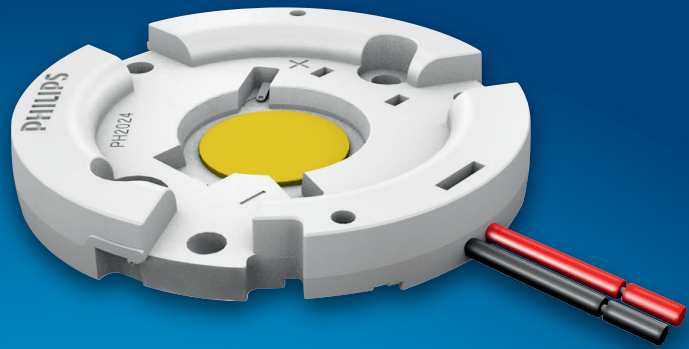


PHILIPS

Fortimo

LED system

SLM Gen4 2000 lm L13



Datasheet

Experience **bright** **and vivid** colors

Fortimo LED SLM 2000 lm L13

The Fortimo LED SLM Gen4 is a next generation solution for spotlight and mini-downlight applications. It is a product in line with the Fortimo brand promise of light quality and a smart system. We provide you with a system proposition ranging from 1100 lm to 4500 lm in preset outputs, with the flexibility to tune as per your needs.



*Measurements showing compliancy to Zhaga book 3 version 1.2 have been done on the 3000 lm L15 module with the standard holder.

October 2014

This module is available in the following options. It is possible to combine these with any of the drivers as described in the design-in guide available at www.Philips.com/Technology. The nominal operating current for this module has been selected as 500 mA. Apart from this value, the module can be operated at different currents. A list of possible Rsets is provided below. More information about such tuning can be found further on in the document.

| Commercial product name | EOC | 12NC |
|--|------------------|----------------|
| Standard with pre-tinned cables (60 cm) | | |
| Fortimo LED SLM 2000lm 830 L13 G4 | 8718291 78325100 | 9290 009 01806 |
| Fortimo LED SLM 2000lm 840 L13 G4 | 8718291 78327500 | 9290 009 01906 |
| Fortimo LED SLM 2000lm 927 L13 G4 | 8718291 78329900 | 9290 009 02006 |
| Fortimo LED SLM 2000lm 930 L13 G4 | 8718291 78331200 | 9290 009 02106 |
| Down light versions with tin-dipped sleeved cable (60 cm) | | |
| Fortimo LED SLM 2000lm 830 DL L13 G4 | 8718291 79947400 | 9290 009 12106 |
| Fortimo LED SLM 2000lm 840 DL L13 G4 | 8718291 79949800 | 9290 009 12206 |
| Fortimo LED SLM 2000lm 927 DL L13 G4 | 8718696 41709600 | 9290 009 28506 |
| Fortimo LED SLM 2000lm 930 DL L13 G4 | 8718696 41766900 | 9290 009 30306 |
| Fortimo LED SLM 2000lm 830 DL PW L13 G4 | 8718696 41742300 | 9290 009 29306 |
| Fortimo LED SLM 2000lm 930 DL PW L13 G4 | 8718696 41748500 | 9290 009 29606 |
| Poke-in (PI) version with no pre-connected wires | | |
| Fortimo LED SLM 2000lm 830 PI L13 G4 | 8718696 43194800 | 9290 009 35706 |
| Fortimo LED SLM 2000lm 840 PI L13 G4 | 8718696 43196200 | 9290 009 35806 |
| Fortimo LED SLM 2000lm 927 PI L13 G4 | 8718696 43198600 | 9290 009 35906 |
| Fortimo LED SLM 2000lm 930 PI L13 G4 | 8718696 43200600 | 9290 009 36006 |
| Premium White (below BBL) | | |
| Fortimo LED SLM 2000lm 830 PW L13 G4 | 8718291 79930600 | 9290 009 11506 |
| Fortimo LED SLM 2000lm 930 PW L13 G4 | 8718696 41736200 | 9290 009 29006 |
| Fortimo LED SLM 2000lm 830 PI PW L13 G4 | 8718696 43218100 | 9290 009 36906 |
| Fortimo LED SLM 2000lm 930 PI PW L13 G4 | 8718696 43228000 | 9290 009 37206 |

