

**PHILIPS**

**Fortimo**

**LED**

Fortimo LED Strip 2ft  
2200lm 8xx FC LV4



Datasheet

# Fortimo LED Strip Gen4

Fortimo LED Strip systems are ideal for use in designer or miniaturized, slim linear luminaires for direct lighting in offices, banks, schools, public buildings, supermarkets and anywhere where a small, flexible form factor is appreciated.

## Key features and benefits

- State-of-the-art LED module efficiency of up to 182 lm/W
- Long life-time: >50,000 hours
- High color rendering (CRI >80 and >90)
- Excellent color consistency of 3 SDCM
- Choice of color temperatures (3000 K, 4000 K and 5000 K)
- Two lumen packages: 650 lm and 1100 lm per foot
- Small LED module width of only 20mm
- Tunable lumen output, efficacy and lifetime
- Wide temperature (Tc) range from -40 °C to +80 °C
- Push-in connectors enabling automated wiring
- Five year system warranty

August 2016

## Ordering data

Commercial product name	EOC	12NC	Box quantity
Fortimo LED Strip 2ft 2200lm 830 FC LV4	8718696 655566 00	9290 015 27006	168
Fortimo LED Strip 2ft 2200lm 840 FC LV4	8718696 655580 00	9290 015 27106	168
Fortimo LED Strip 2ft 2200lm 850 FC LV4	8718696 655603 00	9290 015 27206	168

## Drive currents

Parameter	Nominal*	Life**	Max***	Unit
Fortimo LED Strip 2ft 2200lm 8xx FC LV4	368	520	760	mA

## Module temperatures

Parameter	Nominal*	Life**	Max***	Unit
T <sub>c</sub> (case temperature at T <sub>c</sub> point)	45	70	80	°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)

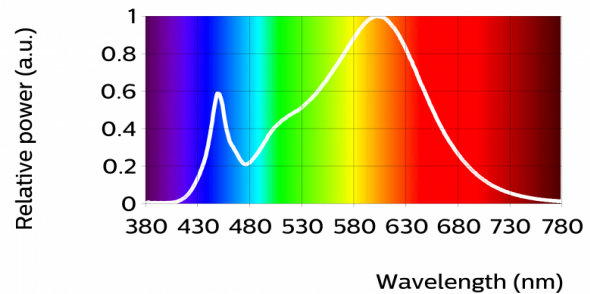
### Fortimo LED Strip 2ft 2200lm 830 FC LV4

Parameter	Min	Typ	Max	Unit
Luminous flux	1931	2088	2245	lm
Module efficacy	152	169	186	lm/W
Correlated color temperature (CCT)		3000		K
Color coordinates (CIEx, CIEy)		(0.432, 0.401)		-
Color consistency			3	SDCM
CRI	80			
Radiation angle		120		deg
Photobiological safety			RG1	
Energy efficiency label		A++		
$\Delta u'v'$ at 6000 hours			0.007	

R9=10

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  $\pm 1.5$

Operation point	830	lm	lm/W
80% I nom 294mA	Tc 25 °C	1737	176
	Tc-nom 45 °C	1702	175
	Tc-life 70 °C	1647	171
I nom 368mA	Tc 25 °C	2131	171
	Tc-nom 45 °C	2088	169
	Tc-life 70 °C	2018	165
I life 520mA	Tc 25 °C	2901	160
	Tc-nom 45 °C	2837	158
	Tc-life 70 °C	2739	155



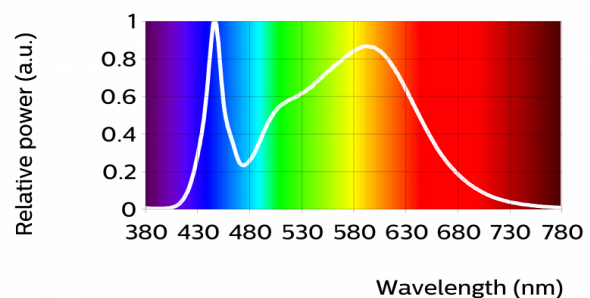
### Fortimo LED Strip 2ft 2200lm 840 FC LV4

