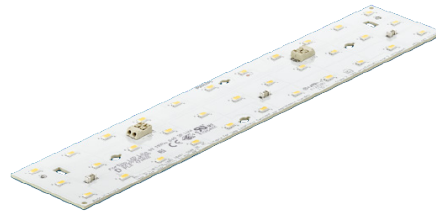


PHILIPS

LED Modules

Fortimo LED Line

1ft 1100lm 3R



Fortimo LED Line gen 4 will enable you to upgrade your linear LED luminaires to latest high-performance technology while offering the freedom to tune and differentiate on lumen output, efficacy and lifetime while delivering into a common footprint and enabling easy generation change.

The Fortimo LED Line 1R system, with 1 row of LEDs on the module, is ideal for applications requiring beam shaping. The Fortimo LED Line 3R systems have been designed for applications where diffuse lighting is key.

The Fortimo LED Line family was upgraded with better color consistency of 3 SDCM. Light sources with good color consistency are recommended in color-critical applications, such as in hospitals or art galleries.

Commercial Product Name	12NC
Fortimo LED Line 1ft 1100lm 830 3R LV4	9290 015 45106
Fortimo LED Line 1ft 1100lm 835 3R LV4	9290 015 45206
Fortimo LED Line 1ft 1100lm 840 3R LV4	9290 015 45306
Fortimo LED Line 1ft 1100lm 850 3R LV4	9290 015 45406

Fortimo LED Line 1ft 1100lm 3R

Features

- High energy efficiency of up to 186 lm/W
- CRI > 80 and 3 SDCM Color Consistency
- Variation of Color Temperatures (3000K, 3500K, 4000K, 5000K)
- Long product lifetime of > 50,000 hrs¹
- Push-in connectors
- Zhaga compliant²
- 5-year limited system warranty³

Benefits

- Low total cost of ownership through reduced energy consumption
- High quality of light
- Easy wiring
- Backward compatible to previous generations

Applications

- Office
- Industry
- Retail

Optical Characteristics – Table per CCT

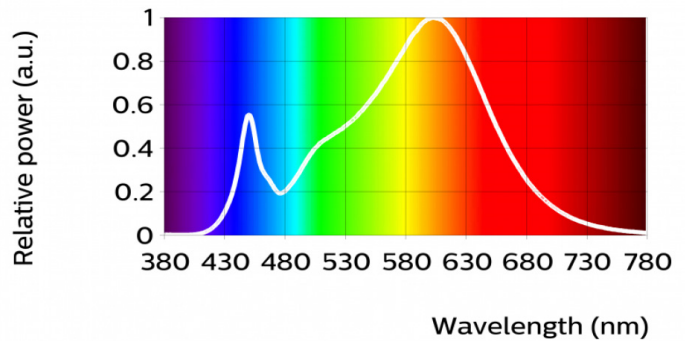
Fortimo LED Line 1ft 1100lm 830 3R LV4

Parameter	Min	Typ	Max	Unit
Luminous Flux	967	1045	1123	Lm
Lumen Efficiency	156	174	191	Lm/W
Correlated Color Temperature (CCT) Target		3000		K
Color Coordinates (CIEx, CIEy)		(0.433, 0.400)		–
Color Consistency			3	SDCM
CRI	80			–
Radiation Angle		120		deg
Photobiological Safety			RG1 unlimited	
Energy Efficiency Label		A++		
Δu'v' at 6000 Hours			0.007	

R9=7

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 163mA	Tc 25 °C	855	179
	Tc-nom 45 °C	841	177
	Tc-life 80 °C	800	170
I-nom 204mA	Tc 25 °C	1060	175
	Tc-nom 45 °C	1045	174
	Tc-life 80 °C	991	167
I-life 300mA	Tc 25 °C	2283	157
	Tc-nom 45 °C	2244	155
	Tc-life 80 °C	2128	149



Footnotes on page 11.