Associated Rsets

| Commercial product name | EOC | 12NC | Value (Ω) | Type |
|----------------------------------|------------------|----------------|--------------------|---------|
| Fortimo LED Rset 300mA | 8718696 40193400 | 9290 009 12506 | 560 | Poke-in |
| Fortimo LED Rset 300mA Connector | 8718696 40195800 | 9290 009 12606 | 560 | JST |
| Fortimo LED Rset 500mA | 8718696 40199600 | 9290 009 12706 | 1200 | Poke-in |
| Fortimo LED Rset 500mA Connector | 8718696 40201600 | 9290 009 12806 | 1200 | JST |
| Fortimo LED Rset 750mA | 8718696 40203000 | 9290 009 12906 | 2050 | Poke-in |
| Fortimo LED Rset 750mA Connector | 8718696 40205400 | 9290 009 13006 | 2050 | JST |
| Fortimo LED Rset 950mA | 8718696 40207800 | 9290 009 13106 | 3090 | Poke-in |
| Fortimo LED Rset 950mA Connector | 8718696 40209200 | 9290 009 13206 | 3090 | JST |

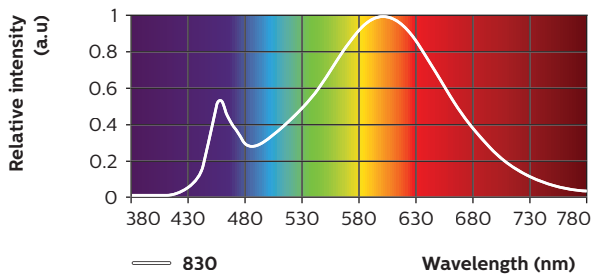
Optical characteristics - table per CCT

Fortimo LED SLM 2000 lm L13 830

| Parameter | Min | Typ | Max | Unit |
|----------------------------------|------|----------------|------|------|
| Luminous Flux | 1810 | 2020 | 2230 | lm |
| Module Efficiency | | 117 | | lm/W |
| Correlated Colour Temperature | | 3000 | | K |
| Colour Coordinates | | (0.434, 0.403) | | - |
| Colour Coordinates Premium White | | (0.430, 0.395) | | - |
| Colour Consistency | | 3 | | SDCM |
| CRI | | >80 | | - |
| Radiation Angle | | 115 | | deg |
| Thermal Power | | | 11.9 | W |
| Energy efficiency label | | A+ | | - |

Note: Specifications stated at Tc nom = 85 °C and I nom = 500 mA

| Ri | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 | R15 |
|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|
| 82 | 80 | 92 | 95 | 76 | 79 | 89 | 83 | 60 | 12 | 81 | 72 | 68 | 83 | 98 | 74 |

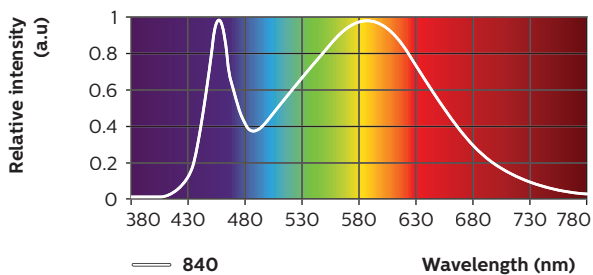


Fortimo LED SLM 2000 lm L13 840

| Parameter | Min | Typ | Max | Unit |
|-------------------------------|------|----------------|------|------|
| Luminous Flux | 1930 | 2150 | 2370 | lm |
| Module Efficiency | | 124 | | lm/W |
| Correlated Colour Temperature | | 4000 | | K |
| Colour Coordinates | | (0.382, 0.380) | | - |
| Colour Consistency | | 3 | | SDCM |
| CRI | | 80 | | - |
| Radiation Angle | | 115 | | deg |
| Thermal Power | | | 11.6 | W |
| Energy efficiency label | | A+ | | - |

