



Ref. Certif. No.

DK-45723-P6-M3-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

Signify Netherlands B.V.
High Tech Campus 48
Eindhoven, 5656 AE Netherlands

Name and address of the manufacturer

Signify Netherlands B.V.
High Tech Campus 48
Eindhoven, 5656 AE Netherlands

Name and address of the factory

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

☒ Additional Information on page 6

Ratings and principal characteristics

HV: I_{max}: 1200 mA ---
LV: I_{max}: 2000 mA ---
See Pages 2-6

Trademark / Brand (if any)



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

Model / Type Ref.

Main series: **Fortimo LED line p xu ylm zcc qR eVgd a**
See Pages 2-6

Additional information (if necessary may also be reported on page 2)

The report was revised to include technical modifications
☒ Additional Information on page 8

A sample of the product was tested and found to be in conformity with

IEC 62031:2008/AMD1:2012, IEC 62031:2008/AMD2:2014, IEC 62031:2008

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

4789071535.1 issued on 2020-02-28

This CB Test Certificate is issued by the National Certification Body



- ☐ UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA
☒ UL (Demko), 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

For full legal entity names see www.ul.com/ncbnames

Date: 2020-03-12

Signature:

Original Issue Date: 2019-07-29

Jan-Erik Storgaard

Model Details:

Product Key:

Main series: Fortimo LED line *p xu ylm zcc qR eVgd a*

Where:

p = Performance (may be blank or "PR" or "ST" or "VO");
x = Product length in feet or mm or inch (1-4 digits/characters (for example 1.5 or 102));
u = Measurement unit for product length (two characters, may be "ft" or "mm" or "in");
y = Lumen output (three or four or five digits);
z = CRI of LED divided by 10 (one digit, may be "8" or "9");
cc = Color temperature of LED divided by 100 (two digits, may be between 27 and 73);
q = Number of LED's rows (one digit, may be "1" or "2" or "3" or "4" or "6" or "9" or "T");
e = Voltage type (one character, may be "H" or "L");
g = Number of LED module's generation (one digit, may be "2" or "3" or "4");
d = Connector designator (may be blank or "F" = front connector, or "B" = back connector, or "D" = dual entry connector);
a = Commercial suffix for commercial purposes (optional)

Maximum ratings of the series:

Type	DC Current [mA]	Power [W]	Number of LEDs	t _c [°C]	Max. working voltage for basic insulation to mount. surface [V]
HV	570	40	72	90	420 (°)
HV (*)	1000	93,6	176	95	420
HV (**)	1000	40	120	85	420
HV (***)	640 (V _{f tot} 81,5 V) or 320 (V _{f tot} 163 V)	52,2	46	95	420
HV (****)	1200	86,4	184	85	420 (°°)
HV (****)	800	21	32	80	350 (°°°)
LV	1120	40	44	90	120

(*) : High flux modules (≥ 2000 lm/ft)

(**) : Only for model Fortimo LED line 2ft 1250lm *zcc 2R HVgd a*

(***) : When *q* = "T" in the product key. Maximum current depends on connecting method of the module.

(****) : For model Lunux (Fortimo LED line 415mm 12000lm *zcc 9R HV4 L*)

(****) : For model Fortimo LED line 1ft 800lm *zcc 4R HV4 L*

(°) : 450 V for model Fortimo LED line 1ft *ylm zcc 3R HV4B T* with parameter *y* ≤ 1500 lm

(°°) : When 1 mm additional creepage to mounting surface is taken near the supply terminal (to be verified in the final product)

(°°°) : When insulating washers (or plastic optics) are used on fixing screws.

Additional information (if necessary)



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Product Key:
Variant series 1: LBA bs xu ylm zcc qR eh d a

Where:

- b** = Platform shape (4-5 characters, may be "Area", "2Line", "Line", "Slim", "USlim", "Point", "Round");
s = Segment (one character, Commercial application);
x = Product Length (or diameter) in feet or mm or inch or Product Area in mm (for example 1178x20) (1-7 digits/characters);
u = Measurement unit for product length (two characters or blank, may be "ft" or "mm" or "in")
y = Lumen output (three or four digits);
z = CRI of LED divided by 10 (one digit, may be "8" or "9");
cc = Color temperature of LED divided by 100 (two digits, may be between 27 and 65);
qR = Number of LED's rows (two characters or blank, may be "1R" to "5R");
e = Voltage type (one character, may be "H" or "L");
h = Last digit of release year (one digit);
d = Connector designator (may be blank or "F" = front connector, or "B" = back connector, or "D" = dual entry connector);
a = Commercial suffix for commercial purposes (optional)

See the following table for the Platform shapes allowed:

