

# PHILIPS

## LED Modules

### Fortimo LED Strip Value Offer

#### 2ft 4000lm LV1



Philips Fortimo LED strip module value offer (VO) is designed to enable cost breakthrough in recessed ambient LED lighting applications. With its optimized design and high overdrive capability of up to 2200 lm/ft, it offers high design flexibility to lighting fixture manufacturers and makes it an economic choice for designers.

With module efficacies of up to 160 lm/W, CRI80, 3SDCM color consistency, 50,000-hour life<sup>1</sup> and a five-year limited system warranty<sup>2</sup>, the Fortimo LED strip module VO is designed to meet all the basic needs of indoor linear lighting applications for maximum customer satisfaction.

| Commercial Product Name                 | 12NC         |
|-----------------------------------------|--------------|
| Fortimo LED Strip VO 2ft 4000lm 830 LV1 | 929000791113 |
| Fortimo LED Strip VO 2ft 4000lm 835 LV1 | 929000791213 |
| Fortimo LED Strip VO 2ft 4000lm 840 LV1 | 929000791313 |
| Fortimo LED Strip VO 2ft 4000lm 850 LV1 | 929000791413 |

Footnotes on next page.

# Fortimo LED strip value offer 2ft 4000lm LV1

## Features

- High overdrive capability with up to 2200 lm/ft
- High energy efficacy with up to 160 lm/W
- High quality of light with 3 SDCM color consistency and CRI 80
- Long lifetime – 50,000 hours<sup>1</sup>
- Push-in connectors enabling easy wiring and daisy chaining
- Mechanical footprint compatible with LED strip and Zhaga

## Benefits

- Enables easy and economical fixture design for existing LED luminaires utilizing 20mm linear LED modules
- 5-year limited system warranty with Philips Advance Xitanium LED drivers<sup>2</sup>
- Perfectly married system components offer low system cost and excellent system performance

## Applications

- Office
- Healthcare
- Retail
- Industry

## Optical Characteristics – Table per CCT

### Fortimo LED Strip VO 2ft 4000lm 830 LV1

| Parameter at Typical Conditions <sup>3</sup> | Min | Typ  | Unit |
|----------------------------------------------|-----|------|------|
| Luminous Flux                                |     | 3720 | Lm   |
| Lumen Efficiency                             |     | 142  | Lm/W |
| Forward Current                              |     | 725  | mA   |
| Correlated Color Temperature (CCT) Target    |     | 3000 | K    |
| CRI                                          | 80  |      | -    |
| Radiation Angle                              |     | 120  | deg  |

| Parameter at Lifetime Conditions | Typ  | Unit |
|----------------------------------|------|------|
| Luminous Flux                    | 4232 | Lm   |
| Lumen Efficiency                 | 135  | Lm/W |
| Forward Current                  | 840  | mA   |

Nominal temperature for performance specification: T<sub>c</sub> = 45°C.

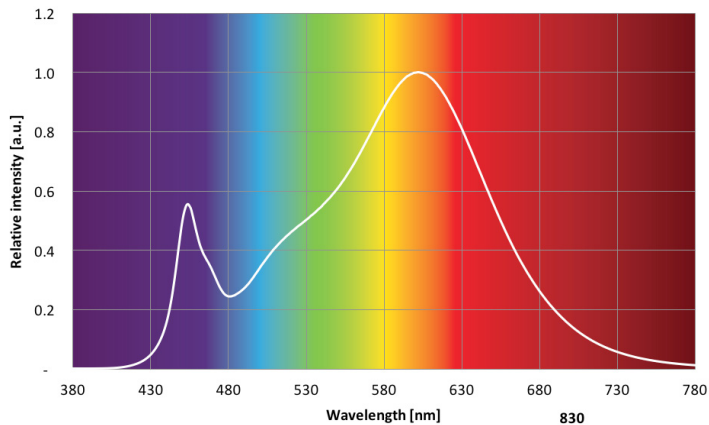
Maximum performance values at llife.

Color consistency of 3 SDCM, averaged over the module.

Tolerance for flux data is ±7.5%.

Tolerance for efficacy data is ±10%.