Note: Specifications stated at Tc nom = 85 °C and I nom = 500 mA

| Ri | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 | R15 |
|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|
| 81 | 79 | 90 | 96 | 76 | 78 | 84 | 85 | 63 | 7 | 74 | 72 | 58 | 82 | 98 | 73 |

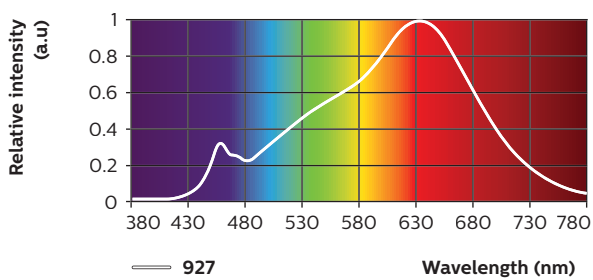


Fortimo LED SLM 2000 lm L13 927

| Parameter | Min | Typ | Max | Unit |
|-------------------------------|------|----------------|------|------|
| Luminous Flux | 1410 | 1570 | 1730 | lm |
| Module Efficiency | | 91 | | lm/W |
| Correlated Colour Temperature | | 2700 | | K |
| Colour Coordinates | | (0.458, 0.410) | | - |
| Colour Consistency | | 3 | | SDCM |
| CRI | | 90 | | - |
| Radiation Angle | | | | deg |
| Thermal Power | | | 12.5 | W |
| Energy efficiency label | | A | | - |

Note: Specifications stated at Tc nom = 85 °C and I nom = 300 mA

| Ri | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 | R15 |
|----|----|-----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|
| 97 | 99 | 100 | 98 | 98 | 98 | 98 | 95 | 91 | 81 | 97 | 100 | 88 | 99 | 98 | 96 |

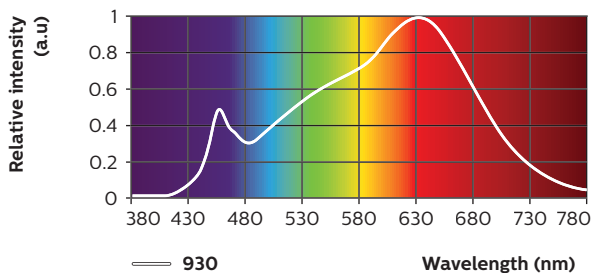


Fortimo LED SLM 2000 lm L13 930

| Parameter | Min | Typ | Max | Unit |
|----------------------------------|------|----------------|------|------|
| Luminous Flux | 1480 | 1650 | 1820 | lm |
| Module Efficiency | | 95 | | lm/W |
| Correlated Colour Temperature | | 3000 | | K |
| Colour Coordinates | | (0.434, 0.403) | | - |
| Colour Coordinates Premium White | | (0.430, 0.395) | | - |
| Colour Consistency | | 3 | | SDCM |
| CRI | | 90 | | - |
| Radiation Angle | | | | deg |
| Thermal Power | | | 13.2 | W |
| Energy efficiency label | | A | | - |

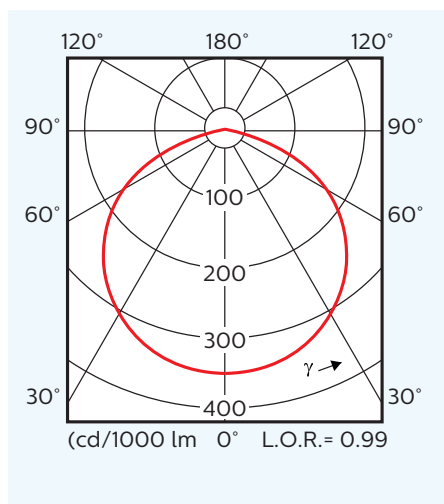
Note: Specifications stated at Tc nom = 85 °C and I nom = 500 mA

| Ri | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 | R15 |
|----|----|-----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|
| 97 | 99 | 100 | 99 | 97 | 98 | 97 | 95 | 93 | 85 | 99 | 98 | 84 | 100 | 98 | 97 |



Beam shape

The Philips Fortimo LED SLM generates a Lambertian beam shape, which is a pragmatic starting point for OEMs wishing to design secondary optics.



