PHILIPS

# Fortimo

## LED

Fortimo LED-R BioUP CED 2ft FC LV5

Datasheet

## Fortimo LED-R BioUP CED 2ft FC LV5

The Fortimo LED-R LED modules are designed together with the BJB OptiLine Louvres. These modules and optics are perfectly fitted for each other which leads to a high performance on both efficiency and uniformity. Besides that, installation in a fixture is extremely easy due to the one-click-system which allows installation without screwing. The range of modules is very complete and offers a solution for many different applications and includes regular CRI80, CRI90 High Efficiency, FlexTune and BioUp CED.

### Key features and benefits

- BioUp Cyan Enhanced Dynamic
- Designed to work together with the Xitanium FlexTune drivers
- Color tunable from 2700K to 5000K
- MDER enhancement from 3000K to 5000K
- MDER of 0,95 at 5000K
- Long life time: >50,000 hours
- Excellent color consistency of 3 SDCM
- 1ft and 2ft lengths
- Good light quality: CRI80, R9 >50
- Extremely easy to install in combination with BJB OptiLine Louvres
- Rotated LED positions to enable better color mixing
- Available in High Voltage (HV) and Low Voltage (LV)
- Five year system warranty when paired with Xitanium drivers

June 2022

indirect

100%

instant

## Ordering data

| Commercial product name | EOC | 12NC | EPREL registration # | Box quantity |
|---|---|---|---|---|
| Fortimo LED-R BioUP CED 2ft FC LV5 | 8719514 448056 00 | 9290 034 06806 | 1227082 | 110 |

These LED-modules are designed to be used with BJB LED OptiLine Louvre Optcs.
Contact your Signify sales representative or BJB for more info.

9290 029 36906 Medium beam lens 1ft (35.306.1001.85)
9290 029 37006 Wide beam lens 1ft (35.306.1002.85)
9290 029 37406 black raster 1ft (35.306.2001.80)
9290 029 37306 white raster 1ft (35.306.2001.50)
9290 029 36806 black raster 2ft (35.312.2001.80)
9290 029 36706 white raster 2ft (35.312.2001.50)

## Drive currents

| Parameter | Nominal* | Life** | Max*** | Unit |
|---|---|---|---|---|
| Fortimo LED-R BioUP CED 2ft FC LV5 | 320 | 480 | 480 | mA |

For FlexTune driver configuration use 0.313, 0.310 (1600lm) and 0.459, 0.405 (1430lm) for cool and warm LED, at a rated current of 320mA for both.

## Module temperatures

| Parameter | Nominal* | Life** | Max*** | Unit |
|---|---|---|---|---|
| $T_c$ (case temperature at $T_c$ point) | 45 | 70 | 85 | °C |

* Nominal value at which typical performance is specified

** Value at which life time is specified

*** Maximum value for safe operation, do not operate above this value

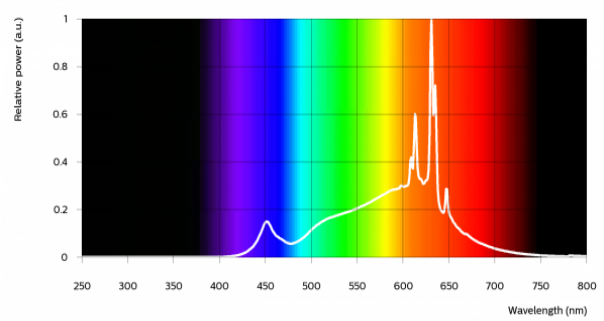
## Optical characteristics - table per color (CCT)

### Fortimo LED-R BioUP CED 2ft FC LV5 [2700K]

| Parameter | Min | Typ | Max | Unit |
|---|---|---|---|---|
| Luminous flux | 1550 | 1600 | 1730 | lm |
| Efficacy | 129 | 135 | 150 | lm/W |
| Correlated color temperature (CCT) | | 2700 | | K |
| Color coordinates (CIEx, CIEy) | | (0.459, 0.405) | | - |
| Color consistency | | | 3 | SDCM |
| CRI | 90 | | | |
| R9 | 50 | | | |
| Photobiological safety | | | RG1 unlimited | |

