

DLP® LightCrafter™ Display 3310 EVM User's Guide

User's Guide



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DLP® LightCrafter™ Display 3310 EVM Overview

This user's guide presents an overview of the DLP® LightCrafter™ Display 3310 evaluation module (EVM) and a general description of the main features and functions. It explains the first steps to getting started and shows a detailed description of on board LEDs, connectors, and overall EVM assembly. It will give the user a start with their first DLP LightCrafter Display 3310 evaluation module.

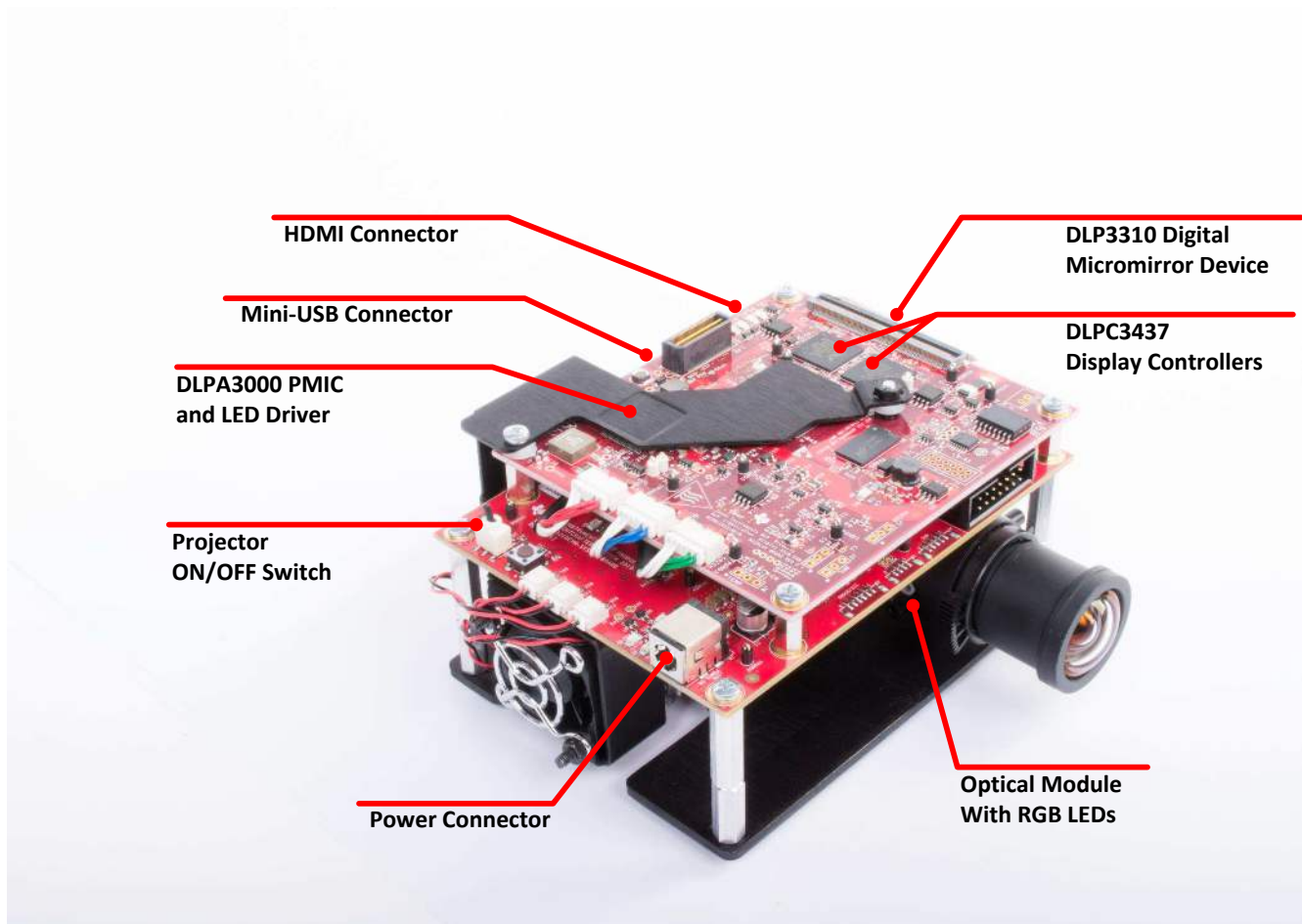


Figure 1-1. DLP LightCrafter Display Complete EVM

In addition to this document, reference the documents listed in [Chapter 3](#).

