PHILIPS

Fortimo

LED

Fortimo LED Line 1ft
2000lm 8xx 3R HV3

Datasheet

Fortimo LED Line High Flux

Fortimo LED Line High Flux system are designed to enable LED lighting at higher application heights where more light is needed, such as trunking, battens and high-bay applications in warehouses, factories or big retail stores.

Key features and benefits

- State-of-the-art LED module efficiency of up to 185 lm/W
- Long life-time: >100,000 hours
- High color rendering: CRI >80
- Excellent color consistency of 3 SDCM
- Choice of color temperatures (3000, 4000 and 5000 K)
- Two module lengths: 1 ft/280 mm or 2 ft/560 mm
- Lumen package: 2000 lm per foot
- 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 +95 °C
- Five year system warranty.

April 2017

Zhaga

Ordering data

Commercial product name	EOC	12NC	Box quantity
Fortimo LED Line 1ft 2000lm 830 3R HV3	8718696 689035 00	9290 015 41906	180
Fortimo LED Line 1ft 2000lm 840 3R HV3	8718696 689059 00	9290 015 42006	180
Fortimo LED Line 1ft 2000lm 850 3R HV3	8718696 689073 00	9290 015 42106	180

Drive currents

Parameter	Nominal*	Life**	Max***	Unit
Fortimo LED Line 1ft 2000lm 8xx 3R HV3	380	630	630	mA

Module temperatures

Parameter	Nominal*	Life**	Max***	Unit
T_c (case temperature at T_c point)	45	90	95	°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)

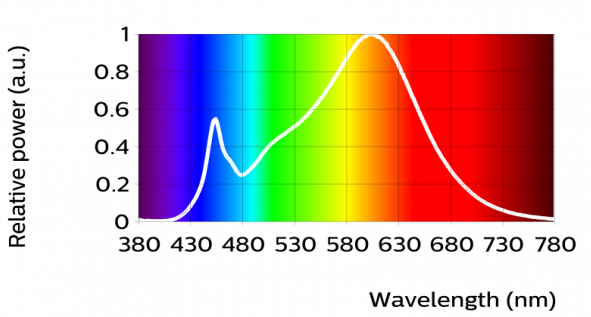
Fortimo LED Line 1ft 2000lm 830 3R HV3

Parameter	Min	Typ	Max	Unit
Luminous flux	1758	1901	2044	lm
Module efficacy		168		lm/W
Correlated color temperature (CCT)		3000		K
Color coordinates (CIEx, CIEy)		(0.437, 0.404)		-
Color consistency			3	SDCM
CRI	80			
Radiation angle		120		deg
Photobiological safety			RG1	
Energy efficiency label		A++		
Δu'v' at 6000 hours			0.007	

R9=13

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 304 mA	Tc 25 °C	1619	179
	Tc-nom 45 °C	1578	176
	Tc-life 90 °C	1467	168
I-nom 380 mA	Tc 25 °C	1993	174
	Tc-nom 45 °C	1901	169
	Tc-life 90 °C	1798	163
I-life 630 mA	Tc 25 °C	3160	161
	Tc-nom 45 °C	3069	158
	Tc-life 90 °C	2821	149



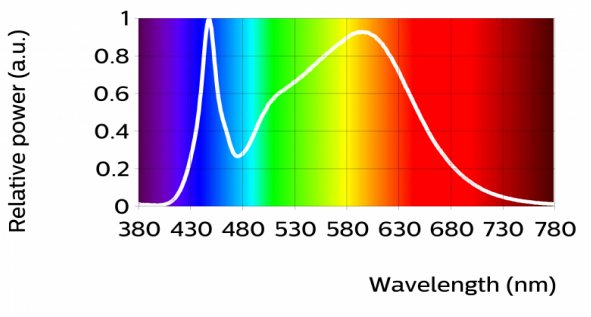
Fortimo LED Line 1ft 2000lm 840 3R HV3

Parameter	Min	Typ	Max	Unit
Luminous flux	1850	2000	2150	lm
Module efficacy		178		lm/W
Correlated color temperature (CCT)		4000		K
Color coordinates (CIEx, CIEy)		(0.384, 0.382)		-
Color consistency			3	SDCM
CRI	80			
Radiation angle		120		deg
Photobiological safety			RG1	
Energy efficiency label		A++		
Δu'v' at 6000 hours			0.007	

