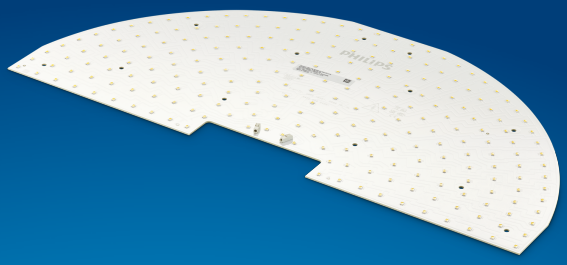
PHILIPS

Fortimo

LED

Fortimo LED CS S540D HF 9xx HV/LV6



Datasheet

Fortimo Circular Shape

The Fortimo LED Circular Shape (CS) is a unique portfolio which offers a combination of energy efficiency, homogenous lighting, long lifetime and design flexibility, making them an important component in many lighting applications. Its form factor makes it easy to design-in and handle in production. Thanks to the availability of three different dimensions, a wide range of needs is covered for our customers.

Key features and benefits

- Typical module efficiency of 200 Lm/W (at 4000K CRI80)
- CRI90 High Efficiency typical performance of 189 Lm/W (at 4000K CRI90)
- Long lifetime: >72,000 hours
- Excellent color consistency of 3 SDCM
- Typical output per dimension available:
  - 220 mm: 2500lm
  - 350 mm: 5500lm
  - 540 mm: 4125lm
- CCTs available: 3000K, 4000K
- CRI >80 & >90 (Based on high efficiency technology)
- Available in Low Voltage (LV)
- Available in front connector (FC)
- PCB thickness of 1.6mm
- Available dimensions: 220mm / 350mm / 540mm / 540Dmm (includes cutout for sensor)
- Wide temperature (Tc) range -40°C to +85°C
- Five-year system warranty (when paired with Xitanium LED drivers)

March 2023



Ordering data

Commercial product name	12NC	EPREL registration #	Box quantity
Fortimo LED CS S540D HF 930 HV/LV6	9290 029 60806	1500767	16
Fortimo LED CS S540D HF 940 HV/LV6	9290 029 61006	1500768	16

Drive currents

Parameter	Nominal*	Life**	Max***	Unit
Fortimo LED CS S540D HF 9xx HV/LV6	414	2880	2880	mA

At drive currents exceeding the nominal current and T case less than nominal T case the forward voltage may exceed 54V which is the operational limit of our

SELV drivers,

Module temperatures

Parameter	Nominal*	Life**	Max***	Unit
T_c (case temperature at T_c point)	35	55	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

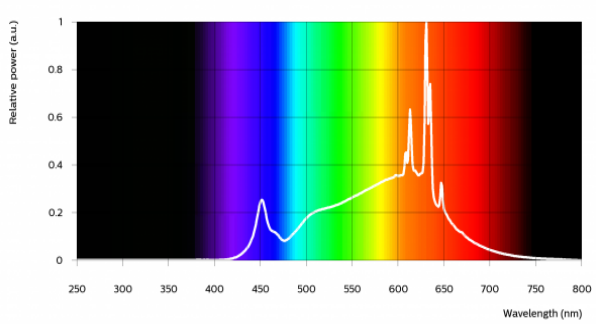
Optical characteristics - table per color (CCT)

Fortimo LED CS S540D HF 930 HV/LV6

Parameter	Min	Typ	Max	Unit
Luminous flux	3840	3974	4330	lm
Efficacy	172	180	207	lm/W
Correlated color temperature (CCT)		3000		K
Color coordinates (CIEx, CIEy)		(0.436, 0.402)		-
Color consistency			3	SDCM
CRI	90			
R9	50			
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	930	lm	lm/W
80% I-nom 331mA	Tc 25 °C	3224	183
	Tc-nom 35 °C	3189	180
	Tc-max 85 °C	2964	164
I-nom 414mA	Tc 25 °C	4019	181
	Tc-nom 35 °C	3974	180
	Tc-max 85 °C	3693	162
I-max 2880mA	Tc 25 °C	25161	142
	Tc-nom 35 °C	24872	140
	Tc-max 85 °C	23030	127