Parameter	Min	Typ	Max	Unit
Luminous flux	2040	2200	2370	lm
Module efficacy	160	178	196	lm/W
Correlated color temperature (CCT)		4000		K
Color coordinates (CIEx, CIEy)		(0.380, 0.377)		-
Color consistency			3	SDCM
CRI	80			
Radiation angle		120		deg
Photobiological safety			RG1	
Energy efficiency label		A++		
$\Delta u'v'$ at 6000 hours			0.007	

R9=5

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  $\pm 1.5$

Operation point	840	lm	lm/W
80% I nom 294mA	Tc 25 °C	1831	186
	Tc-nom 45 °C	1793	184
	Tc-life 70 °C	1736	180
I nom 368mA	Tc 25 °C	2246	180
	Tc-nom 45 °C	2200	178
	Tc-life 70 °C	2128	174
I life 520mA	Tc 25 °C	3058	169
	Tc-nom 45 °C	2992	167
	Tc-life 70 °C	2890	163



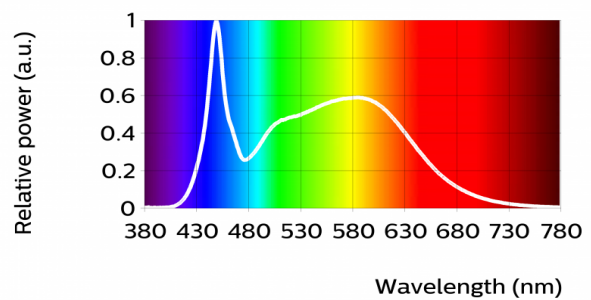
Fortimo LED Strip 2ft 2200lm 850 FC LV4

Parameter	Min	Typ	Max	Unit
Luminous flux	2050	2220	2390	lm
Module efficacy	162	180	198	lm/W
Correlated color temperature (CCT)		5000		K
Color coordinates (CIEx, CIEy)		(0.341, 0.350)		-
Color consistency			3	SDCM
CRI	80			
Radiation angle		120		deg
Photobiological safety			RG1	
Energy efficiency label		A++		
$\Delta u'v'$ at 6000 hours			0.007	

R9=5

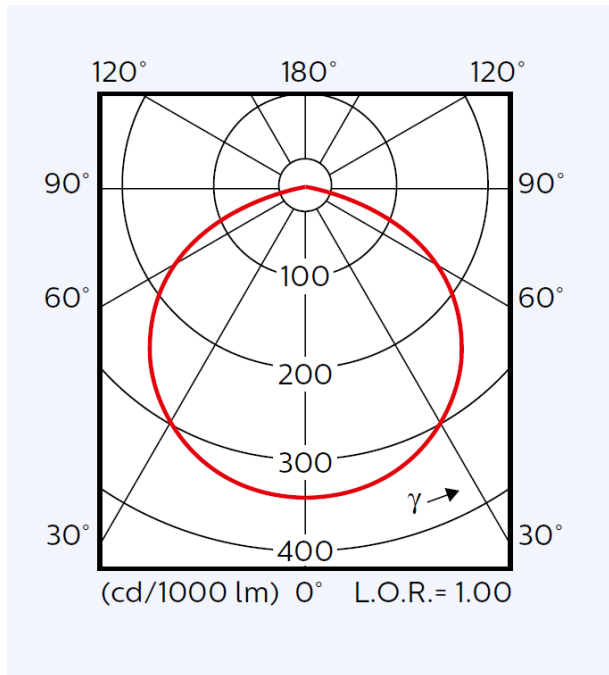
Measurement precision  $\pm 5\%$  for the flux data and  $\pm 6\%$  for the efficacy data. Measurement precision for color coordinates  $\pm 0.005$ . Measurement precision for CRI  $\pm 1.5$

Operation point	850	lm	lm/W
80% I nom 294mA	Tc 25 °C	1850	188
	Tc-nom 45 °C	1812	186
	Tc-life 70 °C	1755	182
I nom 368mA	Tc 25 °C	2270	182
	Tc-nom 45 °C	2220	180
	Tc-life 70 °C	2152	176
I life 520mA	Tc 25 °C	3092	171
	Tc-nom 45 °C	3027	169
	Tc-life 70 °C	2925	165