R9=12

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	840	lm	lm/W
80% I-nom 304 mA	Tc 25 °C	1704	188
	Tc-nom 45 °C	1661	186
	Tc-life 90 °C	1545	177
I-nom 380 mA	Tc 25 °C	2099	184
	Tc-nom 45 °C	2000	178
	Tc-life 90 °C	1895	171
I-life 630 mA	Tc 25 °C	3331	170
	Tc-nom 45 °C	3236	167
	Tc-life 90 °C	2977	157



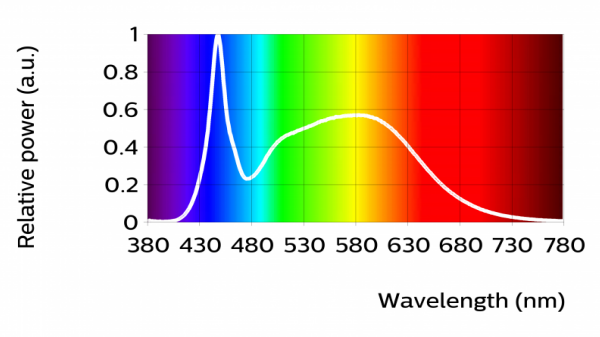
Fortimo LED Line 1ft 2000lm 850 3R HV3

Parameter	Min	Typ	Max	Unit
Luminous flux	1869	2020	2172	lm
Module efficacy		168		lm/W
Correlated color temperature (CCT)		5000		K
Color coordinates (CIEx, CIEy)		(0.346, 0.358)		-
Color consistency			3	SDCM
CRI	80			
Radiation angle		120		deg
Photobiological safety			RG1	
Energy efficiency label		A++		
Δu'v' at 6000 hours			0.007	

R9=18

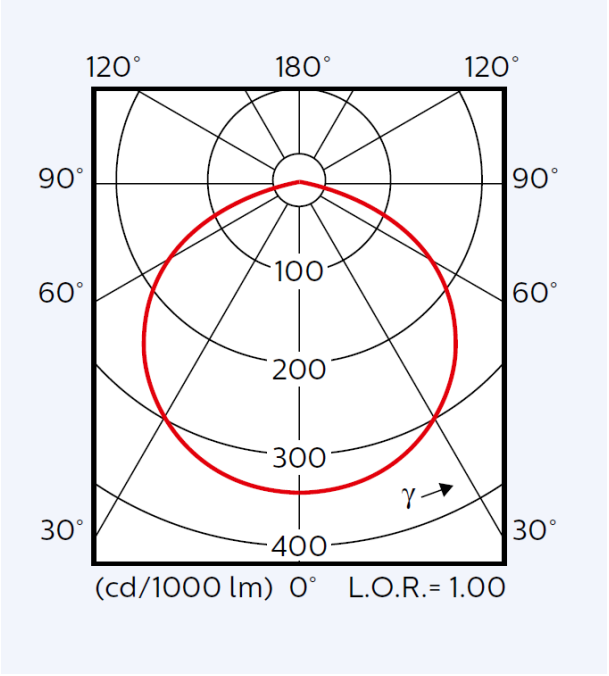
Measurement precision ± 5% for the flux data and ± 6% for the efficacy data. Measurement precision for color coordinates ± 0.005. Measurement precision for CRI ± 1.5

Operation point	850	lm	lm/W
80% I-nom 304 mA	Tc 25 °C	1719	190
	Tc-nom 45 °C	1676	187
	Tc-life 90 °C	1559	178
I-nom 380 mA	Tc 25 °C	2117	185
	Tc-nom 45 °C	2019	179
	Tc-life 90 °C	1911	173
I-life 630 mA	Tc 25 °C	3359	172
	Tc-nom 45 °C	3264	168
	Tc-life 90 °C	3002	158



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 Line 1ft 2000lm 830 3R HV3
Fortimo LED Line 1ft 2000lm 840 3R HV3
Fortimo LED Line 1ft 2000lm 850 3R HV3