Electrical characteristics

| Parameter | Typ | Unit |
|-------------------|------|------|
| Nominal current | 500 | mA |
| Forward voltage | 34.6 | V |
| Power consumption | 17 | W |

Note: Specifications stated at Tc nom = 85 °C and I nom = 500 mA

Lifetime

| Parameter | Min | Typ | Max | Unit |
|------------------------------|--------|-----|--------|------|
| Lumen maintenance B50L70 | 50,000 | | | hrs |
| $\Delta u'v'$ at 6,000 hours | | | 0.0013 | - |
| Critical failures (10%) | 50,000 | | | hrs |

Note: Specifications stated at Tc nom = 85 °C and I nom = 500 mA

| Parameter | Nominal * | Max** |
|--------------|-----------|-------|
| Tc [°C] | 85 | 95 |
| Current [mA] | 500 | 1050 |

* Nominal value at which performance is specified.

** Maximum value for safety (warranty may not hold in this case)

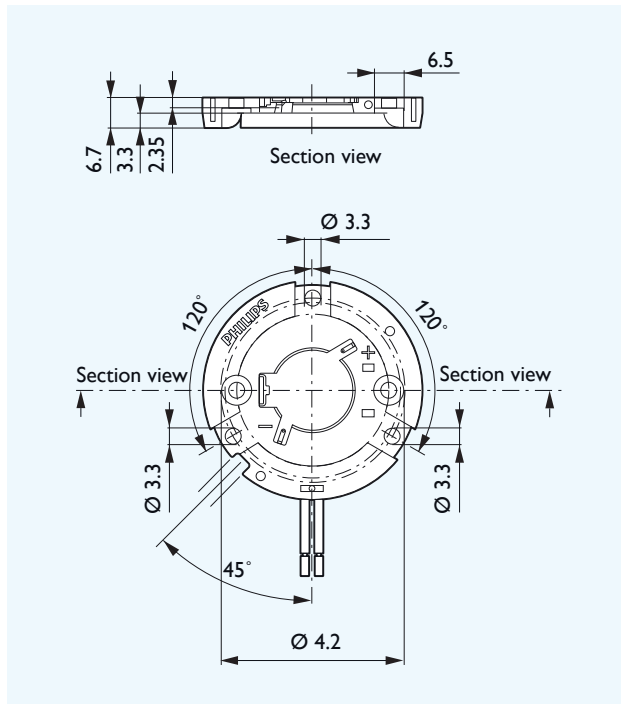
Note: Tc life \leq 85 °C (measured at 25 °C ambient temperature)