## Beam shape

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



## Electrical characteristics

[Fortimo LED Strip 2ft 2200lm 830 FC LV4](#)

[Fortimo LED Strip 2ft 2200lm 840 FC LV4](#)

[Fortimo LED Strip 2ft 2200lm 850 FC LV4](#)

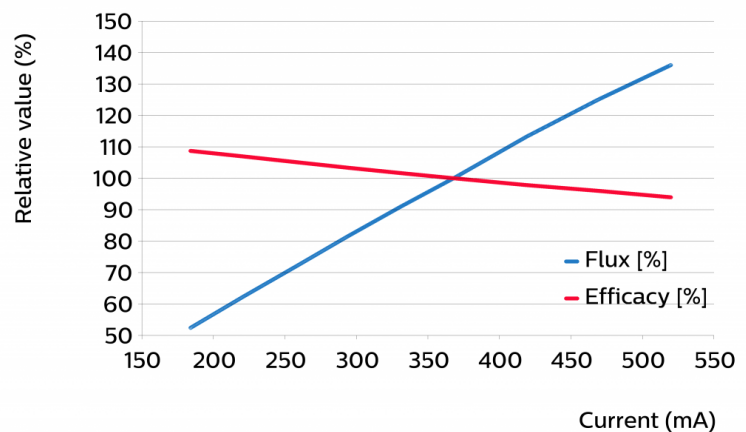
Parameter	Min	Typ	Max	Unit
Forward voltage	32.1	33.6	35.1	V
Power consumption	11.8	12.4	12.9	W
Number of modules in parallel			3	

Measurement precision for Vf +/- 3%. Measurement precision for power +/- 3.3%  
 Specifications stated at Tc-nom and I-nom  
 Bins E and F

## Tuning information

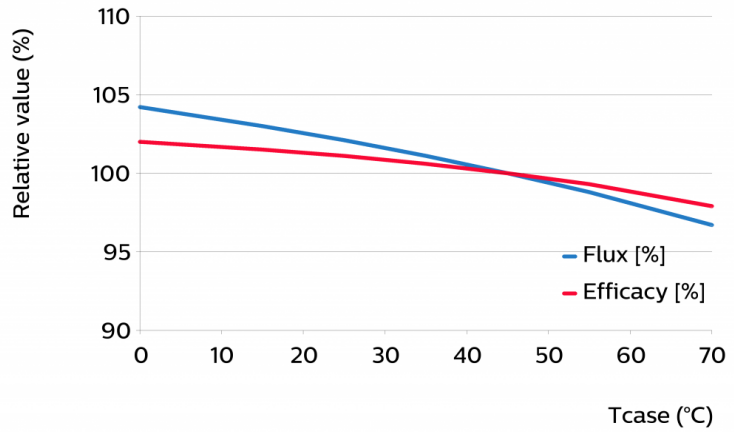
Flux and efficacy versus current (at Tc nominal)

I [mA]	Flux [%]	Efficacy [%]
520	136	94
469	125	96
419	113	98
368	100	100
331	91	102
294	82	103
258	72	105
221	62	107
184	52	109



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

Tcase [°C]	Flux [%]	Efficacy [%]
70	97	98
55	99	99
45	100	100
35	101	101
25	102	101
15	103	102
0	104	102



