



# FO Strip VOcs

Fortimo LED Strip VOcs is an efficient and flexible dual channel LED module from Advance. When paired with CertaDrive Xcs drivers it creates a ready made system to reduce luminaire SKU count by up to 9x (3x CCT and 3x Flux outputs).

## Key features and benefits

### Features

- Low system cost and optimized performance with five-year limited system warranty if paired with Advance CertaDrive Xcs
- High efficiency LEDs
- CRI80 color rendering
- 50,000 hours lifetime
- Mechanical footprint compatibility with LED Strip product family
- 3 SDCM color consistency at endpoints

### Benefits

- Maximize SKU and component flexibility with fewer luminaire SKUs to produce or warehouse

### Applications

- Education
- Office
- Healthcare
- Retail
- Hospitality

## Ordering data

| Commercial product name               | 12NC           | Box quantity |
|---------------------------------------|----------------|--------------|
| FO Strip VOcs 44in 5200lm 835-850 LV1 | 9290 027 46813 | 120          |

## Drive currents

| Parameter                             | Nominal* | Life** | Max*** | Unit |
|---------------------------------------|----------|--------|--------|------|
| FO Strip VOcs 44in 5200lm 835-850 LV1 | 840      | 1100   | 1400   | mA   |

## Module temperatures

| Parameter                                                 | Nominal* | Life** | Max*** | Unit |
|-----------------------------------------------------------|----------|--------|--------|------|
| T <sub>c</sub> (case temperature at T <sub>c</sub> point) | 45       | 85     | 90     | °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

## Suggested maximum current at elevated ambient

| Setting                    | 1    | 2    | 3    | 4   | Unit |
|----------------------------|------|------|------|-----|------|
| Luminaire maximum ambient  | 35   | 45   | 55   | 65  | °C   |
| Suggested maximum current* | 1100 | 1100 | 1100 | 850 | mA   |

\* Drive current that may be possible at the reference external ambient temperature. The maximum suggested current given is for a typical non-lensed luminaire design with good thermal transfer capability. Use of a lensed luminaire or luminaires with non-optimal thermal characteristics will require a further current reduction to meet the same maximum ambient temperature. The current suggestion is based on the module T<sub>c</sub>-life and thermal testing must be used to verify T<sub>c</sub>-life is never exceeded for your specific luminaire. It may be necessary to adjust the final current value in order to meet the T<sub>c</sub>-life rating of the module.

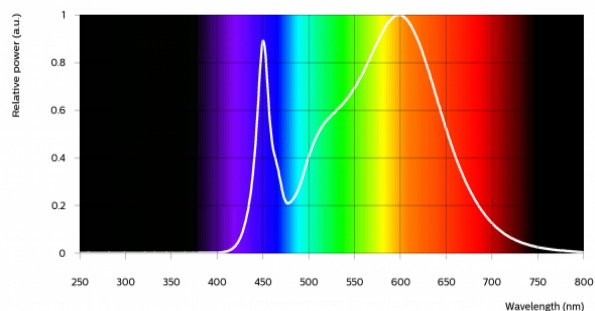
## Optical characteristics – table per color (CCT)

### FO Strip VOcs 44in 5200lm 835-850 LV1 [3500K]

| Parameter                          | Min  | Typ  | Max  | Unit |
|------------------------------------|------|------|------|------|
| Luminous flux                      | 4590 | 4960 | 5330 | lm   |
| Efficacy                           | 159  | 177  |      | lm/W |
| Correlated color temperature (CCT) |      | 3500 |      | K    |
| Color consistency                  |      |      | 3    | SDCM |
| CRI                                | 80   |      |      |      |
| R9                                 | 0    |      |      |      |

Measurement precision  $\pm 5\%$  for the flux data and  $\pm 6\%$  for the efficacy data. Measurement precision for color coordinates  $\pm 0.005$ . Measurement precision for CRI  $\pm 1.5$  and R9  $\pm 3$ .

| Operation point | 835           | lm   | lm/W |
|-----------------|---------------|------|------|
| 80% I-nom 672mA | Tc 25 °C      | 4140 | 186  |
|                 | Tc-nom 45 °C  | 4030 | 182  |
|                 | Tc-life 85 °C | 3780 | 173  |
| I-nom 840mA     | Tc 25 °C      | 5100 | 181  |
|                 | Tc-nom 45 °C  | 4960 | 177  |
|                 | Tc-life 85 °C | 4650 | 169  |
| I-life 1100mA   | Tc 25 °C      | 6530 | 174  |
|                 | Tc-nom 45 °C  | 6350 | 171  |
|                 | Tc-life 85 °C | 5950 | 162  |