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Safety Instructions

CAUTION



Hot surface. To minimize risk of burns, do not touch.

WARNING



Possible hazardous optical radiation emitted from this product. Do not stare at the operating lamp. May be harmful to the eye.

WARNING



Observe handling precautions. Electrostatic sensitive devices.

WARNING

Always ensure all fans are running during operation to help avoid overheating and ensure reliable operation.

Applicable Documents

The following documents are applicable to the DLP LightCrafter Display 3310 EVM and are available at TI.com (www.ti.com).

- DLP3310 0.33 1080p DMD ([DLPS077](#))
- DLPA3000 PMIC and High-Current LED Driver IC ([DLPS052](#))
- DLPC3437 Display Controller ([DLPS084](#))
- DLPC3437 Software Programmer's Guide ([DLPU062](#))
- DLP® LightCrafter™ Display EVM GUI Tool ([DLPU021](#))

If you need assistance, refer to the [DLP Products and MEMS TI E2E™ community support forums](#).

DLP LightCrafter Display 3310 EVM Components

The DLP LightCrafter Display module consists of three subsystems:

- Light engine – Includes the optics, red, green, and blue LEDs, and a Full-HD DMD capable of 300 lumens out-of-the-box.
- Display board – Includes the DLP chipset comprised of DLPC3437 controllers and DLPA3000 PMIC/LED driver.
- System board – Includes the MSP430, ITE HDMI receiver, USB-Serial Bridge controller and several connectors for external inputs (HDMI, USB, and so forth).