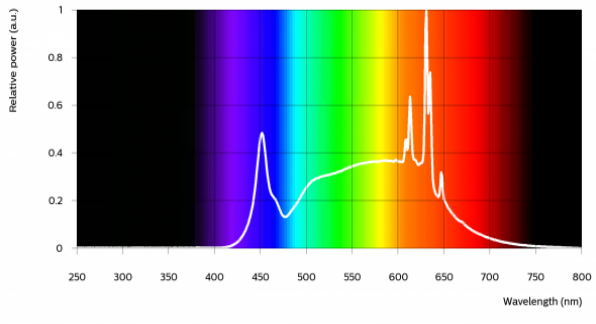


Fortimo LED CS S540D HF 940 HV/LV6

Parameter	Min	Typ	Max	Unit
Luminous flux	4120	4250	4660	lm
Efficacy	184	192	223	lm/W
Correlated color temperature (CCT)		4000		K
Color coordinates (CIEx, CIEy)		(0.384, 0.379)		-
Color consistency			3	SDCM
CRI	90			
R9	50			
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	940	lm	lm/W
80% I-nom 331mA	Tc 25 °C	3453	196
	Tc-nom 35 °C	3411	193
	Tc-max 85 °C	3153	175
I-nom 414mA	Tc 25 °C	4303	194
	Tc-nom 35 °C	4250	192
	Tc-max 85 °C	3929	173
I-max 2880mA	Tc 25 °C	26940	152
	Tc-nom 35 °C	26596	150
	Tc-max 85 °C	24508	136



Electrical characteristics

Fortimo LED CS S540D HF 930 HV/LV6

Parameter	Min	Typ	Max	Unit
Forward voltage	50.5	53.4	54.0	V
Power consumption	20.9	22.1	22.4	W = kWh/1000h
Number of modules in series per chain			2	
Number of modules in parallel			2	

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

Fortimo LED CS S540D HF 940 HV/LV6

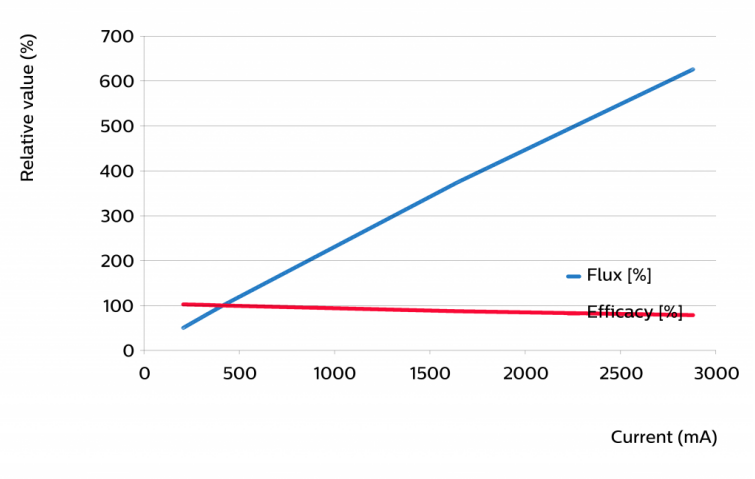
Parameter	Min	Typ	Max	Unit
Forward voltage	50.5	53.4	54.0	V
Power consumption	20.9	22.1	22.4	W = kWh/1000h
Number of modules in series per chain			2	
Number of modules in parallel			2	

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

Tuning information

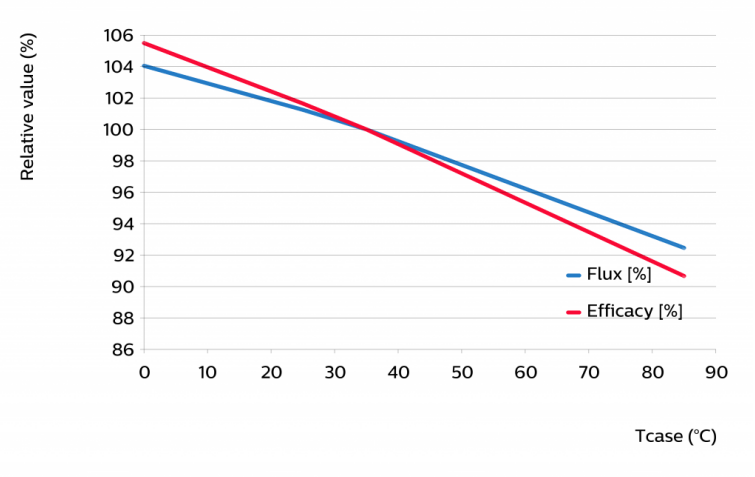
Flux and efficacy versus current (at Tc nominal)

