DLP4500-C350REF Reference Design Test Data

Reference Design

Literature Number:
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DLP

About Test Results

The DLP® LightCrafter4500™ is a third party implementation of the DLP4500-C350REF reference design, which incorporates the DLP 0.45" WXGA chipset. The EVM and reference design enable faster development cycles for applications requiring high resolution, brightness and pattern rates from a flexible light steering solution.

The LED performance data contained below was measured from one DLP LightCrafter4500 EVM to provide an example from a typical unit. Please note, performance will vary between EVMs due to variations in manufacturing. The performance data is not guaranteed.

DLP LightCrafter4500 Evaluation Module

Related Documentation From Texas Instruments

DLPC350 Data Sheet: *DLP Digital Controller for the DLP4500 DMD*, TI literature number DLPS029

DLP4500 Data Sheet: *DLP 0.45 WXGA DMD*, TI literature number DLPS028

DLPC350 and DLP45000 Chip Set Manual: *DLP 0.45 WXGA Chip Set Data Manual.* TI literature number DLPU009

User's Guide: *DLPC350 Programmer's Guide*, TI literature number DLPU010

Application Note:*Using DLP® LightCrafter4500™ Triggers to Synchronize Camera*, TI literature number DLPA036

If You Need Assistance

Refer to the DLP and MEMS TI E2E Community support forums: DLP LightCrafter4500 Development Platform Forum

LED Current Settings

This chapter provides the Red, Green and Blue LED performance levels with respect to the LED driver current levels. References are made to the DLP LightCrafter 4500 Graphical User Interface (GUI) that is available for download from TI's website. Refer to the DLP LightCrafter 4500 to download a copy.

On the top right of the GUI window, the LED Driver Controls the individual currents of the Red, Green, and Blue LEDs. A setting of 255 corresponds to the maximum LED current. A setting of 0 corresponds to minimum LED current. The LED current is computed as follows:

Red LED Current (A) = 0.0175 * (LED Current Value) + 0.4495 (1)

Green LED Current (A) = 0.0181 * (LED Current Value) + 0.3587 (2)

Blue LED Current (A) = 0.0160 * (LED Current Value) + 0.1529 (3)

The performance of the Red, Green, and Blue LEDs are shown in Figure 1-1, Figure 1-2, and Figure 1-3, respectively.

