IEC 62707-1

Edition 1.0 2018-08

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

LED-binning –
Part 1: General requirements and white colour grid intended for automotive applications

Tri des LED –
Partie 1: Exigences générales et matrice de couleur blanche destinées aux applications automobiles

IEC 62707-1:2013-12/AMD1:2018-08(en-fr)

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 29.140.99

ISBN 978-2-8322-5944-3

FOREWORD

This amendment has been prepared by subcommittee 34A: Lamps, of IEC technical committee 34: Lamps and related equipment.

The text of this amendment is based on the following documents:

FDIS	Report on voting
34A/2098/FDIS	34A/2107/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

Title

Replace the part title as follows:

Part 1: General requirements and white colour grid intended for automotive applications

1 Scope

Replace, in the first paragraph, the last sentence with the following new text:

“It applies to LED packages intended for automotive applications.”

Add, at the end of Clause 4, the following new Clause 5:

5 Binning test procedure

5.1 General

For LED packages producing visible radiation the following binning test procedure shall be applied. Annex C gives information on the recommended measurement accuracy.

5.2 Temperature pre-conditioning

Before starting the binning test procedure, the LED package temperatures shall be stabilized as follows:

Each of T_a, T_s, T_c, T_j shall be 23 °C ± 5 °C

where

T_a is the ambient temperature of the air surrounding the LED package;

T_s is the solder temperature of the LED package;

T_c is the temperature at the T_c point of the LED package;

T_j is the junction temperature of the LED package.

5.3 Pulse definition and measurement intervals

During the binning test procedure, the following times and time-intervals (in millisecond, ms) shall be applied, see Table 5 and Figure 5.

Where a certain range is given, the LED package manufacturer shall choose an appropriate value.

This choice of the LED package manufacturer shall be made taking into account the following parameters:

- measurement equipment capability,
- typical input power of the LED package,
- typical heat capacity of the LED package,
- typical thermal conductivity of the LED package,
- typical thermal time-constant of the LED package,
- typical increase of T_j during the measurement e.g. by monitoring changes in forward voltage.

NOTE In this context, “typical” means: representative for the product family.

The integrating times for the measurements shall be chosen by the LED package manufacturer to ensure stabilization of the measurement and to avoid an excessive increase of the junction temperature (T_j) of the LED package during the integration time.

It is recommended that the increase of junction temperature (T_j) during the integration time should not be greater than 5 K.

Table 5 – Times and time-intervals for the binning test procedure

Step	Time (ms)	Action
1	t = 0	LED package is switched ON at the binning current $I_{f,bin}$. See Note 1.
2	t = 1 to 5	End of stabilization time.
3	t = 1 to 10:	Start of the electrical measurement (e.g. V_f), using a 4-wire technique, with an integration time of 1 ms (minimum) to 5 ms (maximum).
4	t = 1 to 10	Start of optical measurement (e.g. luminous flux, luminous intensity, colour, λ_{dom})[a], with an integration time of 1 ms (minimum) to 40 ms (maximum) (see Note 2 and Note 3)
5	t = 50	Latest time at which optical measurement ends and LED package is switched off.

NOTE 1 The method of selecting the binning current $I_{f,bin}$ is described in 5.4.

NOTE 2 A typical integration time for optical measurements is 20 ms.

NOTE 3 For LED packages with intensity values below 50 mcd, higher integration times can be used.

[a] If luminous intensity binning is used, information should be provided for correlation of a luminous intensity value to its corresponding luminous flux value. This correlation factor should be based on a representative value for the product family.

