

# PHILIPS

## LED Modules

Fortimo DLM Flex L2

36 G2 NA



### Philips Fortimo LED downlight module (DLM) Flex L2 G2 Dip Switch (DS)

supersedes its predecessors by offering a variety of lumen packages ranging from 900 lm to 13,000 lm\* with a high efficacy up to 180 lm/W. The new generation also brings the focus on quality of light by introducing CRI 90 range to the portfolio. The all in one DLM Flex L2 G2 provides the ease of switching defined flux levels via a dip switch on board while still allows tuning the models through Advance Xitanium LED Drivers with SimpleSet technology. We bring you the best in class and versatile portfolio which caters to numerous applications.

| Commercial Product Name                 | 12NC         |
|-----------------------------------------|--------------|
| FORTIMO LED DLM FLEX DS L2 830 36 G2 NA | 929001729113 |
| FORTIMO LED DLM FLEX DS L2 835 36 G2 NA | 929001729213 |
| FORTIMO LED DLM FLEX DS L2 840 36 G2 NA | 929001729313 |
| FORTIMO LED DLM FLEX DS L2 927 36 G2 NA | 929001730113 |
| FORTIMO LED DLM FLEX DS L2 930 36 G2 NA | 929001730213 |
| FORTIMO LED DLM FLEX DS L2 935 36 G2 NA | 929001730313 |
| Fortimo LED DLM Thermal Accessory G1    | 929000765413 |
| Fortimo LED DLM Flex Cover NA           | 929000765313 |

For drivers' compatibility, please visit our Easy Design-In Tool:

<https://www.na.easydesignintool.philips.com/select-module/24;jsessionid=B48812A82EB79F03366908351B479626>

\* Achieved with the 84up CRI80

# Fortimo LED DLM L2 36 G2 NA

## Features

- Wide lumen output range: From 900 to 13,000lm\*
- Variation of color temperatures (2700K, 3000K, 3500K, 4000K, and 5000K\*)
- Flexible output/performance when set through the dip switch on board and Philips Advance Xitanium LED drivers with SimpleSet technology
- Lifetime > 50,000hrs<sup>1</sup> (B50L70 at Tc 85°C)
- High color consistency:
  - 2 SDCM for CRI 90
  - 3 SDCM for CRI 80
- Various mechanical interface options:
  - Enabling standard or slim designs
  - Self-cooled option for up to 3,000lm<sup>2</sup>
  - No additional heat sink needed<sup>3</sup>

\* With 84up CRI80

## Benefits

- High energy efficiency (up to 180lm/W at Tc 85°C), also enabling excellent thermal management
- Flexible output/performance when set through the Philips Advance Xitanium LED drivers with SimpleSet technology and the on-board dip switch
- Limited glare
- Integrated thermal protection, enabling universal voltage fixtures and low power consumption (compliant with UL SREC/991)
- Reduced effort with thermal design and testing<sup>3</sup>
- 5-year limited system warranty with Philips Advance Xitanium LED drivers<sup>4</sup>

## Application

- Recessed downlights
  - Offices
  - Hospitality
  - Education
  - Retail
- High-bay
  - Warehouses
  - Industries
- Surface mount luminaries
  - Residential
  - Hospitality
  - Offices

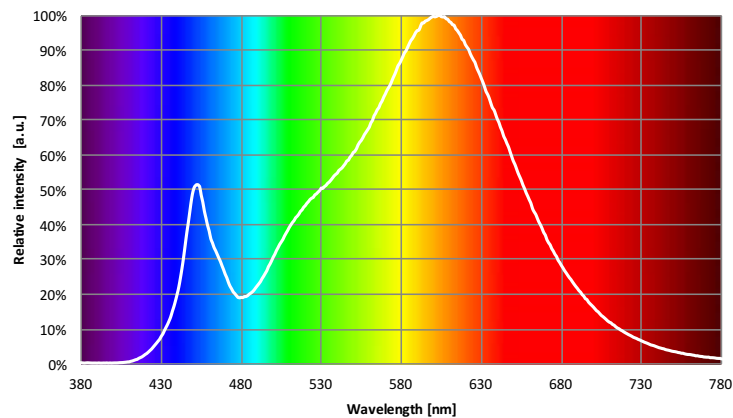
## Optical Characteristics – Table per CCT

| Fortimo LED DLM Flex DS L2 830 36 G2 NA |      |      |      |      |         |
|-----------------------------------------|------|------|------|------|---------|
|                                         | DS4  | DS3  | DS2  | DS1  | Unit    |
| Nominal Current                         | 485  | 348  | 247  | 215  | mA      |
| Luminous Flux                           | 2441 | 1801 | 1304 | 1139 | lm      |
| Luminous Flux with DLM Flex Cover       | 2026 | 1495 | 1083 | 945  | lm      |
| Module Efficacy                         | 149  | 156  | 162  | 164  | lm/W    |
| Module Efficacy with DLM Cover          | 124  | 129  | 134  | 136  | lm/W    |
| Correlated Color Temperature            | 3000 |      |      |      | K       |
| CRI                                     | >80  |      |      |      | -       |
| Color Consistency                       | <3   |      |      |      | SDCM    |
| Radiation Angle                         | 115  |      |      |      | degrees |
| Radiation Angle with DLM Cover          | 110  |      |      |      | degrees |

Note: Specifications stated at Tc nom = 85°C.