Philips maintains a tester tolerance of +/-5% on flux, +/-0.005 on color, +/- 1.5 on CRI, +/- 3% on Vf, +/- 3.3% on power, and +/-6% on efficiency.



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 T<sub>c</sub> point.
2. View limited warranty at <http://www.usa.lighting.philips.com/support/support/warranty> for details and restrictions.

# Fortimo LED strip value offer 2ft 4000lm LV1

## Optical Characteristics – Table per CCT

**Fortimo LED Strip VO 2ft 4000lm 835 LV1**

| Parameter at Typical Conditions <sup>3</sup> | Min | Typ  | Unit |
|----------------------------------------------|-----|------|------|
| Luminous Flux                                |     | 3930 | Lm   |
| Lumen Efficiency                             |     | 150  | Lm/W |
| Forward Current                              |     | 725  | mA   |
| Correlated Color Temperature (CCT) Target    |     | 3500 | K    |
| CRI                                          | 80  |      | -    |
| Radiation Angle                              |     | 120  | deg  |

| Parameter at Lifetime Conditions | Typ  | Unit |
|----------------------------------|------|------|
| Luminous Flux                    | 4480 | Lm   |
| Lumen Efficiency                 | 143  | Lm/W |
| Forward Current                  | 840  | mA   |

Nominal temperature for performance specification: T<sub>c</sub> = 45°C.

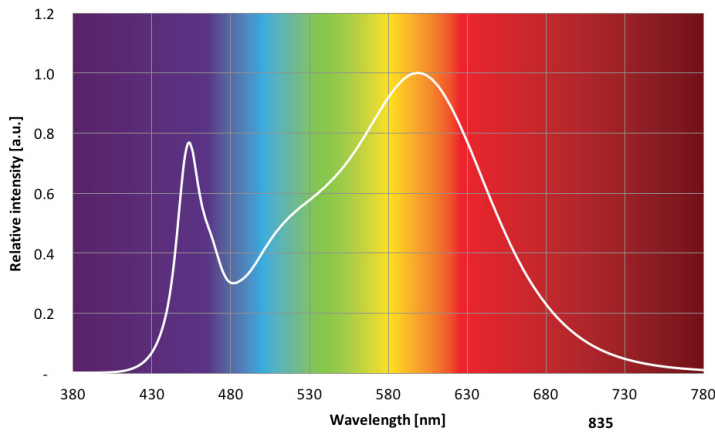
Maximum performance values at llife.

Color consistency of 3 SDCM, averaged over the module.

Tolerance for flux data is ±7.5%.

Tolerance for efficacy data is ±10%.

Philips maintains a tester tolerance of +/-5% on flux, +/-0.005 on color, +/- 1.5 on CRI, +/- 3% on Vf, +/- 3.3% on power, and +/-6% on efficiency.



3. Tolerance for flux data is ±7.5%. Tolerance for efficacy data is ±10%. Measurements tolerance +/- 5% for flux and efficacy, 0.005 on x,y, +/-1.5 on CRI.

# Fortimo LED strip value offer 2ft 4000lm LV1

## Optical Characteristics – Table per CCT

**Fortimo LED Strip VO 2ft 4000lm 840 LV1**

| Parameter at Typical Conditions <sup>3</sup> | Min | Typ  | Unit |
|----------------------------------------------|-----|------|------|
| Luminous Flux                                |     | 4000 | Lm   |
| Lumen Efficiency                             |     | 153  | Lm/W |
| Forward Current                              |     | 725  | mA   |
| Correlated Color Temperature (CCT) Target    |     | 4000 | K    |
| CRI                                          | 80  |      | -    |
| Radiation Angle                              |     | 120  | deg  |

| Parameter at Lifetime Conditions | Typ  | Unit |
|----------------------------------|------|------|
| Luminous Flux                    | 4557 | Lm   |
| Lumen Efficiency                 | 146  | Lm/W |
| Forward Current                  | 840  | mA   |

Nominal temperature for performance specification: Tc = 45°C.

