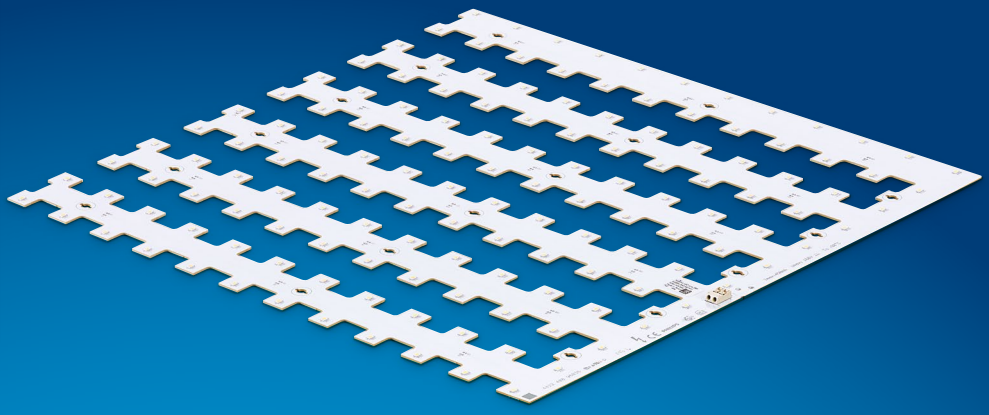
PHILIPS

Fortimo

LED system

LED Square 380 mm
5000 lm LV1



Datasheet

Fortimo **LED Square**

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 up to 143 lm/w
- Long life-time: >50,000 hours
- High color rendering (CRI >80)
- Excellent color consistency of 3 SDCM
- Choice of color temperatures (3000 K and 4000 K)
- Tunable lumen output, efficacy and lifetime
- Wide temperature (Tc) range from -40 °C to +80 °C
- Push-in connectors enabling automated wiring
- Five year system warranty

Suitable for:

Retail Office Industry

March 2015

Zhaga

Ordering data

Commercial product name	EOC	12NC
Fortimo LED Square 380mm 5000lm 830 LV1	8718696 447413 00	9290 009 45106
Fortimo LED Square 380mm 5000lm 840 LV1	8718696 447499 00	9290 009 45506

Drive currents and case temperatures

Parameter	Nominal*	Life**	Max***	Unit
I (current through the LED module)	1012	1800	1800	mA
Tc (case temperature at Tc point)	40	75	80	°C

* Nominal value at which typical performance is specified.
** Value at which lifetime L70B50 ≥ 50,000 hour is specified.
*** Maximum value for safe operation; do not operate above this value.

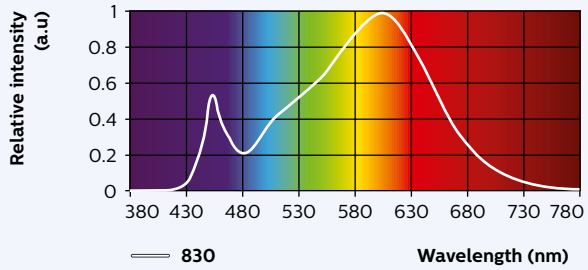
Optical characteristics - table per color (CCT)

Fortimo LED Square 380 mm 5000 lm 830 LV1

Parameter	Min	Typ	Max	Unit
Correlated color temperature (CCT)		3000		K
Color coordinates (CIEx, CIEy)		(0.433, 0.401)		-
CRI	80			-
Radiation angle		120		deg

Color consistency of 3 SDCM, averaged over the module.

Operation point	830	lm	lm/W
80% I-nom 810 mA	Tc 25 °C	3855	136
	Tc-nom 40 °C	3747	134
	Tc-life 75 °C	3482	127
I-nom 1012 mA	Tc 25 °C	4735	132
	Tc-nom 40 °C	**4605**	**129**
	Tc-life 75 °C	4282	122
I-life 1800 mA	Tc 25 °C	7823	115
	Tc-nom 40 °C	7612	113
	Tc-life 75 °C	7092	108



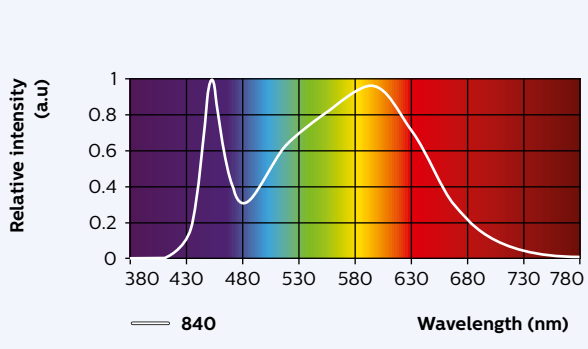
Tolerance for flux data is ±7.5%.
Tolerance for efficacy data is ±10%.

