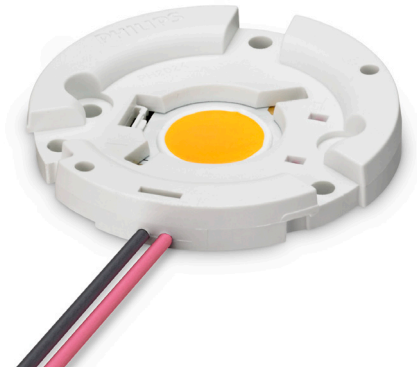


PHILIPS

LED Modules

Fortimo SLM

Fortimo LED SLM Gen 4 Crisp White



The Fortimo LED SLM Gen 4 is a next generation solution for spotlight and 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 1100lm to 4500lm in preset outputs, with the flexibility to tune as per your needs.

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/ledmodulesna. A list of possible Rsets is provided below to set the output current of Philips Xitanium LED driver at different levels. More information about tuning can be found further on in the document.

| Commercial Product Name | 12NC |
|--------------------------------------|----------------|
| Fortimo LED SLM 1100lm 930 CW L9 G4 | 9290 009 57106 |
| Fortimo LED SLM 1100lm 930 CW L13 G4 | 9290 009 49406 |
| Fortimo LED SLM 2000lm 930 CW L13 G4 | 9290 009 49806 |
| Fortimo LED SLM 3000lm 930 CW L15 G4 | 9290 009 03306 |
| Fortimo LED SLM 3800lm 930 CW L19 G4 | 9290 009 03406 |

Associated Rsets

| Commercial Product Name | 12NC | Value (Ω) | Type |
|-------------------------|--------------|--------------------|---------|
| Fortimo LED Rset 300mA | 929000727713 | 560 | Poke-in |
| Fortimo LED Rset 500mA | 929000727813 | 1200 | Poke-in |
| Fortimo LED Rset 750mA | 929000727913 | 2050 | Poke-in |
| Fortimo LED Rset 950mA | 929000728013 | 3090 | Poke-in |
| Fortimo LED Rset 1200mA | 929000728113 | 4780 | Poke-in |

Associated Drivers

| Driver List | Dimming Mechanism | Current Setting Mechanism |
|-------------------|---|------------------------------|
| XI013C030V048DNM1 | 0-10V dimming | Rset2 |
| XI020C050V042RNP1 | Leading Edge and Trailing Edge | Dip Switch |
| XI025C100V045DNM1 | 0-10V dimming | Rset2 |
| XI036C100V048DNMX | 0-10V dimming | Rset2 |
| XI050C100V054DNMX | 0-10V dimming | Rset2 |
| XI050C100V054XPL1 | Trailing Edge and 0-10V dimming @ 120V only | Rset1, Rset2 or programmable |
| XI095C275V054DNF1 | 0-10V dimming | Rset3 |

Fortimo LED SLM Gen 4 Crisp White

Features

- Ability to operate your module at a desired current to get a certain lumen output with a high lm/W or lm/S
- High lumen output out of small Light Emitting Surface (LES) sizes for narrow beam angles and small reflector designs with punch
- High Tc nominal of 85°C
- Zhaga standardized high quality holder concept
- High quality of light

- Dedicated solutions for special needs including the SLM Crisp White

- One-stop shop for your system (detailed list of complementary partners in design-in guide)

Benefits

- High energy efficiency
- Flexibility to tune the performance as per your need by modifying the operating point
- Luminaire manufacturability and ease of design-in
- Excellent thermal management
- Smart systems with Xitanium drivers
- Covered by Philips limited warranty¹

Application

- SLM Gen 4 for accent lighting and down lighting for retail, hospitality and supermarkets
- SLM Crisp White is ideal when bright and clean whites and rich and saturated colors are needed

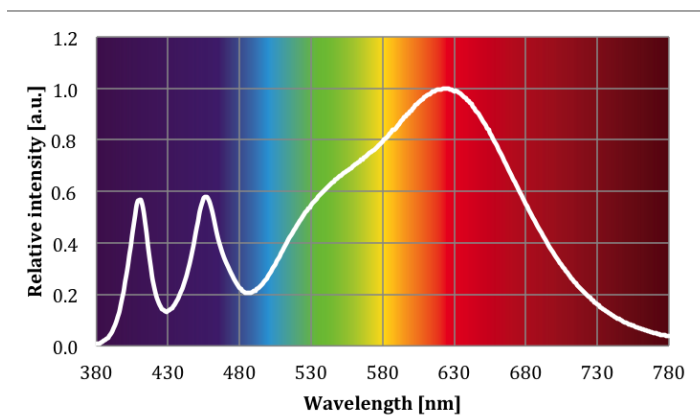
Optical Characteristics – Table per CCT

Fortimo LED SLM 1100lm L9 930 CW

| Parameter | Min | Typ | Max | Unit |
|------------------------------|-----|---------------|------|------|
| Luminous Flux | 830 | 930 | 1030 | lm |
| Module Efficiency | | 88 | | lm/W |
| Correlated Color Temperature | | 3000 | | K |
| Color Coordinates | | (0.43, 0.395) | | - |
| Color Consistency | | 3 | | SDCM |
| CRI | | 92 | | - |
| Radiation Angle | | 115 | | deg |
| Thermal Power | | 16.1 | | W |

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 |
|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|
| 92 | 93 | 95 | 94 | 90 | 92 | 93 | 91 | 84 | 64 | 86 | 89 | 84 | 93 | 96 | 92 |



1. View limited warranty at http://www.usa.lighting.philips.com/connect/tools_literature/warranties.wpd for details and restrictions.