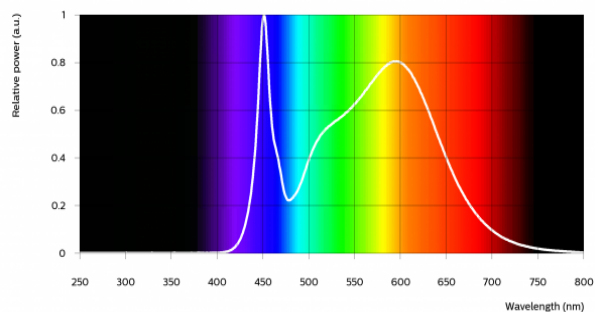


### FO Strip VOcs 44in 5200lm 835-850 LV1 [4000K]

| Parameter                          | Min  | Typ  | Max  | Unit |
|------------------------------------|------|------|------|------|
| Luminous flux                      | 4860 | 5250 | 5640 | lm   |
| Efficacy                           | 175  | 193  |      | lm/W |
| Correlated color temperature (CCT) |      | 4000 |      | K    |
| CRI                                | 80   |      |      |      |
| R9                                 | 0    |      |      |      |

Measurement precision  $\pm 5\%$  for the flux data and  $\pm 6\%$  for the efficacy data. Measurement precision for color coordinates  $\pm 0.005$ . Measurement precision for CRI  $\pm 1.5$  and R9  $\pm 3$ .

| Operation point | 840           | lm   | lm/W |
|-----------------|---------------|------|------|
| 80% I-nom 672mA | Tc 25 °C      | 4380 | 203  |
|                 | Tc-nom 45 °C  | 4270 | 199  |
|                 | Tc-life 85 °C | 4000 | 189  |
| I-nom 840mA     | Tc 25 °C      | 5390 | 197  |
|                 | Tc-nom 45 °C  | 5250 | 193  |
|                 | Tc-life 85 °C | 4920 | 184  |
| I-life 1100mA   | Tc 25 °C      | 6910 | 190  |
|                 | Tc-nom 45 °C  | 6730 | 186  |
|                 | Tc-life 85 °C | 6300 | 177  |

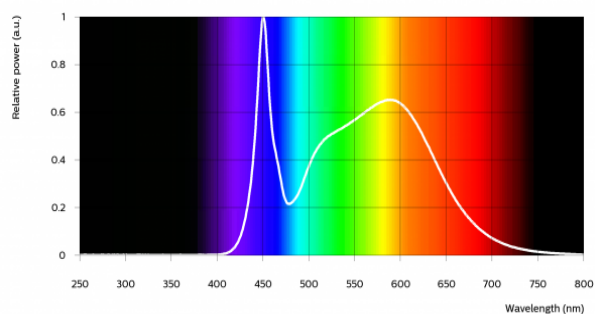


## FO Strip VOcs 44in 5200lm 835-850 LV1 [5000K]

| Parameter                          | Min  | Typ  | Max  | Unit |
|------------------------------------|------|------|------|------|
| Luminous flux                      | 4750 | 5130 | 5510 | lm   |
| Efficacy                           | 165  | 183  |      | lm/W |
| Correlated color temperature (CCT) |      | 5000 |      | K    |
| Color consistency                  |      |      | 3    | SDCM |
| CRI                                | 80   |      |      |      |
| R9                                 | 0    |      |      |      |

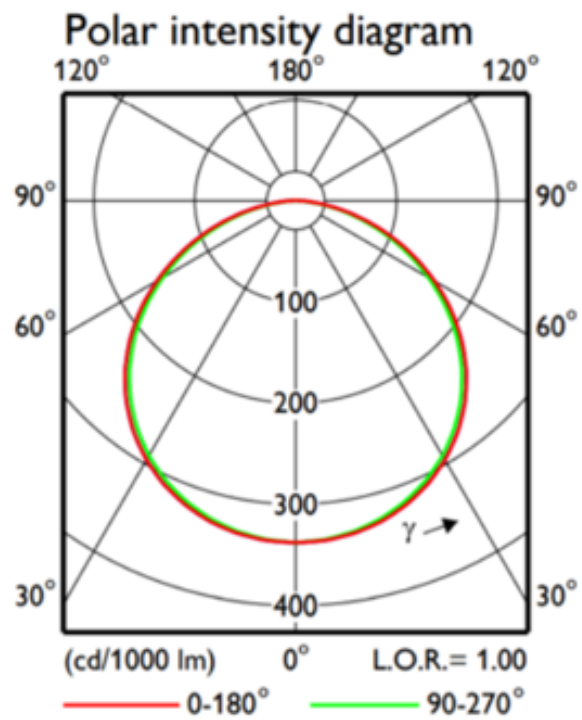
Measurement precision  $\pm 5\%$  for the flux data and  $\pm 6\%$  for the efficacy data. Measurement precision for color coordinates  $\pm 0.005$ . Measurement precision for CRI  $\pm 1.5$  and R9  $\pm 3$ .