Fortimo LED Square 380 mm 5000 lm 840 LV1

Parameter	Min	Typ	Max	Unit
Correlated color temperature (CCT)		4000		K
Color coordinates (CIEx, CIEy)		(0.381, 0.378)		-
CRI	80			-
Radiation angle		120		deg

Color consistency of 3 SDCM, averaged over the module.

Operation point	840	lm	lm/W
80% I-nom 810 mA	Tc 25 °C	4185	148
	Tc-nom 40 °C	4069	145
	Tc-life 75 °C	3781	138
I-nom 1012 mA	Tc 25 °C	5142	143
	Tc-nom 40 °C	**5000**	**140**
	Tc-life 75 °C	4649	133
I-life 1800 mA	Tc 25 °C	8494	125
	Tc-nom 40 °C	8265	123
	Tc-life 75 °C	7700	117

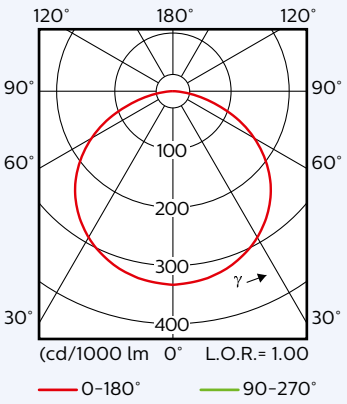


Tolerance for flux data is ±7.5%.
Tolerance for efficacy data is ±10%.

Measurement tolerance is ± 2.5% for the flux data and 5% for the efficacy data.

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

Parameter	Min	Typ	Max	Unit
Nominal current		1012		mA
Forward voltage	34.20	35.3	36.4	V
Power consumption	34.60	35.7	36.8	W
Energy efficiency label		A+		
Minimum dimming for performance	10			%
Number of modules per chain			2	
Bins		N/A		

Specifications stated at Tc-nom and I-nom.

Performance over life

Lumen maintenance

Operation point	Time x 1000 hours	L70			L80			L90		
		B50	B20	B10	B50	B20	B10	B50	B20	B10
80% I-nom 810 mA	Tc 25 °C	>50	>50	>50	>50	>50	>50	27	27	27
	Tc-nom 40 °C	>50	>50	>50	48	48	47	23	22	22
	Tc-life 75 °C	>50	>50	>50	34	33	33	16	16	15
I-nom 1012 mA	Tc 25 °C	>50	>50	>50	>50	>50	>50	27	27	27
	Tc-nom 40 °C	>50	>50	>50	48	48	47	23	22	22
	Tc-life 75 °C	>50	>50	>50	34	33	33	16	16	15
I-life 1800 mA	Tc 25 °C	>50	>50	>50	>50	>50	>50	27	27	27
	Tc-nom 40 °C	>50	>50	>50	48	48	47	23	22	22
	Tc-life 75 °C	>50	>50	>50	34	33	33	16	16	15

Values in the table are based on available LM80 LED data (9000h). Lumen maintenance will be updated once additional measurement data becomes available.

Parameter	Min	Typ	Max	Unit
Δu'v' at 6000 hours			0.007	-

Specifications stated while Tc < Tc-life and I < I-life.