Fortimo LED SLM Gen 4 Crisp White

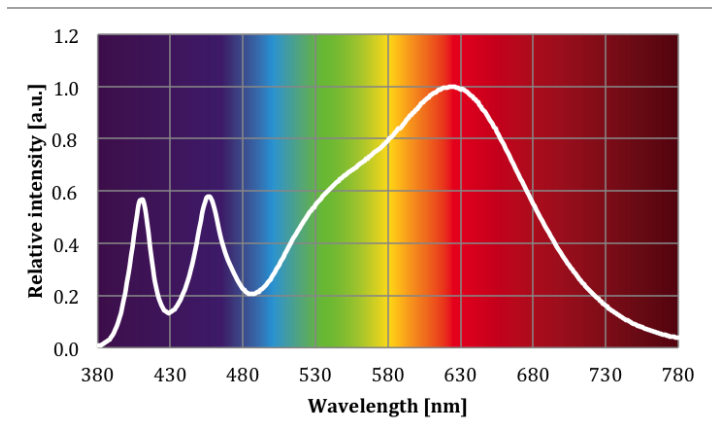
Optical Characteristics – Table per CCT

Fortimo LED SLM 1100lm L13 930 CW

| Parameter | Min | Typ | Max | Unit |
|------------------------------|------|----------------|------|------|
| Luminous Flux | 1340 | 1490 | 1640 | lm |
| Module Efficiency | | 83 | | lm/W |
| Correlated Color Temperature | | 3000 | | K |
| Color Coordinates | | (0.434, 0.403) | | - |
| Color Consistency | | 3 | | SDCM |
| CRI | | 92 | | - |
| Radiation Angle | | 115 | | deg |
| Thermal Power | | 14.6 | | W |

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 |
|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|
| 92 | 93 | 95 | 94 | 90 | 92 | 93 | 91 | 84 | 64 | 86 | 89 | 84 | 93 | 96 | 92 |



Fortimo LED SLM Gen 4 Crisp White

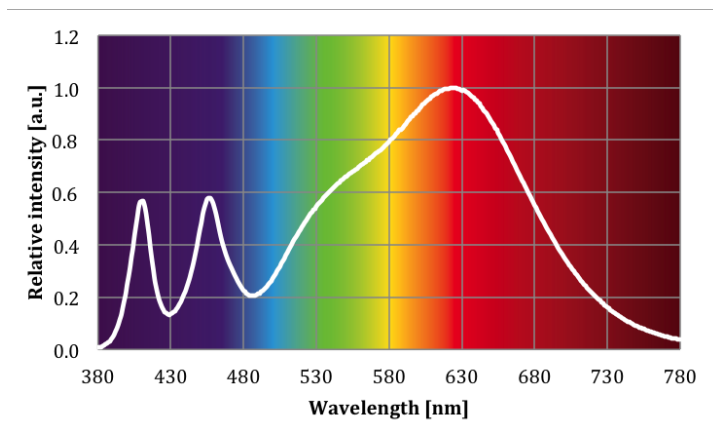
Optical Characteristics – Table per CCT

Fortimo LED SLM 2000lm L13 930 CW

| Parameter | Min | Typ | Max | Unit |
|------------------------------|------|---------------|------|------|
| Luminous Flux | 1960 | 2180 | 2400 | lm |
| Module Efficiency | | 80 | | lm/W |
| Correlated Color Temperature | | 3000 | | K |
| Color Coordinates | | (0.43, 0.395) | | - |
| Color Consistency | | 3 | | SDCM |
| CRI | | 92 | | - |
| Radiation Angle | | 115 | | deg |
| Thermal Power | | 22.5 | | W |

Note: Specifications stated at Tc nom = 85°C and I nom = 750 mA

| Ri | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 | R15 |
|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|
| 92 | 93 | 95 | 94 | 90 | 92 | 93 | 91 | 84 | 64 | 86 | 89 | 84 | 93 | 96 | 92 |



Fortimo LED SLM Gen 4 Crisp White

Optical Characteristics – Table per CCT

Fortimo LED SLM 3000lm L15 930 CW

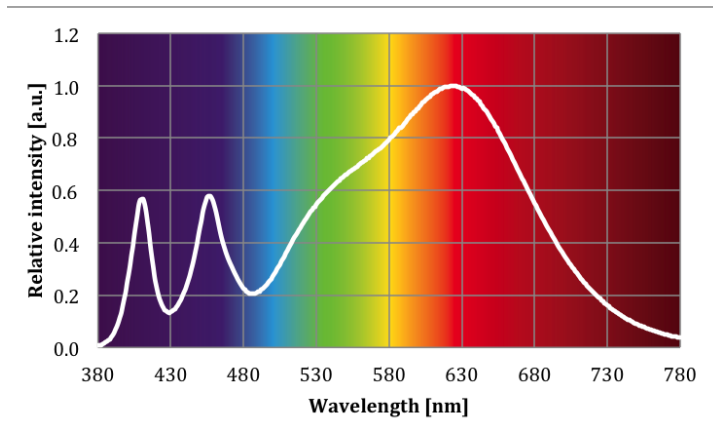
| Parameter | Min | Typ | Max | Unit |
|------------------------------|------|---------------|------|------|
| Luminous Flux | 2490 | 2770 | 3050 | lm |
| Module Efficiency | | 82 | | lm/W |
| Correlated Color Temperature | | 3000 | | K |
| Color Coordinates | | (0.43, 0.395) | | - |
| Color Consistency | | 3 | | SDCM |
| CRI | | 92 | | - |
| Radiation Angle | | 115 | | deg |
| Thermal Power | | 27.4 | | W |