| Operation point | 850           | lm   | lm/W |
|-----------------|---------------|------|------|
| 80% I-nom 672mA | Tc 25 °C      | 4270 | 192  |
|                 | Tc-nom 45 °C  | 4160 | 188  |
|                 | Tc-life 85 °C | 3900 | 179  |
| I-nom 840mA     | Tc 25 °C      | 5260 | 187  |
|                 | Tc-nom 45 °C  | 5130 | 183  |
|                 | Tc-life 85 °C | 4800 | 174  |
| I-life 1100mA   | Tc 25 °C      | 6750 | 180  |
|                 | Tc-nom 45 °C  | 6580 | 177  |
|                 | Tc-life 85 °C | 6160 | 168  |



## Beam shape

The LED-module has a Lambertian light distribution.



## Electrical characteristics

### FO Strip VOcs 44in 5200lm 835-850 LV1 [3500K]

### FO Strip VOcs 44in 5200lm 835-850 LV1 [5000K]

| Parameter                             | Min  | Typ  | Max  | Unit |
|---------------------------------------|------|------|------|------|
| Forward voltage                       | 31.8 | 33.3 | 34.9 | V    |
| Power consumption                     | 26.7 | 28.0 | 29.3 | W    |
| Number of modules in series per chain |      |      | 1    |      |

Measurement precision for Vf +/- 3%. Measurement precision for power +/- 3.3%.

### FO Strip VOcs 44in 5200lm 835-850 LV1 [4000K]

| Parameter                             | Min  | Typ  | Max  | Unit |
|---------------------------------------|------|------|------|------|
| Forward voltage                       | 30.8 | 32.3 | 33.9 | V    |
| Power consumption                     | 25.9 | 27.1 | 28.5 | W    |
| Number of modules in series per chain |      |      | 1    |      |

Measurement precision for Vf +/- 3%. Measurement precision for power +/- 3.3%.

## System chain limits for Same Length modules

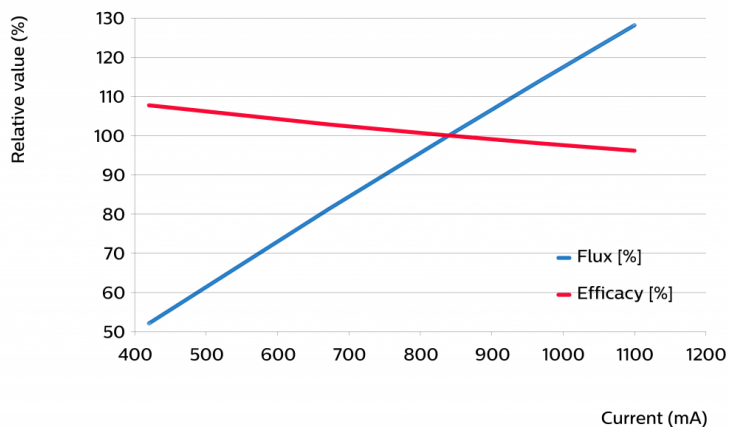
| Total length (in) | Total current limit (mA) |
|-------------------|--------------------------|
| 88                | 700                      |
| 132               | 460                      |
| 176               | 320                      |

Please review the design-in guide or contact the Design-in team for further information.