Absolute maximum ratings

Parameter	Min	Typ	Max	Unit
Current through the LED module (I-max)			1800	mA
Case temperature (Tc-max)			80	°C
Power rated at U-max and I-max			72	W
ESD (direct contact)			8	kV
ESD (air)			15	kV
Working voltage (between input to metal mounting plate)			275	Vdc
Voltage strength (Input to metal mounting plate)			1550	Vac
Ambient temperature	-40			°C

Wiring

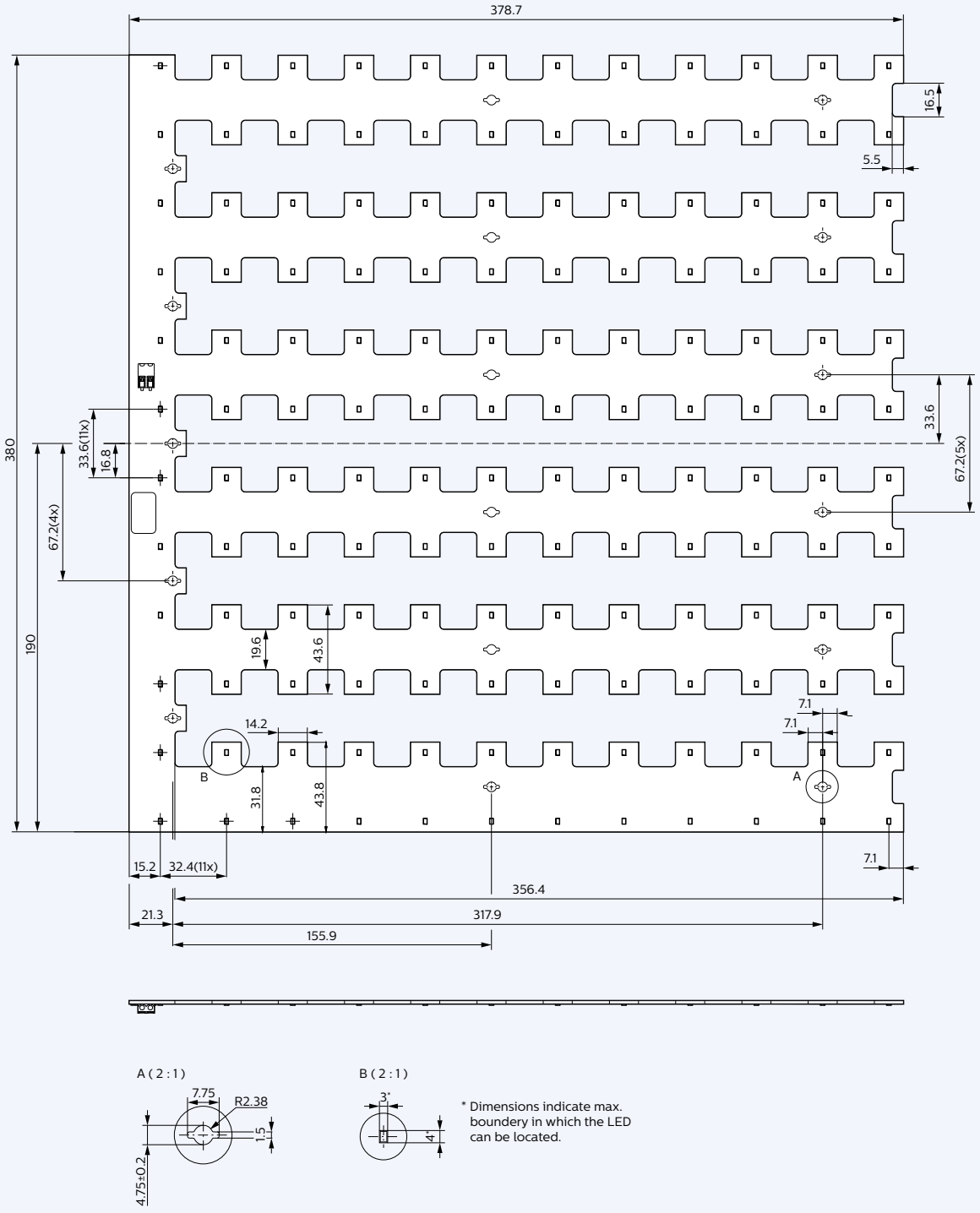
Specification item	Value	Unit	Condition
Input wire cross-section	0.2...0.75	mm^2	Solid
	18...24	AWG	
	0.3..0.5	mm^2	Stranded
	20..22	AWG	
Input wire strip length	7.5..8.5	mm	
Tested cable length	4000	mm	Total length of wiring including LED modules, one way

