



SURFACE VEHICLE RECOMMENDED PRACTICE

J1889™

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LED Signal and Marking Lighting Devices

RATIONALE

The 2019 version allowed for flashing functions to be photometrically stabilized and measured while flashing. In this update, any dual usage LED function, where the flashing function is also used as a steady operating function, the flashing function shall be stabilized and photometrically measured with the LEDs in steady operating mode.

To be harmonized with ECE, a third method to determine photometric values will be added. The three methods will be:

1. Wait 30 minutes and record photometry.
2. Real time monitor stability for 1% change over 5 minutes and record photometry.
3. Pre-determine ratio at 30 minutes and use with data taken at photometric stability.

Changed sections in the document:

- 5.5.2: Testing of flashing functions
- 5.5.4: New method that allows photometric stability to be monitored on goniometer
- 5.6: Color test references SAE J578

Changes to definitions:

- Definition 3.1 changed wording from “minimum” ratio to “final” ratio and subsequent wording changed throughout the document.
- Definition 3.3 changed wording from “maximum” ratio to “initial” ratio and subsequent wording changed throughout the document.

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1. SCOPE

This SAE Recommended Practice applies to functions of motor vehicle signaling and marking lighting devices which use light emitting diodes (LEDs) as light sources. This report provides test methods, requirements, and guidelines applicable to the special characteristics of LED lighting devices. This SAE Recommended Practice is in addition to those required for devices designed with incandescent light sources. This report is intended to be a guide to standard practice and is subject to change to reflect additional experience and technical advances.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J575	Test Methods and Equipment for Lighting Devices for Use on Vehicles Less than 2032 mm in Overall Width
SAE J578	Chromaticity Requirements for Ground Vehicle Lamps and Lighting Equipment
SAE J759	Lighting Identification Code
SAE J1330	Photometry Laboratory Accuracy Guidelines
SAE J2139	Tests for Signal and Marking Devices Used on Vehicles 2032 mm or More in Overall Width

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J387	Terminology - Motor Vehicle Lighting
SAE J2650	Performance Requirements for Road Illumination Devices Using Light Emitting Diode (LED) Sources

3. DEFINITIONS

3.1 FINAL RATIO

The ratio determined between the H-V reading at 30 minutes divided by the H-V reading recorded before photometry test points are taken at photometric stability. This ratio is used to determine final photometric values by multiplying the measured photometric values taken at photometric stability to obtain final photometric values when the predetermined stability method is used.

3.2 INCANDESCENT LIGHT SOURCE

Device in which light is produced by means of one or more filaments heated to incandescence by the passage of an electric current.

3.3 INITIAL RATIO

The ratio determined between the H-V reading within 1 minute divided by the H-V reading recorded before photometry test points are taken. This ratio is used to determine initial photometric values by multiplying the measured photometric values by the initial ratio to obtain initial photometric values.

3.4 LED

A p-n junction semiconductor device that emits incoherent optical radiation when forward biased. The optical emission may be in the ultraviolet, visible, or infrared wavelength regions.

3.5 LED LIGHTING DEVICE

A device in which light is produced by a single or an array of LED light source unit(s).

3.6 LED LIGHTING DEVICE LIGHT CENTER

The geometric center of all the single LED light source centers within the LED array(s) used to illuminate the device function, or the geometric center of the illuminated area if the light output is produced indirectly.

3.7 LED LIGHT SOURCE CENTER

For a single LED light source unit, the point that is located at the geometric center of the junction where the luminescence takes place or the surface from which luminescence appears to originate.

3.8 PHOTOMETRIC STABILITY

The point in time when the Device Under Test (DUT) photometry value is stable to within 1% over the photometric test duration.

3.9 PHOTOMETRIC TEST DURATION

The time between the photometric measurement of the first required test point until the last required test point. The photometric test duration does not include the warm-up stability time.

3.10 SEMICONDUCTOR

A material whose resistivity lies in the broad range between conductors and insulators.

4. LIGHTING IDENTIFICATION CODE

The device may be marked in accordance with SAE J759. Refer to specific device standards for possible additional marking requirements at the discretion of the manufacturer.

5. TESTS

The following section describes individual tests which need not be performed in any particular sequence. Testing may be expedited by performing two or more tests simultaneously on separate samples.

SAE J575 or SAE J2139 is a part of this document. (Used in conjunction with the functional lighting document for the device tested.) Unless otherwise specified, the following tests are applicable with modifications as indicated.

5.1 Vibration Test

The evaluation of the sample at the completion of the test shall also include a functional lighting check. If a partial outage is observed, a photometry test (see 5.5) shall be performed and the results recorded.