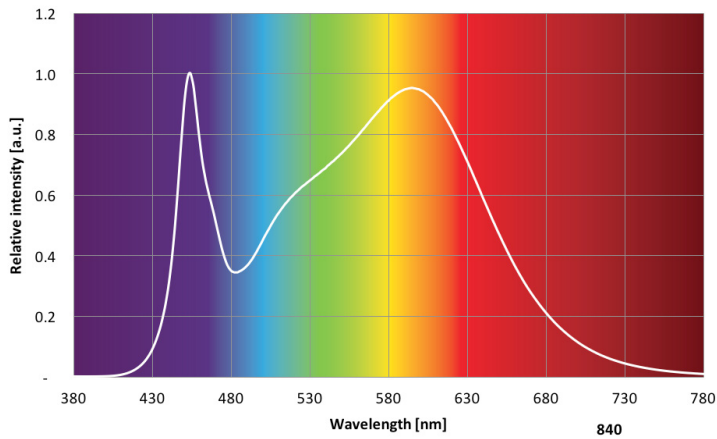
Maximum performance values at llife.

Color consistency of 3 SDCM, averaged over the module.

Tolerance for flux data is ±7.5%.

Tolerance for efficacy data is ±10%.

Philips maintains a tester tolerance of +/-5% on flux, +/-0.005 on color, +/- 1.5 on CRI, +/- 3% on Vf, +/- 3.3% on power, and +/-6% on efficiency.



# Fortimo LED strip value offer 2ft 4000lm LV1

## Optical Characteristics – Table per CCT

**Fortimo LED Strip VO 2ft 4000lm 850 LV1**

| Parameter at Typical Conditions <sup>3</sup> | Min | Typ  | Unit |
|----------------------------------------------|-----|------|------|
| Luminous Flux                                |     | 4000 | Lm   |
| Lumen Efficiency                             |     | 153  | Lm/W |
| Forward Current                              |     | 725  | mA   |
| Correlated Color Temperature (CCT) Target    |     | 5000 | K    |
| CRI                                          | 80  |      | -    |
| Radiation Angle                              |     | 120  | deg  |

| Parameter at Lifetime Conditions | Typ  | Unit |
|----------------------------------|------|------|
| Luminous Flux                    | 4557 | Lm   |
| Lumen Efficiency                 | 146  | Lm/W |
| Forward Current                  | 840  | mA   |

Nominal temperature for performance specification:  $T_c = 45^\circ\text{C}$ .

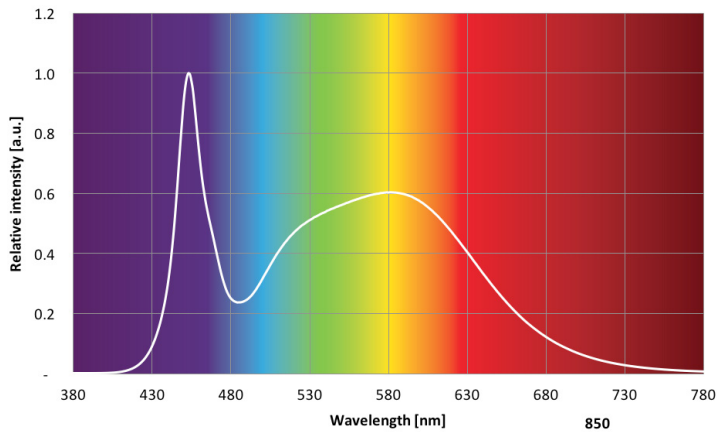
Maximum performance values at llife.

Color consistency of 3 SDCM, averaged over the module.

Tolerance for flux data is  $\pm 7.5\%$ .

Tolerance for efficacy data is  $\pm 10\%$ .

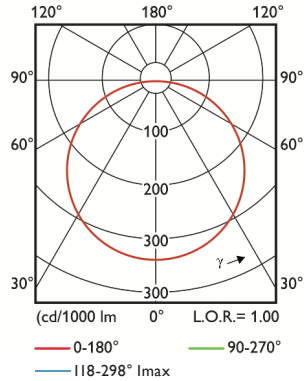
Philips maintains a tester tolerance of  $\pm 5\%$  on flux,  $\pm 0.005$  on color,  $\pm 1.5$  on CRI,  $\pm 3\%$  on Vf,  $\pm 3.3\%$  on power, and  $\pm 6\%$  on efficiency.



