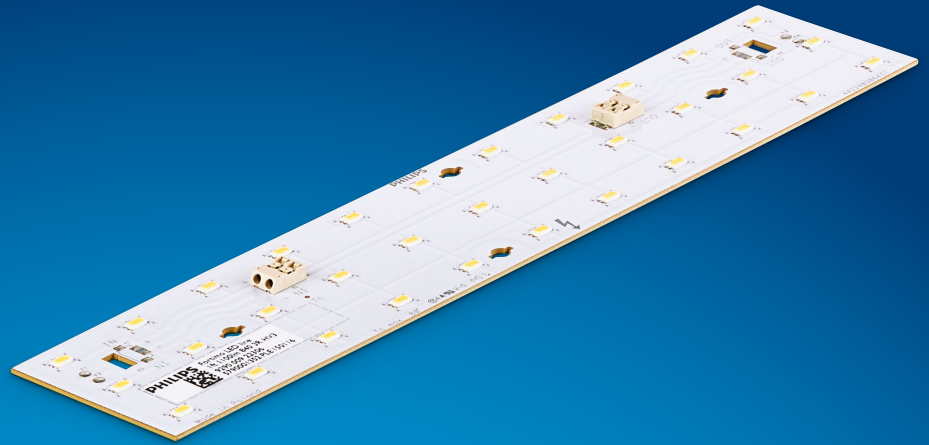


PHILIPS

Fortimo

LED system

LED Line 1 ft
1100 lm 3R HV3



Datasheet

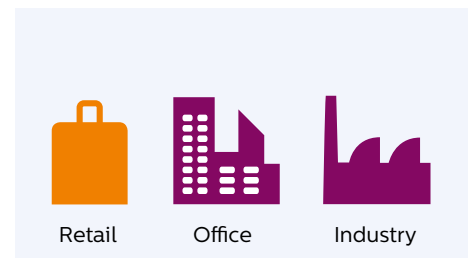
Fortimo LED Line Gen3

Fortimo LED Line systems are designed to produce pure white light for general lighting applications with high efficiency levels. The Fortimo LED Line portfolio consists of 3 main ranges of products, which have been differentiated by the number of rows of LEDs contained on the module. Fortimo LED Linear encompasses a wide range, offering solutions for all the different types of linear luminaires.

Key features and benefits

- State-of-the-art LED module efficiency of up to 165 lm/W
- Long life-time: >50,000 hours
- High color rendering (CRI >80 and >90)
- Excellent color consistency of 3 SDCM
- Choice of color temperatures (3000 K, 4000 K and 5000 K)
- Two lumen packages: 650 lm and 1100 lm per foot/280 mm
- LED module range with 1, 2 or 3 rows of LEDs
- Tunable lumen output, efficacy and lifetime
- Push-in connectors enabling automated wiring
- Five year system warranty

Suitable for:



June 2015



Ordering data

Commercial product name	EOC	12NC
Fortimo LED Line 1ft 1100lm 830 3R HV3	8718696 413555 00	9290 009 22206
Fortimo LED Line 1ft 1100lm 840 3R HV3	8718696 413517 00	9290 009 22306
Fortimo LED Line 1ft 1100lm 850 3R HV3	8718696 413579 00	9290 009 22406

Drive currents and case temperatures

Parameter	Nominal*	Life**	Max***	Unit
I (current through the LED module)	228	450	450	mA
Tc (case temperature at Tc point)	40	80	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 Line 1 ft 1100 lm 830 3R HV3