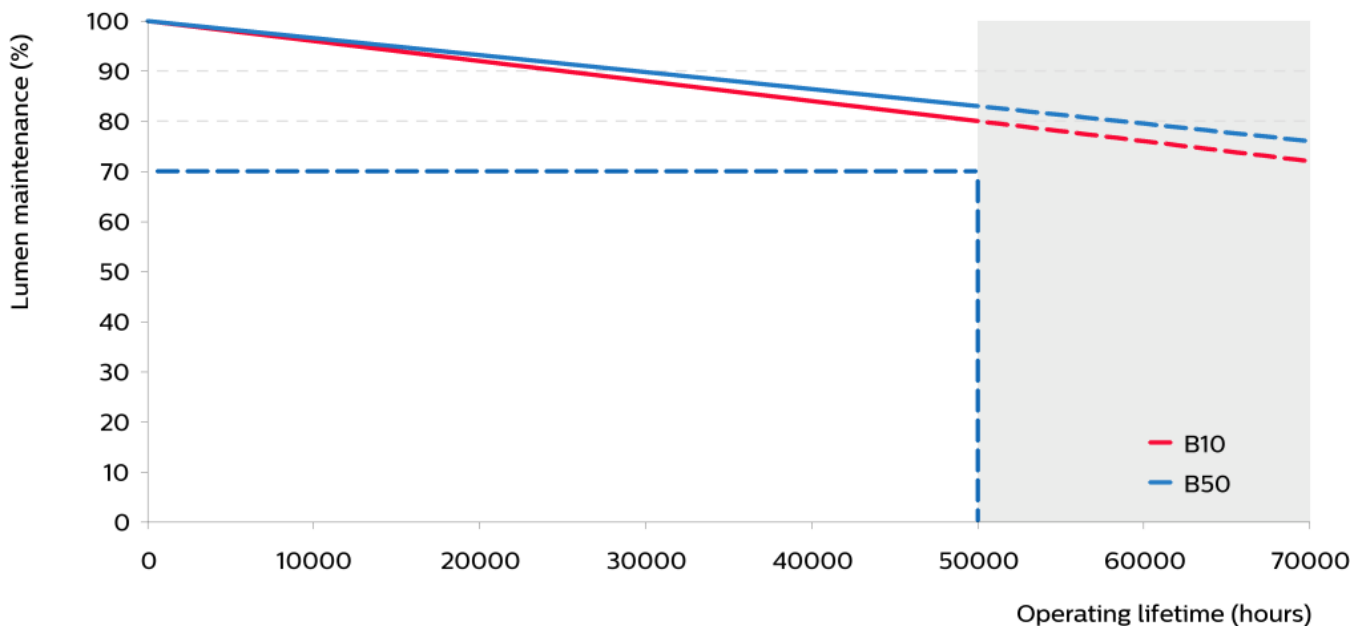
Lifetime

Operation point	Lifetime x 1000 hours	L70			L80			L90		
		B50	B20	B10	B50	B20	B10	B50	B20	B10
80% I nom	Tc 25°C	>72	>72	>72	>72	66	62	38	34	32
	Tc nom 45°C	>72	>72	>72	>72	66	62	38	34	32
	Tc life 70°C	>72	>72	>72	58	52	50	31	28	26
I nom	Tc 25°C	>72	>72	>72	>72	66	62	38	34	32
	Tc nom 45°C	>72	>72	>72	>72	66	62	38	34	32
	Tc life 70°C	>72	>72	>72	58	52	50	31	28	26
I life	Tc 25°C	>72	>72	>72	>72	66	62	38	34	32
	Tc nom 45°C	>72	>72	>72	>72	66	62	38	34	32
	Tc life 70°C	>72	>72	>72	58	52	50	31	28	26

