LED Color Test Probes

KEC2101 / 2102/ 2103 / 2104 / 2105 / 2106

Features

- Accurately detect LED color with RGB sensor
- Applied DC5V/ 5mA, output VR, VG, VB respectively
- Combine the sensor and circuit together, without using optical fiber
- Miniature size and Easy mounting on pin board fixture

Application

- LED test on PCB functional test
- LED test on final production test.
- LCD back light test
- Amusement machine panel test
- Automobile meter panel, brake lamps, side turn lamps

Production Description

LED Color Test Probes KEC2101 / 2102/ 2103 / 2104 / 2105 / 2106 are developed to test the colors and brightness of LED on printed circuit boards and other electronics production. The probe senses the light and output the voltages for RED, GREEN, and BLUE respectively. It makes the function test of PCB or final production easy and smart.

The probe combines the RGB sensor and low input bias and extends temperate range operational amplifiers together, and it is molded by epoxy to protect the humidity. The probe uses DC5V/5mA, and directly output the RGB sensed voltage ranged from 0V to 5V. It work extremely stable at wide temperature range, can meet the needs of not only the LED panels, amusement machine but also the test of Automobile electronics.

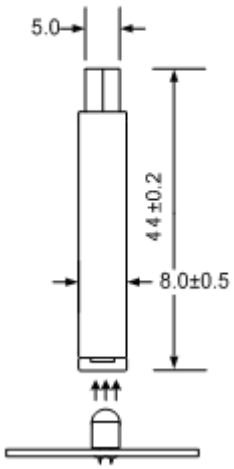
This is the good solution to test the brightness and colors of LED on the PCB, especially for the most update RGB multicolor LED, which are used in automobile and amusement production recently.

Order information

Part number	KEC 2101	KEC 2102	KEC 2103	KEC 2104	KEC 2105	KEC 2106
Sense level of LED luminous intensity	Less than 20mcd *	About 15-60mcd	About 40-160mcd	About 125-500mcd	About 400-1500mcd	over 1500mcd

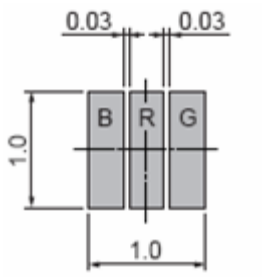
*Note the values are the luminous intensity of LED under test, and are referred for selecting the probe model, when the test probe is placed at the work distance 4mm.

Specification

LED Color Test Probes Model KEC2101, KEC2102, KEC2103, KEC2104, KEC2105, KEC2106		
Work distance Range Recommended	 2-8mm 4mm	 Probe front to the top of LED under test
Sensor used	Miniature RGB sensor B λ= 400 to 540 nm G λ= 480 to 600 nm R λ= 590 to 720 nm	
Supply Voltage Vc Current	 DC 5V±0.25V < 5mA	
Output voltage Channel Range	 VR, VG, VB 0 to Vc	 VR proportion output of RED VG proportion output of GREEN VB proportion output of BLUE
Absolute maximum Supply voltage	7.0V	
Signal Cable Type Length Signal assignment	 Flat flex cable 5contacts (AWG28) About 1000 mm Contact 1 Gray VR Contact 2 Gray VG Contact 3 Gray VB Contact 4 Gray GND Contact 5 Green P5V	
Size Wide Length	 8.0±0.5 mm 44±0.2 mm	
Mount method	Nickel plated Brass spacer at top part of the probe with M3 screw hole	
Temperature Operating Storage	 -10 to 70°C (14 to 158 F) -25 to 70°C (-13 to 158 F)	

Application Consideration

The RGB sensor is mounted at the probe front and it senses the LED light and outputs the voltages according to the RED, GREEN and BLUE light intensities respectively. A higher performance amplifier processes the sense signal, and output the VR, VG and VB according to the light brightness at RED, GREEN and BLUE.



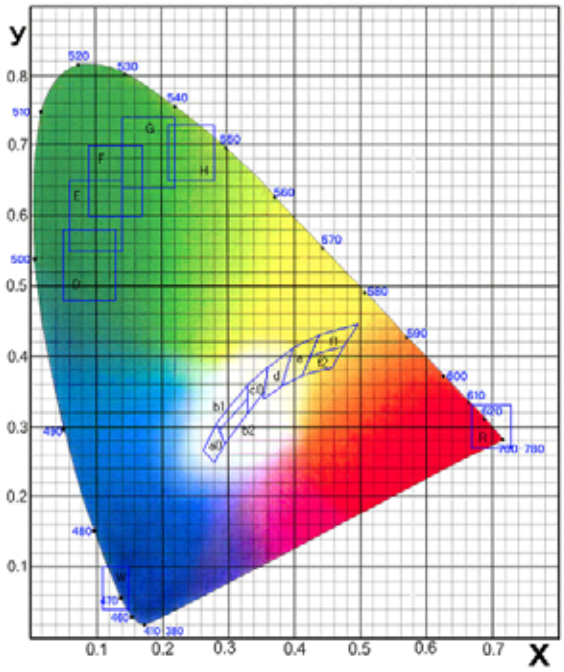
RGB sensor active area

The figure shown at right is the sensor active area. Always place the probe at the center position of LED light area. To get the balanced lighting input, keeping the work distance above 2mm is necessary. Placing the sensor too far from the LED under test will decrease the output level, and increase the interference from the neighbor LED. The work distance 4mm is recommended.

When performs the LED test mounted on a PCB, a simple way is to read the VR,VG,VB with ADC or multi meter in your functional test system, and check the value if they are in the expected limit range. This approach is very simple, but may not be so stable and it may be affected by work distance difference, LED center deviation from the probe and LED luminous intensity varieties. Please note that LED luminous intensity on its data sheet usually has a very wide range.

The approach to convert the RGB color space into one luminance dimension (L) and a pair of chromaticity dimension (x, y) is recommended. The L, and x,y are simply found by the formulas L= (VR+VG+VB) / 3, x = VR / (VR+VG+VB), and y = VG / (VR+VG+VB).

Chromaticity Diagram



The x, y is the approximate value of the coordinates on the CIE 1931 chromaticity space, and it can locate the color exactly. In the most of LED their data sheet, x, y value ranges can be found, which defines the LED color.

In a functional test system, very stable x, y value can been obtained even if VR, VG,VB vary with the PCBs. This approach is strongly recommended, and obtains a higher performance in most of automobile and amusement PCB tests.

For more information visit

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