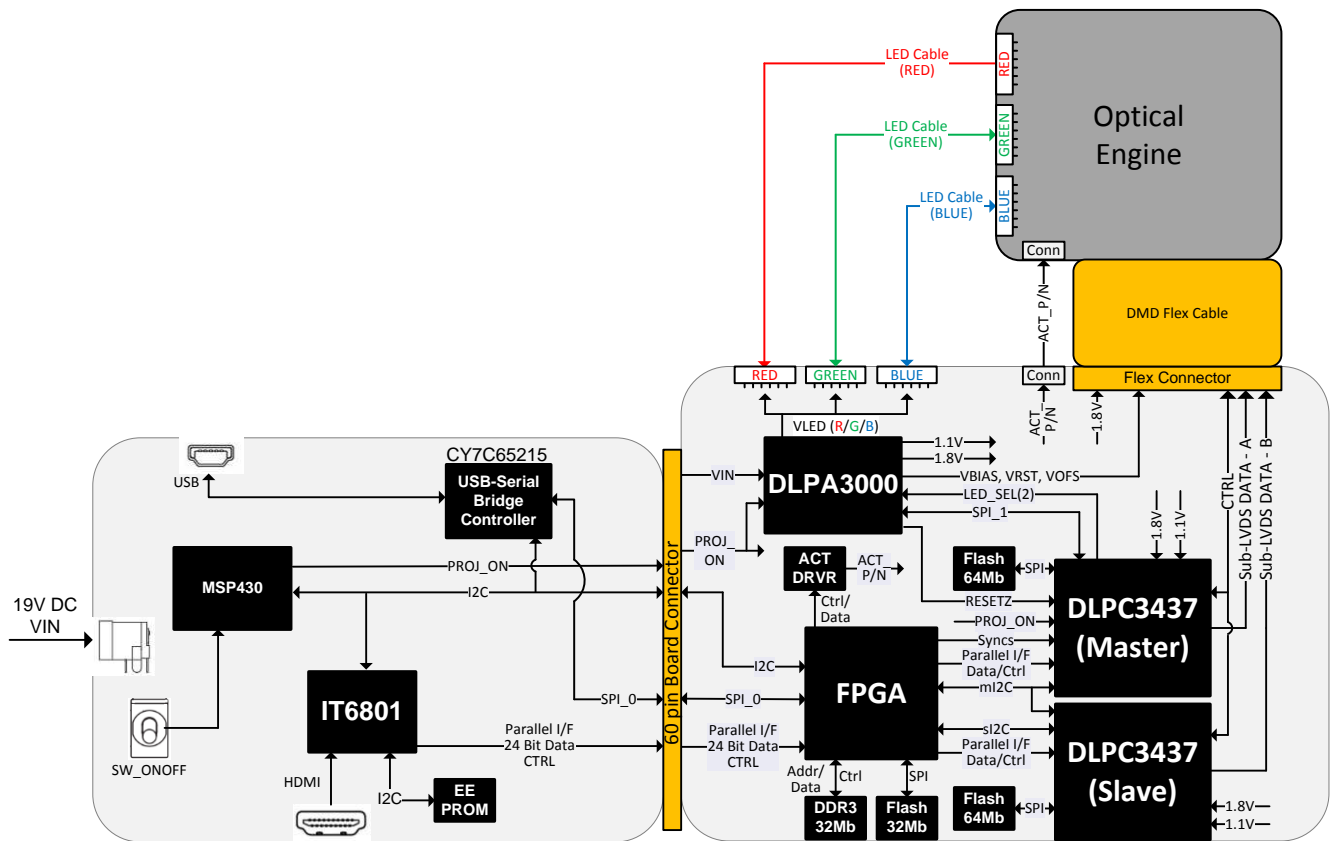


Figure 4-1. DLP LightCrafter Display EVM Block Diagram

Light Engine

The optical engine in the EVM is developed by Young Optics and is production ready.

The light engine consists of the following components:

- DLP3310 (0.33-inch Full-HD DMD)
- Osram red, green, and blue LEDs

Table 5-1. Optical Engine Specifications

PARAMETER	MIN	TYP	MAX	UNIT
Brightness at 6-A RGB LED Current		320		Lm
RGB LED Current		6		A
Brightness Uniformity	85%			
Throw Ratio		1.2		
Offset		100%		
Focusable Diagonal Image Size	60		120	inch