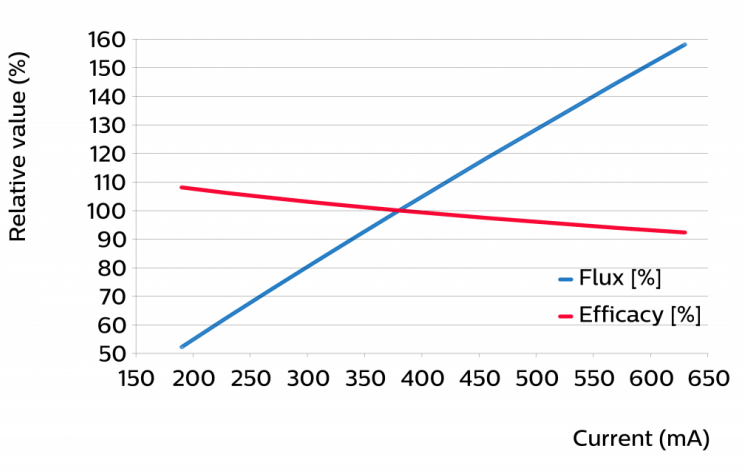
Parameter	Min	Typ	Max	Unit
Forward voltage	28.9	29.6	31.7	V
Power consumption	11.0	11.2	12.0	W
Number of modules in series per chain			10	

Bins E and F
Measurement precision for Vf +/- 3%. Measurement precision for power +/- 3.3%

Tuning information

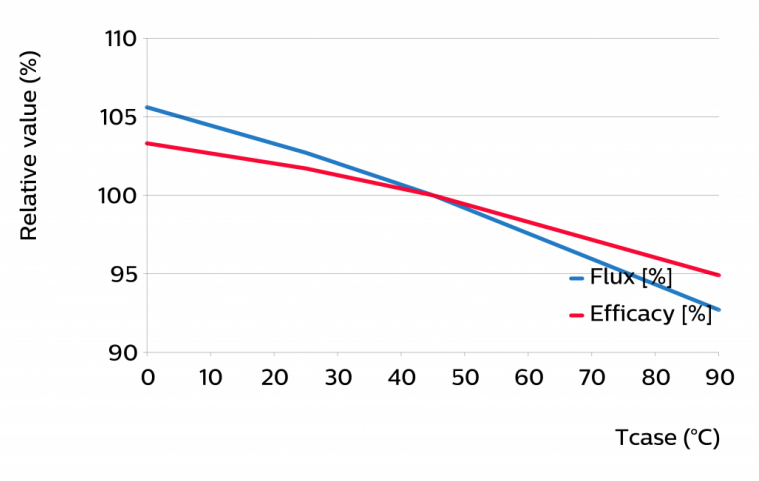
Flux and efficacy versus current (at Tc nominal)

I [mA]	Flux [%]	Efficacy [%]
630	158	92
570	145	94
456	118	97
380	100	100
342	91	101
304	81	103
266	72	105
228	62	106
190	52	108



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

Tcase [°C]	Flux [%]	Efficacy [%]
90	93	95
45	100	100
25	103	102
0	106	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 304 mA	Tc 25°C	>100	>100	>100	>100	>100	>100	>100	>72	>100
	Tc 45°C	>100	>100	>100	>100	>100	>100	>100	>100	>100
	Tc 90°C	>100	>100	>100	94	90	88	44	42	41
I-nom 380 mA	Tc 25°C	>100	>100	>100	>100	>100	>100	>100	>100	>100
	Tc 45°C	>100	>100	>100	>100	>100	>100	>100	>100	>100
	Tc 90°C	>100	>100	>100	76	73	71	35	34	33
I-life 630 mA	Tc 25°C	>100	>100	>100	>100	>100	>100	>100	>100	99
	Tc 45°C	>100	>100	>100	>100	>100	>100	67	65	64
	Tc 90°C	78	74	73	48	46	45	22	22	21

>72k hours claim is based on extrapolating raw LM80-data to lower temperatures and currents by using statistical techniques