Measurement precision ± 5% for the flux data and ± 6% for the efficacy data. Measurement precision for color coordinates ± 0.005. Measurement precision for CRI ± 1.5.

| Operation point | 927 | lm | lm/W |
|---|---|---|---|
| 80% I-nom 256mA | Tc 25 °C | 1348 | 145 |
| | Tc-nom 45 °C | 1317 | 143 |
| | Tc-max 85 °C | 1231 | 135 |
| I-nom 320mA | Tc 25 °C | 1637 | 137 |
| | Tc-nom 45 °C | 1600 | 135 |
| | Tc-max 85 °C | 1493 | 127 |
| I-max 480mA | Tc 25 °C | 2311 | 120 |
| | Tc-nom 45 °C | 2254 | 118 |
| | Tc-max 85 °C | 2099 | 111 |

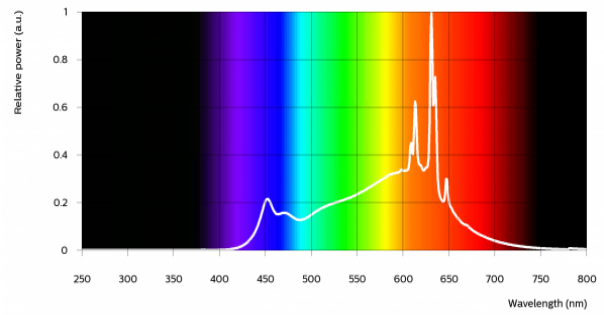



### Fortimo LED-R BioUP CED 2ft FC LV5 [3000K]

| Parameter | Min | Typ | Max | Unit |
|---|---|---|---|---|
| Luminous flux | 1520 | 1570 | 1700 | lm |
| Efficacy | 127 | 133 | 148 | lm/W |
| Correlated color temperature (CCT) | | 3000 | | K |
| Color consistency | | | 3 | SDCM |
| CRI | 80 | | | |
| R9 | 0 | | | |
| Photobiological safety | | | RG1 unlimited | |

Measurement precision ± 5% for the flux data and ± 6% for the efficacy data. Measurement precision for color coordinates ± 0.005. Measurement precision for CRI ± 1.5.

| Operation point | 830 | lm | lm/W |
|---|---|---|---|
| 80% I-nom 256mA | Tc 25 °C | 1326 | 143 |
| | Tc-nom 45 °C | 1296 | 141 |
| | Tc-max 85 °C | 1214 | 134 |
| I-nom 320mA | Tc 25 °C | 1608 | 135 |
| | Tc-nom 45 °C | 1570 | 133 |
| | Tc-max 85 °C | 1471 | 126 |
| I-max 480mA | Tc 25 °C | 2265 | 118 |
| | Tc-nom 45 °C | 2211 | 116 |
| | Tc-max 85 °C | 2063 | 110 |

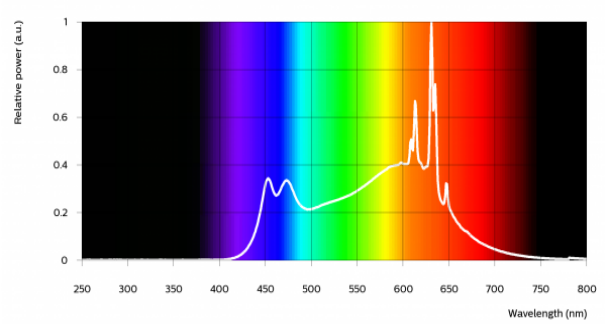


## Fortimo LED-R BioUP CED 2ft FC LV5 [3500K]

| Parameter | Min | Typ | Max | Unit |
|---|---|---|---|---|
| Luminous flux | 1490 | 1540 | 1660 | lm |
| Efficacy | 125 | 130 | 145 | lm/W |
| Correlated color temperature (CCT) | | 3500 | | K |
| Color consistency | | | 3 | SDCM |
| CRI | 80 | | | |
| R9 | 0 | | | |
| Photobiological safety | | | RG1 unlimited | |

