LED Comprehensive Characteristic Measurement (Comprehensive Upgrade Version)

BEX-8202A

Summary

The parts used in the comprehensive LED experiment, such as the voltage stabilizing power supply, constant current source, illuminance meter, integrating sphere, spectrometer and temperature control experiment box, are all jointly developed with professional LED measurement enterprises. Under the premise of meeting the teaching requirements, the functions, accuracy, and reliability are maintained at a high level.
The experiment comprehensively covers the light, electricity, color, and heat characteristics of LEDs. The modules are independent and the functions are clear. It conforms to teaching standards, and the software design is complete. The testing principles strictly follow international authoritative standards. The operation is clear and easy to understand, which helps to deepen theoretical learning.

Features

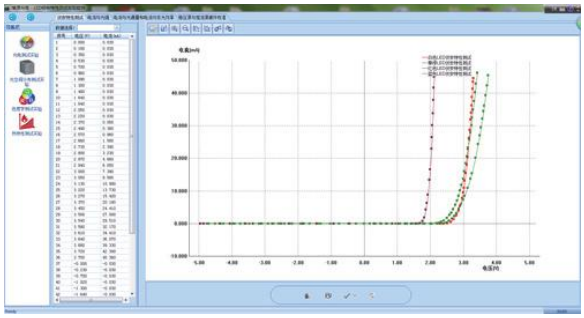
1. The experiment is rich in content and comprehensively covers the four most important characteristics of LED - light, electricity, color and heat. It is the most basic theoretical knowledge required for the compulsory courses of optoelectronics majors in universities.
2. Several experiment modules are independent of each other but also mutually supportive. The function divisions of the components are clearly defined, making it easy for students to understand.
3. The components of the experimental device and the software design are all designed according to the standards of teaching products. The operation settings comply with teaching requirements, and the software functions are complete, including knowledge navigation, independent test modules, which enable students to have a clear logical thinking and easy understanding when using it, achieving the effect of deepening theoretical learning.
4. The principle of parameter testing strictly follows the current authoritative testing standards in China and abroad. For example: the average light intensity test adopts the CIE average light intensity test standard conditions; the luminous flux test adopts the integrating sphere method; the junction temperature measurement adopts the pulse current method. This method has the advantages of simplicity, non-destructiveness, accuracy and good transient response.

Main Experiment Contents

1. Volt-ampere characteristic test experiment.
2. Relationship experiment between light intensity and current.
3. Relationship experiment between luminous flux and current.
4. Measurement experiment of spatial distribution characteristics of LED output light.
5. Measurement experiment of chromaticity parameters of different LEDs.
6. RGB color matching experiment.
7. Measurement experiment of VT coefficient (ripple) of pulse power supply.
8. Measurement experiment of K coefficient.
9. Measurement experiment of junction temperature and thermal resistance.

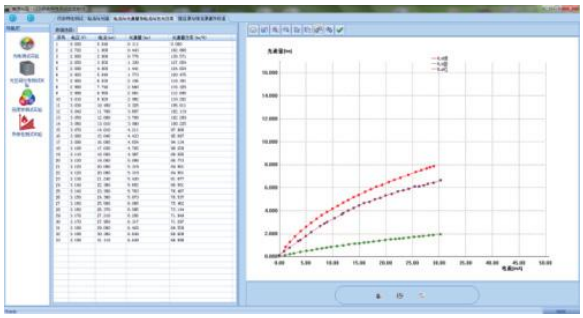
Experiment Contents and Typical Data

1. Electrical & electro-optical conversion experiment



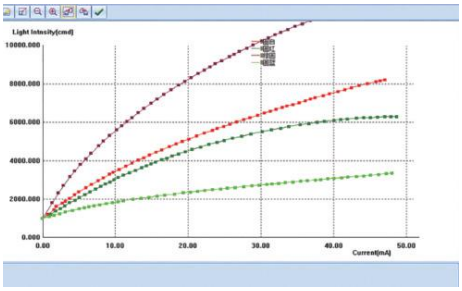
LED Forward and Reverse V-I Characteristics Measurement

2. Investigate the relationship between current, luminous flux and luminous efficiency

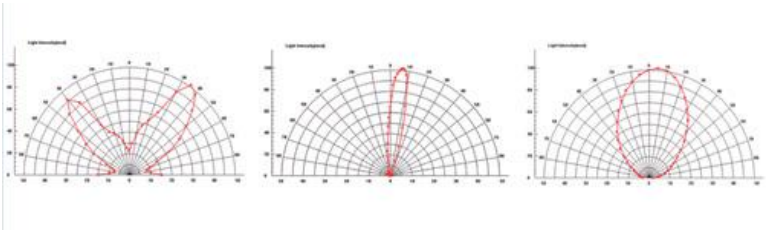


LED Forward and Reverse V-I Characteristics Measurement

3. Light spatial distribution (light distribution curve) experiment

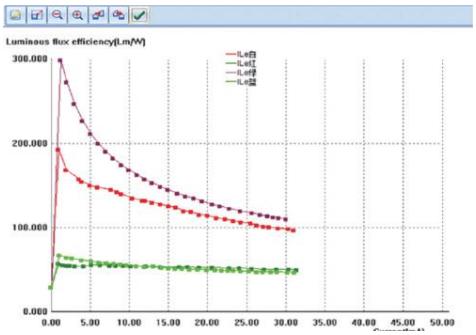


The curve showing the variation of the average light intensity in one-dimensional space with the current