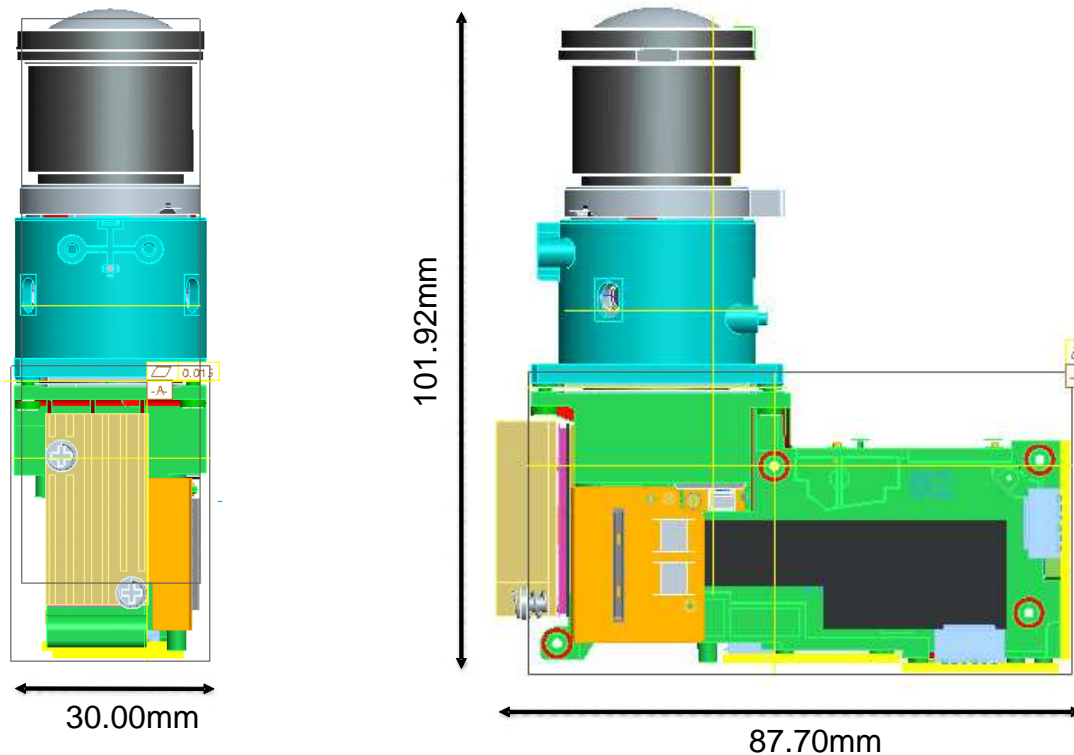


Figure 5-1. Optical Engine Dimensions

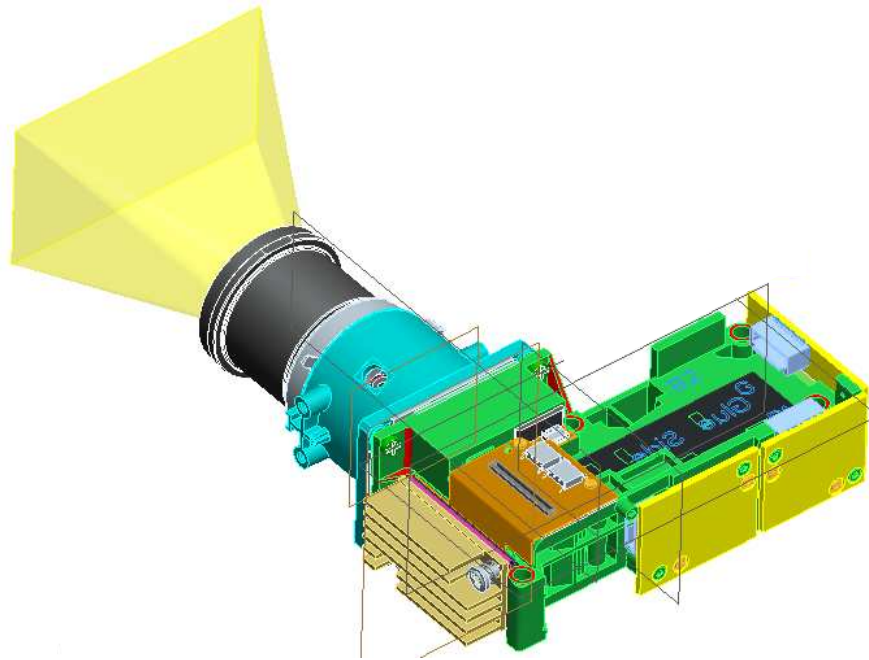


Figure 5-2. Optical Engine View

Quick-Start Procedure

This quick-start assumes default conditions as shipped.

1. Power up the DLP LightCrafter™ Display 3310 EVM by applying an external DC power supply (19-V DC, 3.42 A) to the J4 connector. **External Power Supply Requirements:**
 - Nominal Output Voltage: 19 VDC
 - Minimum Output Current: 2.5 A; Max Output Current: 3.42 A
 - Efficiency Level: VI

NOTE: TI recommends using an external power supply that complies with applicable regional safety standards such as UL, CSA, VDE, CCC, and PSE.
NOTE: The P5V_VIN (D1) and P3P3V_SB (D7) LEDs on the System board will turn on to indicate that 5-V power and 3.3-V power are applied.
2. Move SW2 switch to the ON position to turn on the DLP LightCrafter Display 3310 EVM. When the DLP LightCrafter Display 3310 EVM is turned on, the PROJ_ON LED (D5) will turn on.
3. After the DLP LightCrafter Display 3310 EVM is turned on; the projector will default to displaying a DLP LightCrafter Display splash image.
4. The focus of the image can be adjusted manually on the optical engine.