Note: Specifications stated at Tc nom = 85°C and I nom = 950 mA

| Parameter | Min | Typ | Max | Unit |
|-------------------|------|------|------|------|
| Luminous Flux | 2600 | 2890 | 3180 | lm |
| Module Efficiency | | 81 | | lm/W |
| Thermal Power | | 27.5 | | W |

Note: Specifications stated at Tc nom = 85°C and I = 1000 mA

| Ri | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 | R15 |
|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|
| 92 | 93 | 95 | 94 | 90 | 92 | 93 | 91 | 84 | 64 | 86 | 89 | 84 | 93 | 96 | 92 |



Fortimo LED SLM Gen 4 Crisp White

Optical Characteristics – Table per CCT

Fortimo LED SLM 3800lm L19 930 CW

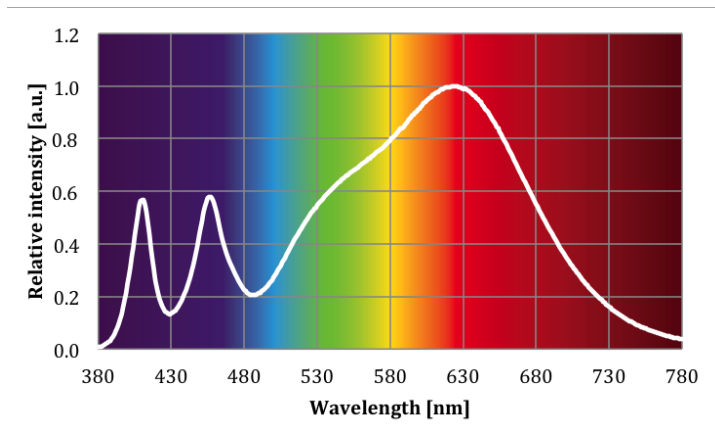
| Parameter | Min | Typ | Max | Unit |
|------------------------------|------|---------------|------|------|
| Luminous Flux | 3240 | 3610 | 3980 | lm |
| Module Efficiency | | 85 | | lm/W |
| Correlated Color Temperature | | 3000 | | K |
| Color Coordinates | | (0.43, 0.395) | | - |
| Color Consistency | | 3 | | SDCM |
| CRI | | 92 | | - |
| Radiation Angle | | 115 | | deg |
| Thermal Power | | 34 | | W |

Note: Specifications stated at Tc nom = 85°C and I nom = 1200 mA

| Parameter | Min | Typ | Max | Unit |
|-------------------|------|------|------|------|
| Luminous Flux | 2780 | 3090 | 3400 | lm |
| Module Efficiency | | 89 | | lm/W |
| Thermal Power | | 25.5 | | W |

Note: Specifications stated at Tc nom = 85°C and I = 1000 mA

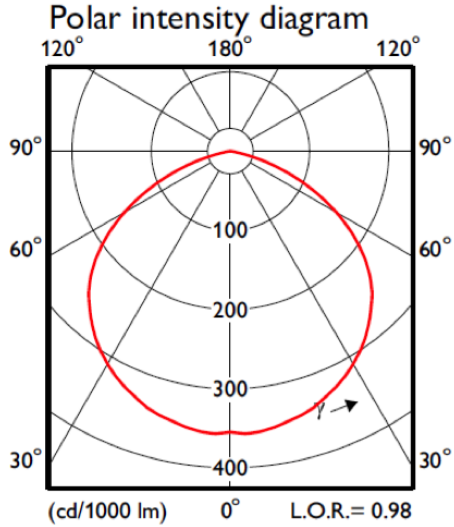
| Ri | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 | R15 |
|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|
| 92 | 93 | 95 | 94 | 90 | 92 | 93 | 91 | 84 | 64 | 86 | 89 | 84 | 93 | 96 | 92 |



Fortimo LED SLM Gen 4 Crisp White

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 | SLM 1100lm 930 CW L9 | SLM 1100lm 930 CW L13 | SLM 2000lm 930 CW L13 | SLM 3000lm 930 CW L15 | SLM 3800lm 930 CW L19 | Units |
|-------------------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------|
| Nominal Current | 300 | 500 | 750 | 950 | 1200 | mA |
| Forward Voltage | 35.4 | 35.8 | 36.3 | 35.6 | 35.2 | V |
| Power Consumption | 10.6 | 17.9 | 27.2 | 33.8 | 42.3 | W |

Note: Specifications stated at Tc nom = 85°C

Lifetime

| Parameter | Min | Typ | Max | Unit |
|-----------------------------|--------|-----|-------|------|
| Lumen Maintenance B50L70 | 50,000 | | | hrs |
| $\Delta u'v'$ at 6000 Hours | | | 0.002 | - |
| Critical Failures (10%) | 50,000 | | | hrs |