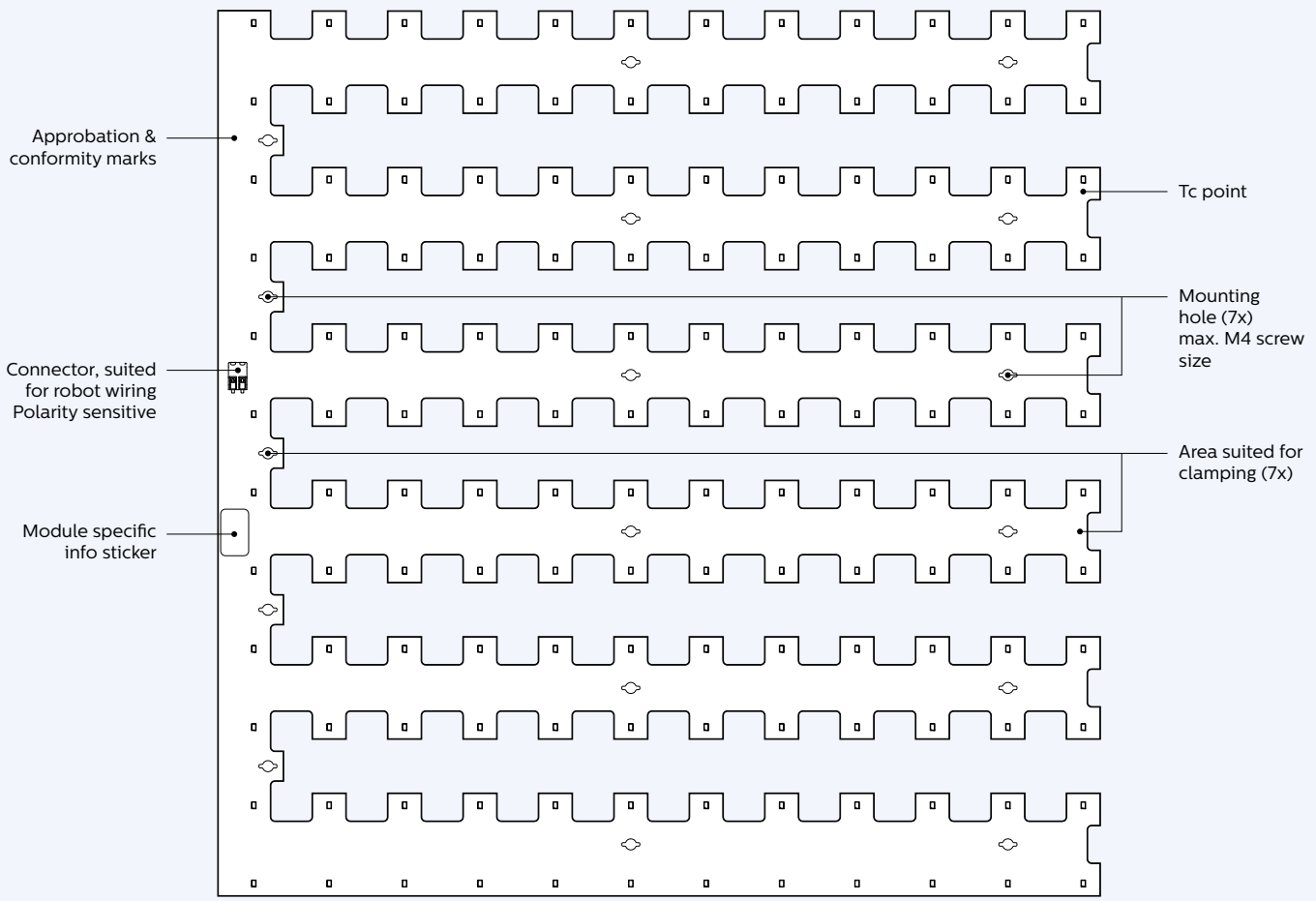
Connector suited for robot wiring.

Mechanical characteristics

Parameter	Min	Typ	Max	Unit
Length	379.5	380	380.5	mm
Width	378.2	378.7	379.2	mm
Height excl. connector	2	2,1	2.2	mm
Height incl. connector	5.6	5.8	6	mm
Warpage (IPC-TM-650)			4	%

Bow & Twist of the PCB after production tested and released according IPC-TM-650 2.4.22.