# Fortimo LED strip value offer 2ft 4000lm LV1

## Beam Shape

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



## Electrical Characteristics

| Parameter         | Min  | Typ  | Max  | Unit |
|-------------------|------|------|------|------|
| Nominal Current   |      | 725  | 960  | mA   |
| Forward Voltage   | 33.6 | 36.1 | 38.5 | V    |
| Power Consumption |      | 26.2 |      | W    |

## Lifetime

| Parameter    | Nominal * | Life** | Max*** |
|--------------|-----------|--------|--------|
| Tc [°C]      | 45        | 80     | 85     |
| Current [mA] | 725       | 840    | 960    |

\* Nominal value at which performance is specified

\*\* Value at which lifetime is specified (max current for warranty)

\*\*\* Maximum value for safety

| Parameter                   | Min | Typ | Max   |
|-----------------------------|-----|-----|-------|
| $\Delta u'v'$ at 6000 Hours |     |     | 0.007 |

Note: Specifications stated while Tc < 80°C and I < 188 mA.

## Abs Max Ratings

| Parameter                   | Min              | Typ | Max | Unit |
|-----------------------------|------------------|-----|-----|------|
| Current I_max               |                  |     | 960 | mA   |
| Case Temperature Tc Max     |                  |     | 85  | °C   |
| ESD (Direct Contact)        |                  |     | 8   | kV   |
| ESD (Air)                   |                  |     | 15  | kV   |
| Isolation Breakdown Voltage | 500              |     |     | Vdc  |
| Ambient Temperature         | -20 <sup>4</sup> |     |     | °C   |
| Number of Modules per Chain |                  |     | 2   |      |

4. There cannot be any ice/fog/mist on any part of the L2 surface during the application at -20°C.

# Fortimo LED strip value offer 2ft 4000lm LV1

## Wiring

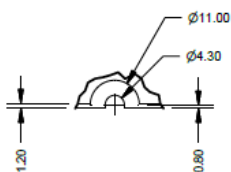
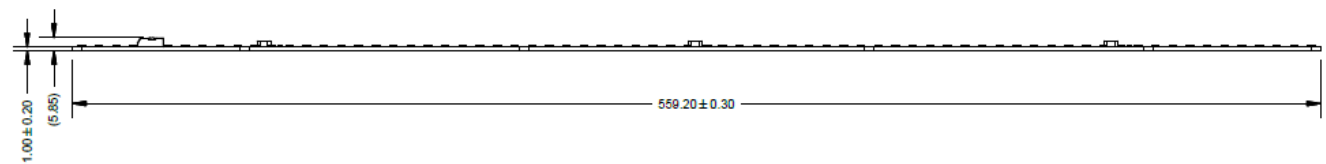
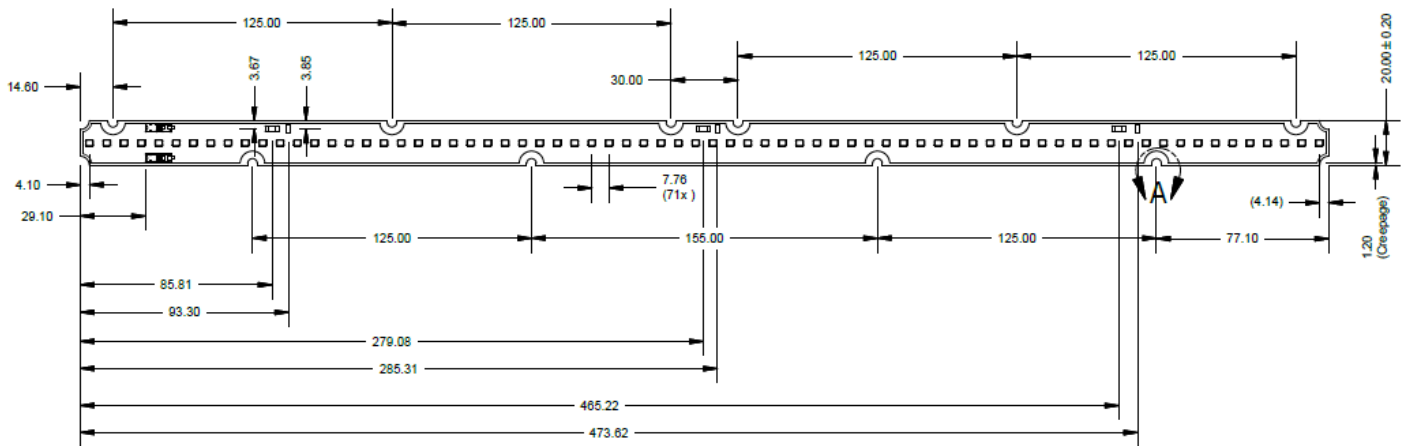
| Specification Item       | Value      | Unit            | Condition |
|--------------------------|------------|-----------------|-----------|
| Input Wire Cross-Section | 0.2...0.8  | mm <sup>2</sup> | Solid     |
|                          | 18...24    | AWG             |           |
|                          | 0.45...0.7 | mm <sup>2</sup> | Stranded  |
|                          | 20...22    | AWG             |           |
| Input Wire Strip Length  | 7.5...8.5  | mm              |           |