Tolerance for flux data is -10% +20%. Tolerance for efficacy data is ±10%.

Measurement precision for flux +/- 5%, for CRI +/- 1.5, for efficacy +/- 6%.



| Dip switch settings |     |     |
|---------------------|-----|-----|
|                     | 1   | 2   |
| DS1                 | ON  | ON  |
| DS2                 | OFF | ON  |
| DS3                 | ON  | OFF |
| DS4                 | OFF | OFF |



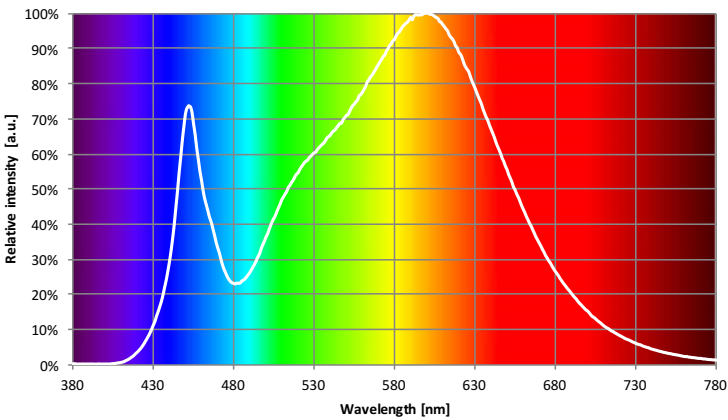
1. Average rated life is based on engineering data testing and probability analysis. The hours are at the B50, L70 point - 50,000 hours life with 70% lumen maintenance at Tc point when used with Philips produced cover and when Philips ESD protection guidelines are followed. Please refer to the design-in-guide for more information.
2. When combined with Fortimo LED thermal accessory G1. Please refer to product design-in guide for design instructions and restrictions.
3. When combined with the Fortimo thermal accessory G1, the need for an external heat sink is eliminated (for up to 3,000lm, according to the product design-in guide rules), resulting in simplified thermal management design and testing. The Fortimo DLM flex design-in guide is available at <http://www.usa.lighting.philips.com/products/oem-components/led-modules-literature.html>.
4. View limited warranty at <http://www.usa.lighting.philips.com/support/support/warranty> for details and restrictions. Warranty is applicable when Philips ESD guidelines are strictly followed. View Philips ESD guidelines at:

# Fortimo LED DLM L2 36 G2 NA

## Optical Characteristics – Table per CCT

| Fortimo LED DLM Flex DS L2 835 36 G2 NA |      |      |      |      |         |
|-----------------------------------------|------|------|------|------|---------|
|                                         | DS4  | DS3  | DS2  | DS1  | Unit    |
| Nominal Current                         | 485  | 348  | 247  | 215  | mA      |
| Luminous Flux                           | 2528 | 1866 | 1351 | 1179 | lm      |
| Luminous Flux with DLM Flex Cover       | 2098 | 1548 | 1121 | 979  | lm      |
| Module Efficacy                         | 154  | 161  | 167  | 169  | lm/W    |
| Module Efficacy with DLM Cover          | 128  | 134  | 139  | 140  | lm/W    |
| Correlated Color Temperature            | 3500 |      |      |      | K       |
| CRI                                     | >80  |      |      |      | -       |
| Color Consistency                       | <3   |      |      |      | SDCM    |
| Radiation Angle                         | 115  |      |      |      | degrees |
| Radiation Angle with DLM Cover          | 110  |      |      |      | degrees |

Note: Specifications stated at Tc nom = 85°C.  
Tolerance for flux data is -10% +20%. Tolerance for efficacy data is ±10%.  
Measurement precision for flux +/- 5%, for CRI +/- 1.5, for efficacy +/- 6%.



| Dip switch settings |     |     |
|---------------------|-----|-----|
|                     | 1   | 2   |
| DS1                 | ON  | ON  |
| DS2                 | OFF | ON  |
| DS3                 | ON  | OFF |
| DS4                 | OFF | OFF |