Approbation &
conformity marks
Connector, suited
for robot wiring
Polarity sensitive
Module specific
info sticker
Tc point
Mounting
hole (7x)
max. M4 screw
size
Area suited for
clamping (7x)

Application information

Compliance and approval
IEC / EN 62031, IEC / EN 62471

Photobiological safety
Risk group: exempt

Environmental
RoHS / REACH

Application information

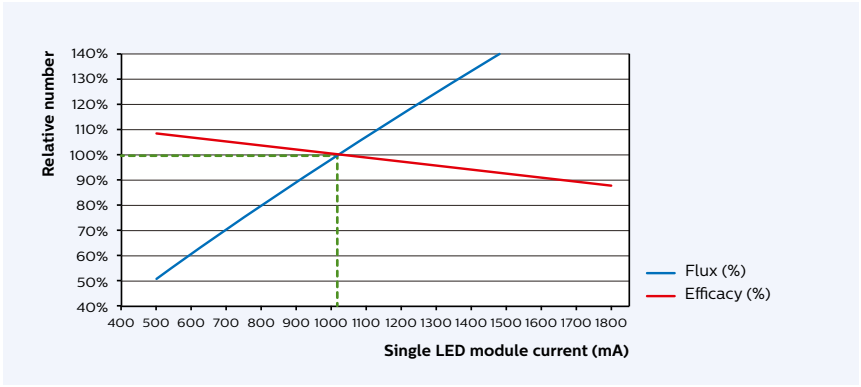
Zhaga	
Designation of the Book-7 LLE category	L38W38
Luminous Flux category	5000
CCT category	3000 K, 4000 K
CRI	80
The position of the temperature measurement point tp	Same as Tc point
The value of tp,max	40

IP rating	**No IP rating**
Overheating protection	No protection
Luminaire class	IEC Class II

Warranted number of full thermal product cycles at which the survival rate of the population ≥90%, at 25 °C ambient temperature

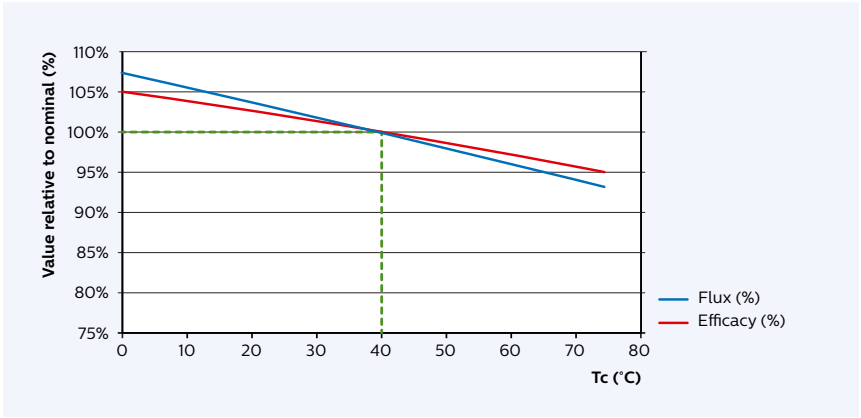
Case temperature Tc [°C]	**Amount of cycles**
35	14,600
40	
45	14,600
50	
55	14,600
60	
65	14,600
70	
75	14,600
80	
85	
90	
95	

Tuning information



Flux and efficacy versus current

	I [mA]	Flux [%]	Efficacy [%]
50% Inom	500	51%	108%
	700	70%	105%
	900	89%	101%
	800	80%	103%
I nom	**1012**	**100%**	**100%**
	1200	116%	97%
	1400	133%	94%
	1600	150%	91%
I-life	1800	166%	88%