Note: Connector suited for robot wiring.

## Mechanical Characteristics

| Parameter              | Min   | Typ   | Max   | Unit |
|------------------------|-------|-------|-------|------|
| Length                 | 558.9 | 559.2 | 559.5 | mm   |
| Width                  | 19.7  | 20.0  | 20.3  | mm   |
| Height Excl. Connector |       | 1.0   |       | mm   |
| Height Incl. Connector |       |       |       | mm   |
| Warpage (IPC-TM-650)   |       |       | 4.2   | mm   |

Note: Bow & twist of the PCB after production tested and released according IPC-TM-650 2.4.22.



DETAIL A  
SCALE 1 : 1

# Fortimo LED strip value offer 2ft 4000lm LV1

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## Application Information

### Compliance and Approval

UL & cUL according to UL8750 (UL Recognized)

### Environmental

RoHS / REACH

### Application Information

|                        |               |
|------------------------|---------------|
| IP Rating              | No IP rating  |
| Overheating Protection | No protection |
| Luminaire Class        | UL Class 2    |

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

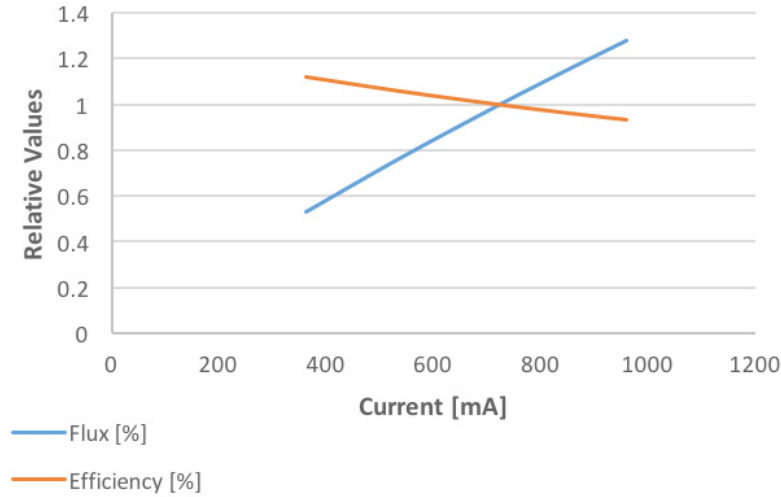
| Case Temperature Tc [°C] | Amount of Cycles |
|--------------------------|------------------|
| 35                       | 40,000           |
| 40                       |                  |
| 45                       |                  |
| 50                       |                  |
| 55                       |                  |
| 60                       |                  |
| 65                       | 40,000           |
| 70                       | 25,000           |
| 75                       | 16,667           |
| 80                       | 15,000           |