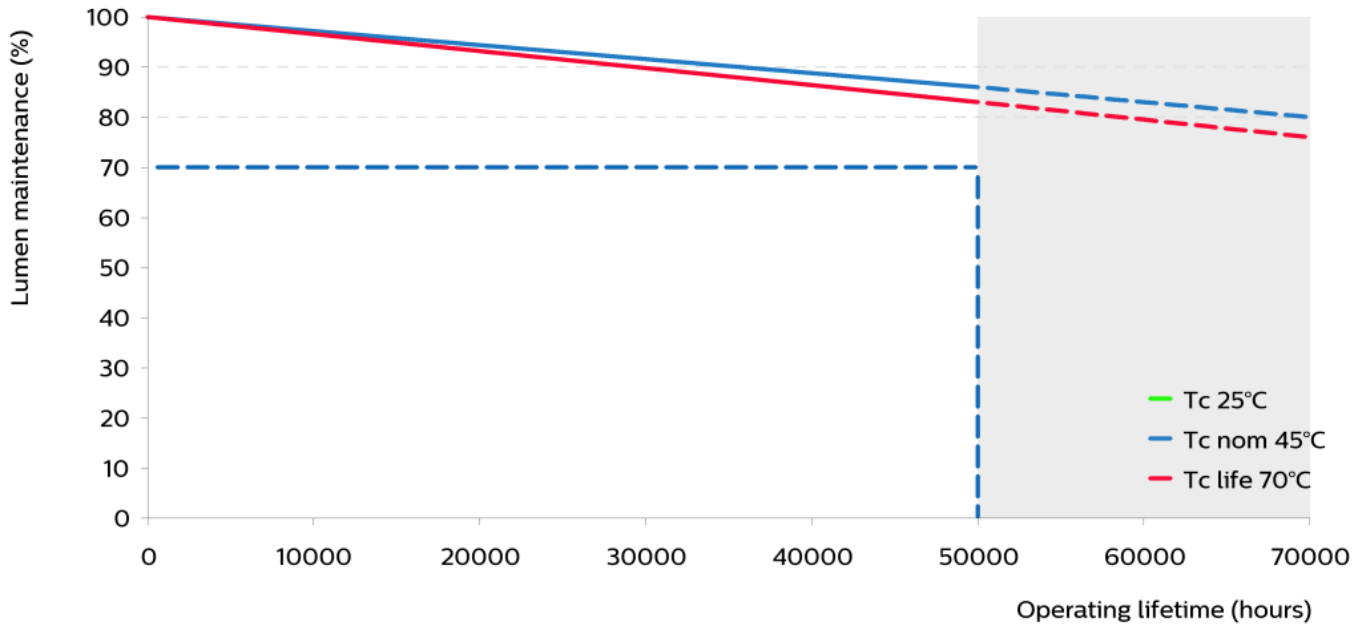
Values in the table are based on available LM80 LED data (12,000h). Lumen maintenance will be updated once additional measurement data becomes available.

Lumen maintenance graphs

Lumen maintenance at I-life and Tc-life conditions

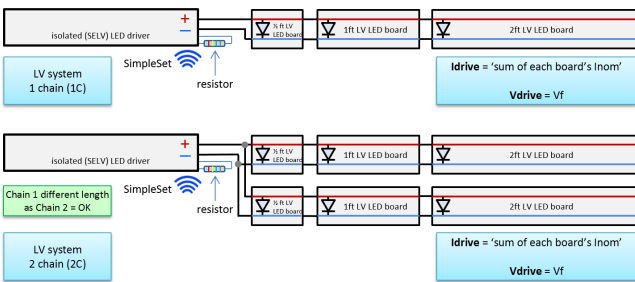


## Lumen maintenance for B50 at current I-life conditions

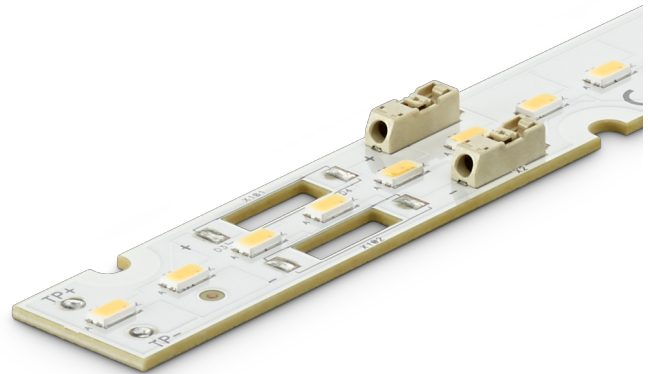


## Wiring

Specification item	Value	Unit	Condition
Input wire cross-section	0.25...0.75	mm <sup>2</sup>	Cable AWG 18-24, solid wire
	18...24	AWG	Cable AWG 18-24, solid wire
Input wire strip length	6...7	mm	
Input wire cross-section	0.33...0.5	mm <sup>2</sup>	stranded wire
	20...22	AWG	stranded wire
Input wire strip length	7.5...8.5	mm	



