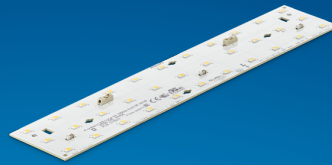


**PHILIPS**

**Fortimo**

**LED**

Fortimo LED Line 1ft  
1100lm 8xx 3R HV4F



Datasheet

# Fortimo LED Line Gen4

Fortimo LED Line is designed to produce pure white light for general lighting applications with high efficiency levels. The Fortimo LED Line portfolio consists of 2 main ranges of products, which have been differentiated by the number of rows of LEDs on the module. Both ranges feature a variety of different length modules, lumen packages and color temperatures for all the different types of linear luminaires.

## Key features and benefits

- State-of-the-art LED module efficiency of up to 186 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, 4000, 5000 and 6500 K)
- Two module lengths: 1 ft/280 mm or 2 ft/560 mm
- Three lumen packages: 650, 1100, and 2000 lm per foot/280 mm
- LED module range with 1 or 3 rows of LEDs
- Tunable lumen output, efficacy and lifetime
- Push-in connectors enabling automated wiring
- Wide temperature (Tc) range from -40 °C up to +80 °C
- Five year system warranty

June 2019



**Zhaga**

## Ordering data

Commercial product name	EOC	12NC	Box quantity
Fortimo LED Line 1ft 1100lm 830 3R HV4F	8718696 901687 00	9290 015 44306	180
Fortimo LED Line 1ft 1100lm 840 3R HV4F	8718696 901694 00	9290 015 44406	180
Fortimo LED Line 1ft 1100lm 850 3R HV4F	8718696 901700 00	9290 015 44506	180
Fortimo LED Line 1ft 1100lm 865 3R HV4F	8718699 696276 00	9290 021 12906	180

## Drive currents

Parameter	Nominal*	Life**	Max***	Unit
Fortimo LED Line 1ft 1100lm 8xx 3R HV4F	198	450	450	mA

## Module temperatures

Parameter	Nominal*	Life**	Max***	Unit
T <sub>c</sub> (case temperature at T <sub>c</sub> point)	40	80	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 Line 1ft 1100lm 830 3R HV4F

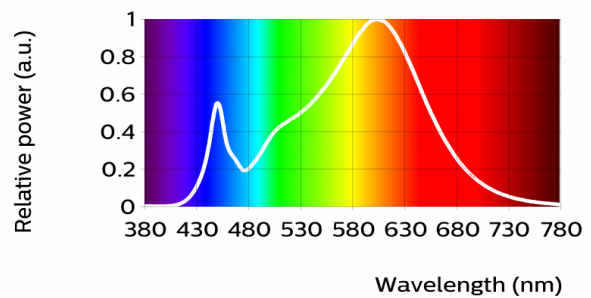
Parameter	Min	Typ	Max	Unit
Luminous flux	967	1045	1123	lm
Module efficacy	156	174		lm/W
Correlated color temperature (CCT)		3000		K
Color coordinates (CIEx, CIEy)		(0.432, 0.401)		-
Color consistency			3	SDCM
CRI	80			
Radiation angle		120		deg
Photobiological safety			RG1 unlimited	
$\Delta u'v'$ at 6000 hours			0.007	



R9=7

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 158mA	Tc 25 °C	855	179
	Tc-nom 40 °C	841	177
	Tc-life 80 °C	800	170
I-nom 198mA	Tc 25 °C	1060	175
	Tc-nom 40 °C	1045	174
	Tc-life 80 °C	991	167
I-life 450mA	Tc 25 °C	2283	157
	Tc-nom 40 °C	2244	155
	Tc-life 80 °C	2128	149



Fortimo LED Line 1ft 1100lm 840 3R HV4F

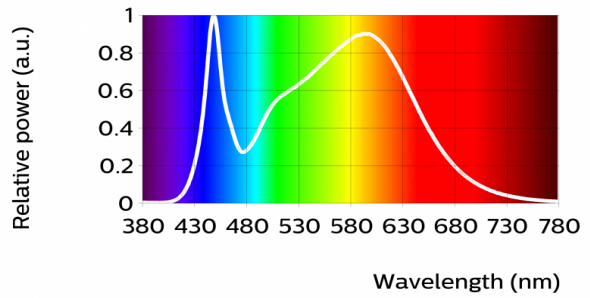
Parameter	Min	Typ	Max	Unit
Luminous flux	1018	1100	1183	lm
Module efficacy	164	183		lm/W
Correlated color temperature (CCT)		4000		K
Color coordinates (CIEx, CIEy)		(0.383, 0.379)		-
Color consistency			3	SDCM
CRI	80			
Radiation angle		120		deg
Photobiological safety			RG1 unlimited	
$\Delta u'v'$ at 6000 hours			0.007	