## Tuning information

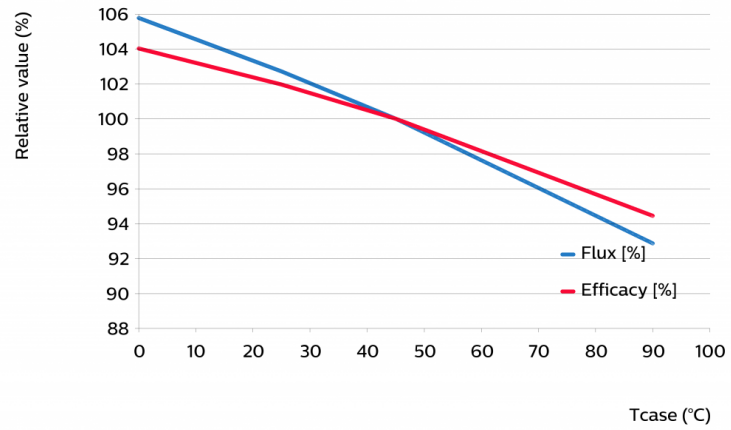
### Flux and efficacy versus current (at Tc nominal)

| I [mA] | Flux [%] | Efficacy [%] |
|--------|----------|--------------|
| 1100   | 128      | 96           |
| 970    | 114      | 98           |
| 840    | 100      | 100          |
| 672    | 81       | 103          |
| 420    | 52       | 108          |



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

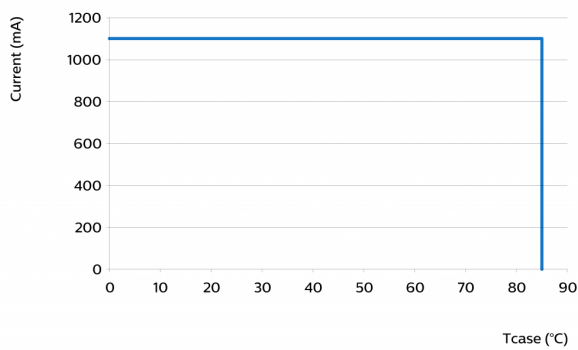
| Tc [°C] | Flux [%] | Efficacy [%] |
|---------|----------|--------------|
| 90      | 93       | 94           |
| 45      | 100      | 100          |
| 25      | 103      | 102          |
| 0       | 106      | 104          |



## Lumen maintenance

| Operation point  | Lumen maintenance<br>x 1000 hours | L70 | L80 | L90 |
|------------------|-----------------------------------|-----|-----|-----|
|                  |                                   | B50 | B50 | B50 |
| 80% I-nom 672 mA | Ts nom 45°C                       | >60 | >60 | 50  |
|                  | Ts 75°C                           | >60 | >60 | 50  |
|                  | Ts-life 85°C                      | >60 | >60 | 50  |
| I-nom 840 mA     | Ts nom 45°C                       | >60 | >60 | 50  |
|                  | Ts 75°C                           | >60 | >60 | 50  |
|                  | Ts-life 85°C                      | >60 | >60 | 50  |
| I-life 1100 mA   | Ts nom 45°C                       | >60 | >60 | 50  |
|                  | Ts 75°C                           | >60 | >60 | 50  |
|                  | Ts-life 85°C                      | >60 | >60 | 50  |

