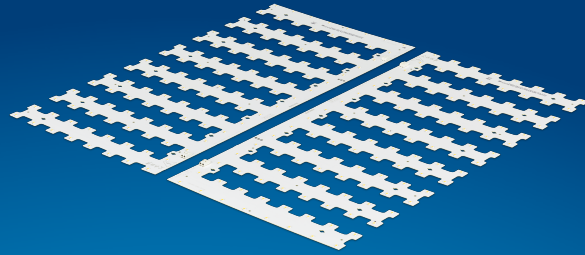


# PHILIPS

## Fortimo

### LED

Fortimo LED Square-DS  
SMF 9xx HV/LV4



## Datasheet

### Fortimo LED Square systems

Fortimo LED Square systems consist of white light LED modules with square outer dimensions delivering high energy efficiency and high quality of light. Fortimo LED Square systems are ideal for office applications where the luminaires require a very homogeneous exit surface window. Typical applications are recessed, surface mounted and suspended office luminaires.

#### Key features and benefits

- LED module efficiency of 200 lm/W (nominal at 4000K, CRI80, S) or 188 lm/W in CRI90 (nominal at 4000K, CRI90, S)
- Long life-time: >70,000 hours
- High color rendering: choice between CRI >80 or CRI >90
- CRI90 products are based on our CRI90 High Efficiency technology
- Excellent color consistency of 3 SDCM
- Choice of color temperatures (3000K, 3500K, 4000K and 6500K)
- Two sizes: Square (1250lm) and Double-Square (2500lm)
- FlexTune tunable white modules available in both lumen packages
- FlexTune tunable white modules can be tuned from 2700K to 6500K in CRI90
- FlexTune tunable white modules work perfectly together with the Xitanium FlexTune non-isolated drivers
- Tunable lumen output, efficacy and lifetime
- Push-in connectors enabling automated wiring
- Five year system warranty when paired with Xitanium drivers

November 2024



## Ordering data

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Commercial product name	12NC	EPREL registration #	Box quantity
Fortimo LED Square-DS SMF 930 HV/LV4	9290 039 93906	10012806	20
Fortimo LED Square-DS SMF 940 HV/LV4	9290 039 94006	10012798	20
Fortimo LED Square-DS SMF 965 HV/LV4	9290 039 94106	10012800	20

## Drive currents

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Parameter	Nominal*	Life**	Max***	Unit
Fortimo LED Square-DS SMF 9xx HV/LV4	310	1920	1920	mA

## Module temperatures

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Parameter	Nominal*	Life**	Max***	Unit
T <sub>c</sub> (case temperature at T <sub>c</sub> point)	45	75	85	°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)

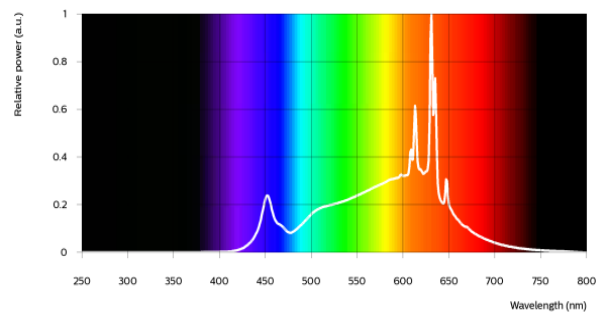
### Fortimo LED Square-DS SMF 930 HV/LV4

Parameter	Min	Typ	Max	Unit
Luminous flux	2240	2276	2530	lm
Efficacy	166	172	202	lm/W
Correlated color temperature (CCT)		3000		K
Color coordinates (CIEx, CIEy)		(0.436, 0.399)		-
Color consistency			3	SDCM
CRI	90			
R9	50			
Radiation angle		120		deg
Photobiological safety			RG1 unlimited	



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	930	lm	lm/W
80% I-nom 248mA	Tc 25 °C	1746	166
	Tc-nom 45 °C	1706	164
	Tc-max 85 °C	1605	156
I-nom 310mA	Tc 25 °C	2275	172
	Tc-nom 45 °C	2276	172
	Tc-max 85 °C	2091	162
I-max 1920mA	Tc 25 °C	10060	107
	Tc-nom 45 °C	9819	106
	Tc-max 85 °C	9209	100



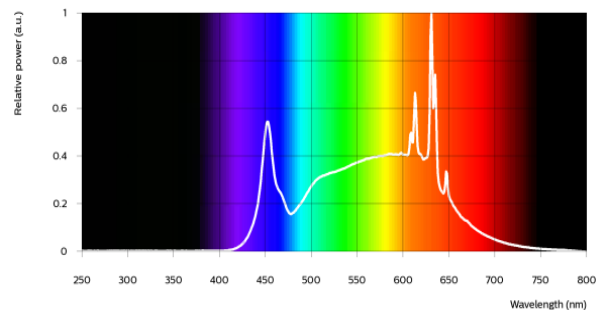
### Fortimo LED Square-DS SMF 940 HV/LV4