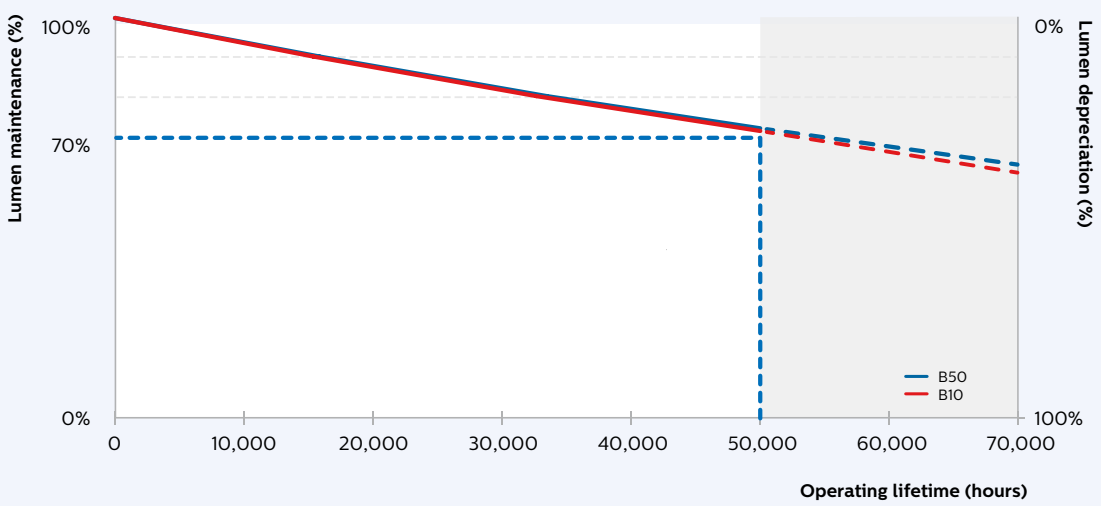


Flux and efficacy versus temperature at Tc

	Tc [°C]	Flux [%]	Efficacy [%]
(0 deg)	0	107%	105%
	25	103%	102%
Tc nom	**40**	**100%**	**100%**
Tc life	75	93%	95%

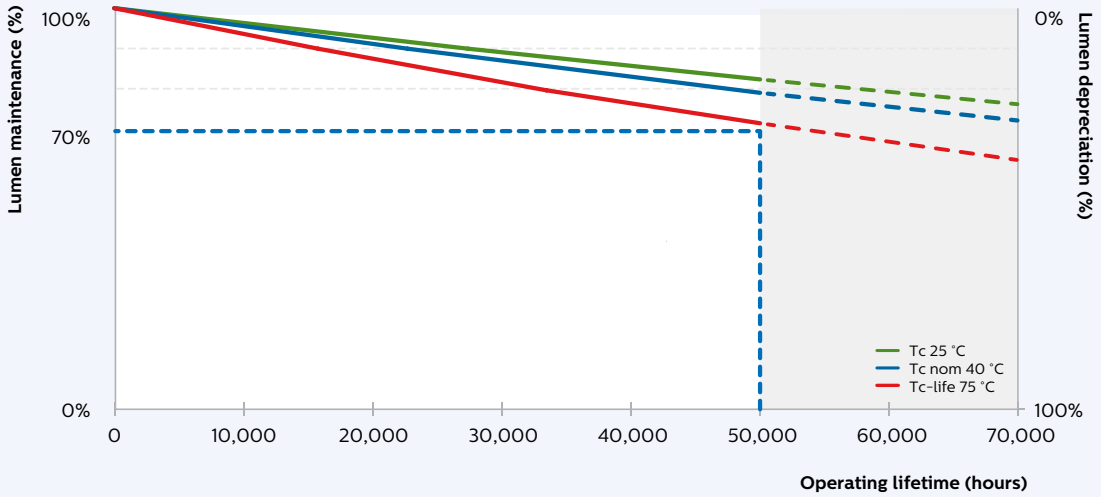
Lumen maintenance

Lumen maintenance at l-life and Tc-life conditions



Lumen depreciation as a function of operating hours for l-life and Tc-life.