Abs max ratings

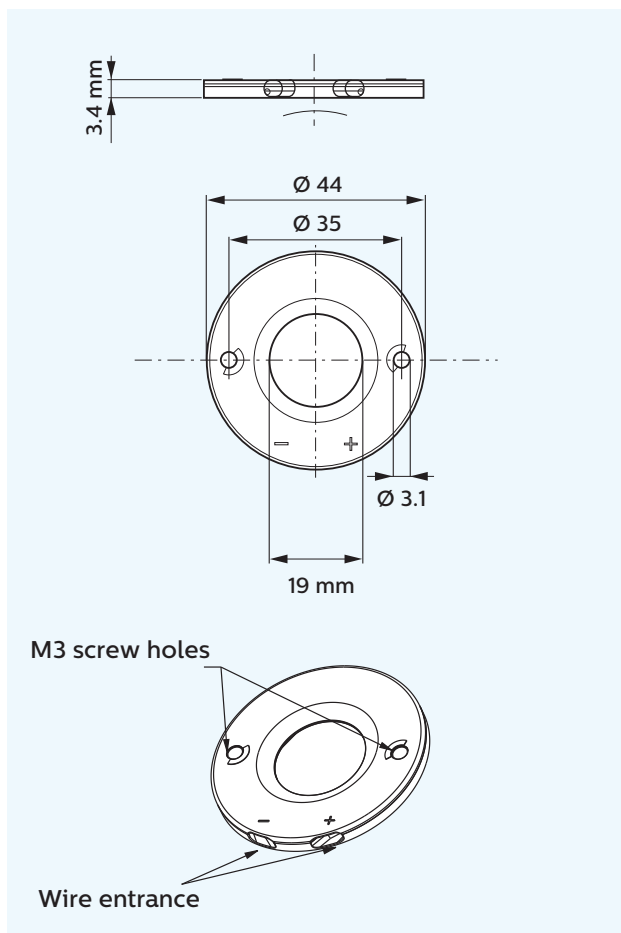
| Parameter | Min | Typ | Max | Unit |
|---|-----|-----|------|------|
| Current Imax | | | 1050 | mA |
| Case temperature Tc max | | | 95 | °C |
| ESD Human Body Model (HBM) Class 3A JESD22-A114-E | | | 8 | kV |
| ESD Machine Model (MM) Class B JESD22-A115-B | | | 400 | kV |
| Operating ambient temperature | -20 | | 40 | °C |
| Storage temperature | -40 | | 80 | °C |

Mechanical characteristics

Standard version



Poke-in version



Application information

Compliance and approval

IEC / EN 62031, IEC / EN 62471

Environmental

RoHS / REACH

Application information

| Zhaga | 2000 lm L13 830 | 2000 lm L13 840 | 2000 lm L13 927 | 2000 lm L13 930 |
|----------------------------------|-----------------|-----------------|-----------------|-----------------|
| Luminous Flux Category | C020 | C020 | C020 | C020 |
| LES diameter [mm] | 13 | 13 | 13 | 13 |
| LES category | LES13 | LES13 | LES13 | LES13 |
| Rotational Symmetry S | 0.9 | 0.9 | 0.9 | 0.9 |
| Uniformity Parameter U | 100% | 100% | 100% | 100% |
| Correlated Color temperature [K] | 3000 | 4000 | 2700 | 3000 |
| Color rendering index | >80 | >80 | >90 | >90 |

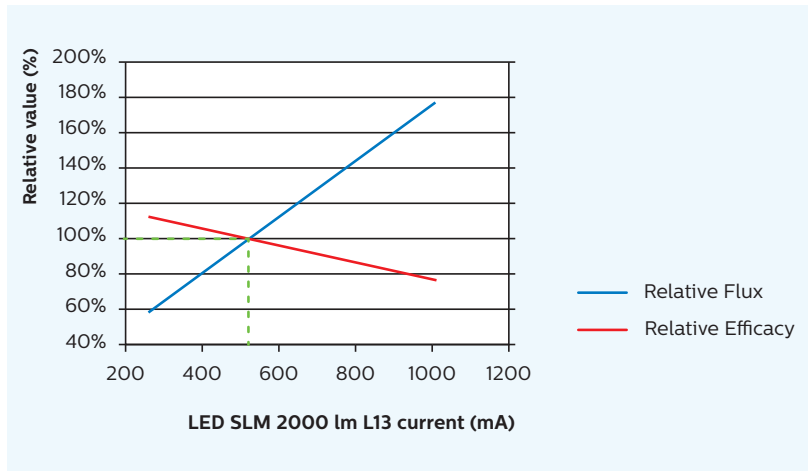
Note: Measurements showing compliancy to Zhaga book 3 version 1.2 have been done on the 3000 lm L15 module with the standard holder.