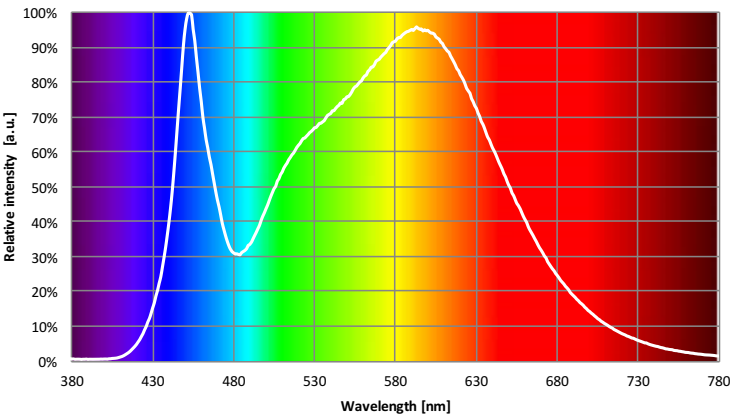


# Fortimo LED DLM L2 36 G2 NA

## Optical Characteristics – Table per CCT

| Fortimo LED DLM Flex DS L2 840 36 G2 NA |      |      |      |      |         |
|-----------------------------------------|------|------|------|------|---------|
|                                         | DS4  | DS3  | DS2  | DS1  | Unit    |
| Nominal Current                         | 485  | 348  | 247  | 215  | mA      |
| Luminous Flux                           | 2615 | 1930 | 1397 | 1220 | lm      |
| Luminous Flux with DLM Flex Cover       | 2170 | 1602 | 1160 | 1012 | lm      |
| Module Efficacy                         | 159  | 167  | 173  | 175  | lm/W    |
| Module Efficacy with DLM Cover          | 132  | 139  | 144  | 145  | lm/W    |
| Correlated Color Temperature            | 4000 |      |      |      | K       |
| CRI                                     | >80  |      |      |      | -       |
| Color Consistency                       | <3   |      |      |      | SDCM    |
| Radiation Angle                         | 115  |      |      |      | degrees |
| Radiation Angle with DLM Cover          | 110  |      |      |      | degrees |

Note: Specifications stated at Tc nom = 85°C.  
Tolerance for flux data is -10% +20%. Tolerance for efficacy data is ±10%.  
Measurement precision for flux +/- 5%, for CRI +/- 1.5, for efficacy +/-6%.



| Dip switch settings |     |     |
|---------------------|-----|-----|
|                     | 1   | 2   |
| DS1                 | ON  | ON  |
| DS2                 | OFF | ON  |
| DS3                 | ON  | OFF |
| DS4                 | OFF | OFF |



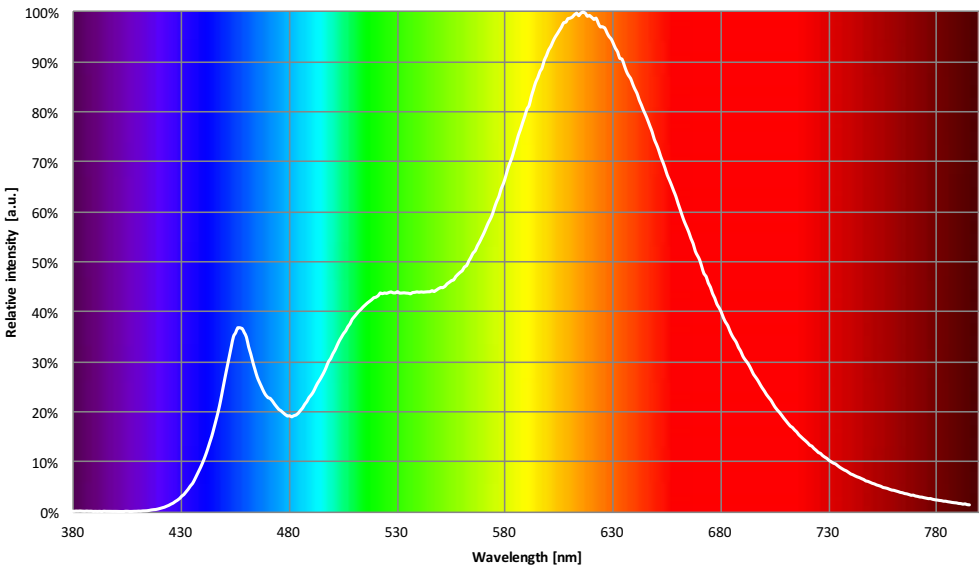
# Fortimo LED DLM L2 36 G2 NA

## Optical Characteristics – Table per CCT

| Fortimo LED DLM Flex DS L2 927 36 G2 NA |      |      |      |      |         |
|-----------------------------------------|------|------|------|------|---------|
|                                         | DS4  | DS3  | DS2  | DS1  | Unit    |
| Nominal Current                         | 591  | 419  | 294  | 253  | mA      |
| Luminous Flux                           | 2326 | 1731 | 1259 | 1097 | lm      |
| Luminous Flux with DLM Flex Cover       | 1931 | 1437 | 1045 | 911  | lm      |
| Module Efficacy                         | 114  | 123  | 130  | 133  | lm/W    |
| Module Efficacy with DLM Cover          | 95   | 102  | 108  | 110  | lm/W    |
| Correlated Color Temperature            | 2700 |      |      |      | K       |
| CRI                                     | >90  |      |      |      | -       |
| Color Consistency                       | <2   |      |      |      | SDCM    |
| Radiation Angle                         | 115  |      |      |      | degrees |
| Radiation Angle with DLM Cover          | 110  |      |      |      | degrees |

Note: Specifications stated at Tc nom = 85°C.  
Tolerance for flux data is -10% +20%. Tolerance for efficacy data is ±10%.  
Measurement precision for flux +/- 5%, for CRI +/- 1.5, for efficacy +/- 6%.

| Dip switch settings |     |     |
|---------------------|-----|-----|
|                     | 1   | 2   |
| DS1                 | ON  | ON  |
| DS2                 | OFF | ON  |
| DS3                 | ON  | OFF |
| DS4                 | OFF | OFF |