Platform shape (b field on Product Key)	Main characteristics
Area	Rectangular shape or E-shape, Up to 5 rows of LEDs or 2 rows of LEDs placed on E-shape, HV/LV Types
2Line	2 rows of LEDs, HV Type
Line	1 row of LEDs, HV/LV Types
Slim and USlim	1 row of LEDs on a slim PCB, HV/LV Types (Slim) LV Type (USlim)
Point	LEDs placed in groups (Max 6 LEDs each group), HV Type
Round	1 or 2 circular rows of LEDs, HV Type, 4 separated circuits

Maximum ratings of the series:

Platform shape (b field on Product Key)	DC Current [mA]	Power [W]	Number of LEDs	t _c [°C]	Max. working voltage for basic insulation to mount. surface [V]
Area and Line (HV Type)	570	40	66	90	420

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Area and Line (HV Type) (*)	650	36,8	56	95	420
Line (HV Type) (**)	800	32	24	95	420
Area and Line (LV Type)	1120	40	44	90	120
Line (LV Type)	840	34	72 (4 ft)	75	120
Area (E-Shape) (HV Type)	280	39	88	85	420
Area (5R)	1000 (HV Type) 2000 (LV Type)	72	120	90	420
2Line	1000	40	120	85	420
Slim	720	27,4	72	95	HV Type: 350 (***) LV Type: 120
USlim	1440	50,4	144	105	120 (***)
Point	1ft: 560	1ft: 11,2	1ft: 12	90	420
	2ft: 560	2ft: 22,4	2ft: 24		
Round	4 x 188 mA (V _{f tot} 4 x 40-80 V)	43,2	80	85	150 (And between adjacent circuits)

(*) : High flux modules (≥ 2000 lm/ft)

(**) : Only for models LBA LineX 1ft 2000lm zcc Hhd a

(***) : See Additional information

Additional information (if necessary)



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Product Key:
Variant series 2: b Strip p w x u y l z c c s d e V g D a

Where:

- b** = Family name (may be "Fortimo LED" or "CertaFlux LED" or "FO" or "CF");
p = Performance (may be blank or "PR" or "ST" or "VO" or "OC" or "CES" or "ST FT" or "PR FT");
w = Product width in mm (optional) (two digits, if it is omitted width is 20 mm);
x = Product length in feet or mm or inch (1-4 digits/characters (for example 1.5 or 102));
u = Measurement unit for product length (two characters, may be "ft" or "mm" or "in");
y = Value of Lumen output or Value of Lumen output divided by 100 (1-4 digits);
l = Measurement unit for Lumen output (may be "lm" or "L");
z = CRI of LED divided by 10 (one digit (or blank when $p = \text{"CES"}$), may be "8" or "9");
cc = Color temperature of LED divided by 100 (two digits or six characters (or blank when $p = \text{"CES"}$), may be a value between 27 to 65 (or "27-865" or "27-965" (when $p = \text{"PR FT"}$ or "ST FT")));
s = Specials (may be blank or "HE" = High Efficiency, or "PW" = Premium White);
d = Connector designator in case of "ft" or "in" (may be blank or "NA" or "1R" or "FC" = front connector or "BC" = back connector);
e = Voltage type (one character, may be "H" or "L");
g = Number of LED module's generation (one or two digits, may be "1" or "2" or "3" or "4" or "4+" or "5" or "6");
D = Connector designator in case of "mm" (may be blank or "F" = front connector, or "B" = back connector);
a = Commercial suffix for commercial purposes (optional)

Maximum ratings of the series:

Typ e	Flux Type	Flux [lm]	Supply DC Current [mA]	LED Current [mA]	Power [W]	Number of LEDs	t _c [°C]	Max. working voltage for basic insulation to mount. surface [V]
HV	-	5500	600	190	89,1	180	85	420 (350 for $b = \text{Fortimo}$ and $g \geq 4$) (350 for $b = \text{CertaFlux}$ and $g \geq 3$)
	-	2200	600	150	35,64	72	80	
	-	2200 (°)	2 x 480	240	2 x 38,4	96	80	
	-	2300 (§)	720	240	37	48	95	
	-	2200 (§§)	1000	200	69	100	85	
	-	4400 (*)	720	180	48	88	90	
	-	6400 (**)	600	200	93,6	138	95	
	HF	6000	720	240	60,48	84	95	
LV	HF	6900 (***)	720	180	59,04	96	85	120
	-	5500	1900	190	72	144	85	
	-	2200	900	150	35,64	72	80	
	-	2200 (°)	2 x 700	175	2 x 30,8	112	95	
	-	2200 (§)	800	200	30	48	85	
	-	2200 (§§)	2000	200	69	100	80	
	HF	4000	400	200	39	72	95	
	HF	8000	1800	150	63	144	95	

(°): When $p = \text{"ST FT"}$ or $p = \text{"PR FT"}$ in the product key. LED Modules with 2 separated circuits not insulated from each other.