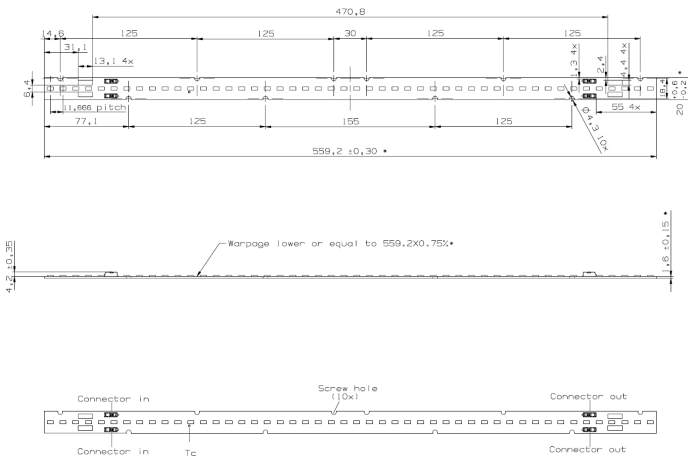
More information in the design-in guide of LED Linear modules.



## Mechanical characteristics

Fortimo LED Strip 2ft 2200lm 830 FC LV4  
 Fortimo LED Strip 2ft 2200lm 840 FC LV4  
 Fortimo LED Strip 2ft 2200lm 850 FC LV4

Parameter	Min	Typ	Max	Unit
Length	558.9	559.2	559.5	mm
Width	19.8	20	20.6	mm
Height excl. connector	1.45	1.6	1.75	mm
Height incl. connector	3.85	4.2	4.55	mm
Warpage (IPC-TM-650)			0.75	%



## Absolute ratings

Parameter	Min	Typ	Max	Unit
Current through the LED module (I-max)			760	mA
Case temperature (Tc-max)			80	°C
Power at rated Vf-max and I-max			29.7	W
ESD Human Body Model (HBM) Class 3A JESD22-A114-E 8 kV			8	kV
ESD Machine Model (MM) Class B JESD22-A115-B			15	kV
Working voltage			120	V <sub>dc</sub>
Voltage strength	1240			V <sub>dc</sub>
Ambient temperature	-40			°C



## Application information

### Certificates and Standards

Relevant clauses of EN 62471:2008 (With IEC/TR 62471-2: 2009 and IEC/TR 62778: 2014)

Relevant clauses of IEC 62471:2006 (Incl. IEC/TR 62471-2: 2009 and IEC/TR 62778: 2014)

EN 62031:2008 (First Edition) + A1:2013 + A2:2015

IEC 62031:2008 (First Edition) + A1:2012 + A2:2014

UL 8750

ENEC+

CE

ENEC

### Environmental

RoHS/REACH

### Zhaga

Compliant\*

\*Book 7

### Application

IP rating	None
Overheating protection	No
Luminaire class	Class I and Class II
Dimming	Yes

### Thermal switching table

Calculated number of switches at which the survival rate of the population  $\geq 90\%$ , at a given ambient temperature and delta T with respect to  $T_c$  (where  $T_c = T_{\text{ambient}} + \Delta T$ )

		Tambient [°C]												
		-40	-30	-20	-10	0	10	20	30	40	50	60	70	
delta T [°C] (delta T = Tc - Tambient)	10	>100 k	>100 k	>100 k	>100 k	>100 k	>100 k	>100 k	>100 k	>100 k	>100 k	>100 k	>100 k	>30 k
	20	>100 k	>100 k	>100 k	>100 k	>100 k	>100 k	>100 k	>100 k	>100 k	>30 k	>30 k	X	X
	30	>100 k	>100 k	>100 k	>100 k	>100 k	>100 k	>100 k	>30 k	>30 k	26 k	X	X	X
	40	>30 k	>30 k	>30 k	>30 k	>30 k	>30 k	>30 k	>30 k	18 k	X	X	X	X
	50	21 k	21 k	20 k	20 k	20 k	20 k	18 k	13 k	X	X	X	X	X
	60	11 k	11 k	11 k	11 k	10 k	9 k	X	X	X	X	X	X	X
	70	6 k	6 k	6 k	6 k	6 k	X	X	X	X	X	X	X	X
	80	4 k	4 k	4 k	4 k	X	X	X	X	X	X	X	X	X
	90	2 k	2 k	2 k	X	X	X	X	X	X	X	X	X	X