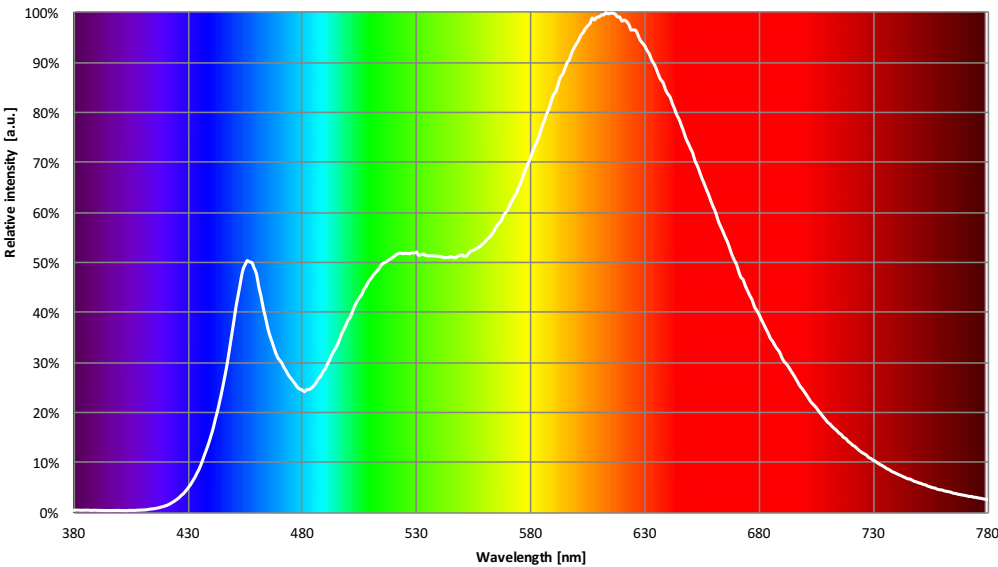
# Fortimo LED DLM L2 36 G2 NA

## Optical Characteristics – Table per CCT

| Fortimo LED DLM Flex DS L2 930 36 G2 NA |      |      |      |      |         |
|-----------------------------------------|------|------|------|------|---------|
|                                         | DS4  | DS3  | DS2  | DS1  | Unit    |
| Nominal Current                         | 591  | 419  | 294  | 253  | mA      |
| Luminous Flux                           | 2422 | 1803 | 1311 | 1142 | lm      |
| Luminous Flux with DLM Flex Cover       | 2010 | 1496 | 1088 | 948  | lm      |
| Module Efficacy                         | 119  | 128  | 136  | 139  | lm/W    |
| Module Efficacy with DLM Cover          | 99   | 106  | 113  | 115  | lm/W    |
| Correlated Color Temperature            | 3000 |      |      |      | K       |
| CRI                                     | >90  |      |      |      | -       |
| Color Consistency                       | <2   |      |      |      | SDCM    |
| Radiation Angle                         | 115  |      |      |      | degrees |
| Radiation Angle with DLM Cover          | 110  |      |      |      | degrees |

Note: Specifications stated at Tc nom = 85°C.  
Tolerance for flux data is -10% +20%. Tolerance for efficacy data is ±10%.  
Measurement precision for flux +/- 5%, for CRI +/- 1.5, for efficacy +/- 6%.

| Dip switch settings |     |     |
|---------------------|-----|-----|
|                     | 1   | 2   |
| DS1                 | ON  | ON  |
| DS2                 | OFF | ON  |
| DS3                 | ON  | OFF |
| DS4                 | OFF | OFF |



# Fortimo LED DLM L2 36 G2 NA

## Optical Characteristics – Table per CCT

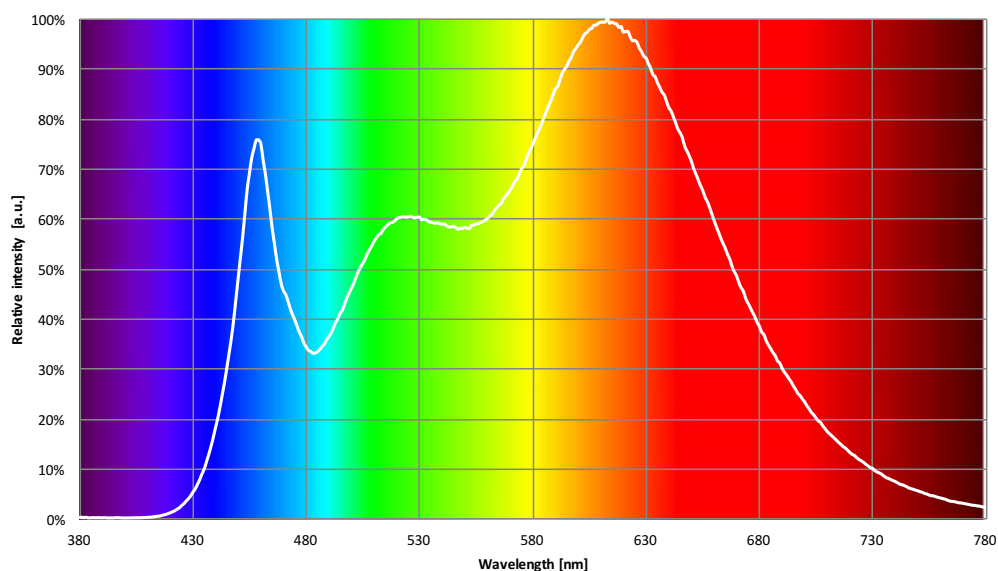
| Fortimo LED DLM Flex DS L2 935 36 G2 NA |      |      |      |      |         |
|-----------------------------------------|------|------|------|------|---------|
|                                         | DS4  | DS3  | DS2  | DS1  | Unit    |
| Nominal Current                         | 591  | 419  | 294  | 253  | mA      |
| Luminous Flux                           | 2491 | 1854 | 1348 | 1175 | lm      |
| Luminous Flux with DLM Flex Cover       | 2068 | 1539 | 1119 | 975  | lm      |
| Module Efficacy                         | 123  | 132  | 140  | 143  | lm/W    |
| Module Efficacy with DLM Cover          | 102  | 110  | 116  | 119  | lm/W    |
| Correlated Color Temperature            | 3500 |      |      |      | K       |
| CRI                                     | >90  |      |      |      | -       |
| Color Consistency                       | <2   |      |      |      | SDCM    |
| Radiation Angle                         | 115  |      |      |      | degrees |
| Radiation Angle with DLM Cover          | 110  |      |      |      | degrees |

Note: Specifications stated at Tc nom = 85°C.