| | |
|------------------------|---------------|
| IP rating | No IP rating |
| Overheating protection | No protection |

Tuning information

Flux and efficacy versus current (at nominal temperature)

2000 lm L13



| I [A] | Flux (lm) | Efficacy (lm/W) |
|------------|---------------|-----------------|
| 250 | 54.0% | 114.5% |
| 270 | 58.0% | 112.8% |
| 292 | 62.4% | 112.0% |
| 300 | 63.9% | 111.1% |
| 323 | 68.3% | 109.4% |
| 368 | 76.8% | 106.8% |
| 387 | 80.3% | 106.0% |
| 436 | 89.0% | 103.4% |
| 485 | 97.5% | 100.9% |
| 500 | 100.0% | 100.0% |
| 536 | 106.1% | 98.3% |
| 669 | 127.2% | 91.5% |
| 750 | 138.4% | 88.9% |
| 853 | 154.3% | 84.6% |
| 950 | 167.3% | 81.2% |
| 1009 | 175.2% | 78.6% |

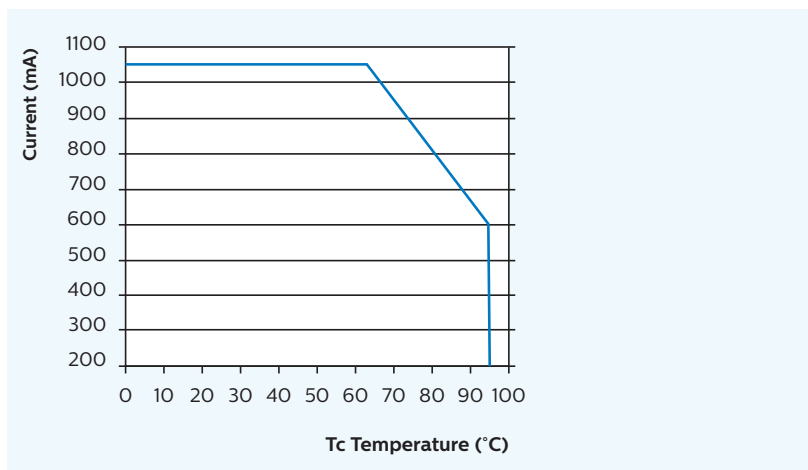
The highlighted current values are available as Rsets as a part of the system.

Flux and efficacy versus temperature at Tc (at nominal current)

| Tc (°C) | Flux (lm) | Efficacy (lm/W) |
|---------|-----------|-----------------|
| 65 | 104.2% | 103.4% |
| 75 | 102.1% | 101.7% |
| 85 | 100.0% | 100.0% |

Please ensure if after tuning, your operating point is still covered by warranty or not.

