



Ref. Certif. No.

DK-47381-P2-A1-UL

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE)  
CB SCHEME

## CB TEST CERTIFICATE

Product

Built-in LED Module

Name and address of the applicant

Philips Lighting B.V.  
High Tech Campus 45  
Eindhoven, 5656 AE Netherlands

Name and address of the manufacturer

Philips Lighting B.V.  
High Tech Campus 45  
Eindhoven, 5656 AE Netherlands

Name and address of the factory

Note: When more than one factory, please report on page 2

Ratings and principal characteristics

Imax 2750 mA DC Vmax 44 VDC  
(see test report for further ratings)

Trademark (if any)

PHILIPS

Type of Customer's Testing Facility (CTF) Stage used

Model / Type Ref.

Fortimo SLM C zcc dd m Lee s Gi a,  
Fortimo SLM zcc Lee hh s Gij a  
See Page 2 to 5Additional information (if necessary may also be  
reported on page 2)Additionally evaluated to EN 62031:2008/ A1:2013/ A2:2015.  
National Differences specified in the CB Test Report.☒ Additional Information on page 6 and 7A sample of the product was tested and found  
to be in conformity with

IEC 62031(ed.1), IEC 62031(ed.1);am1, IEC 62031(ed.1);am2

As shown in the Test Report Ref. No. which forms part  
of this Certificate

4788293213-1 issued on 2018-02-26

This CB Test Certificate is issued by the National Certification Body



UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA

UL (Denmark), Borupvang 5A DK-2750 Ballerup, DENMARK

UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN

UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

Date: 2018-03-01

Original Issue Date: 2018-02-26

Signature:

Jan-Erik Storgaard

For full legal entity names see [www.ul.com/ncbnames](http://www.ul.com/ncbnames)

## Model details:

## Product Key:

Main series: **Fortimo SLM C zcc dd m Lee s G i a**

Where:

- z = CRI of LED divided by 10 (one digit, may be "7" or "8" or "9");  
cc = Color temperature of LED divided by 100 (two digits, may be a value between 25 and 57);  
dd = Color of light (two or three characters or none, may be "CW" or "FP" or "FPR" or "FW" or "FWW" or "PW" or blank)  
m = Die matrix (4 digits, may be "1202" or "1203" or "1204" or "1205" or "1208" or "1211")  
ee = Diameter of Light Emitting Surface (LES) in mm (one or two digits, may be a value between 9 and 19);  
s = CoB size in mm (four digits, example 2828: CoB dimensions = 28 mm x 28 mm);  
i = Number of generation of CoB (one digit, may be "4" or "5");  
a = Suffix for commercial purposes (optional)

## Maximum ratings of the series:

| CoB Type<br>(Die matrix) | Diameter of<br>LES of CoB<br>[mm] | CCT<br>[K] | DC Current<br>[mA]               | Power<br>[W] | Power Density of<br>CoB [W/mm <sup>2</sup> ] | t <sub>c</sub><br>[°C] |
|--------------------------|-----------------------------------|------------|----------------------------------|--------------|--|------------------------|
| 1211                     | 19                                | ≤ 4000     | 2400 (V <sub>f tot</sub> 37,5 V) | 90           | 0,32   | 105                    |
|                          |                                   | > 4000     | 1500 (V <sub>f tot</sub> 36 V) * | 54           | 0,19   |                        |
| 1208                     | 15                                | ≤ 4000     | 1690 (V <sub>f tot</sub> 36 V)   | 60,8         | 0,34   | 105                    |
|                          |                                   | > 4000     | 935 (V <sub>f tot</sub> 36 V) *  | 33,7         | 0,19   |                        |
| 1205                     | 13                                | ≤ 4000     | 1200 (V <sub>f tot</sub> 36 V)   | 43,2         | 0,33   | 105                    |
|                          |                                   | > 4000     | 700 (V <sub>f tot</sub> 36 V) *  | 25,2         | 0,19   |                        |
| 1204                     | 13                                | ≤ 4000     | 960 (V <sub>f tot</sub> 36 V)    | 34,6         | 0,26   | 105                    |
|                          |                                   | > 4000     | 700 (V <sub>f tot</sub> 36 V) *  | 25,2         | 0,19   |                        |
| 1203                     | 9                                 | ≤ 4000     | 600 (V <sub>f tot</sub> 36 V)    | 21,6         | 0,34   | 105                    |
|                          |                                   | > 4000     | 340 (V <sub>f tot</sub> 36 V) *  | 12,2         | 0,19   |                        |
| 1202                     | 9                                 | ≤ 4000     | 480 (V <sub>f tot</sub> 36 V)    | 17,3         | 0,27   | 105                    |
|                          |                                   | > 4000     | 340 (V <sub>f tot</sub> 36 V) *  | 12,2         | 0,19   |                        |