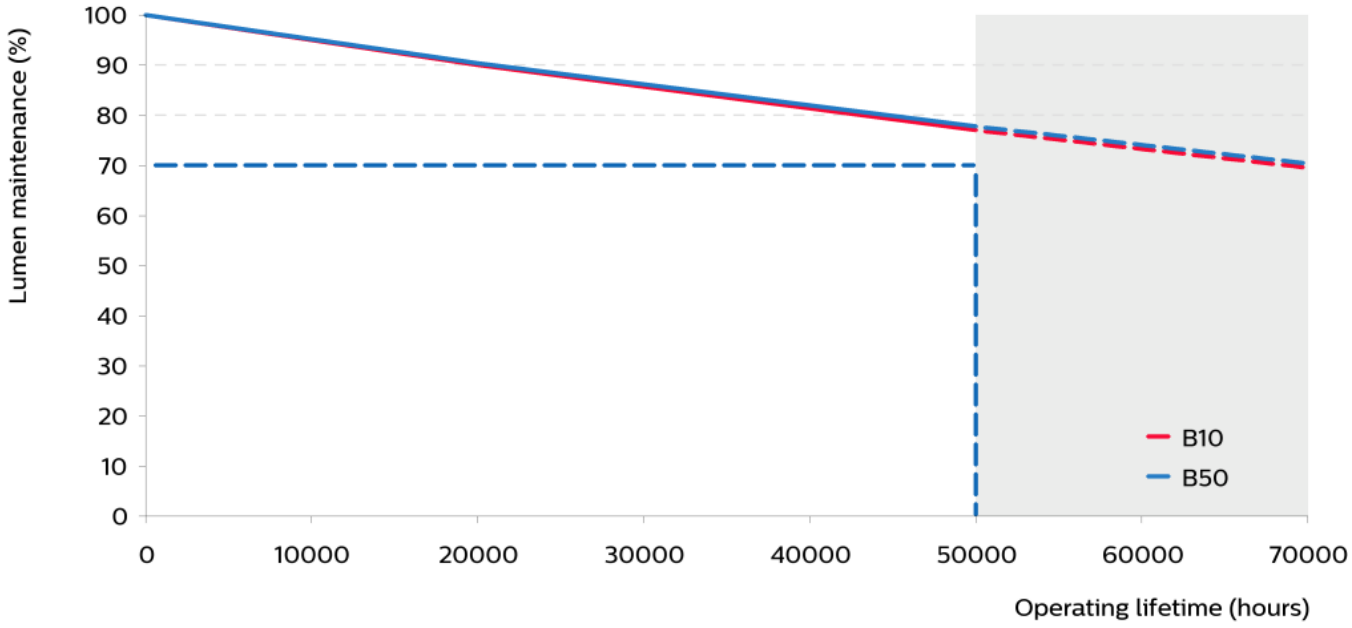
Thermal switching table

Calculated number of switches at which the survival rate of the population >=90%, at a given ambient temperature and delta T with repect to Tc (where Tc = Tambient + delta T)