Note: Specifications stated at Tc nom = 85°C and nominal current of module

| Parameter | SLM 1100lm 930 CW L9 | SLM 1100lm 930 CW L13 | SLM 2000lm 930 CW L13 | SLM 3000lm 930 CW L15 | SLM 3800lm 930 CW L19 | Units |
|-----------------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------|
| Nominal Tc | 85 | 85 | 85 | 85 | 85 | °C |
| Max Tc | 95 | 95 | 95 | 95 | 95 | °C |
| Nominal Current | 300 | 500 | 750 | 950 | 1200 | mA |
| Max Current | 530 | 790 | 1050 | 1580 | 2000 | mA |

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

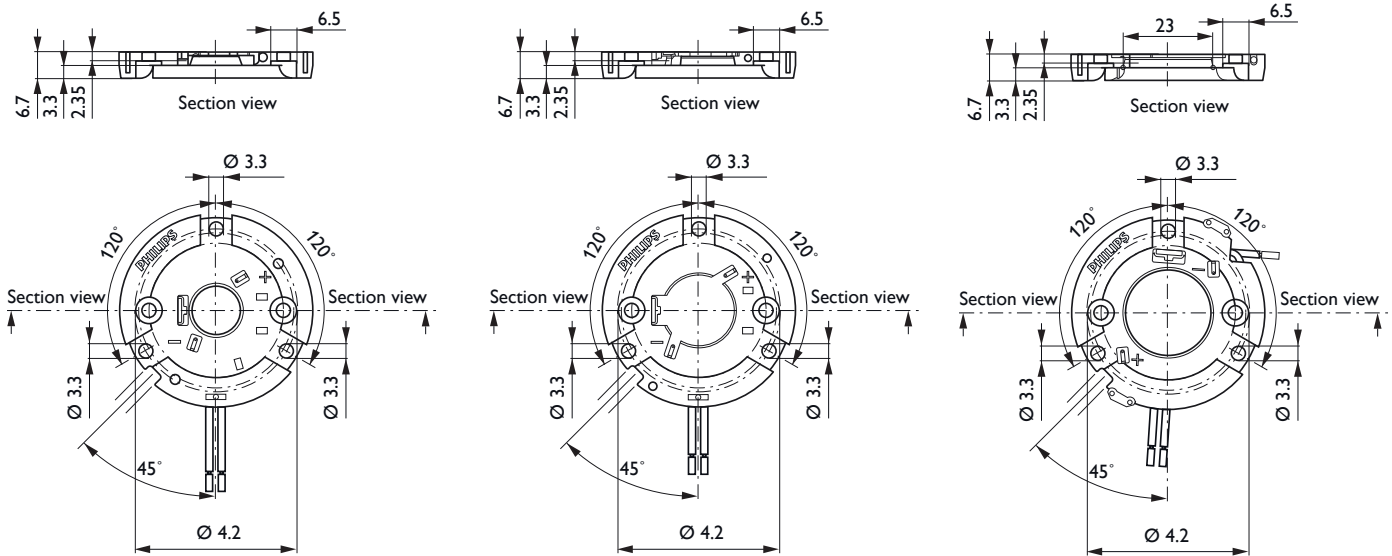
- Nominal value at which performance is specified.
- Maximum value for safety (at this temperature, warranty need not apply).

Fortimo LED SLM Gen 4 Crisp White

Abs Max Ratings

| Parameter | Min | Typ | Max | Unit |
|---|-----|-----|-----|------|
| 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



Fortimo LED SLM 1100lm 930 CW L9 G4

Fortimo LED SLM 1100lm 930 CW L13 G4
 Fortimo LED SLM 2000lm 930 CW L13 G4
 Fortimo LED SLM 3000lm 930 CW L15 G4

Fortimo LED SLM 3800lm 930 CW L19 G4

Fortimo LED SLM Gen 4 Crisp White

Application Information

Compliance and Approval

CSA/UL

Environmental

RoHS

Application Information

| Zhaga* | SLM 1100lm 930 CW L9 | SLM 1100lm 930 CW L13 | SLM 2000lm 930 CW L13 | SLM 3000lm 930 CW L15 | SLM 3800lm 930 CW L19 |
|----------------------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| LES Diameter [mm] | 9 | 13 | 13 | 15 | 19 |
| Rotational Symmetry S | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| Uniformity Parameter U | 100% | 100% | 100% | 100% | 100% |
| Correlated Color Temperature [K] | 3000 | 3000 | 3000 | 3000 | 3000 |
| Color Rendering Index | >90 | >90 | >90 | >90 | >90 |

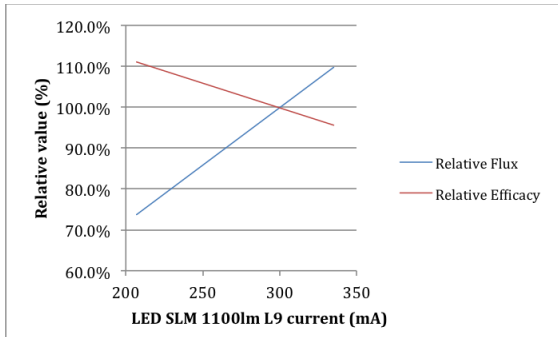
* Measurements showing compliancy to Zhaga book 3 version 1.2 have been done on the 3000lm L15 module.