\* : See additional information

## Additional information (if necessary)



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UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

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Signature:

Jan-Erik Storgaard

Date: 2018-03-01

Original Issue Date: 2018-02-26

**Product Key:**Variant series 1: **Fortimo SLM zcc Lee hh s Gij a**

Where:

**z** = CRI of LED divided by 10 (one digit, may be "7" or "8" or "9");  
**cc** = Color temperature of LED divided by 100 (two digits, may be a value between 25 and 57);  
**ee** = Diameter of Light Emitting Surface (LES) in mm (one or two digits, may be a value between 9 and 19);  
**hh** = Holder type (two characters or none, may be "DL" or "PI" or "ZP" or "ZPw" or blank);  
**s** = CoB size in mm (four digits, example 2828: CoB dimensions = 28 mm x 28 mm);  
**i** = Number of generation of CoB (one digit, may be "4" or "5");  
**j** = Number of generation of Holder (one digit, may be "1" or "2");  
**a** = Suffix for commercial purposes (optional)

The variant series 1 differs from the main series for different product key and for the presence of LED CoB + LED Holder.

**Maximum ratings of the series:**

| CoB Type | Diameter of LES of CoB [mm] | CCT [K] | DC Current [mA]                 | Power [W] | Power Density of CoB [W/mm <sup>2</sup> ] | t <sub>c</sub> [°C] | T Holder [°C] |
|----------|-----------------------------|---------|---------------------------------|-----------|---|---------------------|---------------|
| 1211     | 19                          | ≤ 4000  | 2400 (V <sub>ftot</sub> 37,5 V) | 90        | 0,32                                      | 105                 | 100           |
|          |                             | > 4000  | 1500 (V <sub>ftot</sub> 36 V) * | 54        | 0,19                                      |                     |               |
| 1208     | 15                          | ≤ 4000  | 1690 (V <sub>ftot</sub> 36 V)   | 60,8      | 0,34                                      | 105                 | 100           |
|          |                             | > 4000  | 935 (V <sub>ftot</sub> 36 V) *  | 33,7      | 0,19                                      |                     |               |
| 1205     | 13                          | ≤ 4000  | 1200 (V <sub>ftot</sub> 36 V)   | 43,2      | 0,33                                      | 105                 | 100           |
|          |                             | > 4000  | 700 (V <sub>ftot</sub> 36 V) *  | 25,2      | 0,19                                      |                     |               |
| 1204     | 13                          | ≤ 4000  | 960 (V <sub>ftot</sub> 36 V)    | 34,6      | 0,26                                      | 105                 | 100           |
|          |                             | > 4000  | 700 (V <sub>ftot</sub> 36 V) *  | 25,2      | 0,19                                      |                     |               |
| 1203     | 9                           | ≤ 4000  | 600 (V <sub>ftot</sub> 36 V)    | 21,6      | 0,34                                      | 105                 | 100           |
|          |                             | > 4000  | 340 (V <sub>ftot</sub> 36 V) *  | 12,2      | 0,19                                      |                     |               |
| 1202     | 9                           | ≤ 4000  | 480 (V <sub>ftot</sub> 36 V)    | 17,3      | 0,27                                      | 105                 | 100           |
|          |                             | > 4000  | 340 (V <sub>ftot</sub> 36 V) *  | 12,2      | 0,19                                      |                     |               |

\*: See additional information

**Additional information (if necessary)**

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Date: 2018-03-01

Original Issue Date: 2018-02-26

## Product Key:

Variant series 2: **Fortimo SLM C zcc dd m Lee s Gi a**

Where:

- z** = CRI of LED divided by 10 (one digit, may be "7" or "8" or "9");  
**cc** = Color temperature of LED divided by 100 (two digits, may be a value between 22 and 65);  
**dd** = Color of light (two or three characters or none, may be "CW" or "FP" or "FPR" or "FW" or "FWW" or "PW" or "PC" or blank)  
**m** = Die matrix (4 digits, may be "1202" or "1202s" or "1203" or "1204" or "1204s" or "1205" or "1208" or "1211" or "1216")  
**ee** = Diameter of Light Emitting Surface (LES) in mm (one or two digits, may be a value between 6 and 23);  
**s** = CoB size in mm (four digits, example 2828: CoB dimensions = 28 mm x 28 mm);  
**i** = Number of generation of CoB (one digit, may be "6" or "7");  
**a** = Suffix for commercial purposes (optional)