I [mA]	Flux [%]	Efficacy [%]
2880	626	78
1647	375	87
414	100	100
331	80	101
207	50	102



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

Tc [°C]	Flux [%]	Efficacy [%]
85	92	91
35	100	100
25	101	102
0	104	105



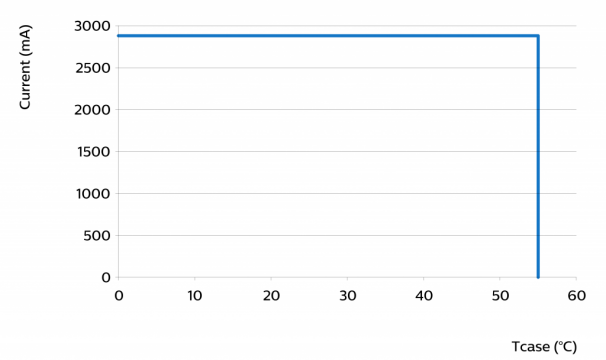
Lumen maintenance

Operation point	Lumen maintenance x 1000 hours	L70			L80			L90		
		B50	B20	B10	B50	B20	B10	B50	B20	B10
80% I-nom 331mA	Tc 25°C	>72	>72	>72	>72	>72	>72	>72	>72	>72
	Tc-nom 35°C	>72	>72	>72	>72	>72	>72	>72	>72	>72
	Tc-life 55°C	>72	>72	>72	>72	>72	>72	54	53	53
I-nom 414 mA	Tc 25°C	>72	>72	>72	>72	>72	>72	>72	>72	>72
	Tc-nom 35°C	>72	>72	>72	>72	>72	>72	69	68	67
	Tc-life 55°C	>72	>72	>72	>72	>72	>72	52	51	51
I-life 2880 mA	Tc=25°C	>72	>72	>72	>72	>72	>72	56	55	54
	Tc-nom 35°C	>72	>72	>72	>72	>72	>72	48	47	46
	Tc-life 55°C	>72	>72	>72	>72	>72	>72	36	35	35

Lifetime

Parameter	Value	Unit
M70F50 nominal	>72000	hours
M70F50 life	>72000	hours

Performance Window



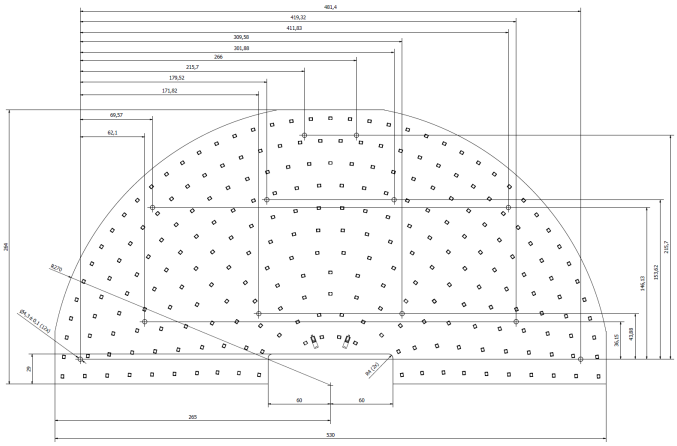
Wiring

Specification item	Value	Unit	Condition
Input wire cross-section	0.25…0.75	mm^2	solid wire
	18…24	AWG	solid wire
Input wire strip length	7.5…8.5	mm	
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	



Mechanical characteristics

Parameter	Min	Typ	Max	Unit
Length	529.7	530	530.3	mm
Width	263.75	264	264.25	mm
Height PCB		1.6		mm
Height	5.9	6.1	6.3	mm
Product mass		366		gram



Absolute ratings

Parameter	Min	Max	Unit
Current through the LED module (I-max)		2880	mA
Case temperature (Tc-max)		85	°C
ESD (direct contact)	8		kV
Working voltage		350	V_{dc}

Application information

Certificates and Standards
CE
ENEC
ENEC+
UL

Environmental
RoHS/REACH

Application	
Dimming	Yes

Suitable for Damp Locations



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