Figure 6-1. Optical Engine with Focus Adjustment

5. Connect the USB to the DLP LightCrafter™ Display 3310 EVM and open the latest GUI on your computer. If needed, connect an HDMI source to the EVM and communicate to the EVM via the GUI software.
6. When turning off the projector, turn off the SW2 switch prior to removing the power cable.
Note: To avoid potential damage to the DMD, it is recommended to turn off the projector with the SW2 switch before disconnecting the power.

There are fourteen indicator LEDs on the DLP LightCrafter Display 3310 EVM (Display and System boards), and they are defined in [Table 6-1](#):

Table 6-1. LEDs on the DLP LightCrafter Display 3310 EVM

Board	LED Reference	Signal Indication	Description
System	D1	P5V_VIN	Regulated 5-V power on.
System	D3	MSP430_REQ	ON when Cypress CY65215 requests the MSP430 to give Cypress master control of the I ² C bus.
System	D4	MSP430_ACK	ON when Cypress CY65215 is I ² C master. OFF when MSP430 is I ² C master.
System	D5	PROJ_ON	On when Projector is turned on via SW_ONOFF
System	D6	RESETZ	OFF when Projector is turned on via SW_ONOFF.
System	D7	P3P3V_SB	Regulated 3.3-V power on.
System	D8	MSP_LED2_ON_Z	ON when HDMI cable is plugged in and external video is detected. OFF when external video is not detected.
System	D9	GPIO_1	Blinking when PC is communicating to flash over SPI.
System	D10	GPIO_0	Blinking when PC is communicating to DLPC3437 over I ² C.
Display	D1	P12V	Regulated 12-V power on.
Display	D2	DONE	ON when FPGA configuration is completed.
Display	D7	INIT_B	On when FPGA initialization is completed. OFF indicates that the FPGA is in reset or when there is a configuration error.
Display	D8	mHOST_IRQ	ON during Master DLPC3437 Boot. OFF when projector is running. Indication of Master DLPC3437 boot-up completed and ready to receive commands.
Display	D9	sHOST_IRQ	ON during Slave DLPC3437 Boot. OFF when projector is running. Indication of Slave DLPC3437 boot-up completed and ready to receive commands.

Circuit Description

7.1 Connectors and Switches on System Board

Table 7-1. Connectors and Switches on System Board

CONNECTORS/ HEADERS/ SWITCHES	DESCRIPTION
J1	MSP430 JTAG Programming interface connector.
J2	Reserved (not installed by default).
J3	Reserved (not installed by default).
J4	Connector for 19-V external power supply interface.
J5	Reserved (not installed by default).
J6	Header for EDID programming.
J7	Header for 5-V DC power (used for LED cooling fan).
J8	Header for 5-V DC power (used for LED cooling fan).
J9	Header for 5-V DC power (used for LED cooling fan).
J10	Connector (60-pin) for DLP LightCrafter Display board interface.
J11	Connector for HDMI input.
J12	Connector for USB cable.
J13	Connector for the I ² C interface (DevaSys box, not installed by default).
SW1	Reserved.
SW2	Projector ON/OFF Switch.

7.2 Connectors on DLP LightCrafter Display Board

Table 7-2. Connectors on the DLP LightCrafter Display Board

CONNECTORS	DESCRIPTION
J1	Reserved (not installed by default).
J2	Reserved (not installed by default).
J3	Reserved (not installed by default).
J4	Reserved (not installed by default).
J5	Connector for optical engine flex cable.
J6	Reserved (not installed by default).
J7	Reserved (not installed by default).
J8	Connector for Green LED cable.
J9	Connector for Blue LED cable.
J10	Connector for the DMD interface flex cable.
J11	Connector for Red LED cable.
J12	Connector (60-pin) for FPD interface.
J13	Connector (60-pin) for DLP LightCrafter System board interface.

