

# **DLP LightCrafter™ Display 4710 EVM Gen2 User's Guide**

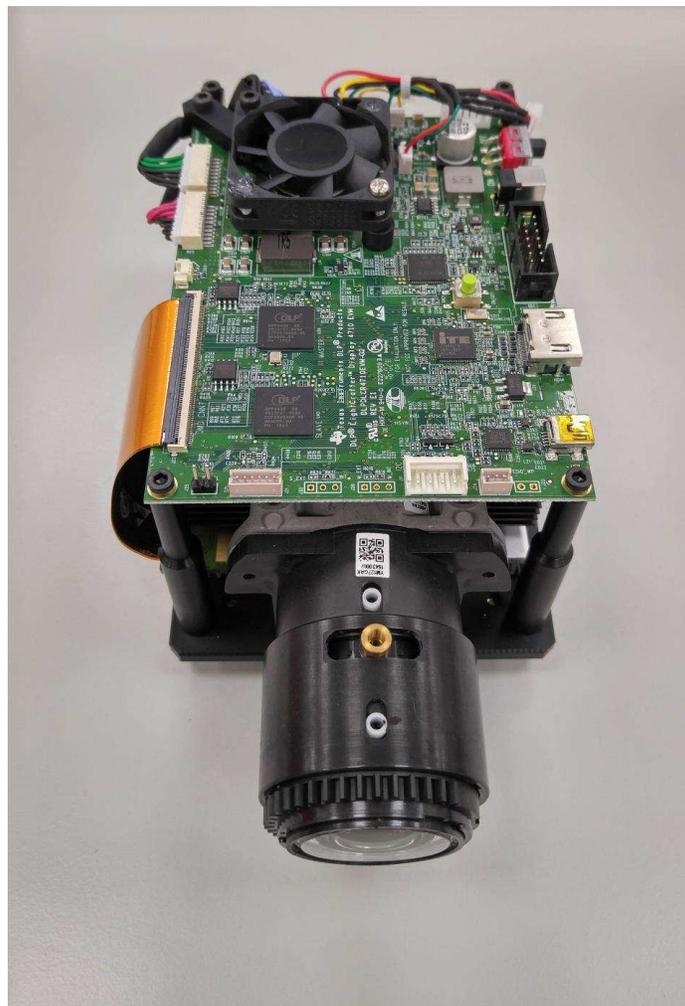
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This user's guide presents an overview of the DLP® LightCrafter™ Display 4710 evaluation module (EVM) and a general description of the main features and functions. It explains the how to get started and provides a detailed description of the on board LEDs as well as the main connectors. ([Figure 1](#)).

## **1 DLP LightCrafter Display 4710 EVM Overview**



**Figure 1. DLP LightCrafter Display 4710 EVM**

In addition to this document, the following documents shown in [Section 2](#) should be used.

## 2 Applicable Documents

The following documents are applicable to the DLP LightCrafter Display 4710 EVM and are available at [ti.com](http://ti.com):

- DLP4710 (.47 1080p) DMD data sheet, [DLPS056](#)
- DLPC3439 controller data sheet, [DLPS057](#)
- DLPA3005 controller data sheet, [DLPS071](#)
- Software Programmer's Guide, [DLPU035](#)
- DLP LightCrafter Display EVM GUI Tool User's Guide, [DLPU021](#)

Visit the DLP and MEMS TI E2E community support forums for assistance.



## 4 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:

- 0.47-inch 1080p DMD (DLP4710)
- OSRAM P1W red, green and blue LED
- This light engine interfaces with the EVM using DMD pin mapping **Option 2**. Please refer to the [DLPC3439](#) datasheet for more information about the DMD interface.

**Table 1. EVM Optical Engine Parameter Values**

| Parameter   | MIN | TYP  | MAX | UNIT |
|---|-----|------|-----|------|
| Brightness at Red 12 A , Green 16 A, Blue 16 A, LED current |     | 600  |     | Lum  |
| Red LED current   |     | 12   |     | A    |
| Green / Blue LED current                                    |     | 16   |     | A    |
| Brightness uniformity                                       | 73% |      |     |      |
| Throw ratio   |     | 1.39 |     |      |
| Offset  |     | 100% |     |      |
| Focus range (wide)  | 40  |      | 120 | inch |
| Image diagonal size   | 10  |      | 100 | inch |

## 5 Quick-Start Procedure

This quick-start assumes that the EVM default conditions are as shipped.