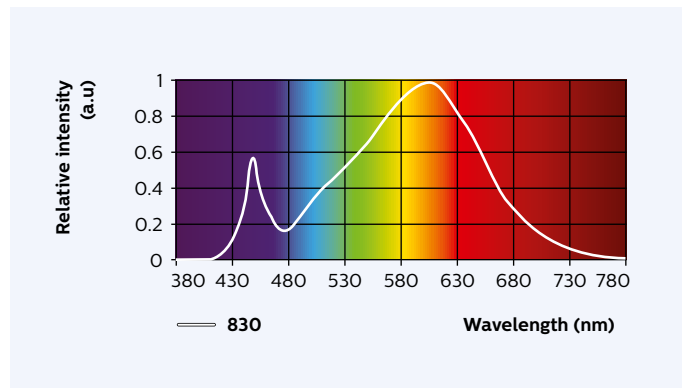
Parameter	Min	Typ	Max	Unit
Correlated color temperature (CCT)		3000		K
Color coordinates (CIEx, CIEy)		(0.432, 0.401)		-
CRI ¹	80			-
Radiation angle		120		deg

Color consistency of 3 SDCM, averaged over the module.

Operation point	830	lm	lm/W
80% I-nom 183 mA	Tc 25 °C	858	162
	Tc-nom 40 °C	841	160
	Tc-life 80 °C	786	155
I-nom 228 mA	Tc 25 °C	1067	157
	Tc-nom 40 °C	1046	156
	Tc-life 80 °C	978	151
I-life 450 mA	Tc 25 °C	2035	138
	Tc-nom 40 °C	1996	137
	Tc-life 80 °C	1867	132

Tolerance for flux data is ±7.5%.

Tolerance for efficacy data is ±10%.



Fortimo LED Line 1 ft 1100 lm 840 3R HV3

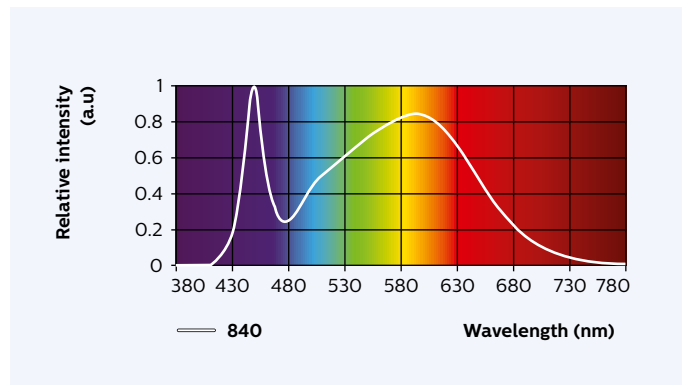
Parameter	Min	Typ	Max	Unit
Correlated color temperature (CCT)		4000		K
Color coordinates (CIEx, CIEy)		(0.383, 0.379)		-
CRI ¹	80			-
Radiation angle		120		deg

Color consistency of 3 SDCM, averaged over the module.

Operation point	840	lm	lm/W
80% I-nom 183 mA	Tc 25 °C	902	170
	Tc-nom 40 °C	884	169
	Tc-life 80 °C	826	163
I-nom 228 mA	Tc 25 °C	1122	165
	Tc-nom 40 °C	1100	164
	Tc-life 80 °C	1029	158
I-life 450 mA	Tc 25 °C	2141	146
	Tc-nom 40 °C	2099	144
	Tc-life 80 °C	1964	139

Tolerance for flux data is ±7.5%.

Tolerance for efficacy data is ±10%.



Fortimo LED Line 1 ft 1100 lm 850 3R HV3

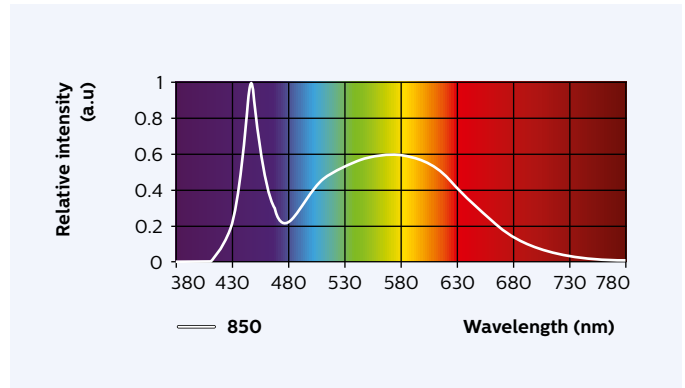
Parameter	Min	Typ	Max	Unit
Correlated color temperature (CCT)		5000		K
Color coordinates (CIEx, CIEy)		(0.345, 0.355)		-
CRI*	80			-
Radiation angle		120		deg

Color consistency of 3 SDCM, averaged over the module.