(§): When $p = \text{"OC"}$ in the product key

(§§): When $p = \text{"CES"}$ in the product key

(*): When $w = \text{"32"}$ in the product key

(**): When $w = \text{"12"}$ in the product key

HF means Flux ≥ 2000 lm/ft

(***): When $a = \text{"T"}$ in the product key

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Product Key:
Variant series 3: Fortimo LED Square ylm zcc d HV/LV2 a

Where:

- y** = Lumen output (three or four digits);
z = CRI of LED divided by 10 (one digit, may be "8" or "9");
cc = Color temperature of LED divided by 100 (two digits, may be between 30 and 65);
d = Connector designator (may be blank or "FC" = front connector or "BC" = back connector);
a = Commercial suffix for commercial purposes (optional)

Maximum ratings of the series:

Type	DC Current [mA]	Power [W]	Number of LEDs	t _c [°C]	Max. working voltage for basic insulation to mount. surface [V]
HV/LV (Max 2500 lm)	700	34,8	128	80	420
HV/LV (Max 3500 lm)	1200	42,1	132	80	350

Factories:

Additional information (if necessary)


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Additional Information:

Additionally evaluated to EN 62031:2008/ A1:2013/ A2:2015.
National differences specified in the CB Test Report.

- Modules having Platform shape b in the Product Key of variant series 1 = "Slim" can be named also with dimensions x in mm instead in feet (for example: LBA SlimS 595x20 500lm 830 L5).
- The model Fortimo LED Strip 2ft 2200lm 835 HV1 KR is identical to the model Fortimo LED Strip 2ft 2200lm 835 HV3, the difference between names is only for commercial purpose.
- The model "Fortimo LED Strip 4ft..." can be also labelled as "Fortimo LED Strip 1150mm..."
- The model "Fortimo LED Strip 5ft..." can be also labelled as "Fortimo LED Strip 1450mm..."
- The insulation between active parts of LED module and accessible conductive parts (metal mounting surface) is tested for basic insulation related to the working voltages listed in the tables of maximum ratings.
- HV modules, modules having Platform shape b in the Product Key of variant series 1 = "Slim", module "LBA LineP 2ft 4000lm zcc L5", module "Fortimo LED line 2ft 4000lm zcc 1R LV3" and all modules of variant series 2 shall use PCBs with PTI > 600 V.
- Manufacturer and customers shall maintain clearances and creepage distances between tracks on PCB and screws/accessible conductive parts in compliance with table 11.1 of IEC/EN 60598-1 using working voltage values listed in the tables of maximum ratings and considering basic insulation. When Connector designator "D" or "d" in the Product Keys = "B" or "BC" or "D" clearances and creepage distances shall be also maintained between accessible conductive parts and terminals mounted in the back of the modules or all metal terminals.
- M4 fixing screws with diameter of their heads not exceeding 8 mm shall be used (if in metallic material). Modules having Number of LED's rows q in the Product Key of main series = "2" or Platform shape b in the Product Key of variant series 1 = "2Line" or "Slim" shall use M3 fixing screws with diameter of their heads not exceeding 5,6 mm. Manufacturer recommends for all modules the use of washers made in insulating material. The fasteners used to secure the module to the mounting surface must be tightened with a torque between 0,6 and 1 Nm.
- For Linux LED Module (Fortimo LED line 415mm 12000lm zcc 9R HV4 L) only insulating struts shall be used.
- LED Module "LBA Slims xft ylm zcc Hh d a" shall be used only with insulating washers made of suitable material, having 2,2 mm minimum thickness, with the internal hole suitable for only M3 screws and having the external diameter not less than 5,6 mm and it shall be installed with creepage/clearance distances to metal mounting surface of at least 1 mm.
- LED Modules of Variant series 2 having in the product key p = "ST FT" or "PR FT" (Flex Tune) are composed by two separated circuits not insulated from each other.
- 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.
- Modules having Platform shape b in the Product Key of variant series 1 = "USlim" can be supplied only by SELV LED Controlgears having Uout max = 120 Vdc.
- The customer is obligated to add an appropriated cooling system to the LED module in order to not exceed tc value and the maximum temperatures of the module's components. Temperature test shall be performed on the final product to verify the effectiveness of this cooling system.
- HV (High Voltage) modules can be used in series configuration if the total voltage of the load of LED controlgear does not exceed the maximum working voltages listed on ratings.
- LV (Low Voltage) modules can be used in parallel configuration if the current per module does not exceed its rated current and the current in the chain of modules does not exceed 2 A for modules with terminals Molex Lite-Trap, Mini Lite-Trap, BJB, WAGO and Tyco Electronics and 1 A for modules with terminals Molex Flexi-Mate.
- The modules have been also evaluated according to IEC TR 62778 (Second Edition): RISK GROUP 1 UNLIMITED with exception of modules having LED 3020, LED NF2*757DRT-V1, LED NF2*757GRT-V1 and LED 3030-2D 6V which are classified RISK GROUP 2 (Worst value of Ethr = 338 lx) (See also photobiological test report for more information).

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The original report was modified to include the following changes/additions:

- Update of critical components list
- Addition of new models and update of product key and maximum ratings of variant series

Additional information (if necessary)



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