EVM Setup

The DLP LightCrafter Display 3310 EVM is composed of three parts:

- System board
- DLP LightCrafter Display board
- Engine with LED connections and Flex cables

The system board contains the connector for the power supply, a USB connector to communicate to the DLP LightCrafter Display software, HDMI, and the connector for the DLP LightCrafter Display board. The system board also contains a switch to turn on the projector in case the DLP LightCrafter Display board and the engine are connected. [Figure 8-1](#) shows the main connectors on the system board.

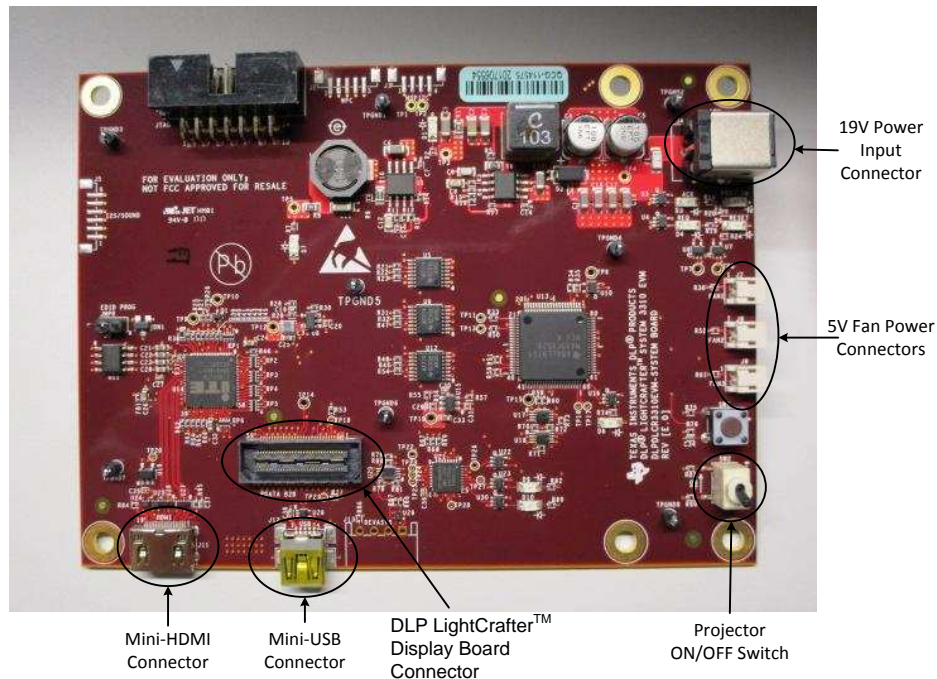


Figure 8-1. DLP LightCrafter Display System Board

The DLP LightCrafter Display board contains the RGB LED connectors, the Flex cable connector, and the system board connector. To connect the system board to the DLP LightCrafter Display board, refer to [Figure 8-2](#). Note that the system board connector on the DLP LightCrafter Display board is on the bottom, while the LED and Flex cable connectors are on the top.