Measurement precision ± 5% for the flux data and ± 6% for the efficacy data. Measurement precision for color coordinates ± 0.005. Measurement precision for CRI ± 1.5.

| Operation point | 835 | lm | lm/W |
|---|---|---|---|
| 80% I-nom 256mA | Tc 25 °C | 1297 | 140 |
| | Tc-nom 45 °C | 1268 | 138 |
| | Tc-max 85 °C | 1191 | 131 |
| I-nom 320mA | Tc 25 °C | 1570 | 132 |
| | Tc-nom 45 °C | 1540 | 130 |
| | Tc-max 85 °C | 1441 | 124 |
| I-max 480mA | Tc 25 °C | 2205 | 116 |
| | Tc-nom 45 °C | 2154 | 114 |
| | Tc-max 85 °C | 2016 | 108 |

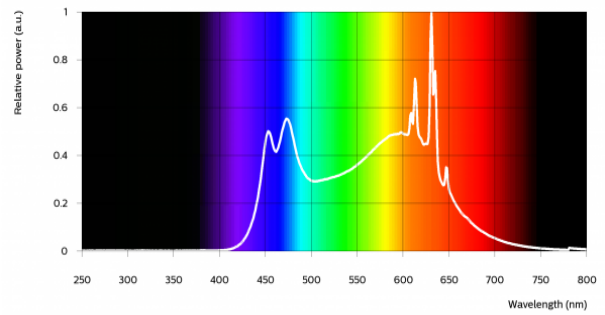



## Fortimo LED-R BioUP CED 2ft FC LV5 [4000K]

| Parameter | Min | Typ | Max | Unit |
|---|---|---|---|---|
| Luminous flux | 1460 | 1510 | 1630 | lm |
| Efficacy | 122 | 128 | 142 | lm/W |
| Correlated color temperature (CCT) | | 4000 | | K |
| Color consistency | | | 3 | SDCM |
| CRI | 80 | | | |
| R9 | 0 | | | |
| Photobiological safety | | | RG1 unlimited | |

Measurement precision ± 5% for the flux data and ± 6% for the efficacy data. Measurement precision for color coordinates ± 0.005. Measurement precision for CRI ± 1.5.

| Operation point | 840 | lm | lm/W |
|---|---|---|---|
| 80% I-nom 256mA | Tc 25 °C | 1274 | 138 |
| | Tc-nom 45 °C | 1248 | 136 |
| | Tc-max 85 °C | 1174 | 130 |
| I-nom 320mA | Tc 25 °C | 1541 | 130 |
| | Tc-nom 45 °C | 1510 | 128 |
| | Tc-max 85 °C | 1418 | 122 |
| I-max 480mA | Tc 25 °C | 2159 | 114 |
| | Tc-nom 45 °C | 2112 | 112 |
| | Tc-max 85 °C | 1980 | 106 |

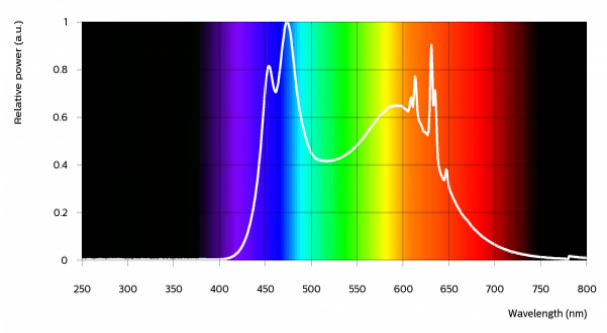


## Fortimo LED-R BioUP CED 2ft FC LV5 [5000K]

| Parameter | Min | Typ | Max | Unit |
|---|---|---|---|---|
| Luminous flux | 1430 | 1470 | 1590 | lm |
| Efficacy | 120 | 125 | 139 | lm/W |
| Correlated color temperature (CCT) | | 5000 | | K |
| Color consistency | | | 3 | SDCM |
| CRI | 80 | | | |
| R9 | 0 | | | |
| Photobiological safety | | | RG1 unlimited | |