R9=6

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 158mA	Tc 25 °C	902	189
	Tc-nom 40 °C	886	186
	Tc-life 80 °C	832	178
I-nom 198mA	Tc 25 °C	1121	185
	Tc-nom 40 °C	1100	183
	Tc-life 80 °C	1033	174
I-life 450mA	Tc 25 °C	2437	165
	Tc-nom 40 °C	2390	163
	Tc-life 80 °C	2241	155



Fortimo LED Line 1ft 1100lm 850 3R HV4F

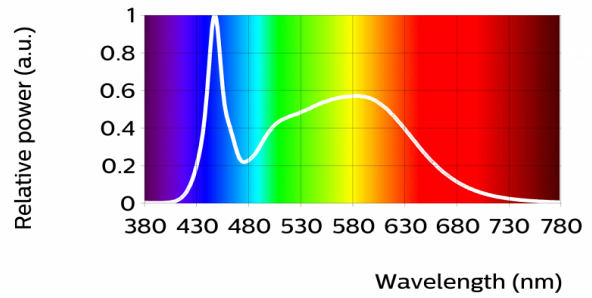
Parameter	Min	Typ	Max	Unit
Luminous flux	1028	1111	1194	lm
Module efficacy	166	185		lm/W
Correlated color temperature (CCT)		5000		K
Color coordinates (CIEx, CIEy)		(0.343, 0.352)		-
Color consistency			3	SDCM
CRI	80			
Radiation angle		120		deg
Photobiological safety			RG1 unlimited	
$\Delta u'v'$ at 6000 hours			0.007	



R9=8

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 158mA	Tc 25 °C	909	190
	Tc-nom 40 °C	894	188
	Tc-life 80 °C	850	181
I-nom 198mA	Tc 25 °C	1127	186
	Tc-nom 40 °C	1111	185
	Tc-life 80 °C	1054	177
I-life 450mA	Tc 25 °C	2429	167
	Tc-nom 40 °C	2388	164
	Tc-life 80 °C	2265	158



Fortimo LED Line 1ft 1100lm 865 3R HV4F

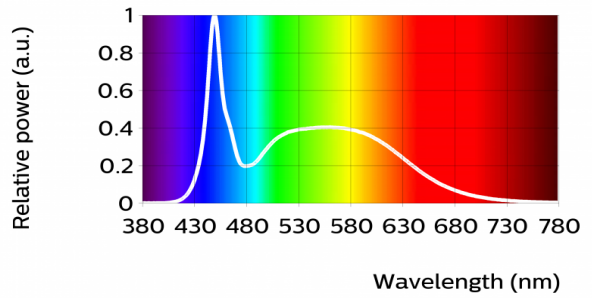
Parameter	Min	Typ	Max	Unit
Luminous flux	1018	1100	1182	lm
Module efficacy	169	183		lm/W
Correlated color temperature (CCT)		6500		K
Color coordinates (CIEx, CIEy)		(0.311, 0.325)		-
Color consistency			3	SDCM
CRI	80			
Radiation angle		120		deg
Photobiological safety			RG1 unlimited	
$\Delta u'v'$ at 6000 hours			0.007	



R9=8

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	865	lm	lm/W
80% I-nom 158mA	Tc 25 °C	902	189
	Tc-nom 40 °C	886	186
	Tc-max 80 °C	832	178
I-nom 198mA	Tc 25 °C	1121	185
	Tc-nom 40 °C	1100	183
	Tc-max 80 °C	1033	174
I-life 450mA	Tc 25 °C	2437	165
	Tc-nom 40 °C	2390	163
	Tc-max 80 °C	2241	155





## Electrical characteristics

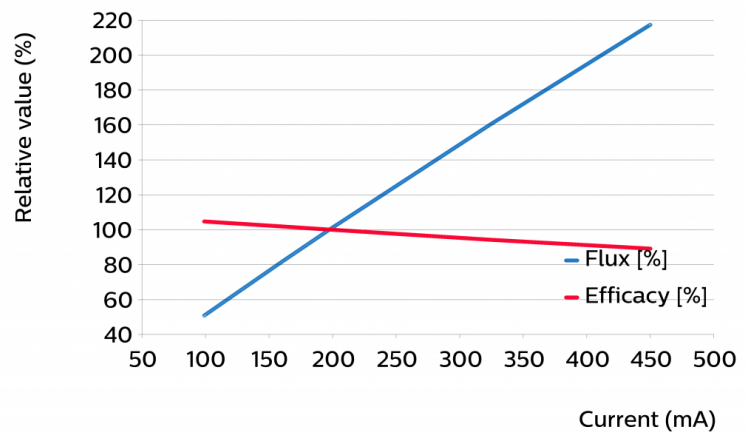
Parameter	Min	Typ	Max	Unit
Forward voltage	29.7	30.5	31.3	V
Power consumption	5.9	6.0	6.2	W = kWh/1000h
Number of modules in series per chain			8	
Number of modules in parallel per chain			1	
Number of modules in parallel			3	