Fortimo LED Line 1ft 1100lm 3R

Optical Characteristics – Table per CCT

Fortimo LED Line 1ft 1100lm 835 3R LV4

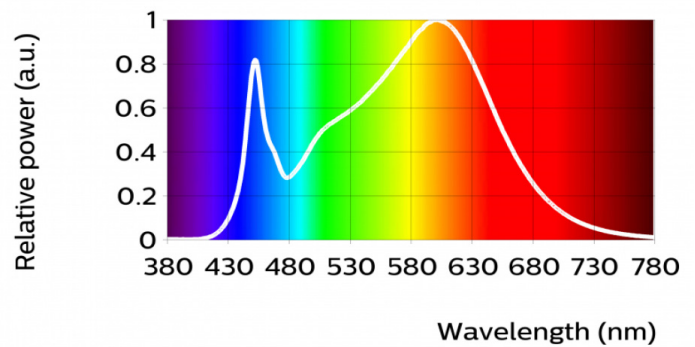
Parameter	Min	Typ	Max	Unit
Luminous Flux	997	1078	1159	Lm
Lumen Efficiency	161	179	197	Lm/W
Correlated Color Temperature (CCT) Target		3500		K
Color Coordinates (CIEx, CIEy)		(0.405, 0.391)		-
Color Consistency			3	SDCM
CRI	80			-
Radiation Angle		120		deg
Photobiological Safety			RG1 unlimited	
Energy Efficiency Label		A++		
$\Delta u'v'$ 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 ± 0.005 .

Measurement precision for CRI ± 1.5 .

Operation Point	830	lm	lm/W
80% I-nom 163mA	Tc 25 °C	885	185
	Tc-nom 45 °C	870	183
	Tc-life 80 °C	825	177
I-nom 204mA	Tc 25 °C	1097	182
	Tc-nom 45 °C	1078	179
	Tc-life 80 °C	1020	173
I-life 300mA	Tc 25 °C	2364	161
	Tc-nom 45 °C	2320	158
	Tc-life 80 °C	2184	151



Fortimo LED Line 1ft 1100lm 3R

Optical Characteristics – Table per CCT

Fortimo LED Line 1ft 1100lm 840 3R LV4

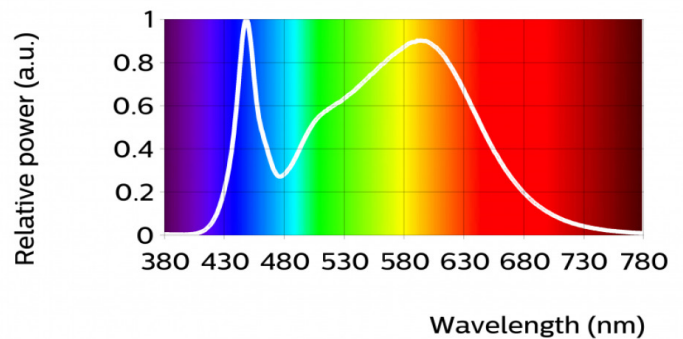
Parameter	Min	Typ	Max	Unit
Luminous Flux	1018	1100	1183	Lm
Lumen Efficiency	164	183	201	Lm/W
Correlated Color Temperature (CCT) Target		4000		K
Color Coordinates (CIEx, CIEy)		(0.383, 0.375)		-
Color Consistency			3	SDCM
CRI	80			-
Radiation Angle		120		deg
Photobiological Safety			RG1 unlimited	
Energy Efficiency Label		A++		
$\Delta u'v'$ 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 ± 0.005 .

Measurement precision for CRI ± 1.5 .