Measurement precision ± 5% for the flux data and ± 6% for the efficacy data. Measurement precision for color coordinates ± 0.005. Measurement precision for CRI ± 1.5.

| Operation point | 850 | lm | lm/W |
|---|---|---|---|
| 80% I-nom 256mA | Tc 25 °C | 1242 | 135 |
| | Tc-nom 45 °C | 1218 | 133 |
| | Tc-max 85 °C | 1149 | 127 |
| I-nom 320mA | Tc 25 °C | 1500 | 127 |
| | Tc-nom 45 °C | 1470 | 125 |
| | Tc-max 85 °C | 1385 | 120 |
| I-max 480mA | Tc 25 °C | 2095 | 111 |
| | Tc-nom 45 °C | 2051 | 109 |
| | Tc-max 85 °C | 1928 | 104 |



## Electrical characteristics

### Fortimo LED-R BioUP CED 2ft FC LV5 [2700K]

| Parameter | Min | Typ | Max | Unit |
|---|---|---|---|---|
| Forward voltage | 36.0 | 37.1 | 37.5 | V |
| Power consumption | 11.5 | 11.9 | 12.0 | W = kWh/1000h |
| Number of modules in series per chain | | | 1 | |
| Number of modules per chain | | | 3 | |

### Fortimo LED-R BioUP CED 2ft FC LV5 [3000K]

| Parameter | Min | Typ | Max | Unit |
|---|---|---|---|---|
| Forward voltage | 35.9 | 37.0 | 37.4 | V |
| Power consumption | 11.5 | 11.8 | 12.0 | W = kWh/1000h |
| Number of modules in series per chain | | | 1 | |
| Number of modules per chain | | | 3 | |

### Fortimo LED-R BioUP CED 2ft FC LV5 [3500K]
### Fortimo LED-R BioUP CED 2ft FC LV5 [4000K]

| Parameter | Min | Typ | Max | Unit |
|---|---|---|---|---|
| Forward voltage | 35.8 | 36.9 | 37.3 | V |
| Power consumption | 11.5 | 11.8 | 11.9 | W = kWh/1000h |
| Number of modules in series per chain | | | 1 | |
| Number of modules per chain | | | 3 | |

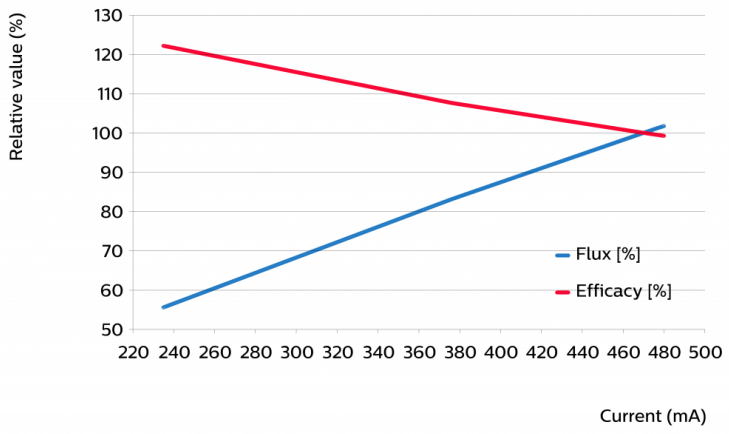
### Fortimo LED-R BioUP CED 2ft FC LV5 [5000K]

| Parameter | Min | Typ | Max | Unit |
|---|---|---|---|---|
| Forward voltage | 35.7 | 36.8 | 37.2 | V |
| Power consumption | 11.4 | 11.8 | 11.9 | W = kWh/1000h |
| Number of modules in series per chain | | | 1 | |
| Number of modules per chain | | | 3 | |