| | |
|------------------------|---------------|
| IP Rating | No IP rating |
| Overheating Protection | No protection |

Fortimo LED SLM Gen 4 Crisp White

Tuning Information

Flux and Efficacy Versus Current (at Nominal Temperature) 1100lm L9



| I [A] | Rel flux | Rel effic |
|------------|---------------|---------------|
| 207 | 73.4% | 111.2% |
| 270 | 91.8% | 103.1% |
| 292 | 98.0% | 101.0% |
| 300 | 100.0% | 100.0% |
| 313 | 103.6% | 98.0% |
| 323 | 106.2% | 96.9% |
| 335 | 109.5% | 95.9% |

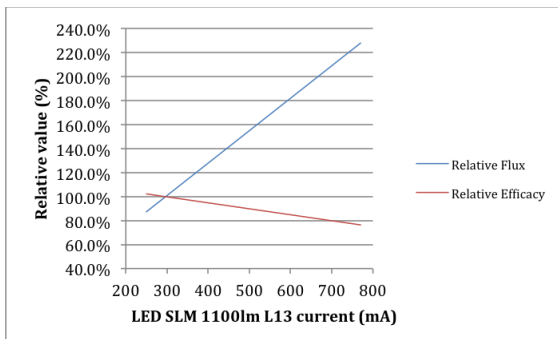
The highlighted current values are available as Rsets as a part of the system.

Flux and Efficacy Versus Temperature at Tc (at Nominal Current) 1100lm L9

| Tc (°C) | Flux (lm) | Efficacy (lm/W) |
|---------|-----------|-----------------|
| 65 | 103.6% | 103.1% |
| 75 | 101.8% | 101.1% |
| 85 | 100.0% | 100.00% |

Please ensure that while tuning the product's operating point, it stays within limits of temperature (Tc) and current (I) that are covered within the warranty window.

Flux and Efficacy Versus Current (at Nominal Temperature) 1100lm L13



| I [A] | Rel flux | Rel effic |
|------------|---------------|---------------|
| 250 | 84.9% | 103.3% |
| 270 | 90.9% | 101.6% |
| 292 | 97.8% | 100.8% |
| 300 | 100.0% | 100.0% |
| 323 | 107.0% | 98.4% |
| 368 | 120.2% | 95.9% |
| 387 | 125.5% | 95.1% |
| 436 | 139.5% | 92.6% |
| 485 | 152.9% | 89.3% |
| 500 | 156.8% | 89.3% |
| 536 | 166.6% | 86.9% |
| 602 | 183.1% | 84.4% |
| 669 | 200.4% | 81.1% |
| 724 | 214.0% | 79.5% |
| 750 | 220.1% | 77.9% |
| 770 | 227.3% | 77.0% |

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

Flux and Efficacy Versus Temperature at Tc (at Nominal Current) 1100lm L13

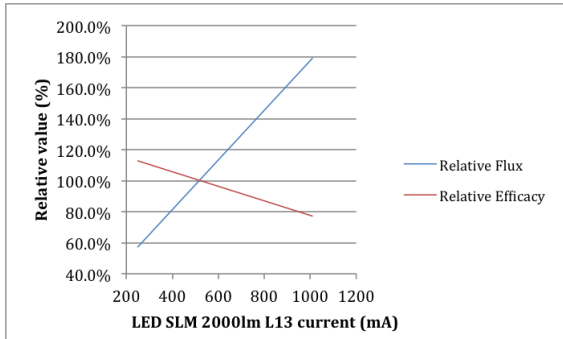
| Tc (°C) | Flux (lm) | Efficacy (lm/W) |
|---------|-----------|-----------------|
| 65 | 104.0% | 103.2% |
| 75 | 102.1% | 101.6% |
| 85 | 100.0% | 100.0% |

Please ensure that while tuning the product's operating point, it stays within limits of temperature (Tc) and current (I) that are covered within the warranty window.

Fortimo LED SLM Gen 4 Crisp White

Tuning Information

Flux and Efficacy Versus Current (at Nominal Temperature) 2000lm L13



| I [A] | Rel flux | Rel effic |
|------------|---------------|---------------|
| 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% |

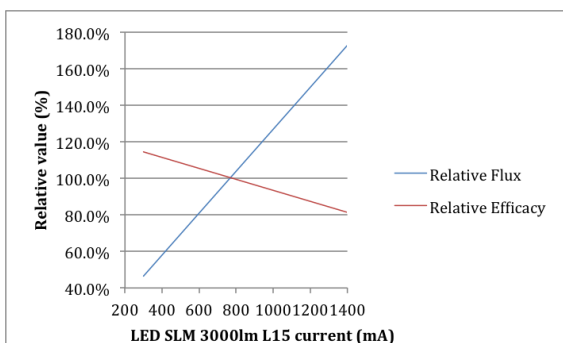
The highlighted current values are available as Rsets as a part of the system.

Flux and Efficacy Versus Temperature at Tc (at Nominal Current) 2000lm L13

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

Please ensure that while tuning the product's operating point, it stays within limits of temperature (Tc) and current (I) that are covered within the warranty window.