Tolerance for flux data is -10% +20%. Tolerance for efficacy data is ±10%.

Measurement precision for flux +/- 5%, for CRI +/- 1.5, for efficacy +/- 6%.

| Dip switch settings |     |     |
|---------------------|-----|-----|
|                     | 1   | 2   |
| DS1                 | ON  | ON  |
| DS2                 | OFF | ON  |
| DS3                 | ON  | OFF |
| DS4                 | OFF | OFF |



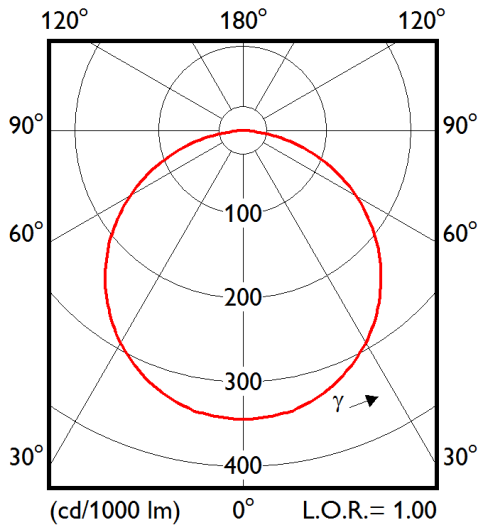
# Fortimo LED DLM L2 36 G2 NA

## Beam Shape

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

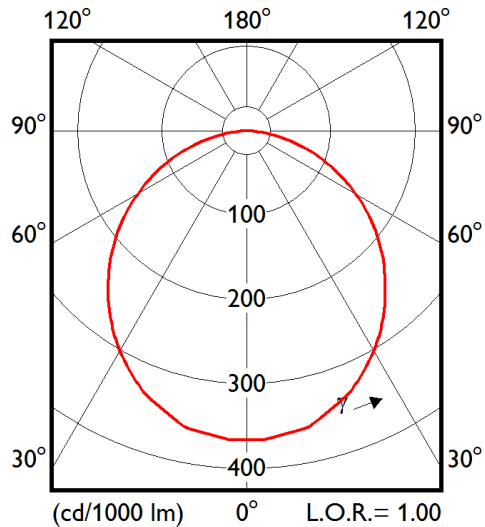
### Polar Intensity Diagram

#### DLM Flex L2 36 G2



### Polar Intensity Diagram

#### DLM Flex L2 36 G2 with DLM Flex Cover



## Electrical Characteristics

### Fortimo LED DLM Flex DS L2 36 G2 CRI 80

| Parameter         | Min  | Typ  | Max  | Unit |
|-------------------|------|------|------|------|
| Current           |      | 485  |      | mA   |
| Forward Voltage   | 32.6 | 33.9 | 35.0 | V    |
| Power Consumption | 15.8 | 16.4 | 17.0 | W    |

Note: Specifications stated at Tc nom = 85°C.  
Measurement precision for Vf +/-3%, for Power +/-3.3%

### Fortimo LED DLM Flex DS L2 36 G2 CRI 90

| Parameter         | Min  | Typ  | Max  | Unit |
|-------------------|------|------|------|------|
| Current           |      | 591  |      | mA   |
| Forward Voltage   | 33.9 | 34.4 | 35.7 | V    |
| Power Consumption | 20.0 | 20.3 | 21.1 | W    |

## Lifetime

| Parameter                | Min    | Unit |
|--------------------------|--------|------|
| Lumen Maintenance B50L70 | 50,000 | hrs  |

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

| Parameter      | Nominal <sup>5</sup> | Max <sup>6</sup> | Max. Current <sup>7</sup> |
|----------------|----------------------|------------------|---------------------------|
| Tc [°C] CRI 80 | 85                   | 95               | 85                        |
| Tc [°C] CRI 90 | 85                   | 95               | 75                        |

Refer to the warranty windows

5. Nominal value at which performance is specified.
6. Maximum value for safety.
7. Maximum TC allowed at maximum current within warranty window.