## Tuning information

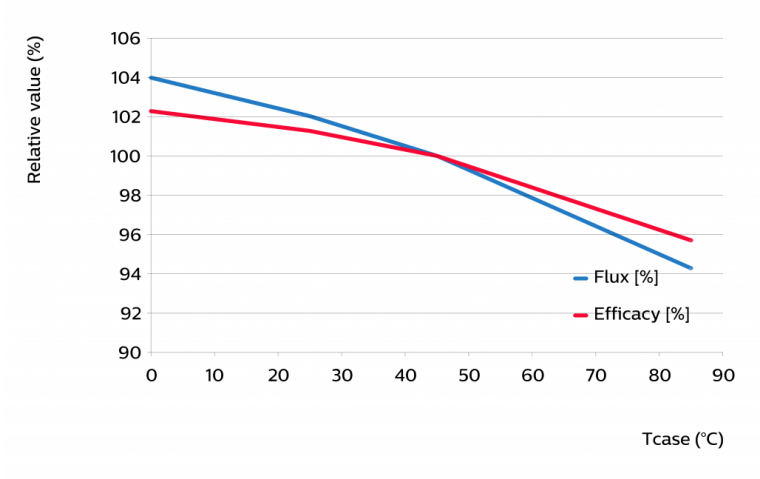
Flux and efficacy versus current (at Tc nominal)

| I [mA] | Flux [%] | Efficacy [%] |
|---|---|---|
| 480 | 102 | 99 |
| 475 | 101 | 100 |
| 470 | 100 | 100 |
| 376 | 83 | 108 |
| 235 | 56 | 122 |



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

| Tc [°C] | Flux [%] | Efficacy [%] |
|---|---|---|
| 85 | 94 | 96 |
| 45 | 100 | 100 |
| 25 | 102 | 101 |
| 0 | 104 | 102 |



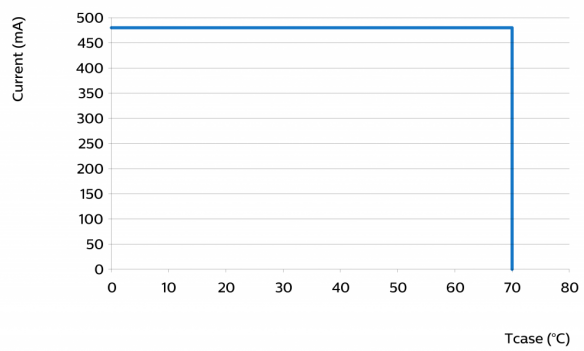

## Lumen maintenance

| Operation point | Lumen maintenance x 1000 hours | L70 | | | L80 | | | L90 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | B50 | B20 | B10 | B50 | B20 | B10 | B50 | B20 | B10 |
| 80% Inom=256mA | Tc=25°C | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 |
| | Tc_nom=45°C | >70 | >70 | >70 | >70 | >70 | >70 | 65 | 63 | 62 |
| | Ilife=450mA | >70 | >70 | >70 | >70 | >70 | >70 | 50 | 48 | 48 |
| Inom=320mA | Tc=25°C | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 |
| | Tc_nom=45°C | >70 | >70 | >70 | >70 | >70 | >70 | 62 | 60 | 60 |
| | Ilife=450mA | >70 | >70 | >70 | >70 | >70 | >70 | 47 | 46 | 46 |
| Ilife=480mA | Tc=25°C | >70 | >70 | >70 | >70 | >70 | >70 | >70 | 70 | 69 |
| | Tc_nom=45°C | >70 | >70 | >70 | >70 | >70 | >70 | 57 | 56 | 55 |
| | Ilife=450mA | >70 | >70 | >70 | >70 | >70 | >70 | 44 | 43 | 42 |