## Maximum ratings of the series:

| CoB Type<br>(Die matrix) | Diameter of LES<br>of CoB [mm] | DC Current<br>[mA]            | Power<br>[W] | Power Density of<br>CoB [W/mm <sup>2</sup> ] | t <sub>c</sub><br>[°C] |
|--------------------------|--------------------------------|-------------------------------|--------------|--|------------------------|
| 1216                     | 23 *, 23**                     | 2750 (V <sub>ftot</sub> 41 V) | 113          | 0,27   | 105                    |
| 1211                     | 19 *, 19**                     | 2400 (V <sub>ftot</sub> 41 V) | 98           | 0,35   | 105                    |
| 1208                     | 15 *, 15**                     | 1710 (V <sub>ftot</sub> 41 V) | 70           | 0,40   | 105                    |
| 1205                     | 13 *, 13**                     | 1050 (V <sub>ftot</sub> 41 V) | 43           | 0,32   | 105                    |
| 1204                     | 13 *                           | 850 (V <sub>ftot</sub> 41 V)  | 35           | 0,26   | 105                    |
|                          | 9 **                           | 1350 (V <sub>ftot</sub> 44 V) | 59,4         | 0,93   | 105                    |
| 1204s                    | 9 *                            | 740 (V <sub>ftot</sub> 41 V)  | 30,3         | 0,47   | 105                    |
| 1203                     | 9 *, 9**                       | 570 (V <sub>ftot</sub> 41 V)  | 23           | 0,36   | 105                    |
| 1202s                    | 6,5 *                          | 380 (V <sub>ftot</sub> 41 V)  | 15,5         | 0,47   | 105                    |
| 1202                     | 6 **                           | 675 (V <sub>ftot</sub> 44 V)  | 29,7         | 0,90   | 105                    |

\*: Concerning CoB's Generation 6

\*\*: Concerning CoB's Generation 7

## Additional information (if necessary)



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## Product Key:

Variant series 3: **Fortimo SLM zcc Lee hh s Gij a**

Where:

**z** = CRI of LED divided by 10 (one digit, may be "7" or "8" or "9");  
**cc** = Color temperature of LED divided by 100 (two digits, may be a value between 22 and 65);  
**ee** = Diameter of Light Emitting Surface (LES) in mm (one or two digits, may be a value between 6 and 23);  
**hh** = Holder type (two or three characters or none, may be "DL" or "PI" or "ZP" or "ZPw" or blank);  
**s** = CoB size in mm (four digits, example 2828: CoB dimensions = 28 mm x 28 mm);  
**i** = Number of generation of CoB (one digit, may be "6" or "7");  
**j** = Number of generation of Holder (one digit, may be "1" or "2");  
**a** = Suffix for commercial purposes (optional)

The variant series 3 differs from the variant series 2 for different product key, for the presence of LED CoB + LED Holder and for different maximum ratings for CoB Type 1216.

## Maximum ratings of the series:

| CoB Type | Diameter of LES of CoB [mm] | DC Current [mA]                | Power [W] | Power Density of CoB [W/mm <sup>2</sup> ] | t <sub>c</sub> [°C] | T Holder [°C] |
|----------|-----------------------------|--------------------------------|-----------|---|---------------------|---------------|
| 1216     | 23 *, 23**                  | 2400 (V <sub>f tot</sub> 41 V) | 98        | 0,24                                      | 105                 | 100           |
| 1211     | 19 *, 19**                  | 2400 (V <sub>f tot</sub> 41 V) | 98        | 0,35                                      | 105                 | 100           |
| 1208     | 15 *, 19**                  | 1710 (V <sub>f tot</sub> 41 V) | 70        | 0,40                                      | 105                 | 100           |
| 1205     | 13 *, 13**                  | 1050 (V <sub>f tot</sub> 41 V) | 43        | 0,32                                      | 105                 | 100           |
| 1204     | 13 *                        | 850 (V <sub>f tot</sub> 41 V)  | 35        | 0,26                                      | 105                 | 100           |
|          | 9 **                        | 1350 (V <sub>f tot</sub> 44 V) | 59,4      | 0,93                                      | 105                 | 100           |
| 1204s    | 9 *                         | 740 (V <sub>f tot</sub> 41 V)  | 30,3      | 0,47                                      | 105                 | 100           |
| 1203     | 9 *, 9**                    | 570 (V <sub>f tot</sub> 41 V)  | 23        | 0,36                                      | 105                 | 100           |
| 1202s    | 6,5 *                       | 380 (V <sub>f tot</sub> 41 V)  | 15,5      | 0,47                                      | 105                 | 100           |
| 1202     | 6 **                        | 675 (V <sub>f tot</sub> 44 V)  | 29,7      | 0,90                                      | 105                 | 100           |

\*: Concerning CoB's Generation 6

\*\*: Concerning CoB's Generation 7

## Additional information (if necessary)



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Date: 2018-03-01

Original Issue Date: 2018-02-26

Factories:

Additional Information:

Correction reason: missing additional information.