Operation Point	830	lm	lm/W
80% I-nom 163mA	Tc 25 °C	900	188
	Tc-nom 45 °C	885	186
	Tc-life 80 °C	842	179
I-nom 204mA	Tc 25 °C	1116	185
	Tc-nom 45 °C	1100	185
	Tc-life 80 °C	1043	176
I-life 300mA	Tc 25 °C	2405	165
	Tc-nom 45 °C	2363	163
	Tc-life 80 °C	2243	156



Fortimo LED Line 1ft 1100lm 3R

Optical Characteristics – Table per CCT

Fortimo LED Line 1ft 1100lm 850 3R LV4

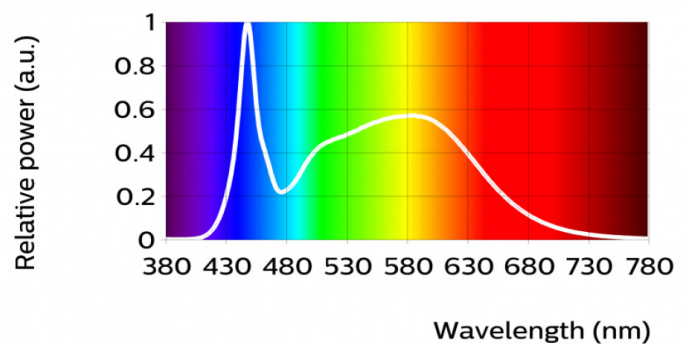
Parameter	Min	Typ	Max	Unit
Luminous Flux	1028	1111	1194	Lm
Lumen Efficiency	166	185	203	Lm/W
Correlated Color Temperature (CCT) Target		5000		K
Color Coordinates (CIEx, CIEy)		(0.345, 0.352)		-
Color Consistency			3	SDCM
CRI	80			-
Radiation Angle		120		deg
Photobiological Safety			RG1 unlimited	
Energy Efficiency Label		A++		
$\Delta u'v'$ 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 ± 0.005 .

Measurement precision for CRI ± 1.5 .

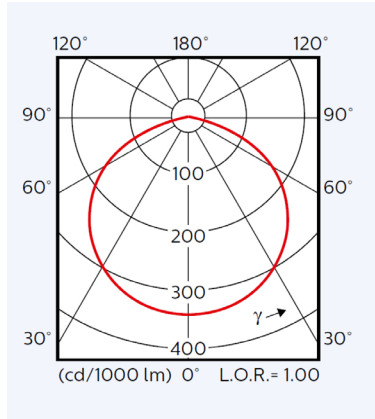
Operation Point	830	lm	lm/W
80% I-nom 163mA	Tc 25 °C	909	190
	Tc-nom 45 °C	894	188
	Tc-life 80 °C	850	181
I-nom 204mA	Tc 25 °C	1127	186
	Tc-nom 45 °C	1111	185
	Tc-life 80 °C	1054	177
I-life 300mA	Tc 25 °C	2429	167
	Tc-nom 45 °C	2388	164
	Tc-life 80 °C	2265	158



Fortimo LED Line 1ft 1100lm 3R

Beam Shape

The Philips Fortimo LED Line 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
Forward Voltage	29.5	30.5	31.5	V
Power Consumption	5.8	6.0	6.2	W
Number of Modules in Parallel per Chain			5	

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

Drive Currents

Parameter	Nominal *	Life**	Max***	Unit
Fortimo LED Line 1ft 1100lm 8xx 3R LV4	198	450	450	mA

Module Temperatures

Parameter	Nominal *	Life**	Max***	Unit
Tc (case temperature at Tc point)	40	80	80	°C

* Nominal value at which typical performance is specified

** Value at which lifetime L70B50 ≥ 50,000h is specified (max current for warranty)

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

Abs Max Ratings

Parameter	Min	Typ	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			120	Vdc
Voltage Strength	1240			Vdc
Ambient Temperature	-40			°C