## Lifetime

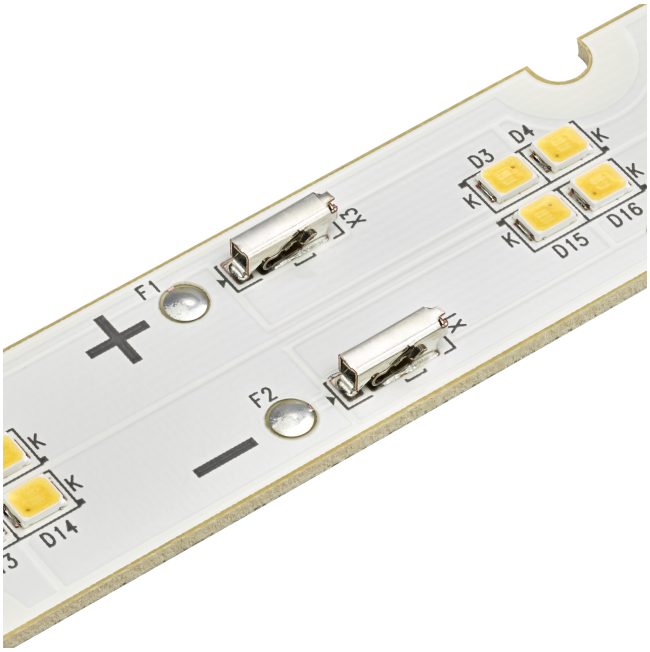
| Parameter | Value | Unit |
|---|---|---|
| M70F50 nominal | >70000 | hours |
| M70F50 life | >70000 | hours |

## Performance Window



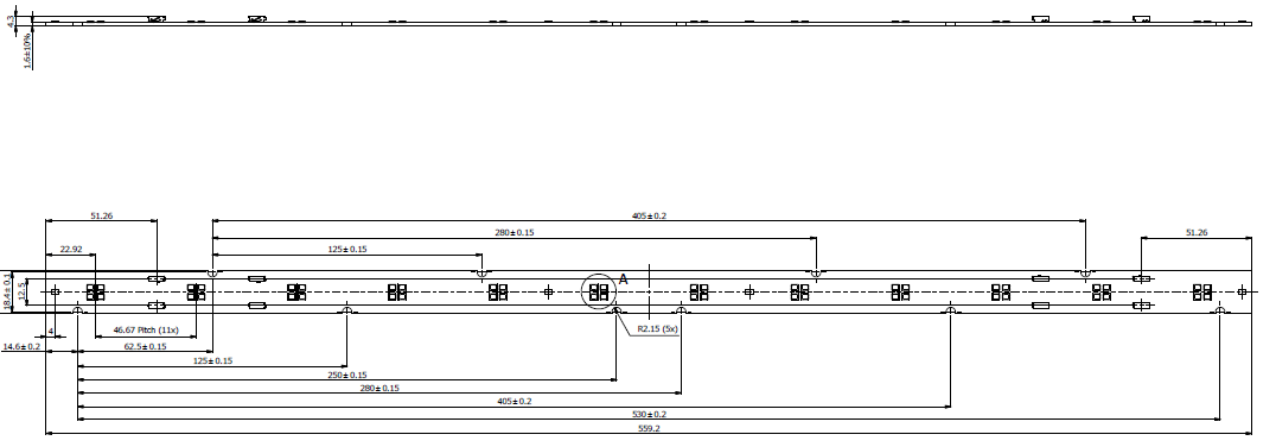
## Wiring

| Specification item | Value | Unit | Condition |
|---|---|---|---|
| Input wire cross-section | 0.2...0.75 | $mm^2$ | solid wire, stranded wire |
| | 18...24 | AWG | solid wire, stranded wire |
| Input wire strip length | 7.5...9.5 | mm | |




## Mechanical characteristics

| Parameter | Min | Typ | Max | Unit |
|---|---|---|---|---|
| Length | 558.9 | 559.2 | 559.5 | mm |
| Width | 19.8 | 20 | 20.6 | mm |
| Height PCB | | 1.6 | | mm |
| Height Total | | 4.3 | | mm |
| Product mass | | 50 | | gram |



## Absolute ratings

| Parameter | Min | Max | Unit |
|---|---|---|---|
| Current through the LED module (I-max) | | 480 | mA |
| Case temperature (Tc-max) | | 85 | °C |
| ESD (direct contact) | 8 | | kV |
| Working voltage | | 120 | $V_{dc}$ |

## Application information

**Certificates and Standards**
CE
ENEC
ENEC+
cULus

| Application | |
|---|---|
| Overheating protection | no |
| Dimming | Yes |

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