Flux and Efficacy Versus Current (at Nominal Temperature) 3000lm L15



| I [A] | Rel flux | Rel effic |
|-------------|---------------|---------------|
| 300 | 43.1% | 115.8% |
| 387 | 55.1% | 112.3% |
| 436 | 61.3% | 111.4% |
| 485 | 67.8% | 108.8% |
| 500 | 70.0% | 108.8% |
| 536 | 74.3% | 107.0% |
| 669 | 90.3% | 102.6% |
| 750 | 100.0% | 100.0% |
| 853 | 111.9% | 97.4% |
| 916 | 118.6% | 95.6% |
| 950 | 122.5% | 93.9% |
| 968 | 123.5% | 93.9% |
| 1009 | 129.1% | 93.0% |
| 1200 | 148.6% | 87.7% |
| 1400 | 169.3% | 83.3% |

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

Flux and Efficacy Versus Temperature at Tc (at Nominal Current) 3000lm L15

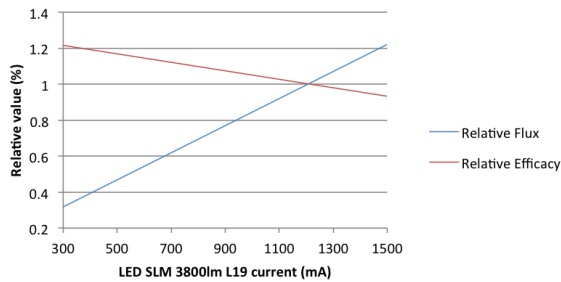
| Tc (°C) | Flux (lm) | Efficacy (lm/W) |
|---------|-----------|-----------------|
| 65 | 104.1% | 103.5% |
| 75 | 102.1% | 101.7% |
| 85 | 100.0% | 100.0% |

Please ensure that while tuning the product's operating point, it stays within limits of temperature (Tc) and current (I) that are covered within the warranty window.

Fortimo LED SLM Gen 4 Crisp White

Tuning Information

Flux and Efficacy Versus Current (at Nominal Temperature) 3800lm L19



| I [A] | Rel flux | Rel effic |
|-------------|---------------|---------------|
| 300 | 27.8% | 124.3% |
| 500 | 45.9% | 118.3% |
| 669 | 59.7% | 113.0% |
| 750 | 66.1% | 111.3% |
| 853 | 74.2% | 108.7% |
| 916 | 79.2% | 107.0% |
| 950 | 79.5% | 106.1% |
| 968 | 82.4% | 105.2% |
| 1009 | 86.0% | 104.3% |
| 1200 | 100.0% | 100.0% |
| 1231 | 102.1% | 99.1% |
| 1335 | 109.5% | 96.5% |
| 1403 | 114.3% | 95.7% |
| 1500 | 120.8% | 93.0% |

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

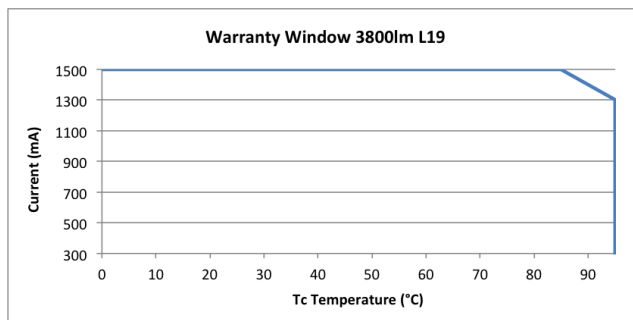
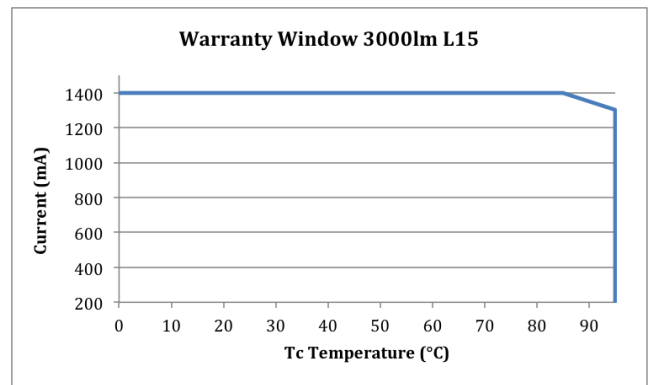
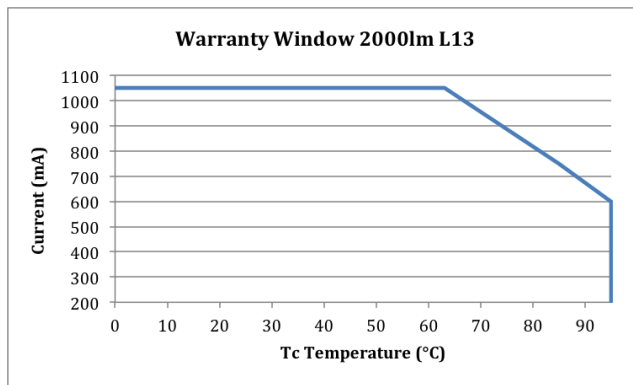
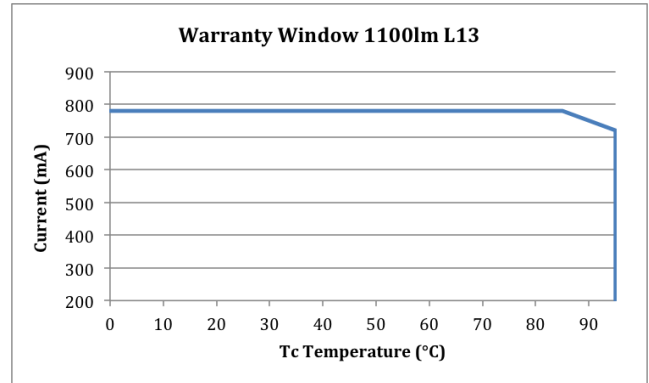
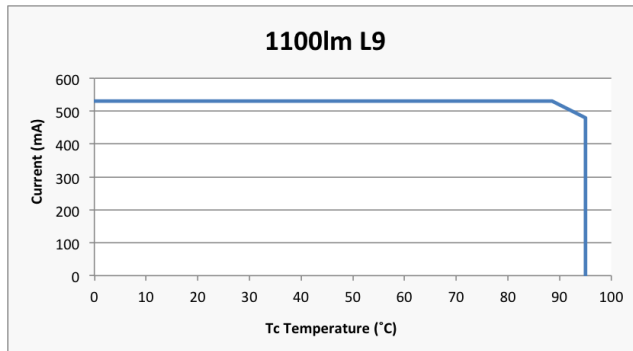
Flux and Efficacy Versus Temperature at Tc (at Nominal Current) 3800lm L19

