

## LED Electrical Characteristic Measurement

Equipment: DUT x 2, adapter(Editech) x 1, DMM x 1

Condition:

Make LED on DUT to turn on for warm white color and measure as below:

1. PP\_PWR\_IN, 2. LED forward voltage, Limited Resistor(R:R1309/G:R1306/B:R1303), 3. BJT Transistor voltage(R:Q1103/G:Q1002/B:Q1001).

Then to calculate the current of RGB color LED. The ideal value is Red=7mA, Green=7mA, Blue=5mA

## Theoretical Value

|              |             |                   |                        |                 |           |
|--------------|-------------|-------------------|------------------------|-----------------|-----------|
| LED power(V) | 5           |                   |                        |                 |           |
| Suggest II-1 | Current(mA) | Calculation (ohm) | Using Resistance (ohm) | Forward Voltage | Placement |
| Red          | 7           | 428.5714286       | 432                    | 1.6~2.2V        | R1309     |
| Green        | 7           | 285.7142857       | 280                    | 2.5~3.3V        | R1306     |
| Blue         | 5           | 400               | 392                    | 2.4~3.2V        | R1303     |

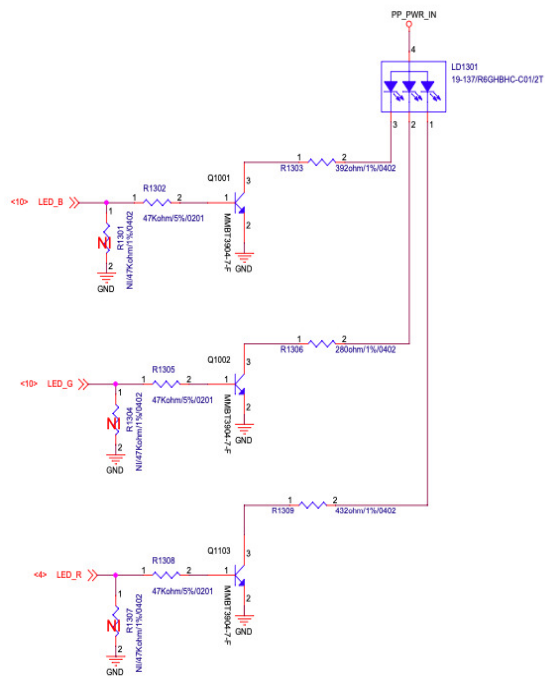
## Measurement Results

|            |           |                 |             |      |             |                |
|------------|-----------|-----------------|-------------|------|-------------|----------------|
| Color      |           | Red             |             |      |             |                |
| Position   | PP_PWR_IN | Forward Voltage | R1309(Pin2) |      | Q1103(Pin3) | Current(R1309) |
| Unit       | mV        | mV              | Ohm         | mV   | mV          | mA             |
| DUT NO.: 1 | 5070      | 1807            | 432         | 3263 | 237         | 7.00462963     |
| DUT NO.: 2 | 5100      | 1882            | 430         | 3218 | 244.6       | 6.914883721    |

|            |           |                 |             |      |             |                |
|------------|-----------|-----------------|-------------|------|-------------|----------------|
| Color      |           | Green           |             |      |             |                |
| Position   | PP_PWR_IN | Forward Voltage | R1306(Pin2) |      | Q1002(Pin3) | Current(R1306) |
| Unit       | mV        | mV              | Ohm         | mV   | mV          | mA             |
| DUT NO.: 1 | 5070      | 2849            | 280         | 2221 | 233.7       | 7.0975         |
| DUT NO.: 2 | 5100      | 2905            | 279.8       | 2195 | 219.4       | 7.060757684    |

|            |           |                 |             |      |             |                |
|------------|-----------|-----------------|-------------|------|-------------|----------------|
| Color      |           | Blue            |             |      |             |                |
| Position   | PP_PWR_IN | Forward Voltage | R1303(Pin2) |      | Q1001(Pin3) | Current(R1303) |
| Unit       | mV        | mV              | Ohm         | mV   | mV          | mA             |
| DUT NO.: 1 | 5070      | 2776            | 391         | 2294 | 162.6       | 5.451150895    |
| DUT NO.: 2 | 5100      | 2882            | 391         | 2218 | 161.6       | 5.259335038    |

# Schematic and Electro-Optical Characteristics



| Electro-Optical Characteristics (Ta=25°C) |        |      |       |      |       |                                                 |
|-------------------------------------------|--------|------|-------|------|-------|-------------------------------------------------|
| Parameter                                 | Symbol | Code | Min.  | Typ. | Max.  | Unit Condition                                  |
| Luminous Intensity                        | Iv     | R    | 28.5  | ---- | 72.0  | mcd R6 : IF=7mA                                 |
|                                           |        | G    | 112.0 | ---- | 285.0 | mcd GH : IF=7mA                                 |
|                                           |        | B    | 14.5  | ---- | 36.0  | mcd BH : IF=5mA                                 |
|                                           |        | Mix* | 180.0 | ---- | 360.0 | mcd                                             |
| Viewing Angle                             | 2θ1/2  |      | 100   | 120  | 140   | Deg                                             |
| Peak Wavelength                           | λp     | R6   | ----  | 632  |       | nm<br>R6 : IF=7mA<br>GH : IF=7mA<br>BH : IF=5mA |
|                                           |        | BH   | ----  | 468  |       |                                                 |
| Dominant Wavelength                       | λd     | R6   | 616   | ---- | 632   |                                                 |
|                                           |        | BH   | 460   | ---- | 475   |                                                 |
| Forward Voltage                           | VF     | R6   | 1.6   | ---- | 2.2   | V                                               |
|                                           |        | BH   | 2.5   | ---- | 3.3   |                                                 |
|                                           |        | BH   | 2.4   | ---- | 3.2   |                                                 |
| Reverse Current                           | IR     |      | ----  | ---- | 10    | μA VR=5V                                        |

\*When three LED dies are operated simultaneously.  
Note:  
1. Tolerance of Luminous Intensity: ±11%  
2. Tolerance of Forward Voltage: ±0.10V  
3. Tolerance of Dominant Wavelength: ±1nm  
3.RA test @ 5mA.



## Summary

Summary:  
After checking the Red/Green/Blue LED components, forward voltage, current limited resistor and current, there is no significant defect were found on the LED circuit