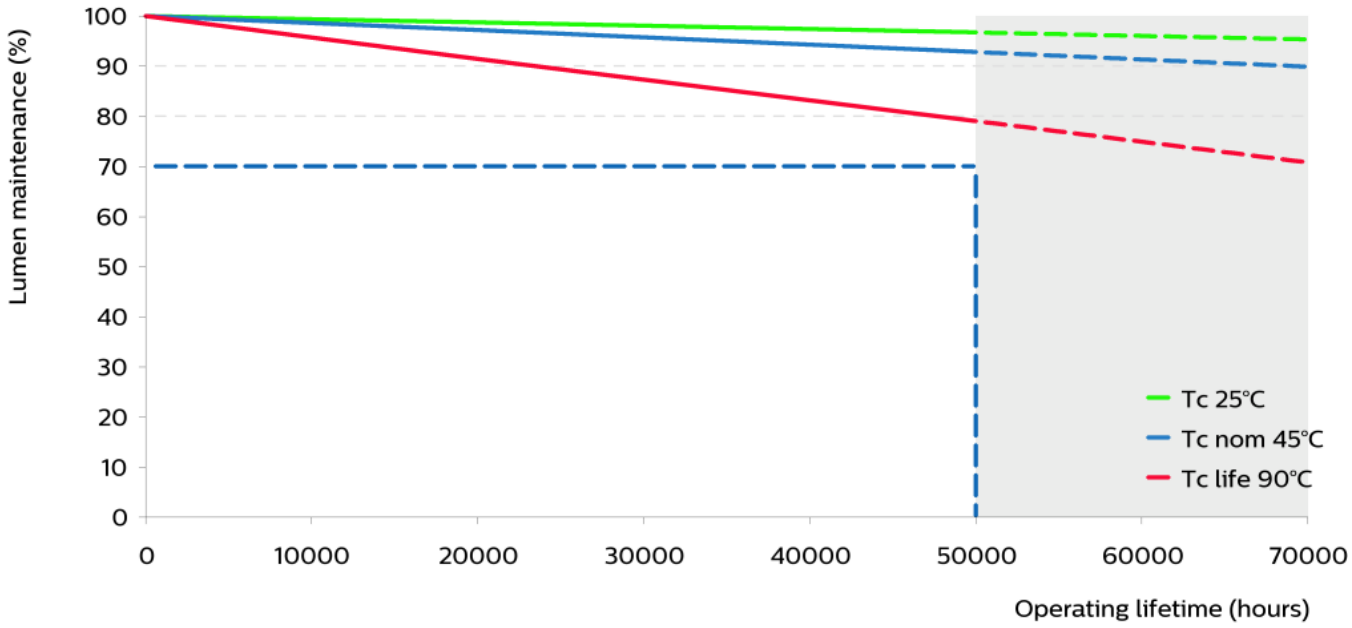
		Tambient [°C]											
		-40	-30	-20	-10	0	10	20	30	40	50	60	70
delta T [°C] (delta T = Tc - Tambient)	10	Continuous operation or dimming only	>100k	>100k	>100k	>100k	>100k	>100k	>100k	>100k	>100k	>100k	>100k
	20		>100k	>100k	>100k	>100k	>100k	>100k	>100k	100k	76k	43k	26k
	30		>100k	>100k	>100k	>100k	>100k	>100k	83k	46k	27k	16k	X
	40		97k	96k	95k	93k	83k	58k	34k	20k	11k	X	X
	50		54k	53k	53k	49k	41k	27k	16k	10k	X	X	X
	60		32k	32k	31k	28k	22k	14k	8k	X	X	X	X
	70		20k	20k	20k	16k	12k	7k	X	X	X	X	X
	80		14k	14k	13k	10k	7k	X	X	X	X	X	X
	90		10k	10k	8k	6k	X	X	X	X	X	X	X
	100		7k	7k	6k	X	X	X	X	X	X	X	X

Lumen maintenance graphs

Lumen maintenance at I-life and Tc-life conditions

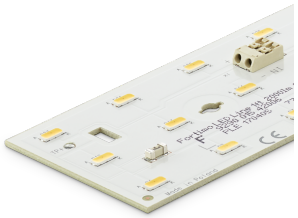


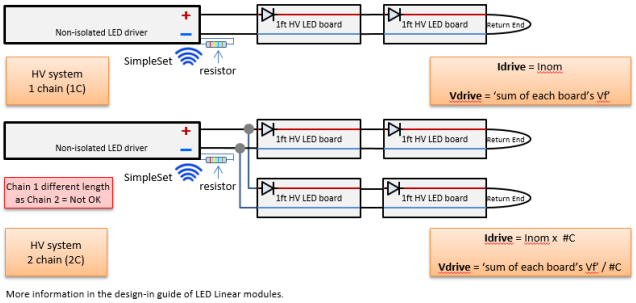
Lumen maintenance for B50 at current I-life conditions



Wiring

Specification item	Value	Unit	Condition
Input wire cross-section	0.33…0.5	mm²	stranded wire
	20…22	AWG	stranded wire
Input wire strip length	7.5…8.5	mm	
Input wire cross-section	0.33…0.75	mm²	solid, fused, stranded
	18…22	AWG	solid, fused, stranded
Input wire strip length	7.5…8.5	mm	