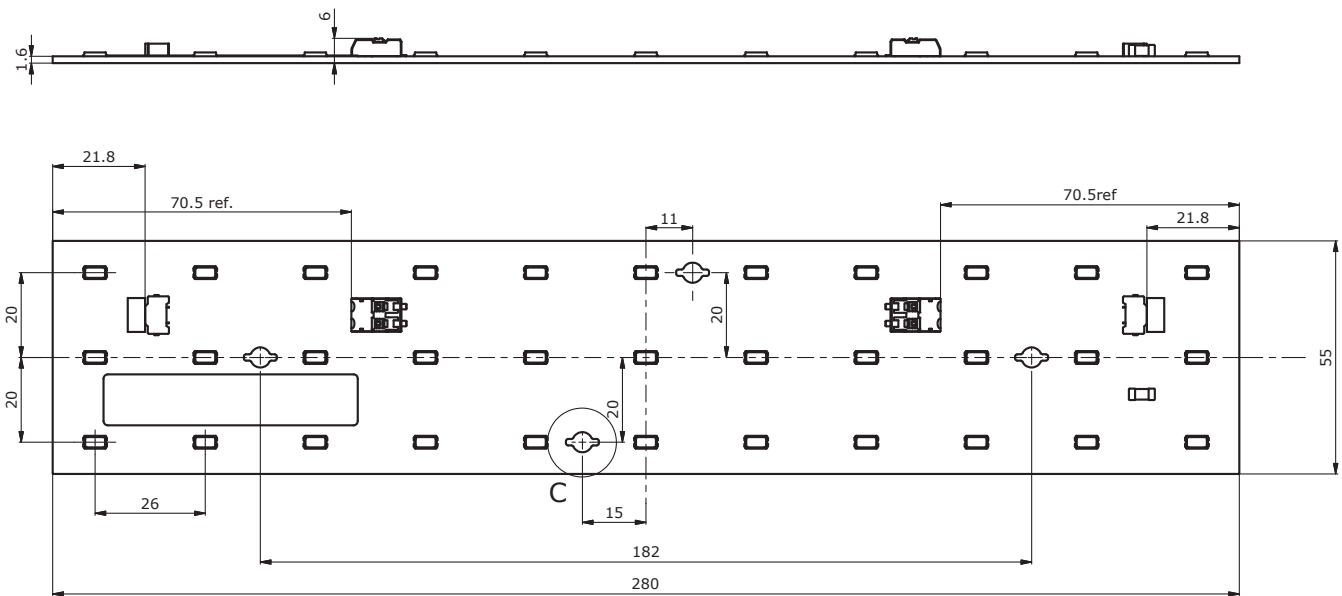
Fortimo LED Line 1ft 1100lm 3R

Wiring

Specification Item	Value	Unit	Condition
Input Wire Cross-Section	0.33...0.5	mm ²	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 ²	solid, fused, stranded
	18...22	AWG	solid, fused, stranded
Input Wire Strip Length	7.5...8.5	mm	

Mechanical Characteristics

Parameter	Min	Typ	Max	Unit
Length	279.2	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



Fortimo LED Line 1ft 1100lm 3R

Application Information

Compliance and Approval

IEC/TR 62278:2014
IEC 62384
IEC 62031:2008 (First Edition) + 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

Environmental

RoHS / REACH

Application Information

Zhaga ²	Compliant*
*L28W4	

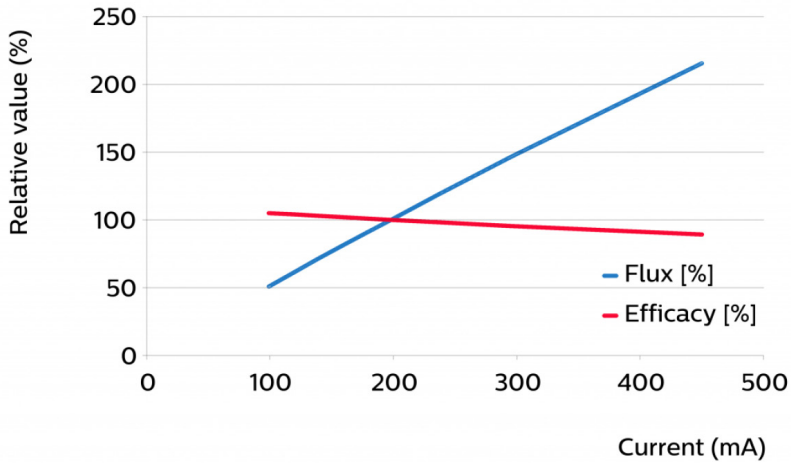
IP Rating	No IP rating
Overheating Protection	No protection
Luminaire Class	IEC Class I and IEC Class II
Dimming	Yes