## Performance Window



### Thermal switching table

Warranted Number of Full Thermal Product Cycles at 25°C ambient temperature

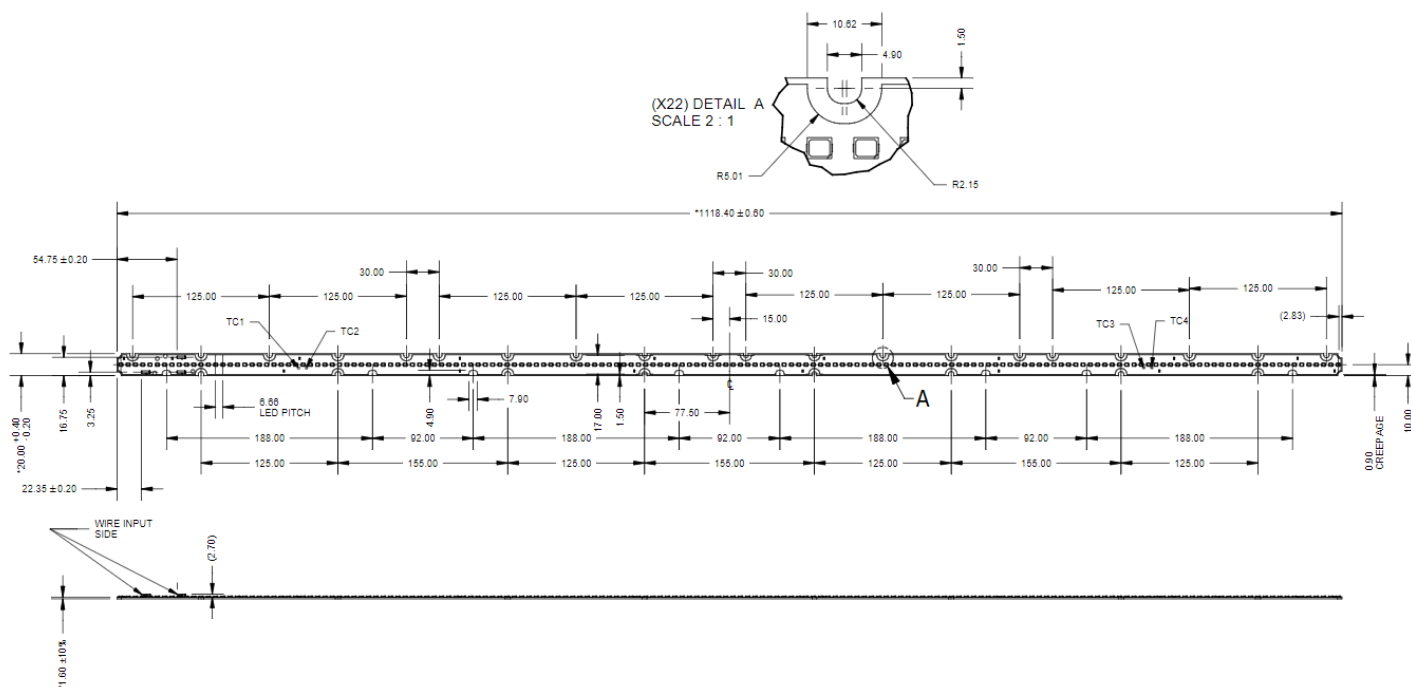
| Case Temperature - Tc [°C] | Amount of Cycles |
|----------------------------|------------------|
| 45 (or less)               | >100,000         |
| 55                         | >100,000         |
| 65                         | >100,000         |
| 75                         | 66,000           |
| 85                         | 32,000           |
| 90                         | 22,000           |

## Wiring

| Specification item       | Value       | Unit            | Condition       |
|--------------------------|-------------|-----------------|-----------------|
| Input wire cross-section | 0.25...0.75 | mm <sup>2</sup> | solid, stranded |
|                          | 18...24     | AWG             | solid, stranded |
| Input wire strip length  | 7.5...9.5   | mm              |                 |

## Mechanical characteristics

| Parameter            | Min    | Typ    | Max    | Unit |
|----------------------|--------|--------|--------|------|
| Length               | 1117.9 | 1118.4 | 1118.9 | mm   |
| Width                | 19.8   | 20     | 20.2   | mm   |
| Height PCB           | 1.4    | 1.6    | 1.8    | mm   |
| Height total         |        | 4.3    |        | mm   |
| Warpage (IPC-TM-650) |        |        | 0.75   | %    |





## Absolute ratings

| Parameter                              | Min | Max  | Unit            |
|----------------------------------------|-----|------|-----------------|
| Current through the LED module (I-max) |     | 1400 | mA              |
| Case temperature (Tc-max)              |     | 90   | °C              |
| ESD (direct contact)                   | 2   |      | kV              |
| Working voltage                        |     | 60   | V <sub>dc</sub> |
| Ambient temperature                    | -40 |      | °C              |

This LED module is an ESD sensitive device with ESD protection up to 2kV, tested according CAN/CSA-IEC 61000-4-2. Proper precautions to protect the product must be in place to maintain product reliability and warranty. These precautions are described in the design-in guide for the product and ANSI/ESD S20.20-2014. Precautions include, but are not limited to: ESD protection areas, equipment grounding, personal ESD protective measures and anti-static clothing, conductive flooring, ionizers, ESD packaging, etc. This product is not field replaceable.

Surge protection of the module must be provided by the driver or other components. Advance Xitanium and Certadrive drivers have built in protection circuitry and will protect the module up to the specified driver surge rating. When using third party drivers testing or confirmation from manufacturer is suggested to ensure adequate module protection.

## Application information

### Certificates and Standards

UL 8750

### Environmental

RoHS/REACH

### Application

|                        |               |
|------------------------|---------------|
| IP rating              | No IP rating  |
| Overheating protection | No protection |
| Luminaire class ANSI   | Class 2       |
| Dimming                | Yes           |

There cannot be any ice/fog/mist on any part of the module surface during the application at -40°C.

## Notes

View limited warranty at [www.signify.com/warranties](http://www.signify.com/warranties) for details and restrictions.



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