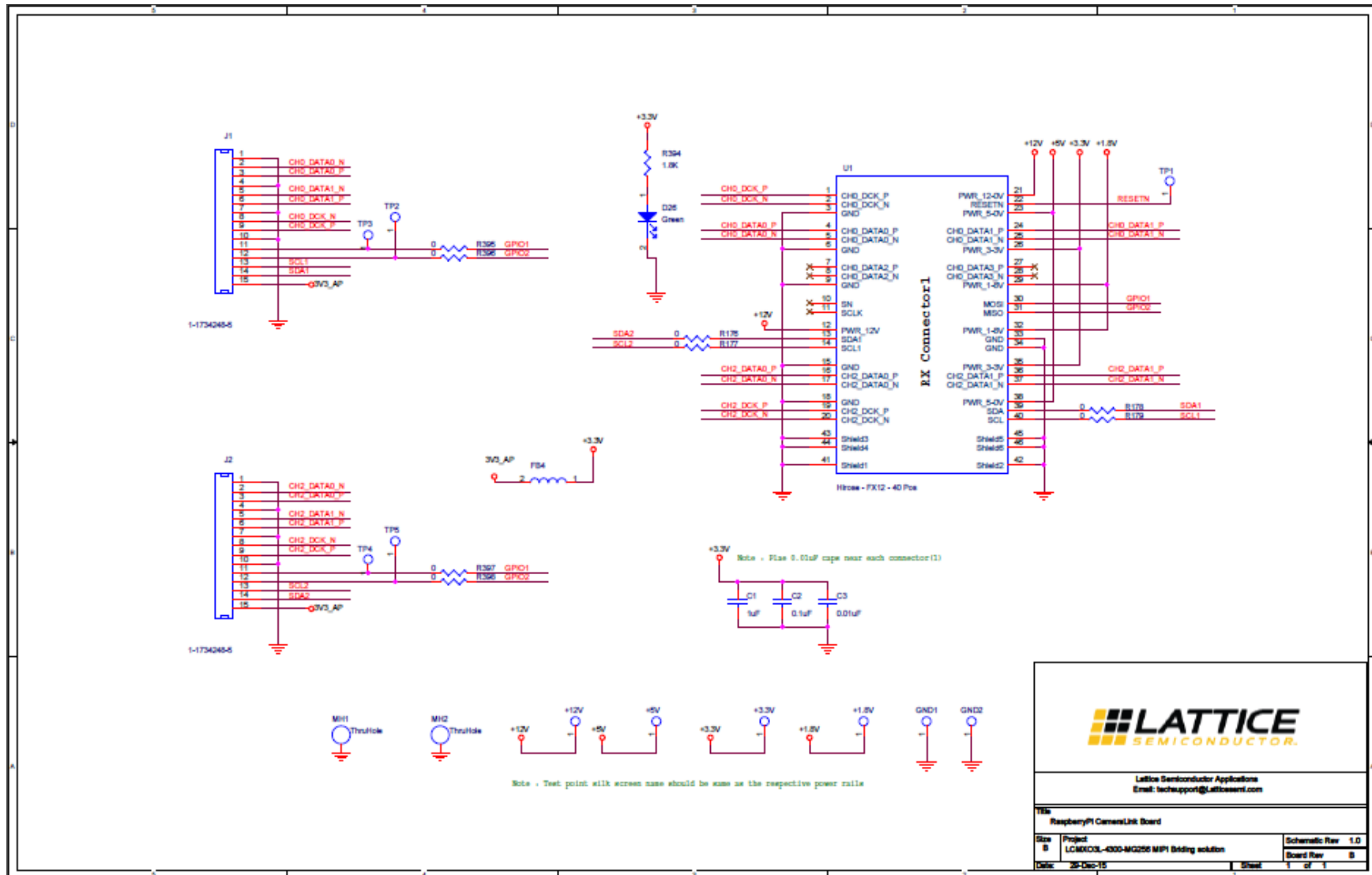


Figure A.1. Raspberry Pi Camera Link Board

## Appendix B. Raspberry Pi Camera Link Board Bill of Materials

### Raspberry Pi Camera Link Board Bill of Materials

Item	Reference	Quantity	Part	PCB Footprint	Comments	PART_NUMBER	Manufacturer	Description
1	TP1, GND1, TP2, GND2, TP3, TP4, TP5, +5V, +12V, +1.8V, +3.3V	11	TP_S_40_63	tp_s_40_63	DNL	—	—	Square test point, 40 mil inner diameter, 63 mil outer diameter
2	C1	1	1 $\mu$ F	C0402	—	C0402C105K9 PACTU	Kemet	CAP CERAMIC 1 $\mu$ F 6.3 V X5R 0402
3	C2	1	0.1 $\mu$ F	C0402	—	C0402C104K4 RACTU	Kemet	CAP CERAMIC 0.1 $\mu$ F 16 V X7R 0402
4	C3	1	0.01 $\mu$ F	C0402	—	C0402C103J4 RACTU	Kemet	CAP CERAMIC 10 nF 16 V 5% X7R 0402
5	D26	1	Green	led_0603	—	LTST-C190KGKT	LITE-On INC	LED SUPER GREEN CLEAR 0603 SMD
6	FB4	1	3 A	FB0603	—	BKP1608HS33 0-TV	Taiyo Yuden	FERRITE BEAD 33 $\Omega$ 0603
7	J1, J2	2	1-1734248-5	1-1734248-5	—	1-1734248-5	TE CONNECTIVITY	CONN FPC VERT 15 POS 1.00 mm SMD
8	MH1, MH2	2	ThruHole	MTG125	DNL	—	—	—
9	R176, R177, R178, R179	4	0	R0603	—	RC0603JR-070RL	Yageo	Res 1/10 W 0.0 $\Omega$ 5% 0603
10	R394	1	1.8K	R0603	—	RC0603FR-071K8L	Yageo	Thick Film Resistors - SMD 1.8 k $\Omega$ 1%
11	U1	1	Hirose - FX12 - 40 Pos	Hirose-FX12S	—	FX12B-40S-0.4SV	Hirose Electric Co Ltd	Conn Board to Board PL 40 POS 0.4 mm Solder ST SMD T/R
12	RASPBERRYPI CAMERALINK BOARD PCB	1	—	—	—	305-PD-15-0471	PACTRON	—

## Revision History

Date	Version	Change Summary
January 2018	1.1	<ul style="list-style-type: none"><li>• Changed CrossLink pASSP to CrossLink FPGA in the <a href="#">Introduction</a> section.</li><li>• Updated Lattice Logo on the cover pages, headers, and footers of this document.</li></ul>
April 2017	1.0	Initial release.



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