- The modules have been evaluated according to IEC/TR 62778 and the Lamp classification Group for Blue Light Hazard is Risk Group 1 Unlimited for modules having generation of CoB "4" or "5", Risk Group 2 for modules having generation of CoB "6" or "7" when are used at maximum rated currents. These Generation 6 and 7 modules are classified as Risk Group 1 if they are used according to the maximum currents listed below.

| -                                      | CoB Type     |              |             |             |                            |       |             |                          |
|--|--------------|--------------|-------------|-------------|----------------------------|-------|-------------|--------------------------|
|  | 1216         | 1211         | 1208        | 1205        | 1204                       | 1204s | 1203        | 1202s                    |
| Maximum Currents for RG1 Classif. [mA] | 1824 (Gen 6) | 1254 (Gen 6) | 912 (Gen 6) | 570 (Gen 6) | 456 (Gen 6)<br>420 (Gen 7) | 456   | 342 (Gen 6) | 228 (216 for 1202 Gen 7) |

| -                                      |           | CoB Type     |              |             |             |             |
|--|-----------|--------------|--------------|-------------|-------------|-------------|
|  |           | 1216         | 1211         | 1208        | 1205        | 1203        |
| Maximum Currents for RG1 Classif. [mA] | zcc = 765 | 1797 (Gen 7) | 1248 (Gen 7) | 548 (Gen 7) | 468 (Gen 7) | 258 (Gen 7) |
|  | zcc = 857 | 2298 (Gen 7) | 1349 (Gen 7) | 599 (Gen 7) | 480 (Gen 7) | 264 (Gen 7) |

- For modules having generation of CoB "4" or "5" with CCT > 4000 K the customer can increase the rated currents (for example 1500 mA for Type 1211) up to the rated currents of modules having CCT ≤ 4000 K (2400 mA for Type 1211). In this case the photobiological hazard shall be additionally evaluated in the final product.

- The insulation between active parts of LED CoB and accessible conductive parts (metal mounting surface) is tested for basic insulation related to 50 Vdc for CoB Types 1202, 1202s, 1203, 1204s, 1204 Gen 7 and all CoBs provided with holders having Field hh in the product key of variant series = "PI", 150 Vdc for CoB Types 1204, 1205, 1208, 1211, 1216 provided with holders having Field hh in the product key of variant series = "DL" or blank and 200 Vdc for CoB Types 1204 Gen 6, 1205, 1208, 1211, 1216 provided with holder having Field hh in the product key of variant series = "ZP" or "ZPw".

- Maximum 3 CoBs can be placed in series configuration for CoB Types 1204 Gen 6, 1205, 1208, 1211, 1216 provided with holders having Field hh in the product key of variant series = "DL" or blank.

Maximum 4 CoBs can be placed in series configuration for CoB Types 1204 Gen 6, 1205, 1208, 1211, 1216 provided with holder having Field hh in the product key of variant series = "ZP" or "ZPw". No series configuration can be used for CoB Types 1202, 1202s, 1203, 1204s, 1204 Gen 7 and all CoBs provided with holders having Field hh in the product key of variant series = "PI".

- Creepage and clearance distances on the overall LED module (LED CoB + LED Holder) shall be evaluated on the final product.

- LED Holders have been evaluated as integral component according to IEC/EN 60838-1:2004 + A1:2008 + A2:2011 and IEC/EN 60838-2-2:2006 + A1:2012

#### Additional information (if necessary)



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- M3 fixing screws for LED Holders shall be used. The fasteners used to secure the module to the mounting surface must be tightened with a torque between 0,4 and 0,6 Nm.
- The modules can be supplied only by electronic LED controlgears separately approved according to IEC/EN 61347-2-13 and protected against output short-circuit and overload.
- The customer is obligated to add an appropriated cooling system to the LED module in order to not exceed to value. Temperature test shall be performed on the final product to verify the effectiveness of this cooling system.

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