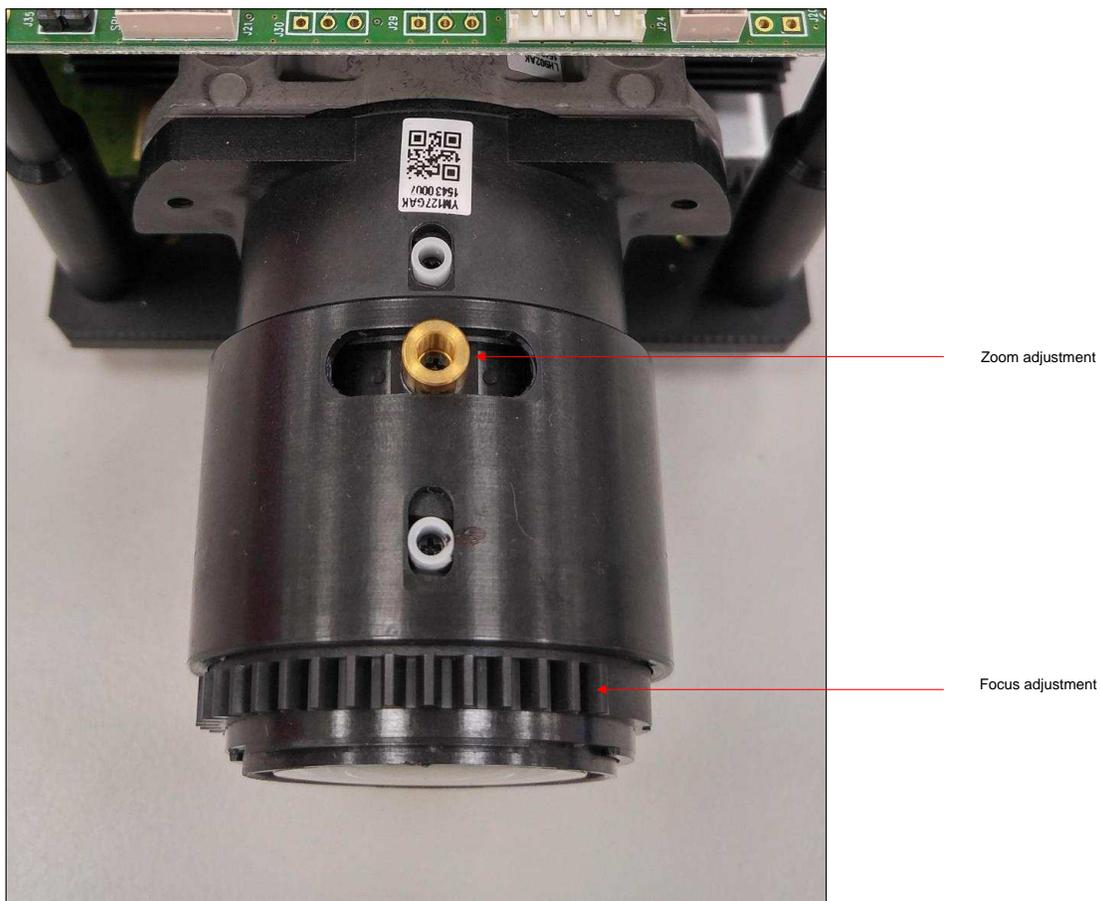
1. Power up the DLP LightCrafter Display 4710 EVM by applying an external DC power supply (19 V DC, 4.74 A) to PWR\_IN connector (J28).