Footnotes on page 11.

Fortimo LED Line 1ft 1100lm 3R

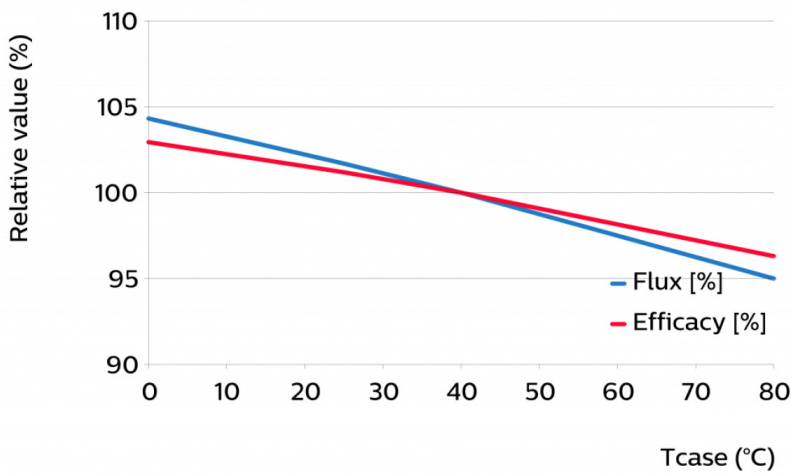
Tuning Information

Flux and Efficacy Vs. Current



I [A]	Flux [%]	Efficacy [%]
450	215	89
296	147	95
237	119	98
198	100	100
178	90	101
158	81	102
158	71	103
119	61	104
99	51	105

Flux and Efficacy Vs. Temperature at Tc



Tc [°C]	Flux [%]	Efficacy [%]
80	96	96
40	100	100
25	102	101
0	104	103

Fortimo LED Line 1ft 1100lm 3R

Lumen Maintenance

Operation point	Lumen maintenance x 1000 hours	L70			L80			L90		
		B50	B20	B10	B50	B20	B10	B50	B20	B10
80% I-nom 163mA	Tc 25°C	>50	>50	>50	>50	>50	>50	>50	>50	>50
	Tc-nom 45°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 204mA	Tc 25°C	>50	>50	>50	>50	>50	>50	>50	>50	>50
	Tc-nom 45°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 300mA	Tc 25°C	>50	>50	>50	>50	>50	>50	>50	>50	>50
	Tc-nom 45°C	>50	>50	>50	>50	>50	>50	>50	>50	>50
	Tc-life 80°C	>50	>50	>50	>50	>50	>50	35	35	35

Values in the table are based on available LM80 LED data. Lumen maintenance will be updated once additional measurement data becomes available.

Lifetime

Lifetime L70B50 = 60 000 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	> 100 k	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	X	X	X	X	X	X
	70	17 k	17 k	17 k	17 k	17 k	X	X	X	X	X	X	X
	80	10 k	10 k	10 k	10 k	X	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

- 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 Tc point of 56°C for 3R and 61°C for 1R.
- Philips Fortimo LED Line 1ft 1100lm 1R LV3 Module is a Zhaga certified light engine. Visit www.zhagastandard.org for more information.
- View limited warranty at www.philips.com/warranties for details and restrictions.



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