Parameter	Min	Typ	Max	Unit
Luminous flux	2420	2500	2740	lm
Efficacy	179	188	218	lm/W
Correlated color temperature (CCT)		4000		K
Color coordinates (CIEx, CIEy)		(0.384, 0.378)		-
Color consistency			3	SDCM
CRI	90			
R9	50			
Radiation angle		120		deg
Photobiological safety			RG1 unlimited	



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	940	lm	lm/W
80% I-nom 248mA	Tc 25 °C	2011	190
	Tc-nom 45 °C	1962	187
	Tc-max 85 °C	1839	179
I-nom 310mA	Tc 25 °C	2499	188
	Tc-nom 45 °C	2500	188
	Tc-max 85 °C	2285	177
I-max 1920mA	Tc 25 °C	13733	151
	Tc-nom 45 °C	13388	148
	Tc-max 85 °C	12515	141



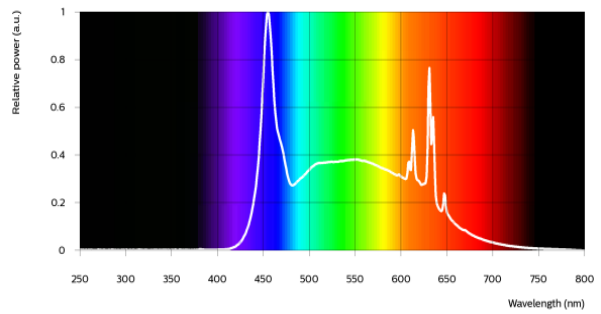
Fortimo LED Square-DS SMF 965 HV/LV4

Parameter	Min	Typ	Max	Unit
Luminous flux	2370	2445	2650	lm
Efficacy	175	184	211	lm/W
Correlated color temperature (CCT)		6500		K
Color coordinates (CIEx, CIEy)		(0.314, 0.326)		-
Color consistency			3	SDCM
CRI	90			
R9	50			
Radiation angle		120		deg
Photobiological safety			RG1 unlimited	



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	965	lm	lm/W
80% I-nom 248mA	Tc 25 °C	1964	185
	Tc-nom 45 °C	1910	182
	Tc-max 85 °C	1785	173
I-nom 310mA	Tc 25 °C	2444	184
	Tc-nom 45 °C	2445	184
	Tc-max 85 °C	2221	171
I-max 1920mA	Tc 25 °C	13596	150
	Tc-nom 45 °C	13215	147
	Tc-max 85 °C	12327	139



## Electrical characteristics

### Fortimo LED Square-DS SMF 930 HV/LV4

Parameter	Min	Typ	Max	Unit
Forward voltage	40.3	42.7	43.5	V
Power consumption	12.5	13.2	13.5	W = kWh/1000h
Number of modules in series per chain			7	
Number of modules in parallel			2	

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

### Fortimo LED Square-DS SMF 940 HV/LV4

Parameter	Min	Typ	Max	Unit
Forward voltage	40.5	42.8	43.6	V
Power consumption	12.5	13.3	13.5	W = kWh/1000h
Number of modules in series per chain			7	
Number of modules in parallel			2	

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

### Fortimo LED Square-DS SMF 965 HV/LV4

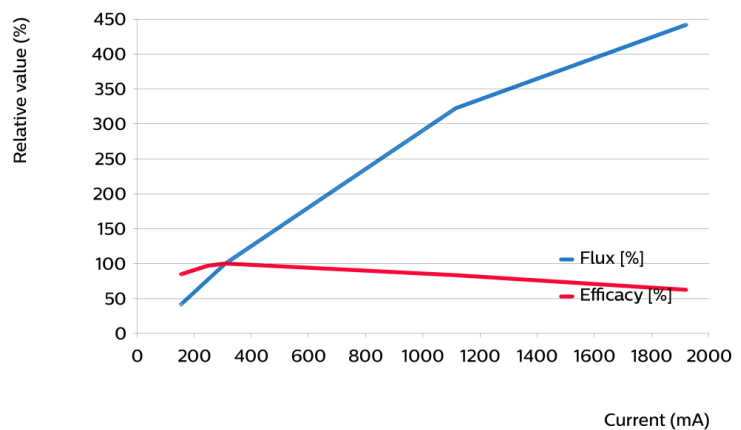
Parameter	Min	Typ	Max	Unit
Forward voltage	40.5	42.9	43.7	V
Power consumption	12.6	13.3	13.5	W = kWh/1000h
Number of modules in series per chain			7	
Number of modules in parallel			2	