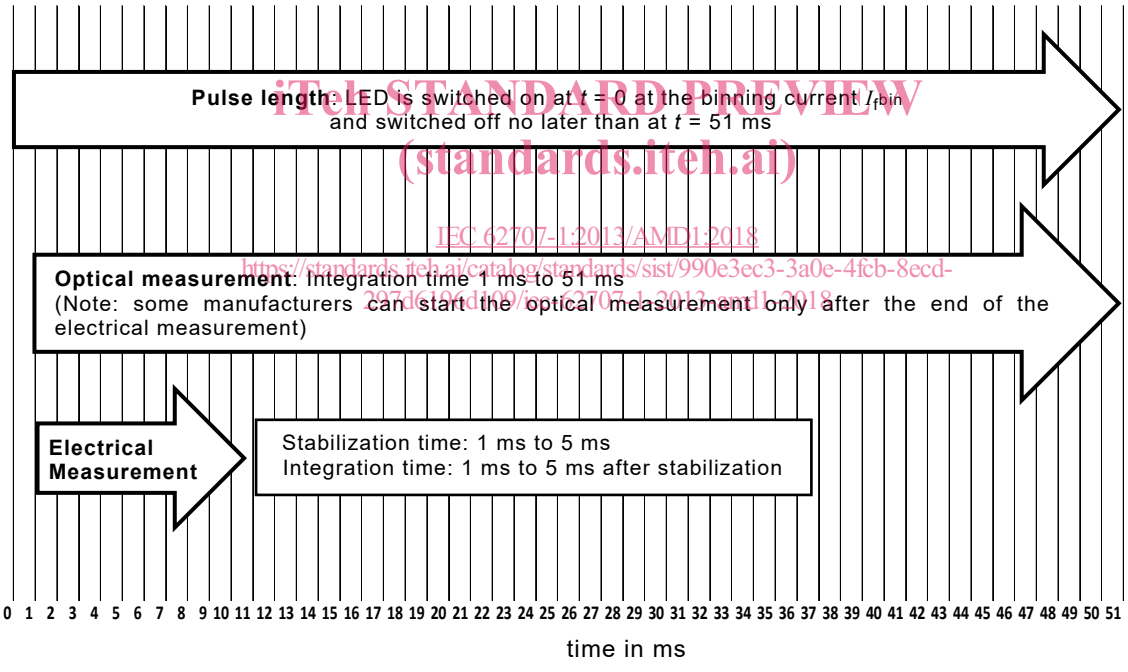

Figure 5 – Times and time-intervals for binning tests

5.4 Binning currents

5.4.1 High-power (rated power ≥ 250 mW) InGaN-based LED packages

For LED packages with a rated input power equal or greater than 250 mW, based on InGaN technology, the appropriate binning current shall be selected from the list of binning currents given in Table 6, in order to be within the range of 65 % to 75 % of the maximum rated value as given in the LED package datasheet, i.e. 0,65 x $I_{f,max}$ ≤ $I_{f,bin}$ ≤ 0,75 x $I_{f,max}$ where $I_{f,bin}$ is chosen from the values given in Table 6 (rule No.1)

where

$I_{f,bin}$ is the binning current;

$I_{f,max}$ is the maximum drive current specified on the data sheet.

If more than one value of Table 6 meet this criteria, then the value closest to one of the two border values shall be chosen (rule No.1a).

In case of doubt, the higher value shall be chosen (rule No.1b).

NOTE The input power of an LED package and its material-technology are given by the LED package manufacturer on the data sheet.

If no value from Table 6 fulfils the above requirements ("unlisted values, holes"), the next higher binning current from Table 6, which lies above 75 % of the maximum rated current, but below the maximum rated current, shall be used i.e. 0,75 x $I_{f,max} < I_{f,bin} \leq I_{f,max}$ (rule No.2a).

If no value from Table 6 fulfils this requirement, the next smallest value from Table 6 shall be used, i.e. $I_{f,bin} < 0{,}65 \times I_{f,max}$ (rule No.2b).

5.4.2 Low- and mid power (rated power < 250 mW) InGaN-based LED packages and all AlInGaP-based LED packages

For LED packages with a rated input power less than 250 mW based on InGaN technology and all LED packages based on AlInGaP technology, the binning current shall be chosen from those listed in Table 6, based on the most common application for this LED package (rule No.3).

Rule No.1 and rule No.2 do not apply for these LED packages, because for these LED packages the currents in the application are often much lower than the maximum rated values from the datasheet.

Table 6 – Binning currents

Number	Binning current $I_{f,bin}$ mA
1	2
2	5
3	10
4	20
5	30
6	50
7	70
8	100
9	150
10	200
11	350
12	500
13	700
14	850
15	1 000
16	1 500
17	2 000
18	3 000
19	5 000
20	6 000

Add, at the end of Annex B, the following new Annex C:

Annex C
(informative)

Measurement accuracy

C.1 General

For the electrical and optical measurements described in 5.3, the values for the internal reproducibility tolerance and absolute uncertainty should be determined in accordance with ISO/IEC Guide 98-3:2008.

C.2 Luminous flux and luminous intensity

The internal reproducibility tolerance for luminous flux and luminous intensity measurements should be no greater than ± 8 %, and the absolute uncertainty (traceable to national calibration standards) should be no greater than ± 11 % (both with a coverage factor of k = 3).

C.3 Single-die forward voltage (in volts)

The internal reproducibility should not be worse than ± 0,050 V, and the absolute uncertainty (traceable to national standards) not greater than ± 0,100 V (with a coverage factor of k = 3).

C.4 Calibration standards

All equipment calibration should be traceable to national calibration standards.

Bibliography

Add the following new reference:

ISO/IEC Guide 98-3:2008, *Uncertainty of measurement – Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

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