Operation point	850	lm	lm/W
80% I-nom 183 mA	Tc 25 °C	902	170
	Tc-nom 40 °C	884	169
	Tc-life 80 °C	826	163
I-nom 228 mA	Tc 25 °C	1122	165
	Tc-nom 40 °C	1100	164
	Tc-life 80 °C	1029	158
I-life 450 mA	Tc 25 °C	2141	146
	Tc-nom 40 °C	2099	144
	Tc-life 80 °C	1964	139

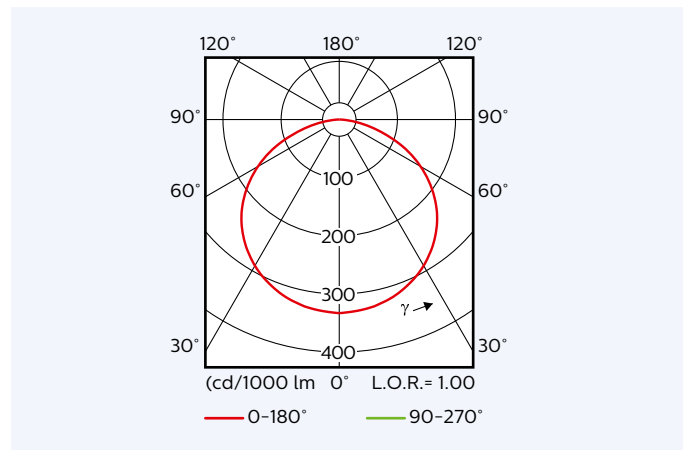
Tolerance for flux data is ±7.5%.
Tolerance for efficacy data is ±10%.

Measurement tolerance is ± 2.5% for the flux data and 5% for the efficacy data.
* Measurement tolerance is ± 1.



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		228		mA
Forward voltage	28	29.4	31.4	V
Power consumption	6.4	6.7	7.2	W
Energy efficiency label		A++		
Minimum dimming for performance	10			%
Number of modules per chain			8	
Bins		2 (C and D)		

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 183 mA	Tc 25 °C	>70	>70	>70	>70	>70	>70	36	35	35
	Tc-nom 40 °C	>70	>70	>70	68	66	65	32	31	31
	Tc-life 80 °C	>70	70	69	45	44	43	21	21	20
I-nom 228 mA	Tc 25 °C	>70	>70	>70	>70	>70	>70	36	35	35
	Tc-nom 40 °C	>70	>70	>70	68	66	65	32	31	31
	Tc-life 80 °C	>70	70	69	45	44	43	21	21	20
I-life 450 mA	Tc 25 °C	>70	>70	>70	66	64	63	31	30	30
	Tc-nom 40 °C	>70	>70	>70	58	56	56	27	27	26
	Tc-life 80 °C	61	60	59	38	37	37	18	18	17

Values in the table are based on available LM80 LED data (12,000h). Lumen maintenance will be updated once additional measurement data becomes available.

Parameter	Min	Typ	Max	Unit
$\Delta u'v'$ at 6000 hours			0.007	-

Specifications stated while $T_c < T_{c-life}$ and $I < I-life$.