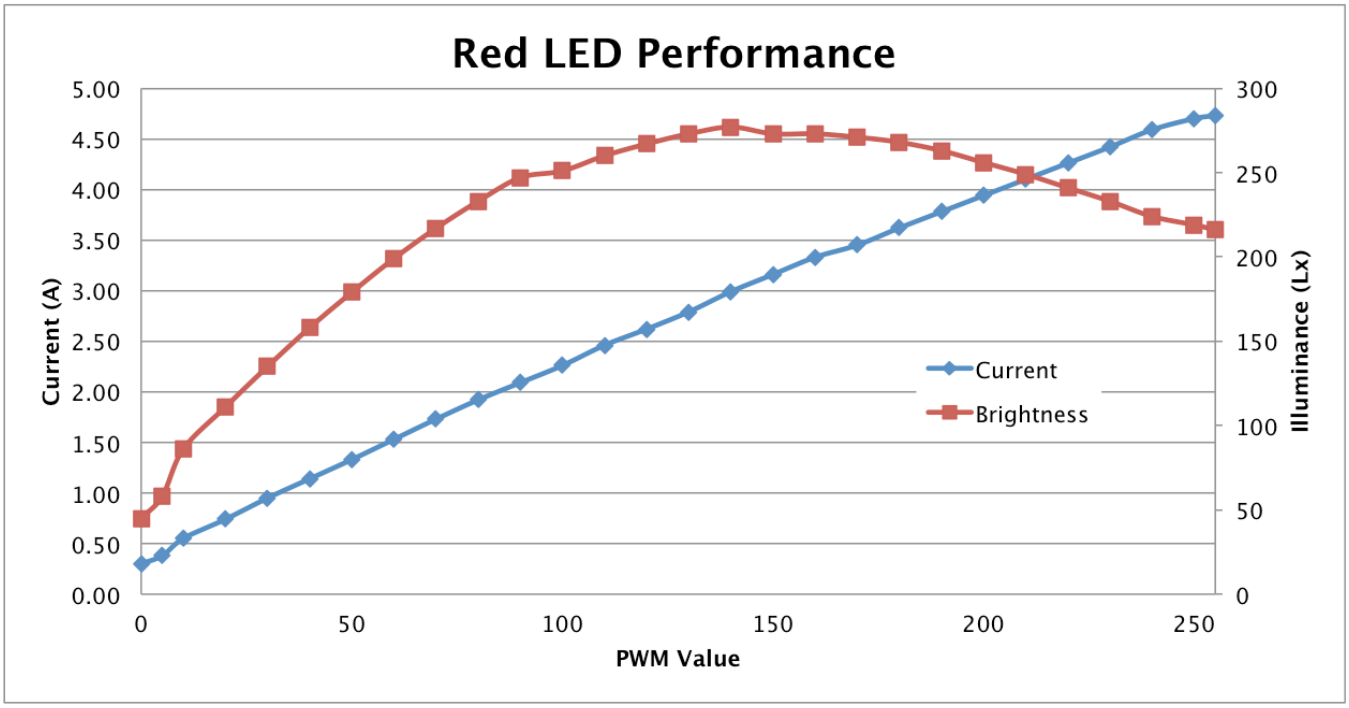

Figure 1-1. Typical Red LED Current and Illuminance based on PWM values

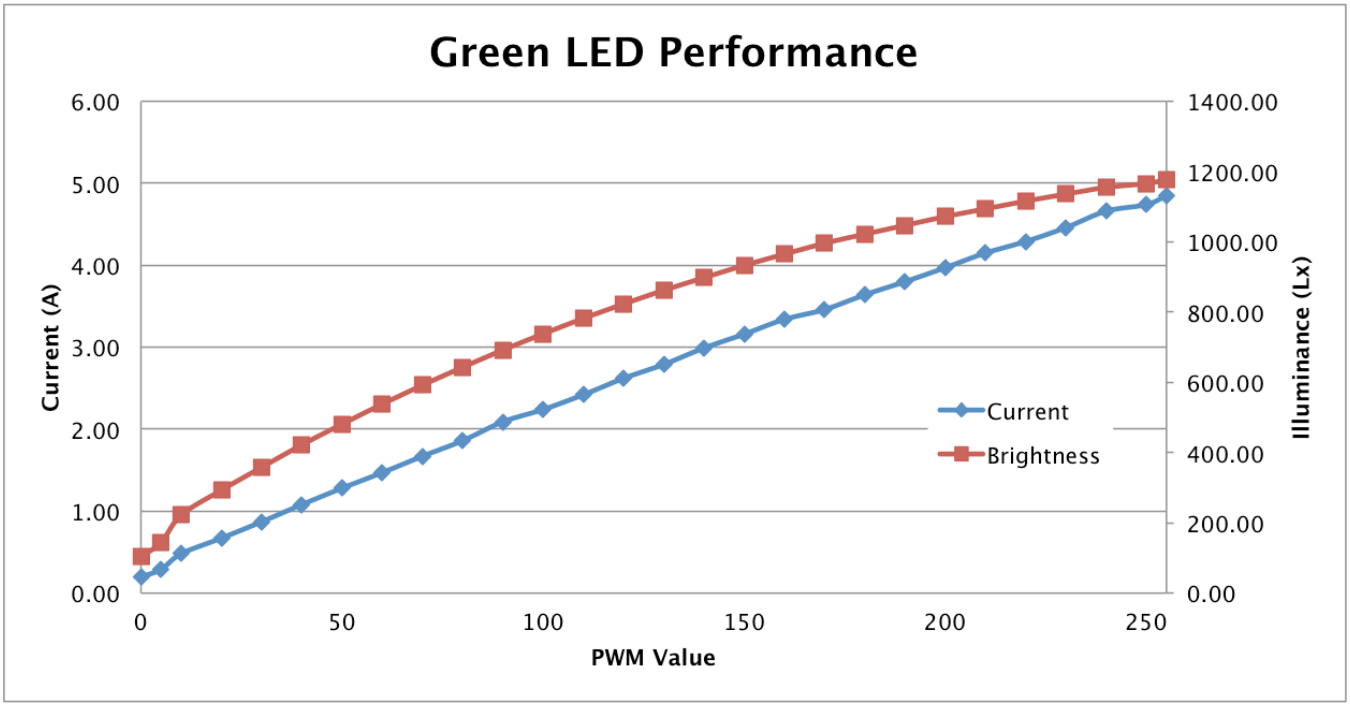

Figure 1-2. Typical Green LED Current and Illuminance based on PWM values

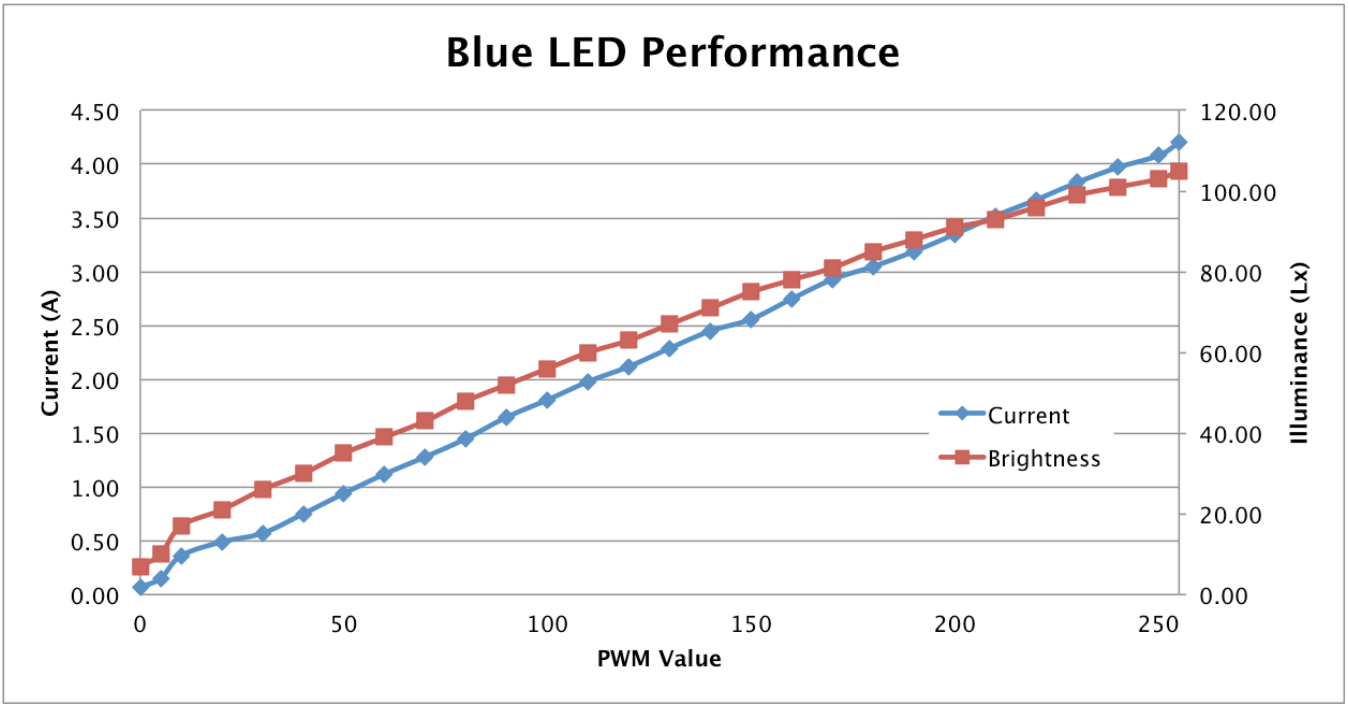

Figure 1-3. Typical Blue LED Current and Illuminance based on PWM values

CAUTION

The DLP LightCrafter4500 is an actively cooled system that has a thermal limit resulting in total Red, Green, and Blue LED currents under 4.3A for continuous and simultaneous LED operation. Care must exercised by the user not to overheat the system by turning all LEDs at maximum power during prolonged simultaneous LED use. Exceeding more than 4.3A for continuous or simultaneous LED operation can damage the LightCrafter4500 LEDs.

Typical variations in LED manufacturing can lead to changes in the brightness and current consumption. Thus for typical white balance point, the following percentages of colors is recommended:

- Red/Green ~ 87.5%
- Blue/Green ~ 97.6%

at the default LED Current values of:

- Red = 104
- Green = 135
- Blue = 130

The LED selection box determines the control of the LED enables signals. Two options are allowed:

- Automatic: LED enables are controlled by the DLPC350 sequencer. In Video Mode, the LED enables are color sequentially set. In Pattern Sequence, the LED enables are controlled by the downloaded pattern sequence settings.
- Manual: LED enables are controlled by the check boxes. Checking a color, continuously enables the LED of that color at the given LED current setting.

Appendix A: Equipment List for LED Performance Measurements

A.1 Description of Equipment and Measurement

Fluke 29 Digital Multi-Meter - measured total current from DLP LightCrafter 4500

Tektronix 7254 Digital Phosphor Oscilloscope and TCP202 Current Probe - measured individual LED current levels

UDT Instruments Optometer 5471 - measured brightness at the center of a solid color projection for each LED

Power Supply Requirements

B.1 External Power Supply Requirements

The DLP LightCrafter4500 does not include a power supply. The external power supply requirements are:

- Nominal Voltage: 12 V DC
- Minimum Current: 0 A
- Maximum Current: 7 A
- DC Connector size:
  - Inner diameter: 2.5 mm
  - Outer diameter: 5.5 mm
  - Shaft: 9.5 mm female, center positive
- Effiiciency Level: V

NOTE: External Power Supply Regulatory Compliance Certifications: Recommend selection and use of an external power supply which meets TI's required minimum electrical ratings in addition to complying with applicable regional product regulatory/safety certification requirements such as (by example) UL, CSA, VDE, CCC, PSE, etc.

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