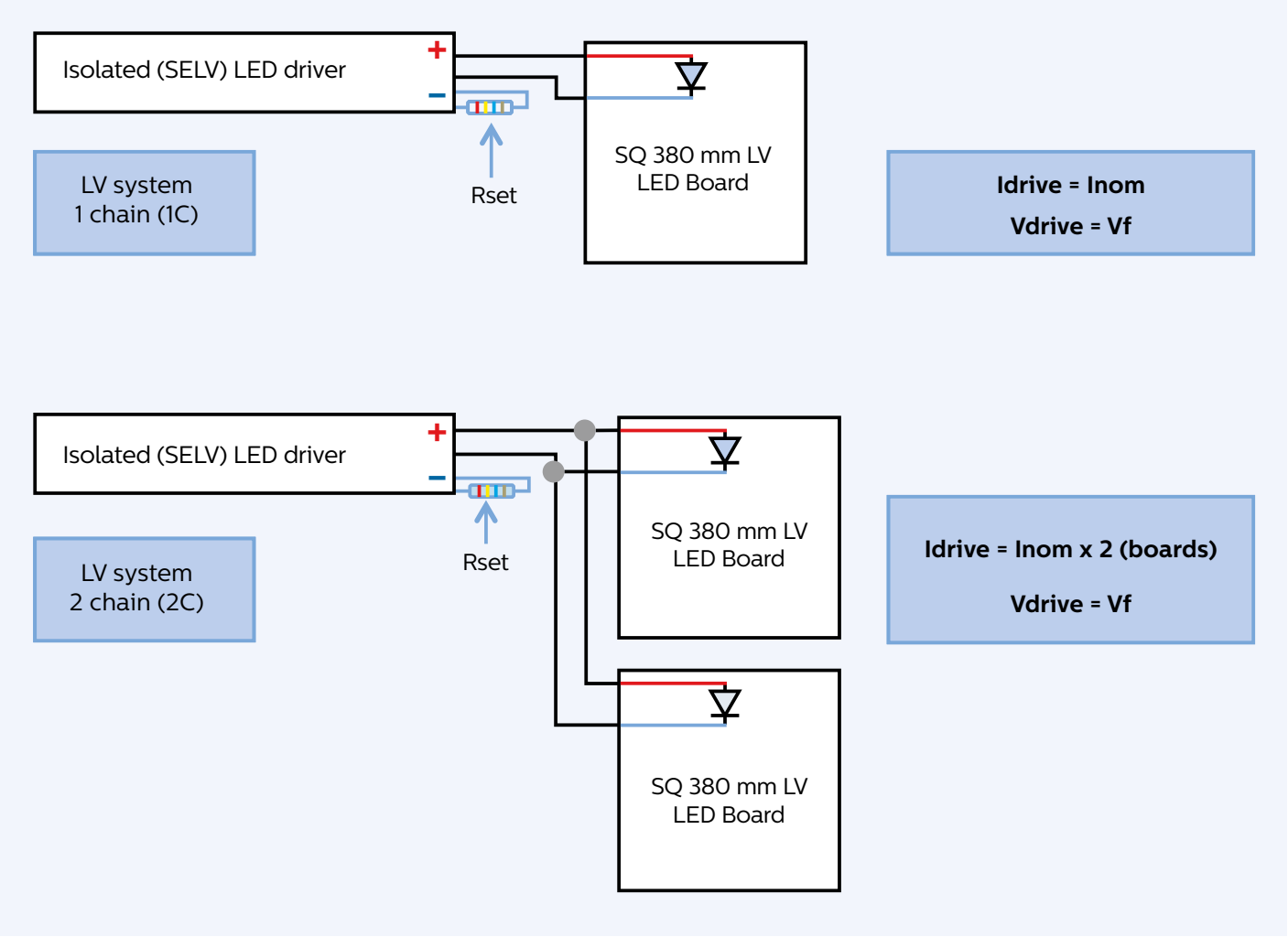
Lumen maintenance for B50 at current l-life conditions

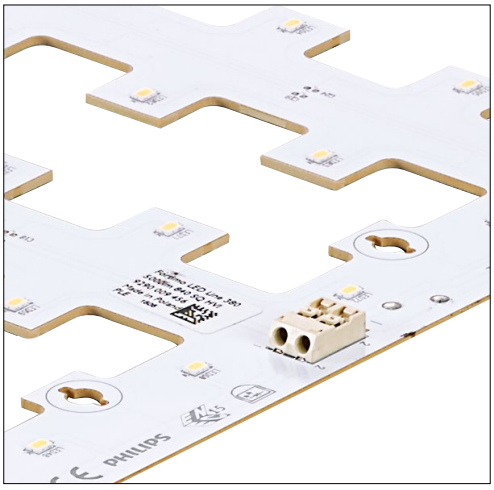


Lumen depreciation as a function of operating hours at different Tc values and l-life.

Wiring schematic

Examples





03/2015
Data subject to change

www.philips.com/technology
www.philips.com/fortimo
www.philips.com/xitanium