Raspberry Pi Camera Connector Daughter Card User Guide

RPICAM-DC-UG-v1.3
October 2022
www.efinixinc.com

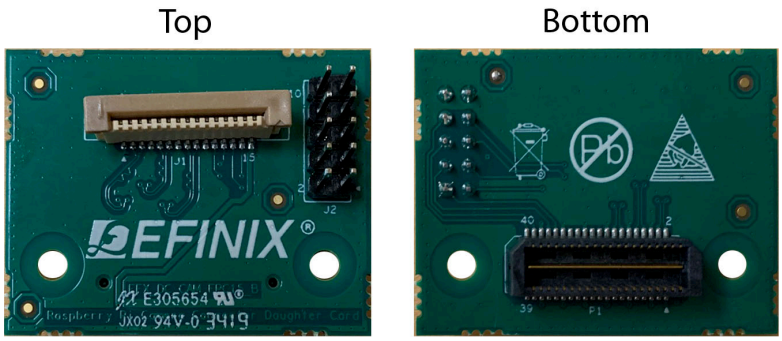
Contents

Introduction

The Raspberry Pi Camera Connector Daughter Card (part number: EFX_DC_CAM_FPC15_B) bridges between the development board and a Raspberry Pi camera module. The daughter card connects to a Raspberry Pi computer or any Raspberry Pi camera using a 15 pin flat cable. Additionally, the board has a 10 pin header for optional camera control pins.

Learn more: Refer to the **Raspberry Pi Camera Connector Daughter Card Schematics and BOM** for the part details and schematics.

Figure 1: Raspberry Pi Camera Connector Daughter Card



Warning: The board can be damaged without proper anti-static handling.

Supported Development Boards

You can use Raspberry Pi Camera Connector Daughter Card with:

- Titanium Ti60 F225 Development Board
- Trion T120 BGA576 Development Board
- Trion T120 BGA324 Development Board
- Trion T20 MIPI Development Board

What's in the Box?

The Raspberry Pi Camera Connector Daughter Card includes:

- Raspberry Pi Camera Connector Daughter Card
- 2 standoffs
- 2 screws
- 2 nuts

Features

- Bridges 40-pin MIPI CSI-2 interface on a Trion MIPI-enabled development board to a 15-pin interface
- Pin to pin compatible with Raspberry Pi cameras
- Supports up to 1.5 Gbps on MIPI interface
- User selectable pins for optional camera functions
- Power supplied from the Trion MIPI-enabled development board; no external power required; each pin supports up to 3 A

Note: For technical support using Raspberry Pi cameras, please refer to their web site at www.raspberrypi.org.

Headers

Table 1: Raspberry Pi Camera Connector Daughter Card Headers

Reference Designator	Description
P1	40-pin QTE header bringing MIPI signals, power, and 1.8 V GPIO pins from the Trion MIPI-enabled development board.
J1	15-pin flexible printed cable (FPC) connector for Raspberry Pi MIPI camera modules.
J2	10-pin header for optional Raspberry Pi MIPI camera module signals.

Header P1 (Development Board Connector)

P1 is a 40-pin QTE header to connect the daughter card to the development board. The header provides MIPI signals and power to the camera module.

- *Raspberry Pi computer*—When using this daughter card with a Raspberry Pi computer, connect header P1 to a MIPI TX socket on the development board.
- *Raspberry Pi camera*—When using this daughter card with a Raspberry Pi camera, connect header P1 to a MIPI RX socket on the development board.

Table 2: Development Board Connector (P1)

where *n* is RXD or TXD, depending on whether you are connecting to a camera or Raspberry Pi computer.

Pin Number	Pin Name	Description	Pin Number	Pin Name	Description
1	3V3_15FPC	3.3V Supply	2	MIPI_P0_15FPC	Differential MIPI lane 0
3	NC	No connect	4	MIPI_N0_15FPC	
5	GND	Ground	6	GND	Ground
7	NC	No connect	8	MIPI_P1_15FPC	Differential MIPI lane 1
9	NC		10	MIPI_N1_15FPC	
11	GND	Ground	12	GND	Ground
13	NC	No connect	14	MIPI_P2_15FPC	Differential MIPI lane 2
15	NC		16	MIPI_N2_15FPC	
17	GND	Ground	18	GND	Ground
19	NC	No connect	20	NC	No connect
21	NC		22	NC	
23	GND	Ground	24	GND	Ground
25	NC	No connect	26	NC	No connect
27	NC		28	NC	
29	GND	Ground	30	GND	Ground
31	NC	No connect	32	GPIO0	1.8 V GPIO
33	NC		34	GPIO1	1.8 V GPIO
35	GND	Ground	36	GND	Ground
37	NC	No connect	38	GPIO2	1.8 V GPIO
39	NC		40	GPIO3	1.8 V GPIO

Header J1 (Raspberry Pi FPC15 Connector)

J1 is a 15-pin flexible flat cable header for connecting to a Raspberry Pi MIPI camera module.

- *Raspberry Pi computer*—When using this daughter card with a Raspberry Pi computer, these pins are TX.
- *Raspberry Pi camera*—When using this daughter card with a Raspberry Pi camera, these pins are RX.

Table 3: Raspberry Pi FPC15 Connector (J1)

where *n* is RXD or TXD, depending on whether you are connecting to a camera or Raspberry Pi computer.

Pin Number	Pin Name	Description
1	GND	Ground
2	MIPI_N0_15FPC	Differential MIPI lane 0
3	MIPI_P0_15FPC	
4	GND	Ground
5	MIPI_N1_15FPC	Differential MIPI lane 1
6	MIPI_P1_15FPC	
7	GND	Ground
8	MIPI_N2_15FPC	Differential MIPI lane 2
9	MIPI_P2_15FPC	
10	GND	Ground
11	GPIO2_15FPC	GPIO for Raspberry Pi MIPI camera module
12	GPIO3_15FPC	
13	GPIO0_15FPC	Serial clock for Raspberry Pi MIPI camera module
14	GPIO1_15FPC	Serial data for Raspberry Pi MIPI camera module
15	3V3_15FPC	3.3 V power supply

Header J2 (Optional Camera Signals)

The J2 header has optional pins (SCL and SDA) that are used for MIPI Camera Command Set (CSS) transactions. These signals are routed to the Trion® FPGA on the board. You can control these pins with an external device by removing the jumpers and connecting wires from the header to an external device.

Note: If you connect jumpers to any pins in J2, do not use the corresponding GPIO in your design. For example, if you use jumpers on pins 1-2 and 3-4, do not use `GPIO_69` or `GPIO_70`.

Table 4: Optional Camera Signals (J2)

Pin Number	Pin Name	Description	Pin Number	Pin Name	Description
1	GPIO0	1.8 V I/O from development board	2	GPIO0_15FPC	I^2C bus SCL signal
3	GPIO1		4	GPIO1_15FPC	I^2C bus SDA signal
5	GPIO2		6	GPIO2_15FPC	Camera GPIO
7	GPIO3		8	GPIO3_15FPC	Camera clock
9	GND	Ground	10	GND	Ground

Installing Standoffs

Before using the board, attach the standoffs with the screws provided in the kit.

Warning: You can damage the board if you over tighten the screws. Tighten all screws to a torque between 4 ± 0.5 kgf/cm and 5 ± 0.5 kgf/cm.

Revision History

Table 5: Revision History

Date	Version	Description
October 2022	1.3	Added part number. (DOC-917) Added supported development board.
April 2021	1.2	Updated J2 header pin names.
December 2020	1.1	Updated header pin names.
May 2020	1.0	Initial release.