

**AUTOMOTIVE INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

QC/T 1201.4-2023

**Compatibility of on-board battery swap system for battery
electric commercial vehicles - Part 4: Swappable battery system
(English Translation)**

Issued on: May 9, 2025

Implemented on: November 1, 2025

**Issued by: Ministry of Industry and Information Technology of the
People's Republic of China**

Table of Contents

Foreword...	3
1 Scope...	4
2 Normative references...	4
3 Terms and definitions...	5
4 Basic parameters of OLED lighting sources...	7
5 Measurement requirements...	8

1 Scope

This Standard specifies the performance parameters of organic light emitting diode (OLED) lighting sources for automobiles (hereinafter referred to as "OLED lighting sources") in terms of optical characteristics, electrical characteristics and automotive durability characteristics, as well as the standard test conditions and standard test methods for these performance parameters.

This Standard applies to OLED lighting sources used in automotive interior and exterior lighting fixtures.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 36919, Organic light-emitting diode (OLED) lighting -- Terminology and letter symbols

GB/T 39394-2020, Test method for LED lamps, LED luminaires and LED modules

GB/T 20871.2-2007, Organic light emitting diode display -- Part 2.Terminology and letter symbols

ANSI/ESDA/JEDEC JS-001, For electrostatic Discharge Sensitivity Testing Human Body Model (HBM) Device Level

JEDEC JESD22-A115C, Electrostatic Discharge (ESD) Sensitivity Testing, Machine Model (MM)

JEDEC JESD22-A101D.01, Steady-State Temperature-Humidity Bias Life Test

JEDEC JESD22-A103E.01, High-temperature Storage Life

JEDEC JESD22-A104F, Temperature Cycling

JEDEC JESD22-A105D, Power and Temperature Cycling

JEDEC JESD22-A108F, Temperature, Bias, And Operating Life

JEDEC JESD22-A119A, Low-temperature Storage Life

DIN 75220, Aging Automobile Components in Solar Simulation Units

IEC 60068-2-27, Environmental testing-Part 2-27.Tests-Test Ea and guidance.

Shock)

IEC 60068-2-60-2015, Environmental testing -- Part 2-60.Tests -- Test Ke. Flowing mixed gas corrosion test

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 36919 as well as the followings apply.

3.1 OLED lighting

The function of interior and exterior lighting fixtures using OLED as the light source.

3.2 OLED light unit

The smallest indivisible light-emitting unit within an OLED lighting device.

3.3 OLED lighting panel

A panel consisting of one or more OLED light-emitting units, with mechanical and electrical interfaces.

3.4 OLED automotive lamp

Automotive lighting fixtures that use OLED lighting sources in whole or in part, with at least one OLED light source included in the design of the lighting fixture.

3.5 OLED lighting source

An electric light source that uses organic semiconductor materials to emit light through carrier injection and recombination under an electric field.

3.6 surface light source

A light source of which the luminescent body has a surface structure.

3.7 forward current

When the positive electrode of the OLED lighting source is connected to a positive potential electrode and the negative electrode of the OLED is connected to a negative panel is significantly lower than that of the surrounding area.

3.17 edge shrinkage

A phenomenon that when an OLED panel operates under rated conditions, the boundary of the light-emitting area shrinks relative to the design contour, resulting in a reduction in the area of the light-emitting region.

3.18 bending radius

In the bending test of flexible OLED lighting sources, the radius of curvature of the center line between the inner and outer surfaces corresponding to the arc. This applies only to flexible OLED lighting sources.

3.19 lifetime

The normal operating time for an OLED lighting source to reduce its luminous flux from its initial value to a set value under specified operating conditions.

NOTE: If the luminous flux decreases to 70% of its initial value, it is denoted as L70, and the unit is hours (h).

4.1 Luminance

The luminous intensity of an OLED lighting source per unit projected area in a specified direction or at a specified point is denoted by L and is measured in candela per square meter (cd/m^2).

4.2 Luminous flux

The radiant flux emitted by OLED lighting sources that can be perceived by the human eye, denoted by Φ_i , and measured in lumens (lm).

4.3 Chrominance

The coordinates of the emitted color of an OLED lighting source in its corresponding chromaticity coordinate system. In the CIE 1931 chromaticity coordinate system, the coordinates are represented by (x, y) . In the CIE 1976 UCS (Uniform Color Space) chromaticity coordinate system, the coordinates are represented by (u', v') .

4.4 Rated operating current

The current value required for OLED lighting sources to operate normally for extended periods. This is typically provided by the manufacturer.

4.5 Forward voltage

See definition in 3.8.

4.6 Power

The input electrical power required by the OLED lighting source when the entire panel is lit.

5.1 Requirements for the Measurement Environment

The measurement environment should meet the following requirements.

- a) Ambient temperature. $25^{\circ}\text{C}\pm 3^{\circ}\text{C}$;
- b) Relative humidity. 25%~75%;
- c) Atmospheric pressure. 86 kPa~106 kPa.

In special circumstances, such as when the environmental conditions differ from those described above, this should be noted in the test report.

During the measurement process, it should be ensured that the light source under test is not affected by the surrounding convective air.

The measurement environment should be free from mechanical vibrations, electromagnetic interference, and photoelectric interference that could affect the accuracy of the test.

5.2 Requirements for measurement darkroom

When the OLED lighting source is off, the illuminance of ambient light at any position on the lighting panel should be less than 0.005 lx.

5.3 Stability of OLED lighting sources

Illuminate the OLED lighting source under rated operating current conditions.

Continuously measure the OLED lighting source and its operating parameters (such as voltage, power, or current) using appropriate instruments. Once the parameters no longer show a trend of change, ensure that the luminance variation per minute is less than 2% from the application of the rated constant current source until repeated luminance measurements are performed.

During the stabilization and testing period, the test environment for the OLED lighting source should not change significantly. The position and operating parameters (such as voltage, power, or current) of the OLED lighting source should not be altered. During measurement, attention should be paid to the impact of any additional heat dissipation devices on the OLED lighting source. Ensure that no other structures providing additional heat dissipation, besides the light source's own internal heat dissipation structure, come