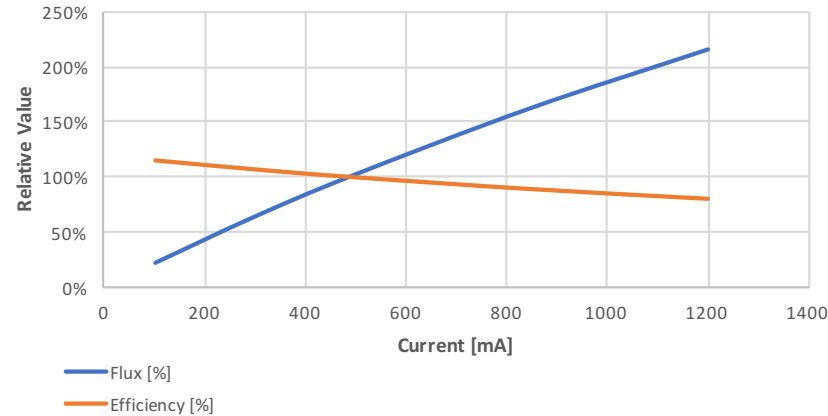




# Fortimo LED DLM L2 36 G2 NA

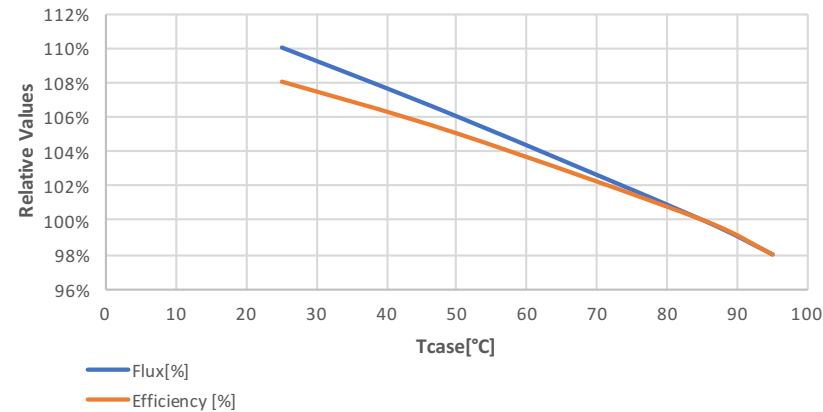
## Tuning Information

### Flux and Efficacy versus Current (at Nominal Temperature) DLM Flex L2 36 G2 - CRI 80



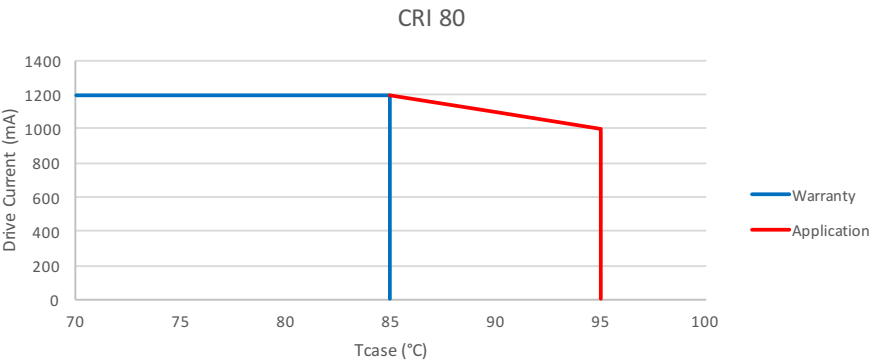
| Current [mA] | Flux [%] | Efficiency [%] |
|--------------|----------|----------------|
| 100          | 22%      | 115%           |
| 293          | 63%      | 107%           |
| 485          | 100%     | 100%           |
| 843          | 162%     | 89%            |
| 1200         | 216%     | 80%            |

### Flux and Efficacy versus Temperature at Tc (at Nominal Current) DLM Flex L2 36 G2 - CRI 80



| Tcase [°C] | Flux [%] | Efficiency [%] |
|------------|----------|----------------|
| 95         | 98%      | 98%            |
| 85         | 100%     | 100%           |
| 50         | 106%     | 105%           |
| 25         | 110%     | 108%           |

## Warranty Window

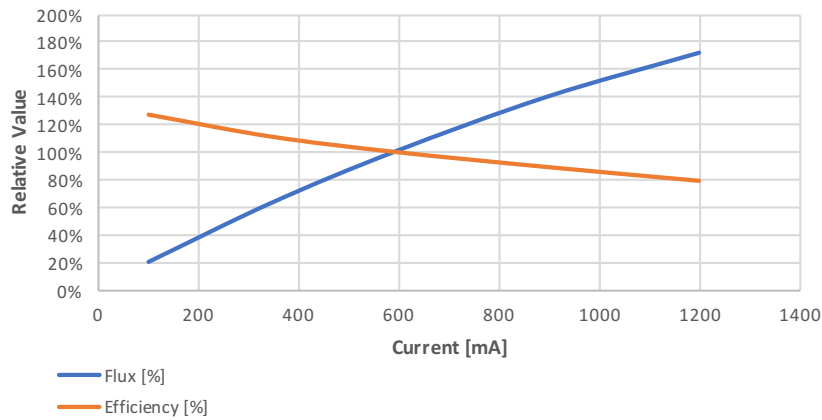


### Warranted Number of Full Thermal Product Cycles @ 25°C Ambient Temperature CRI 80

| Case Temperature Tcase [°C] | Number of Cycles |
|-----------------------------|------------------|
| 85                          | 12,500           |
| 80                          | >12,500          |
| 75                          | >12,500          |
| 70                          | >12,500          |
| 65                          | >12,500          |
| 55                          | >12,600          |