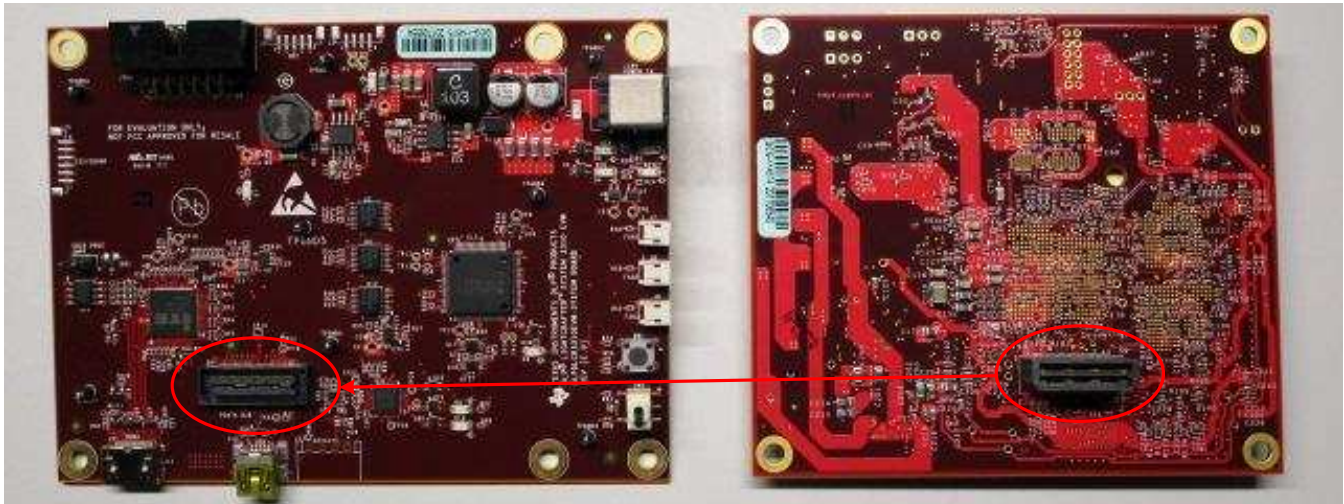


Figure 8-2. Connection System Board and DLP LightCrafter Display Board

[Figure 8-3](#) shows the display board and how it connects to the system board. The different connectors for each LED are named on the board as well as on the light engine.

Always ensure a good connection of the flex cables and LED cables to the DLP LightCrafter Display board before turning it on.

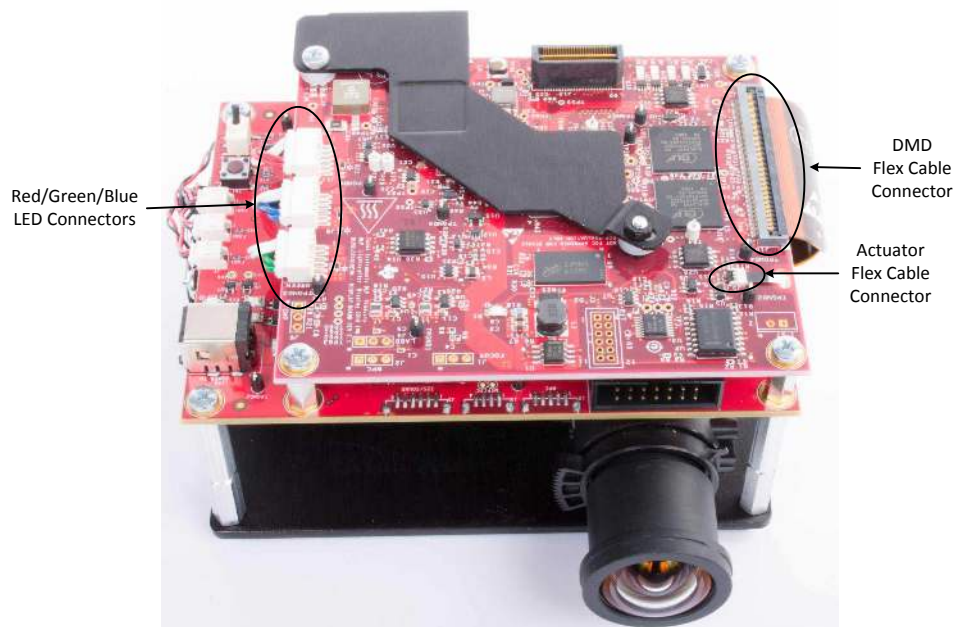


Figure 8-3. DLP LightCrafter Display EVM

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