

ICS 43.040.20
CCS T38



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 4599-2024

Replacing GB 4599-2007

Road illumination devices and systems for motor vehicles

汽车道路照明装置及系统

Issued on: September 29, 2024

Implemented on: July 1, 2025

**Issued by: State Administration for Market Regulation;
Standardization Administration of China**

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1 Scope

GB 4599-2024 is the Chinese national standard on road illumination devices and systems for motor vehicles, in the field of road vehicles engineering. It carries no /T suffix, which in the Chinese system means compliance is mandatory: a product or a practice within its scope has to meet it to be lawfully made, sold or carried out in China. It was issued on 29 September 2024 by the State Administration for Market Regulation; Standardization

Administration of China, and has been in force since 1 July 2025. Classification: ICS 43.040.20, CCS T38. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies the same type determination, overall requirements, light source requirements, light color requirements, photometric performance, photometric stability, test methods and inspection rules for road illumination devices and systems for motor vehicles. This document applies to the design, manufacture and acceptance of road illumination devices and systems such as passing beam, driving beam, front fog lamps, corner lamps, etc. used in M and N category vehicles.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB 4785, Prescription for installation of the external lighting and light-signalling devices for motor vehicles and their trailers

GB/T 43081-2023, Lamps and light sources for road vehicles - Dimensional, electrical and luminous requirements

IEC 60825-1:2014, Safety of laser products - Part

3 Terms and definitions

For the purpose of this document, the following terms and definitions, as well as those given in GB 4785, apply.

3.1 road illumination device A unit or group of units used to illuminate the road and objects in the direction of the vehicle's advance to achieve one or more functions.

3.2 road illumination system A system - consisting of left and right side units or unit groups and a controller - used to illuminate the road and objects in the direction of the vehicle's advance.

3.3 lighting unit The light-emitting component of the system, which provides a light beam for one or more road lighting functions of the system.

3.4 installation unit An inseparable housing (lamp body) containing one or more lighting units.

3.5 neutral status The system is in use without any adaptive control signal input.

4 Determination of identical types

Devices that do not differ in the following main features are considered to be of the same type.

5.1 Beam adjustment device

5.2 Beam switching device The device used to switch the light beam in the device or system shall meet the following requirements.

5.3 Marking of device or system

5.3.1 The lamp body of the device or system shall be marked with the rated voltage. Devices or systems that are applicable only to 12 V rated voltage systems or only to 24 V rated voltage systems shall comply with the provisions on voltage marking in Appendix A.

5.4 Reference center marking The device or system shall be marked with the reference centre, and the marking method shall comply with the provisions of Appendix A. If two driving beam headlamps are installed on each side of the vehicle, each driving beam headlamp shall be marked separately.

6.2 Non-replaceable light source

6.2.1 For light sources that can only be replaced as a whole with the device or installation unit, filament light sources or gas discharge light sources shall not be used. This requirement does not apply to corner lights.

6.2.2 Headlamps may use LED modules or laser light source modules. If laser light source modules are used, the passing beam and driving beam shall comply with the requirements of

4.4 of IEC 60825-1:2014 and the requirements of BLH-C of IEC 62471-7:2023. Laser modules are not allowed to be used in front fog lamps and corner lamps.

6.2.3 The LED modules or laser light source modules used in the device or system shall be able to prevent misoperation and their design shall comply with.

7 Light color requirements

The light color of the device and system shall be white, and the light color of the front fog lamp can also be selectively yellow. The chromaticity characteristics shall comply with the relevant provisions of GB 4785.

8 Light distribution performance

8.1 General requirements All light distribution performance tests required by this document

shall be carried out in the coordinate system specified in Appendix B.

8.2 Passing beam distribution performance

8.2.3 If the passing beam has an adaptive function, it shall comply with the provisions of Part A of Table 1 under the conditions of use specified by the applicant or manufacturer. Under the adaptive function state of the passing beam, when the driving speed is greater than 70 km/h, if it cannot meet the provisions of Part A of Table 1, its light distribution performance shall comply with the provisions of Part A of Table 2.

8.2.5 For the S50, S50LL, S50RR, S100, S100LL and S100RR test points, the front position lamps may be turned on during the test.

8.2.6 When using the passing beam adaptive function, it shall be possible to manually switch to the basic passing beam at any time. Manual switching is allowed between different adaptive systems. The beams within the same adaptive system shall be able to switch automatically. The same adaptive system shall include a basic passing beam mode.

8.5 Corner lamp light distribution performance

8.5.1 The test points of light intensity are expressed as angles relative to the datum axis. The coordinates and diagrams of all the following test points correspond to the device installed on the left side of the vehicle. For the device installed on the right side of the vehicle, the coordinates of the test points in the left and right directions need to be mirrored.

9 Light distribution stability of devices or systems (except corner lamps)

9.1 General According to the requirements of Appendix E, test the clean lamp, dirty lamp and changes in the vertical position of the cut-off line under the influence of heat. The test results shall meet the requirements of 9.2 ~ 9.4.

9.2 Clean lamp light distribution performance stability

9.2.1 Once the sample has stabilized to ambient temperature, a clean damp cotton cloth shall be used to clean its lens. Visual inspection shall be carried out to find no obvious deformation, distortion, cracks or discoloration of the lens.

9.3 Dirty lamp light distribution performance stability After the dirty lamp test is carried out according to E.2.2 in Appendix E, the test results shall meet the requirements of 9.2.

9.4.3 Calculate the average value of the two tests $\Delta t' = (\Delta t_I + \Delta t_{II}) / 2$

2.If $\Delta t'$ does not exceed the limit given in Table 12, it is considered to meet the requirements.