| Tc (°C) | Flux (lm) | Efficacy (lm/W) |
|---------|-----------|-----------------|
| 65 | 104.1% | 102.5% |
| 75 | 102.1% | 101.6% |
| 85 | 100.0% | 100.0% |

Please ensure that while tuning the product's operating point, it stays within limits of temperature (Tc) and current (I) that are covered within the warranty window.

Fortimo LED SLM Gen 4 Crisp White

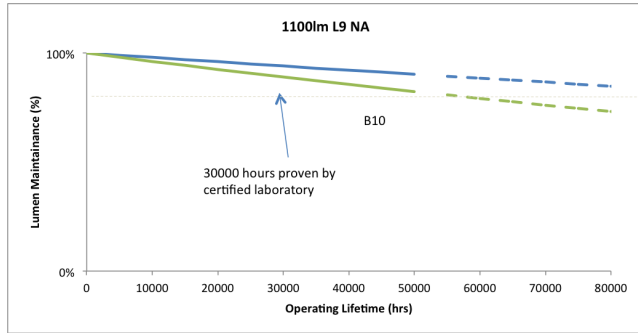
Warranty Windows



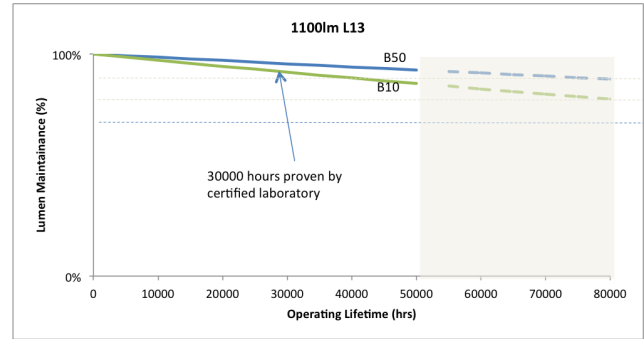
Fortimo LED SLM Gen 4 Crisp White

Lumen Maintenance

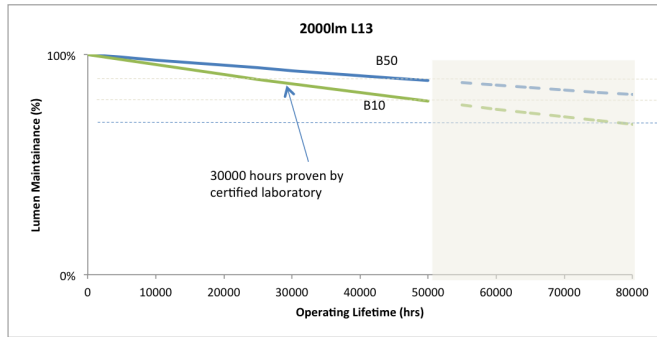
Fortimo LED SLM 1100lm L9



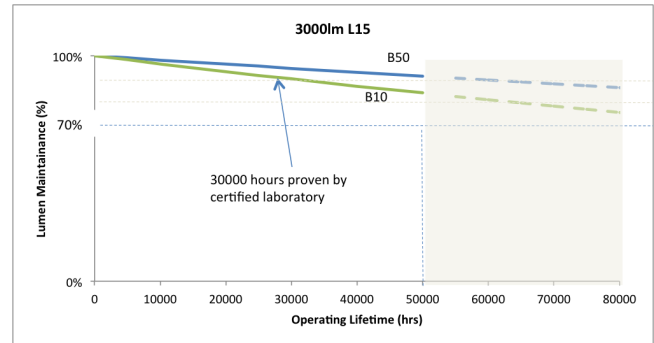
Fortimo LED SLM 1100lm L13



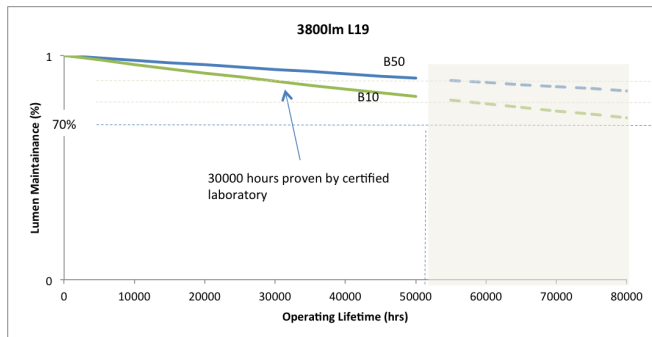
Fortimo LED SLM 2000lm L13



Fortimo LED SLM 3000lm L15

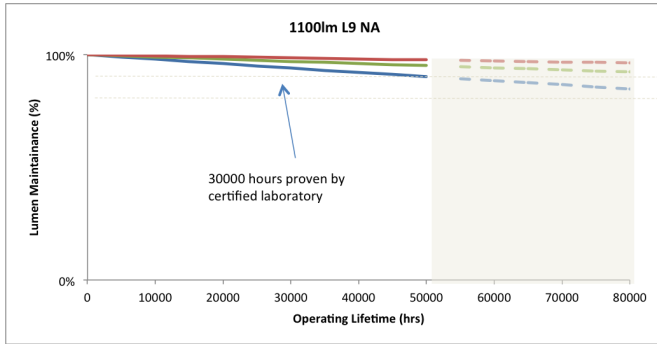


Fortimo LED SLM 3800lm L19

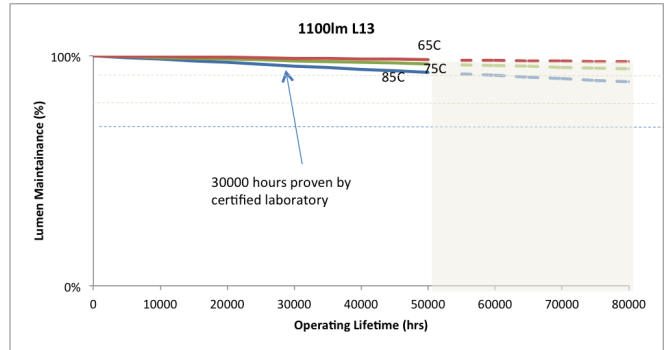