# Fortimo LED strip value offer 2ft 4000lm LV1

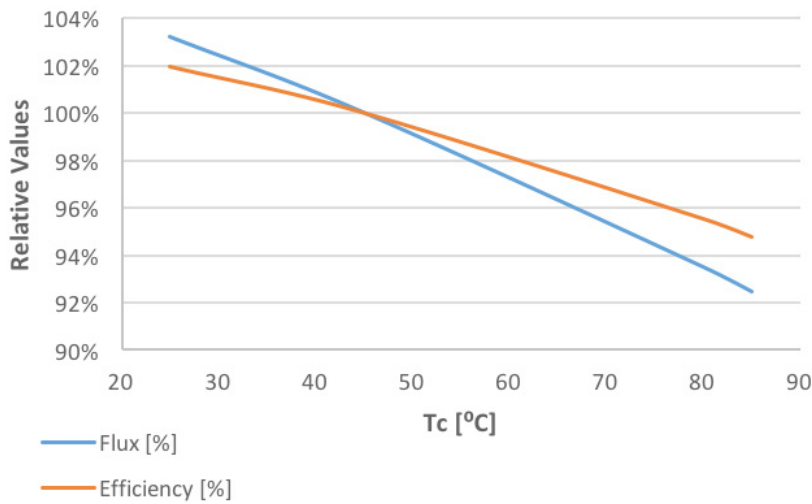
## Tuning Information

### Flux and Efficacy Vs. Current (at Nominal Temperature)



| I [mA]     | Flux [%]    | Efficacy [%] |
|------------|-------------|--------------|
| 363        | 53%         | 112%         |
| 544        | 77%         | 106%         |
| <b>725</b> | <b>100%</b> | <b>100%</b>  |
| 803        | 109%        | 98%          |
| 882        | 119%        | 96%          |
| 960        | 128%        | 94%          |

### Flux and Efficacy Vs. Tc



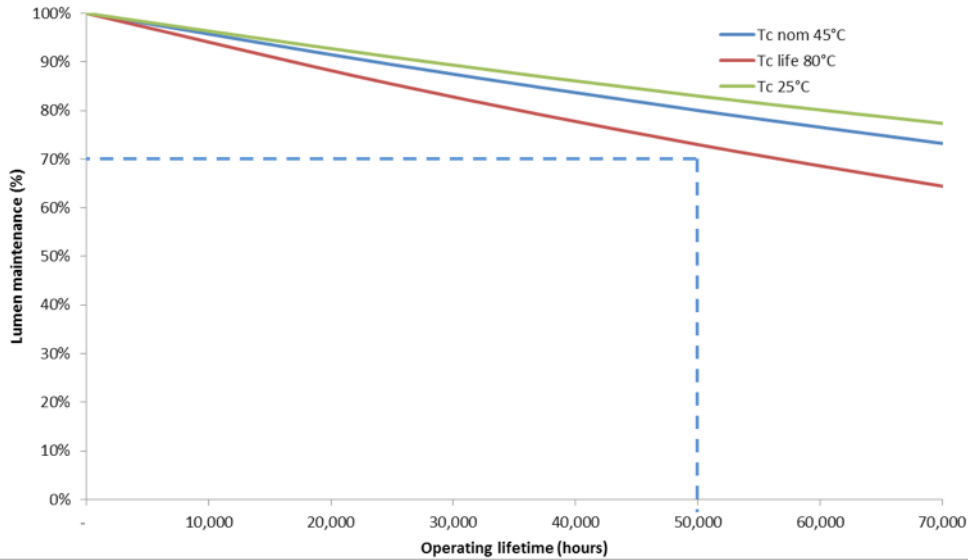
| Tc [°C]   | Flux [%]    | Efficacy [%] |
|-----------|-------------|--------------|
| 80        | 93%         | 95%          |
| <b>45</b> | <b>100%</b> | <b>100%</b>  |
| 25        | 103%        | 102%         |

# Fortimo LED strip value offer 2ft 4000lm LV1

## Lumen Maintenance

### Lumen Maintenance: at I Life and Tc Life Conditions

Fortimo LED Strip VO 2ft 4000lm LV1



Lumen depreciation as a function of operating hours for I-life and Tc.  
50,000 hours proven by certified laboratory.

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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

Philips Lighting Canada Ltd.  
281 Hillmount Rd,  
Markham, ON, Canada L6C 2S3  
Tel. 800-668-9008