Absolute maximum ratings

Parameter	Min	Typ	Max	Unit
Current through the LED module (I-max)			450	mA
Case temperature (Tc-max)			80	°C
Power rated at U-max and I-max			16.2	W
ESD (direct contact)			8	kV
ESD (air)			15	kV
Working voltage (between input to metal mounting plate)			420	Vdc
Voltage strength (Input to metal mounting plate)			1840	Vac
Ambient temperature	-40			°C

Wiring

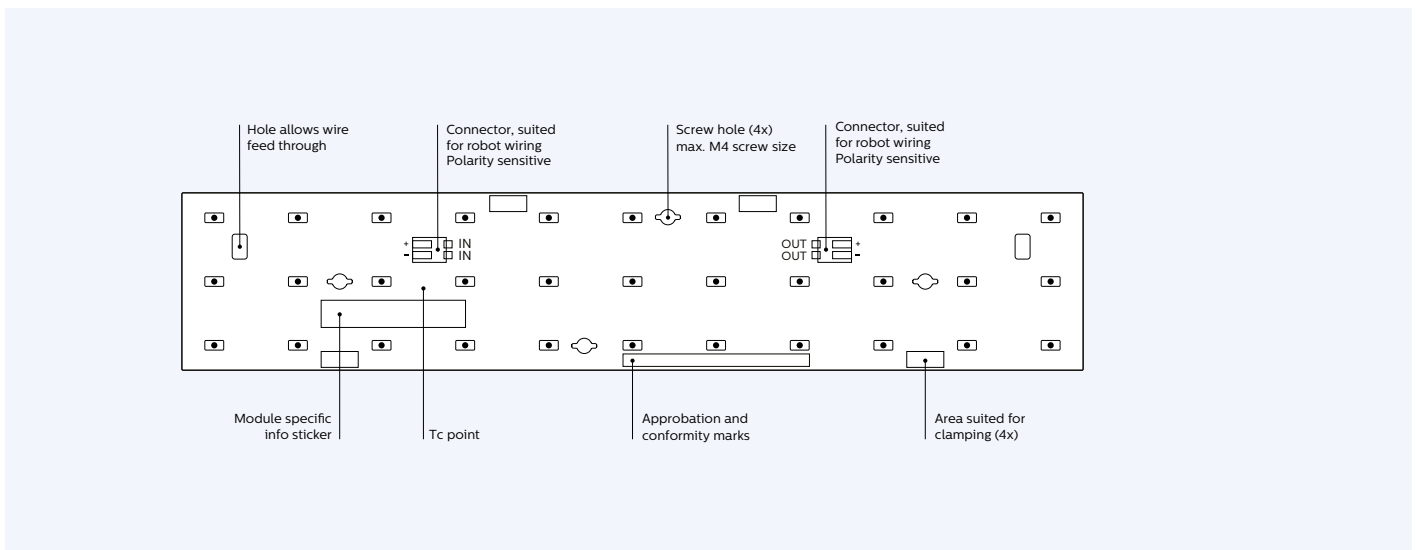
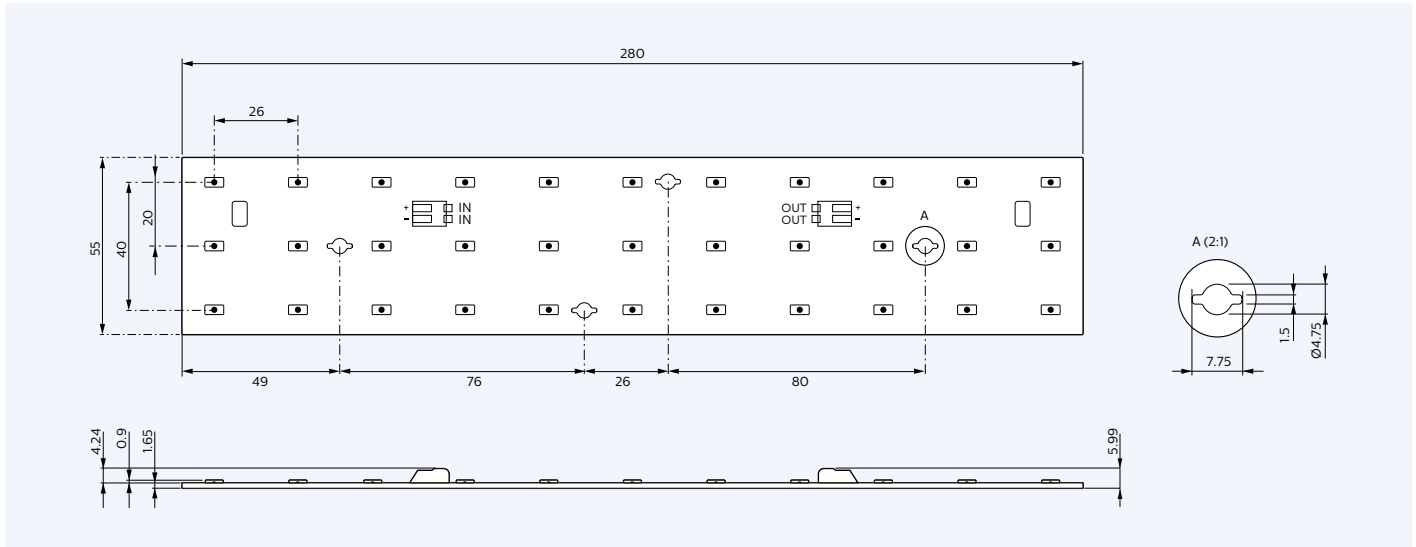
Specification item	Value	Unit	Condition
Input wire cross-section	0.2...0.75	mm ²	Solid
	18...24	AWG	
	0.3...0.5	mm ²	Stranded
	20...22	AWG	
Input wire strip length	7.5..8.5	mm	
Tested cable length	4000	mm	Total length of wiring including LED modules, one way