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

## Tuning information

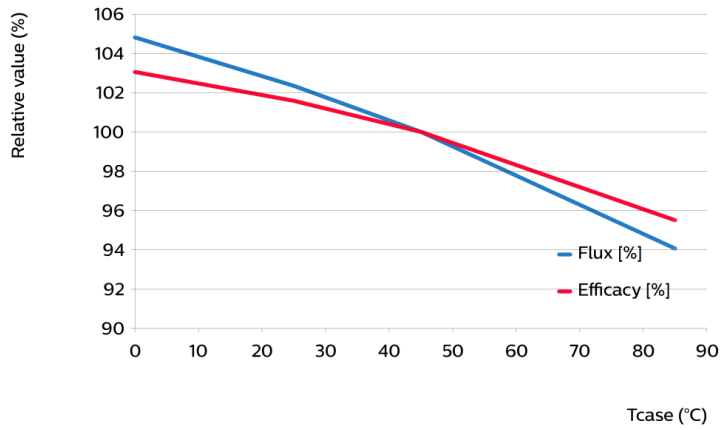
Flux and efficacy versus current (at Tc nominal)

I [mA]	Flux [%]	Efficacy [%]
1920	442	62
1115	322	83
310	100	100
248	77	97
155	41	85



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

Tc [°C]	Flux [%]	Efficacy [%]
85	94	96
45	100	100
25	102	102
0	105	103



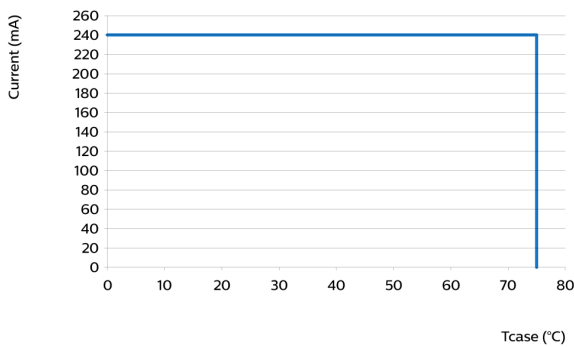
Lumen maintenance

Operation point	Lumen maintenance x 1000 hours	L70			L80			L90		
		B50	B20	B10	B50	B20	B10	B50	B20	B10
80% Inom=248mA	Tc=25°C	>100	>100	>100	>100	>100	>100	67	66	66
	Tc_nom=45°C	>100	>100	>100	>100	>100	>100	53	53	52
	Tc_life=75°C	>100	>100	97	83	81	80	39	38	38
Inom=310mA	Tc=25°C	>100	>100	>100	>100	>100	>100	67	66	66
	Tc_nom=45°C	>100	>100	>100	>100	>100	>100	53	53	52
	Tc_life=75°C	>100	>100	97	83	81	80	39	38	38
Ilife=1200mA	Tc=25°C	>100	>100	>100	>100	>100	>100	56	55	55
	Tc_nom=45°C	>100	>100	>100	94	93	92	44	44	43
	Tc_life=75°C	>100	>100	97	69	68	67	32	32	32

Lifetime

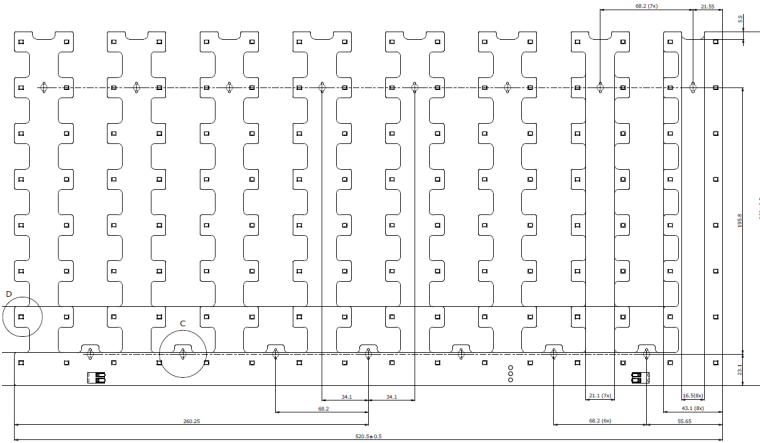
Parameter	Value	Unit
M70F50 nominal	100000	hours
M70F50 life	100000	hours

Performance Window



## Mechanical characteristics

Parameter	Min	Typ	Max	Unit
Length	520	520.5	521	mm
Width	255.5	260	260.5	mm
Height total	5.1	5.5	5.9	mm
Height PCB		1.7		mm
Product mass		208		gram



## Absolute ratings

Parameter	Min	Max	Unit
Current through the LED module (I-max)		1920	mA
Case temperature (Tc-max)		85	°C
ESD (direct contact)	8		kV
Working voltage		350	V <sub>dc</sub>

## Application information

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### Certificates and Standards

CE  
cULus  
ENEC  
ENEC+

### Application

Dimming

Yes



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