**External Power Supply Requirements:**

- Output voltage (nom): 19 VDC
- Output current (max): 4.74 A
- Efficiency level: V

TI recommends using an external power supply that complies with applicable regional safety standards (such as UL, CSA, VDE, CCC, and PSE)

2. Move PS\_ON/OFF slide switch (SW28) to the ON position.  
+3.3V (D43) and INTZ (D57) LED indicates when 19 V power is applied.
3. Push ON/OFF switch (SW21) to turn on the DLP LightCrafter Display 4710 EVM.  
+3.3V (D43), SYS\_ON-OFF (D36), M\_IRQ (D33) and S\_IRQ (D34) LED will indicate that the DLP LightCrafter Display 4710 EVM is turned on.
4. After the DLP LightCrafter Display 4710 EVM is turned on, the projector will show a DLP LightCrafter Display splash image by default.
5. The focus and zoom of the image can be adjusted on the optical engine ([Figure 3](#)).



**Figure 3. Optical Engine With Focus and Zoom Adjustment**

6. Connect USB to the LightCrafter Display 4710 EVM and open the GUI for 4710 EVM on your computer. Then you can communicate to the EVM over the GUI software. If needed, please connect an HDMI source to the EVM.
7. When turning off the projector, push ON/OFF switch (SW21) and then move slide switch (SW28) to the OFF position before removing the power cable.  
**IMPORTANT NOTE:** To avoid potential damage to the DMD, it is required to turn off the projector with the above sequence before disconnecting the power.
8. There are eleven LED indicators on the DLP LightCrafter Display 4710 EVM ([Table 2](#)):

**Table 2. LEDs on the DLP LightCrafter Display 4710 EVM**

| Location | Name       | Description  |
|----------|------------|--|
| D33      | M_IRQ      | LED OFF during DLPC3439_Master boots<br>LED ON when DLPC3439_Master boot-up process is completed and ready to receive commands |
| D34      | S_IRQ      | LED OFF during DLPC3439_Slave boots<br>LED ON when DLPC3439_Slave boot-up process is completed and ready to receive commands   |
| D36      | SYS_ON-OFF | LED ON when projector is in normal operation   |
| D43      | +3.3V      | LED ON when 19 V Power is applied and +3.3 V is working normally   |
| D44      | WPC_01     | Reserved   |
| D45      | WPC_02     | Reserved   |
| D46      | WPC_03     | Reserved   |
| D56      | RESETZ     | LED ON when DLPC3439 is in RESET   |
| D57      | INTZ       | LED ON when DMD is in PARK mode  |
| D66      | STAT_LED1  | LED blinking when PC is communicating to flash over SPI  |
| D67      | STAT_LED0  | LED blinking when PC is communicating to DLPC3439 over I2C   |