Fortimo LED SLM Gen 4 Crisp White

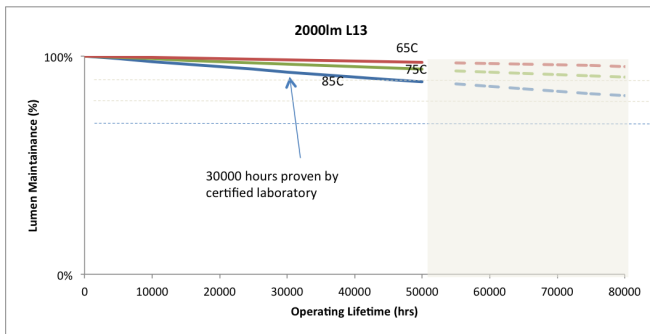
Lumen Maintenance (B50) Fortimo LED SLM 1100lm L9



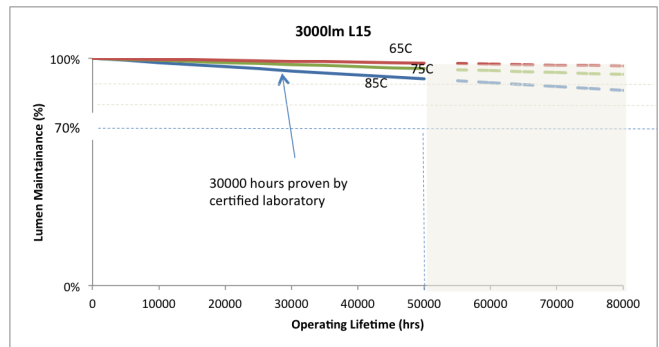
Fortimo LED SLM 1100lm L13



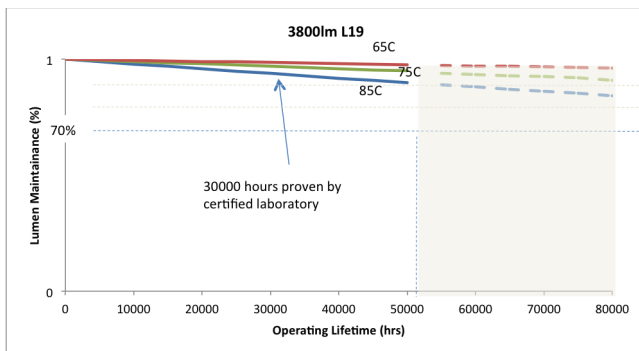
Fortimo LED SLM 2000lm L13



Fortimo LED SLM 3000lm L15



Fortimo LED SLM 3800lm L19



Fortimo LED SLM Gen 4 Crisp White



Measurements showing compliancy to Zhaga book 3 version 1.2 have been done on the 7000lm L23 module.

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Philips Lighting North America Corporation
10275 W. Higgins Road, Rosemont IL 60018
Tel: 800-322-2086 Fax: 888-423-1882
Customer/Technical Service: 800-372-3331
OEM Support: 866-915-5886

Imported by: Philips Lighting
A division of Philips Electronics Ltd.
281 Hillmount Rd, Markham, ON, Canada L6C 2S3
Tel. 800-668-9008