Connector suited for robot wiring.

Mechanical characteristics

Parameter	Min	Typ	Max	Unit
Length	279.5	280	280.5	mm
Width	54.5	55	55.5	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.



Application information

Compliance and approval

IEC / EN 62031, IEC / EN 62471

Photobiological safety

Risk group: Risk group 1

Environmental

RoHS / REACH

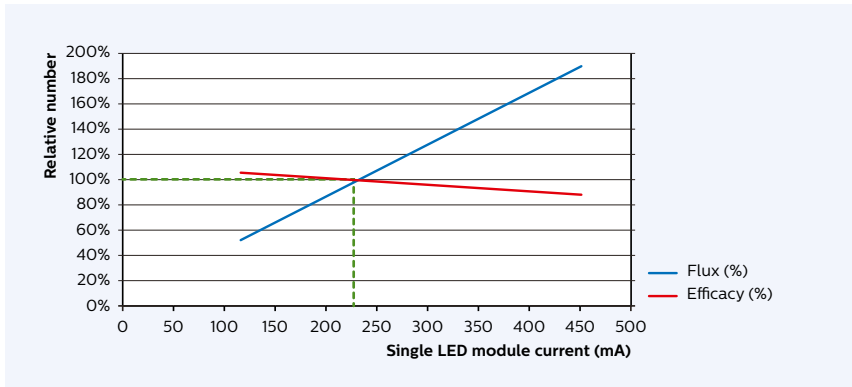
Application information

Zhaga	
Designation of the Book-7 LLE category	L28W6
Luminous Flux category	C011
CCT category	3000 K, 4000 K, 5000 K
CRI	80
The position of the temperature measurement point t_p	Same as T_c point
The value of $t_{p,max}$	40
IP rating	
Overheating protection	No IP rating
Luminaire class	IEC Class I or Class II

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

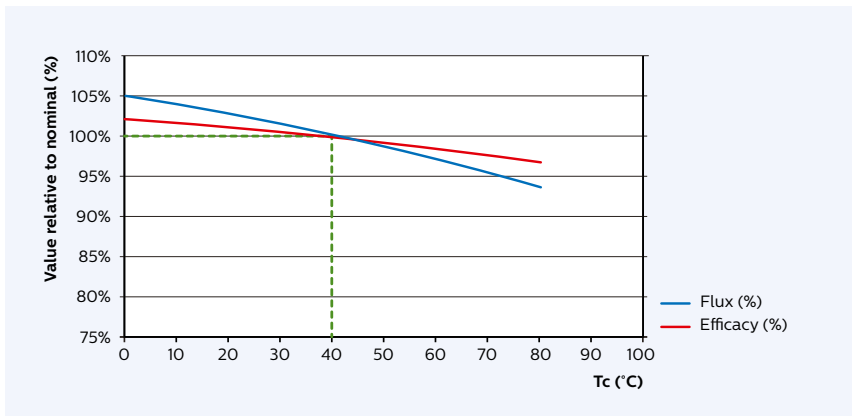
Case temperature T_c [°C]	Amount of cycles
35	14,600
40	
45	14,600
50	
55	14,600
60	
65	14,600
70	
75	
80	14,600