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

## Tuning information

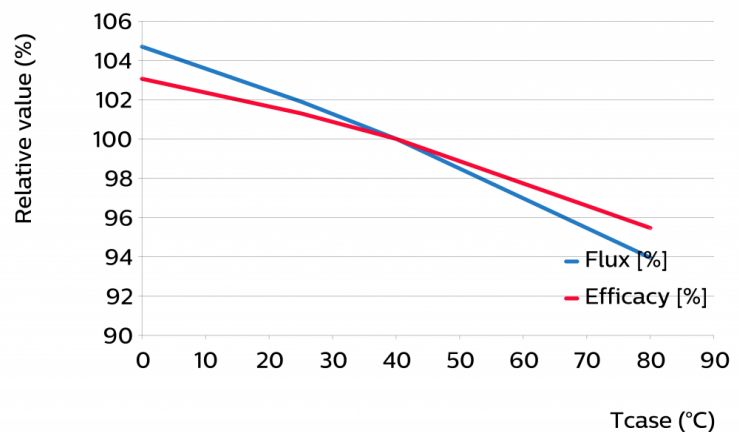
Flux and efficacy versus current (at Tc nominal)

I [mA]	Flux [%]	Efficacy [%]
450	217	89
324	160	94
198	100	100
158	80	102
99	51	105



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

Tc [°C]	Flux [%]	Efficacy [%]
80	94	95
40	100	100
25	102	101
0	105	103





## Lumen maintenance

Operation point	Lumen maintenance x 1000 hours	L70			L80			L90		
		B50	B20	B10	B50	B20	B10	B50	B20	B10
80% I-nom 158 mA	Tc 25°C	>50	>50	>50	>50	>50	>50	>50	>50	>50
	Tc-nom 40°C	>50	>50	>50	>50	>50	>50	>50	>50	>50
	Tc-life 80°C	>50	>50	>50	>50	>50	>50	35	35	35
I-nom 198 mA	Tc 25°C	>50	>50	>50	>50	>50	>50	>50	>50	>50
	Tc-nom 40°C	>50	>50	>50	>50	>50	>50	>50	>50	>50
	Tc-life 80°C	>50	>50	>50	>50	>50	>50	35	35	35
I-life 450 mA	Tc 25°C	>50	>50	>50	>50	>50	>50	>50	>50	>50
	Tc-nom 40°C	>50	>50	>50	>50	>50	>50	>50	>50	>50
	Tc-life 80°C	>50	>50	>50	>50	>50	>50	35	35	35

## Lifetime

Parameter	Value	Unit
M70F50 nominal	>70000	hours
M70F50 life	61000	hours

Lifetime L70B50 = 60 0000 hours at I-life and Tc-life. >70 000 hours claim is based on extrapolating raw LM80-data to lower temperatures and currents by using statistical techniques.

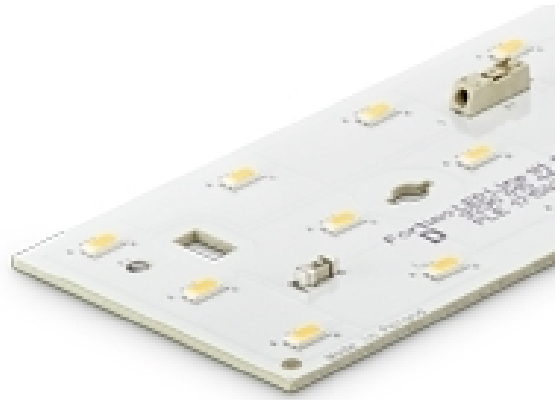
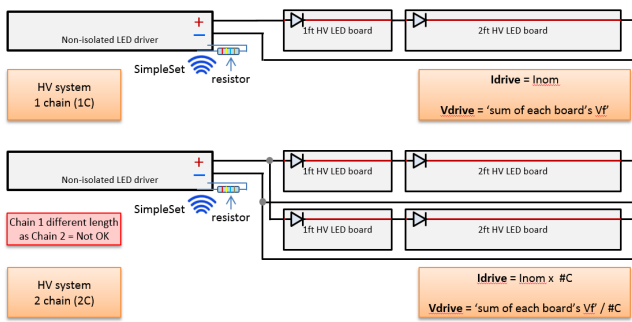
## Thermal switching table