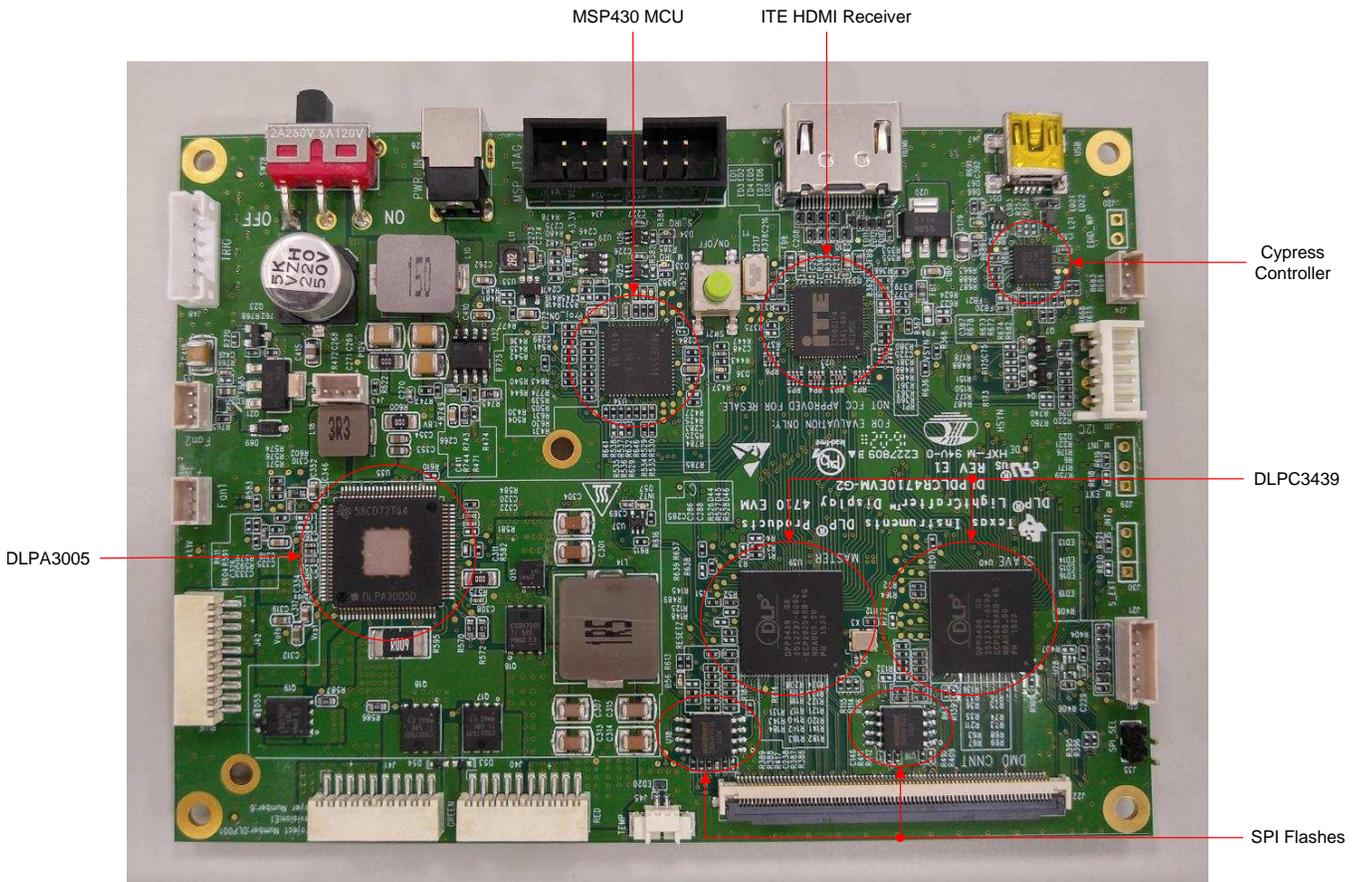
## 6 Connectors, Headers, and Switch Description

**Table 3. List of Installed Connectors on the 4710 EVM Board**

| Location | Name         | Description  |
|----------|--------------|--|
| J11      | I2C          | Connector for the I2C interface (DeVaSys USB-I2C/IO board)                     |
| J18      | HDMI         | Connector for HDMI input   |
| J21      | SPI          | External SPI Programming interface connector                                   |
| J22      | DMD CNNT     | Connector for DMD Flex Cable   |
| J23      | Spy-Bi-Wire  | MSP430 Spy-Bi-Wire Programming interface connector                             |
| J24      | WPC          | Reserved   |
| J26      | Color Sensor | Reserved   |
| J28      | PWR_IN       | Connector for 19 V DC power  |
| J32      | Fan1         | Connector for 12 V Fan   |
| J33      | Fan2         | Connector for 12 V Fan   |
| J34      | MSP_JTAG     | MSP430 JTAG Programming interface connector                                    |
| J35      | SPI_SEL      | Header to select Master/Slave SPI flash for external SPI Programming interface |
| J40      | RED          | Connector for RED LED cable  |
| J41      | GREEN        | Connector for GREEN LED cable  |
| J42      | BLUE         | Connector for BLUE LED cable   |
| J43      | Fan3         | Connector for 12 V Fan   |
| J45      | TEMP         | Reserved   |
| J47      | Mini_USB     | Connector for Cypress USB controller   |
| J48      | TRIG         | Reserved   |
| SW21     | ON/OFF       | Projector ON/OFF Switch  |
| SW28     | PS_ON/OFF    | Power Supply ON/OFF Switch   |

## 7 EVM Setup

The DLP LightCrafter Display 4710 EVM is comprised of the **DLP4710** (.47 1080p) DMD, **DLPC3439** display controller, **DLPA3005** PMIC/LED driver and other supporting components such as the Cypress Controller, the MSP430 MCU and the ITE HDMI Receiver. All of the above components besides the DLP4710 (located in the optical engine) are included on one board. The locations of the named parts are shown in [Figure 4](#).