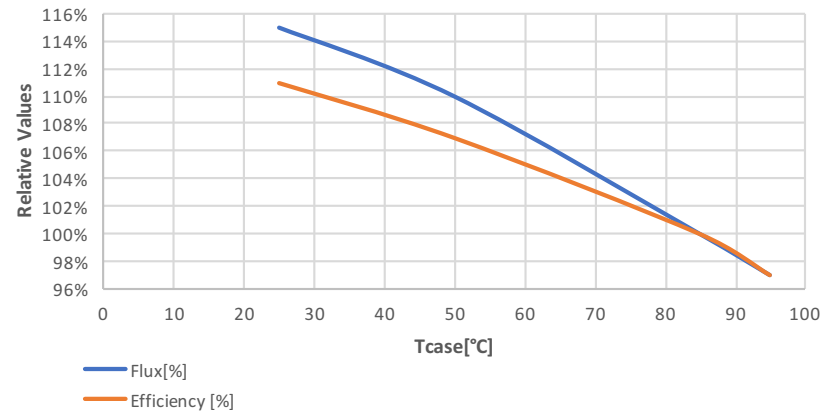
# Fortimo LED DLM L2 36 G2 NA

## Flux and Efficacy versus Current (at Nominal Temperature) DLM Flex L2 36 G2 - CRI 90



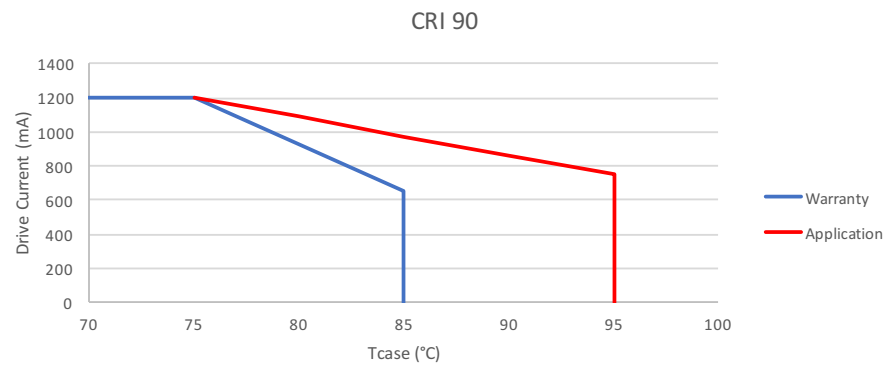
| Current [mA] | Flux [%] | Efficiency [%] |
|--------------|----------|----------------|
| 100          | 20%      | 127%           |
| 346          | 63%      | 111%           |
| 591          | 100%     | 100%           |
| 896          | 140%     | 89%            |
| 1200         | 172%     | 79%            |

## Flux and Efficacy versus Temperature at Tc (at Nominal Current) DLM Flex L2 36 G2 - CRI 90



| Tcase [°C] | Flux [%] | Efficiency [%] |
|------------|----------|----------------|
| 95         | 97%      | 97%            |
| 85         | 100%     | 100%           |
| 50         | 110%     | 107%           |
| 25         | 115%     | 111%           |

## Warranty Window



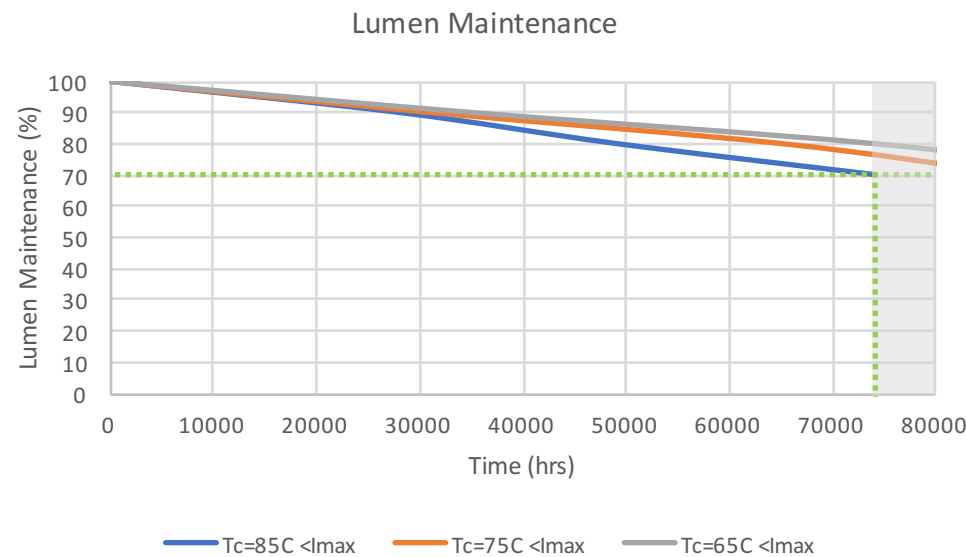
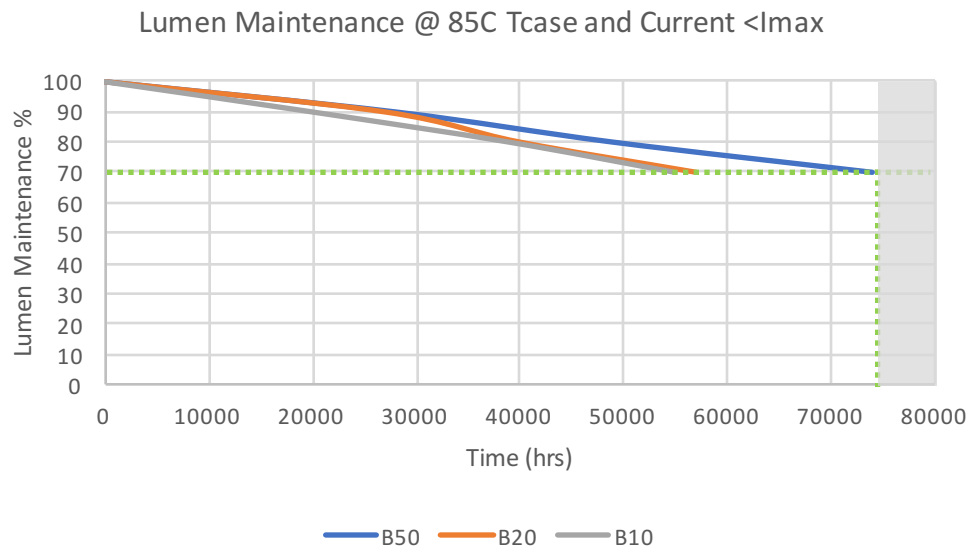
## Warranted Number of Full Thermal Product Cycles @ 25°C Ambient Temperature CRI 90