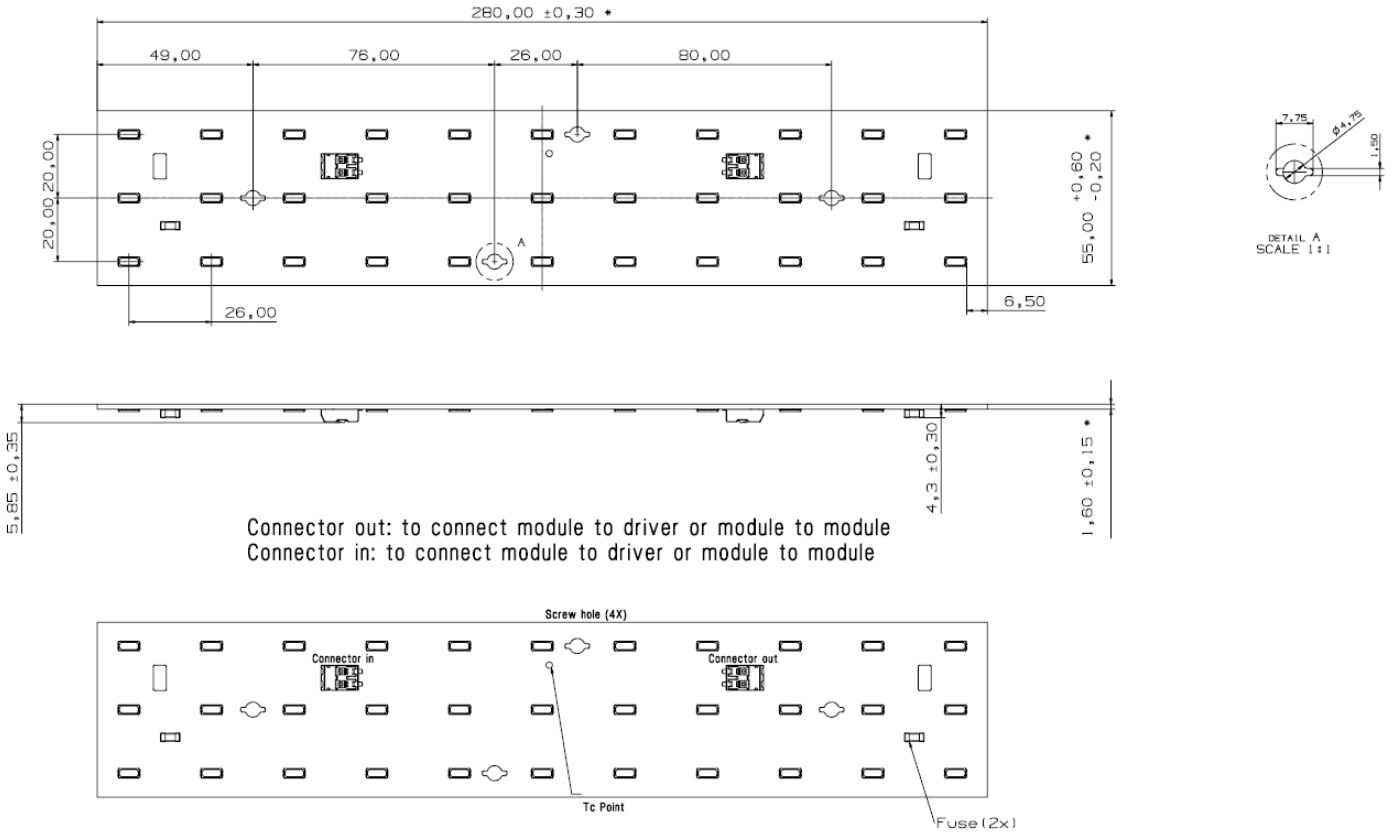


More information in the design-in guide of LED Linear modules.

Mechanical characteristics

Fortimo LED Line 1ft 2000lm 830 3R HV3
Fortimo LED Line 1ft 2000lm 840 3R HV3
Fortimo LED Line 1ft 2000lm 850 3R HV3

Parameter	Min	Typ	Max	Unit
Length	279.4	279.7	280	mm
Width	39.7	54.8	55	mm
Height excl. connector	55.6	1.6	1.75	mm
Height incl. connector	5.5	5.85	6.2	mm
Warpage (IPC-TM-650)			0.75	%



Absolute ratings

Parameter	Min	Typ	Max	Unit
Current through the LED module (I-max)			500	mA
Case temperature (Tc-max)			95	°C
Power at rated Vf-max and I-max			22.4	W
ESD (direct contact)			8	kV
ESD (air)			15	kV
Working voltage			420	V_{dc}
Voltage strength	1840			V_{dc}
Ambient temperature	-40			°C

Application information

Certificates and Standards
IEC 62384
IEC 62031:2008 (First Edition) + A1:2012 + A2:2014
EN 62031:2008 (First Edition) + A1:2013 + A2:2015
Relevant clauses of EN 62471:2008 (With IEC/TR 62471-2: 2009 and IEC/TR 62778: 2014)
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

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