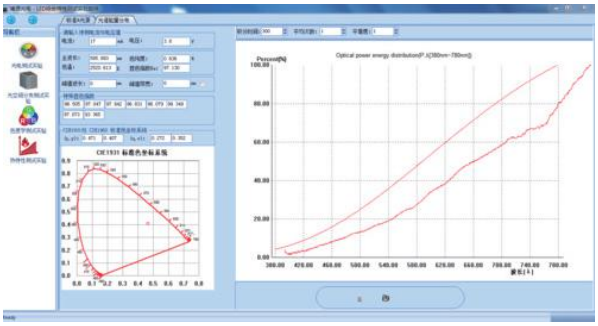
Two-dimensional spatial light distribution (light distribution) curve

4. The curve showing the relationship between current and luminous flux



The curve showing the relationship between current and luminous efficiency

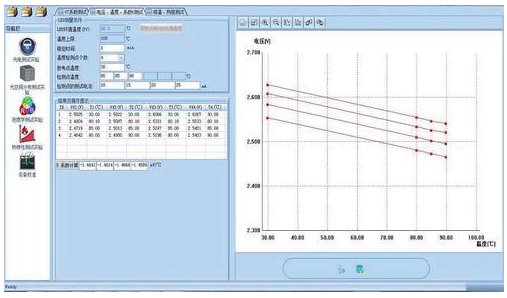
5.Measure the chromaticity parameters of different LEDs



The curve showing the relationship between current and luminous efficiency

6. Thermal Characteristic Test Experiment

This module is used to measure and calculate the K coefficient, thermal resistance, and junction temperature of LEDs. The experimental setup includes a temperature control system, a temperature control power supply, and a pulse power supply. After the experiment begins, the voltage-time curve can be displayed in real time on the software interface, allowing for the analysis of the junction temperature and thermal resistance at the steady state.



Small current K coefficient test

Specifications

NO.	Part Name	Main Parameter
1	LED Power Supply I (constant current source)	110V/220V input, 0~50/500mA output, voltage range 0-10V
2	LED Power Supply II (constant voltage source)	110V/220V input, 0~10V output; current range 0 - 0.1A
3	(Programmable) Pulse Power Supply	Output small current ranging from 0 to 50 mA; output large current ranging from 50 to 500 mA.
4	Temperature Control Power Supply	Heating range: 0 - 100°C
5	Illuminometer with Detector	Measurable illuminance and luminous flux values, illuminance range: 0.001 LX to 2000 LX; Luminous flux range: 0.001 LM to 999 LM;
6	RGB Power Supply (constant current source)	Three-phase current output
7	Fiber Spectrometer	Wavelength range: 350-1050nm, resolution 2nm
8	Fan Cooling Tungsten Light Source	Wavelength range: 400 nm-2000 nm Cooling method: Fan
9	Temperature Controller System	Heating range 0~100°C
10	Integrating Sphere	Radiation integrating sphere
11	LED Fixture and Holder	Dia 50mm

Configuration List

NO.	Part Name	Model	Qty.
1	LED Power Supply I (constant current source)	BEM-5036	1
2	LED Power Supply I (constant voltage source)	BEM-5035	1
3	(Programmable) Pulse Power Supply	BEM-5037	1
4	Temperature Control Power Supply	BEM-5038	1
5	Illuminometer with Detector	BEM-5409	1
6	RGB Power Supply (constant current source)	BEM-5711	1
7	Fiber Spectrometer	BIM-6001-06	1
8	Fan Cooling Tungsten Light Source	BIM-6210	1
9	Temperature Controller System	BEM-5040A	1
10	Integrating Sphere	BEM-5216-15004	1
11	LED Fixture and Holder	BEM-5217	1
12	RGB Light Source Fixture	BEM-5224	1
13	Adjustment Platform for Light Source	BEM-5214	1
14	Aperture tube with Holder	BEM-5215	1
15	Aperture	BEM-5221-03	1
16	View Screen	BEM-5410	1
17	Track	BEM-5201-06	1
18	Carrier	BEM-5204-50	1
19	Adjustable Post Holder	BEM-5205-25	1
20	Poster	BEM-5209-09	1
21	Quartz Fiber	SIM-6102-0605-S/S-P	1
22	Laser Module with Fixture	BEM-5047	1
23	LED Test Samples with Storage Case	BEM-5048	1
24	Power Cable	BC-105075	5
25	USB Data Cable	BC-105080	2
26	4mm Banana Plug Connector Cable, Red	BC-105084	6
27	4mm Banana Plug Connector Cable, Black	BC-105083	6
28	6-Pin Aviation Connector Cable	BC-104103	1