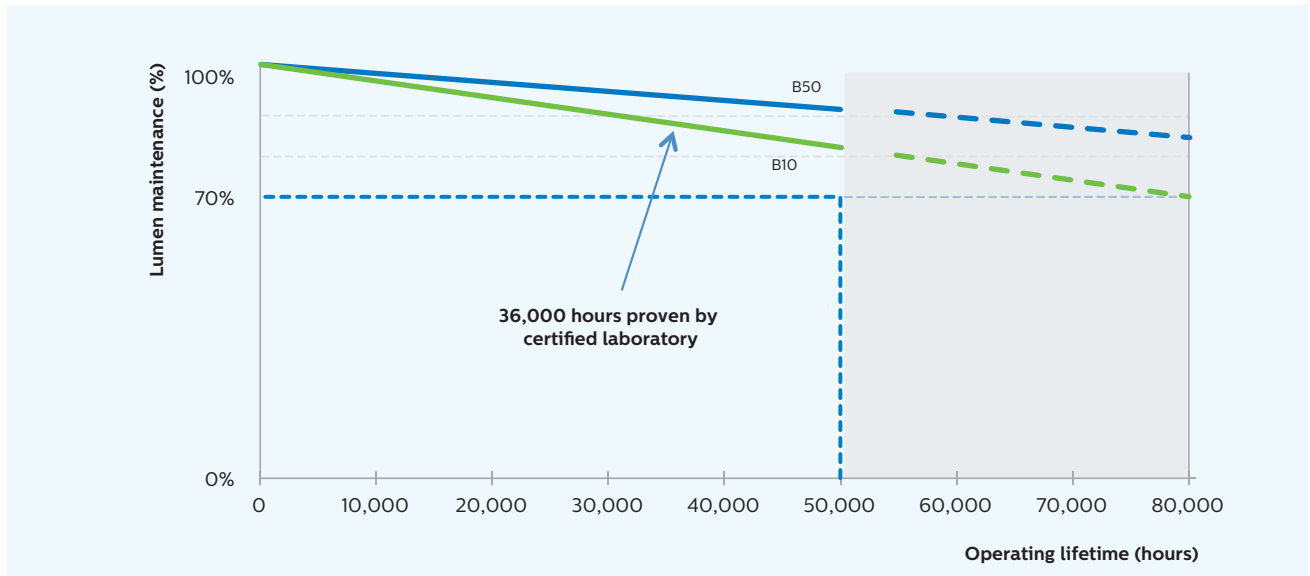
Warranty Window 2000 lm L13



Lumen maintenance

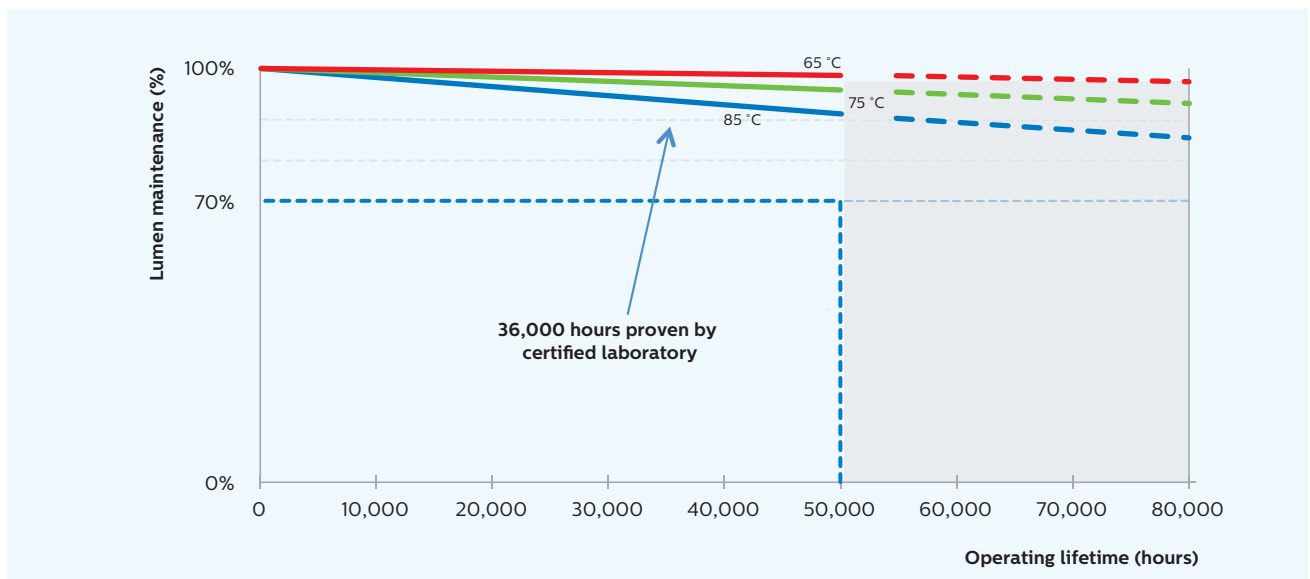
Lumen maintenance: at nominal conditions

Fortimo LED SLM 2000 lm L13



Lumen maintenance (B50): at nominal current

Fortimo LED SLM 2000 lm L13





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