| Case Temperature Tcase [°C] | Number of Cycles |
|-----------------------------|------------------|
| 85                          | 12,300           |
| 80                          | 12,500           |
| 75                          | 12,500           |
| 70                          | >12,500          |
| 65                          | >12,500          |
| 55                          | >12,500          |

# Fortimo LED DLM L2 36 G2 NA

## Lumen Maintenance

Fortimo LED DLM Flex L2 36 G2 NA - CRI 80

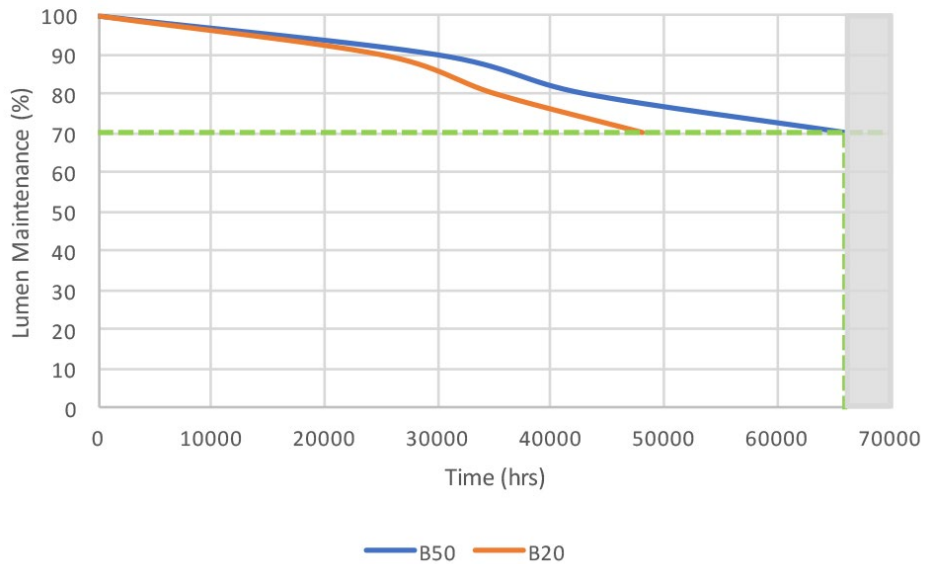


# Fortimo LED DLM L2 36 G2 NA

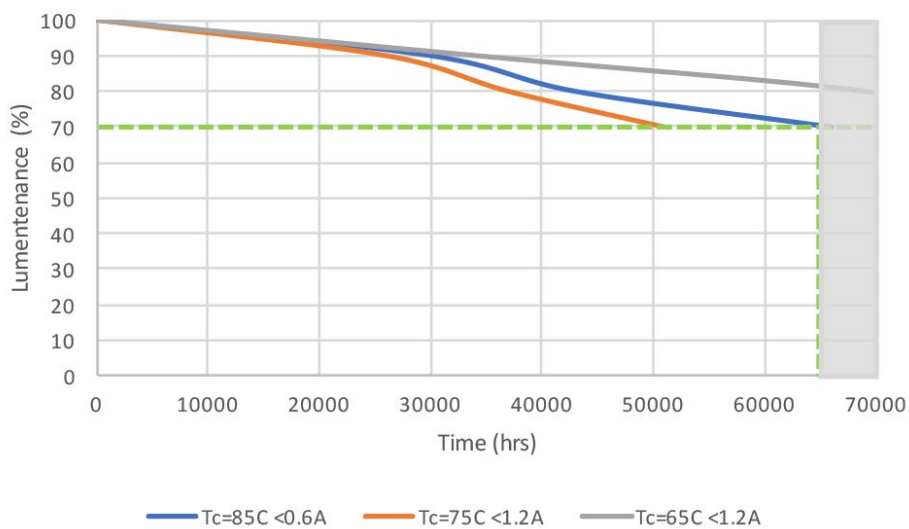
## Lumen Maintenance

### Fortimo LED DLM Flex L2 36 G2 NA - CRI 90

Lumen Maintenance @ 85C Tcase and Current <0.6A



## Lumen Maintenance



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