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 Tc (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
	20	> 100 k	> 100 k	> 100 k	> 100 k	> 100 k	>100 k	>100 k	>100 k	>100 k	>100 k	>100 k	X
	30	> 100 k	> 100 k	> 100 k	> 100 k	> 100 k	>100 k	>100 k	>100 k	>100 k	>100 k	X	X
	40	> 100 k	> 100 k	> 100 k	> 100 k	> 100 k	> 100 k	>100 k	>100 k	X	X	X	X
	50	62 k	62 k	62 k	62 k	62 k	62 k	62 k	62 k	X	X	X	X
	60	31 k	31 k	31 k	31 k	31 k	31 k	31 k	X	X	X	X	X
	70	17 k	17 k	17 k	17 k	17 k	17 k	X	X	X	X	X	X
	80	10 k	10 k	10 k	10 k	10 k	X	X	X	X	X	X	X
	90	7 k	7 k	7 k	X	X	X	X	X	X	X	X	X
	100	4 k	4 k	X	X	X	X	X	X	X	X	X	X

## Wiring

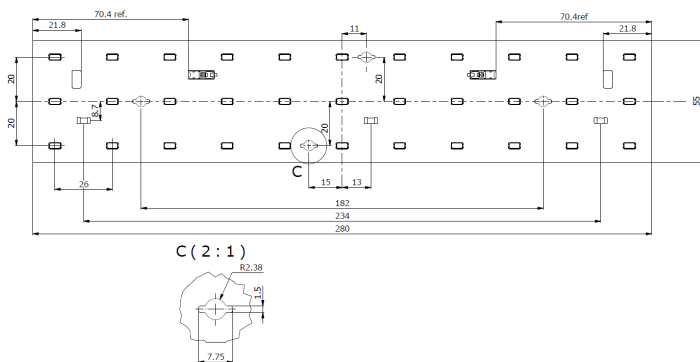
Specification item	Value	Unit	Condition
Input wire cross-section	0.33...0.5	mm <sup>2</sup>	stranded wire
	20...22	AWG	stranded wire
Input wire strip length	7.5...8.5	mm	
Input wire cross-section	0.33...0.75	mm <sup>2</sup>	solid, fused, stranded
	18...22	AWG	solid, fused, stranded
Input wire strip length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



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

## Mechanical characteristics

Parameter	Min	Typ	Max	Unit
Length	279.5	280	280.5	mm
Width	54.5	55	55.5	mm
Height excl. connector	4.19	4.29	4.39	mm
Height incl. connector	5.6	5.8	6	mm
Product mass		50		gram



## Absolute ratings

Parameter	Min	Max	Unit
Current through the LED module (I-max)		450	mA
Case temperature (Tc-max)		80	°C
Power at rated Vf-max and I-max		15.4	W
ESD (direct contact)		8	kV
ESD (air)		15	kV
Working voltage		420	V <sub>dc</sub>
Voltage strength	1840		V <sub>ac</sub>
Ambient temperature	-40		°C

## Application information

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### Certificates and Standards

IEC TR 62778

IEC 62384

IEC 62031:2008/A1:2012/A2:2014

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

UL 8750

ENEC+

CE

ENEC

### Zhaga

### Compliant\*

\*L28W6

### Application

IP rating

No IP-rating

Overheating protection

No protection

Luminaire class

IEC Class I and IEC Class II

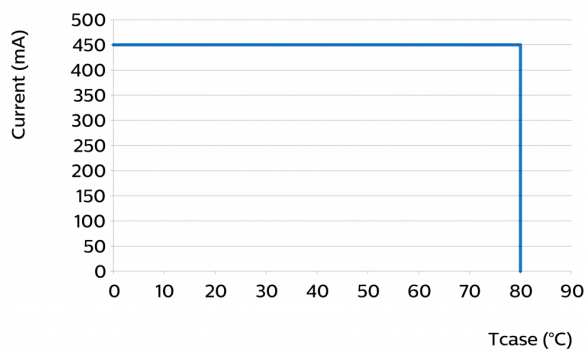
Dimming

Yes

Switching cycles in accordance with EU 1194/2012: >15000

## Performance Window

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04/06/2019