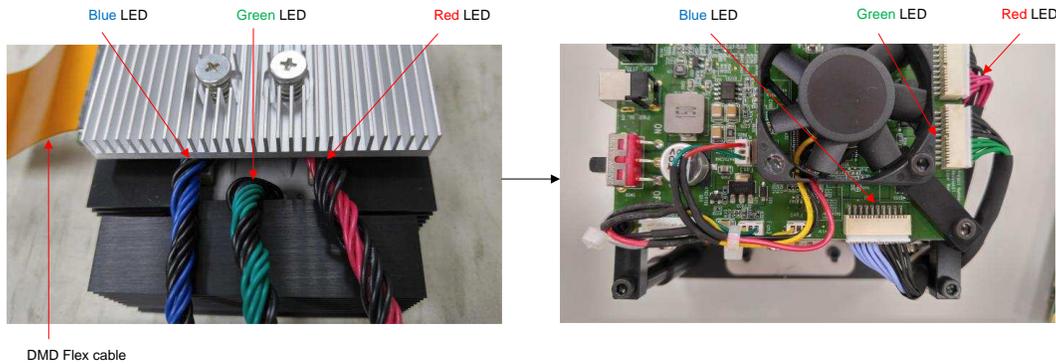
**Figure 4. DLP LightCrafter Display 4710 Board**

The DLP LightCrafter Display 4710 board has one connector for the DMD Flex cable to the 0.47-inch 1080p DMD and three LED connectors for red, green and blue LEDs.

The connectors for each LED are named on the board as well as on the light engine. Please refer to [Figure 5](#) to see the proper setup.

**CAUTION**

Ensure a good connection between the LED cable and the DMD flex cable to the DLP LightCrafter Display 4710 board.



**Figure 5. LED Connection**

[Figure 6](#) shows the final setup of all parts.



**Figure 6. DLP LightCrafter Display 4710 EVM**

**CAUTION**

Make sure all connections are set up correctly before connecting the power! Verify that the DMD flex cable is connected correctly to the LightCrafter Display 4710 board.

## 8 Safety Instructions



### **CAUTION**

Caution Hot surface.  
Contact with heatsinks may cause burns.  
Do not touch.



### **CAUTION**

**Risk Group 2**  
Possibly hazardous optical radiation emitted  
from this product.  
Do not stare at operating lamp.  
May be harmful to the eye.



### **ATTENTION**

Observe precautions for handling.  
**ELECTROSTATIC SENSITIVE DEVICES.**

## Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

| <b>Changes from C Revision (February 2019) to D Revision</b>                                  | <b>Page</b> |
|---|-------------|
| • Updated <a href="#">Figure 2</a> .....  | 3           |
| • Changed <i>Throw ratio</i> specification to 1.39 (typical) in <a href="#">Table 1</a> ..... | 4           |

| <b>Changes from B Revision (October 2015) to C Revision</b>               | <b>Page</b> |
|---|-------------|
| • Added pin mapping option description to <a href="#">Section 4</a> ..... | 4           |

| <b>Changes from A Revision (September 2016) to B Revision</b>                      | <b>Page</b> |
|--|-------------|
| • Updated DMD brightness from 460 to 600 lumens in <a href="#">Section 3</a> ..... | 3           |
| • Updated Brightness from 456 to 600 lumens in <a href="#">Table 1</a> .....       | 4           |

| <b>Changes from Original (September 2016) to A Revision</b>                               | <b>Page</b> |
|---|-------------|
| • Corrected Light Engine resolution from 180p to 1080p in <a href="#">Section 4</a> ..... | 4           |

### 1 Trademarks

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