Tuning information



Flux and efficacy versus current

	I [mA]	Flux [%]	Efficacy [%]
(I-nom x 50%)	115	51%	107%
	140	62%	105%
	170	75%	104%
	200	88%	102%
	228	100%	100%
(I-nom)	260	114%	98%
	290	126%	96%
	320	139%	95%
	350	151%	93%
	380	163%	91%
(I-life)	410	175%	90%
	450	191%	88%

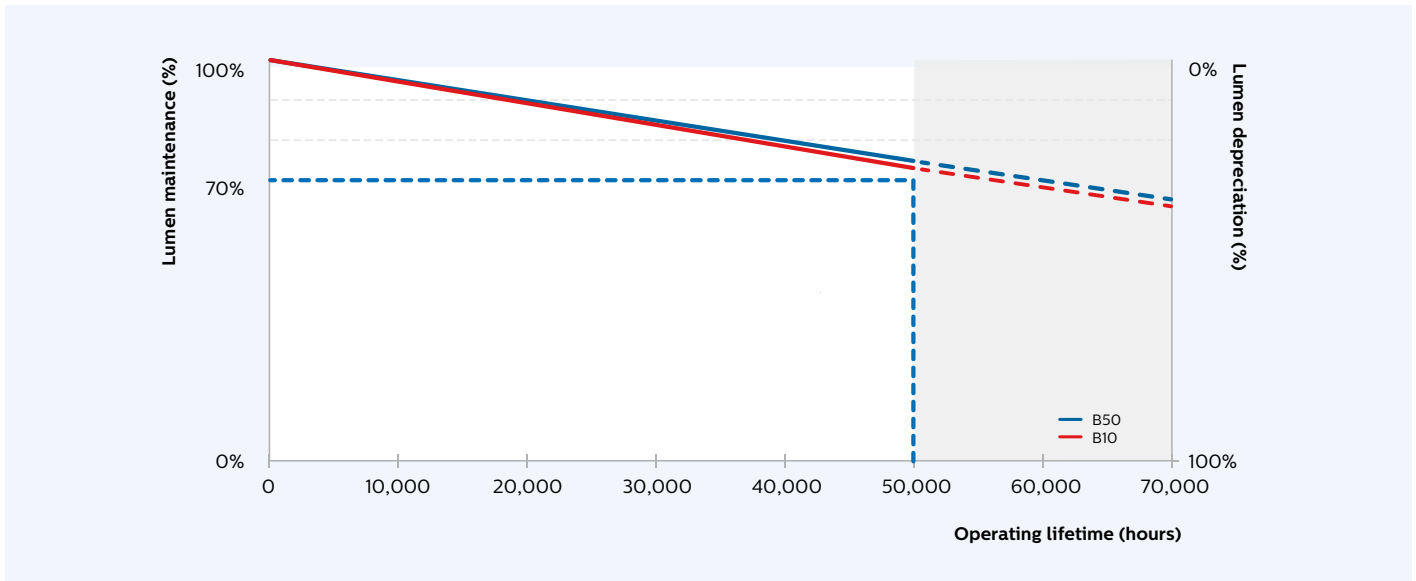


Flux and efficacy versus temperature at Tc

	Tc [°C]	Flux [%]	Efficacy [%]
(Tc-life)	80	94%	97%
	75	94%	97%
	70	95%	98%
(Tc-nom)	40	100%	100%
	25	102%	101%
	0	105%	102%

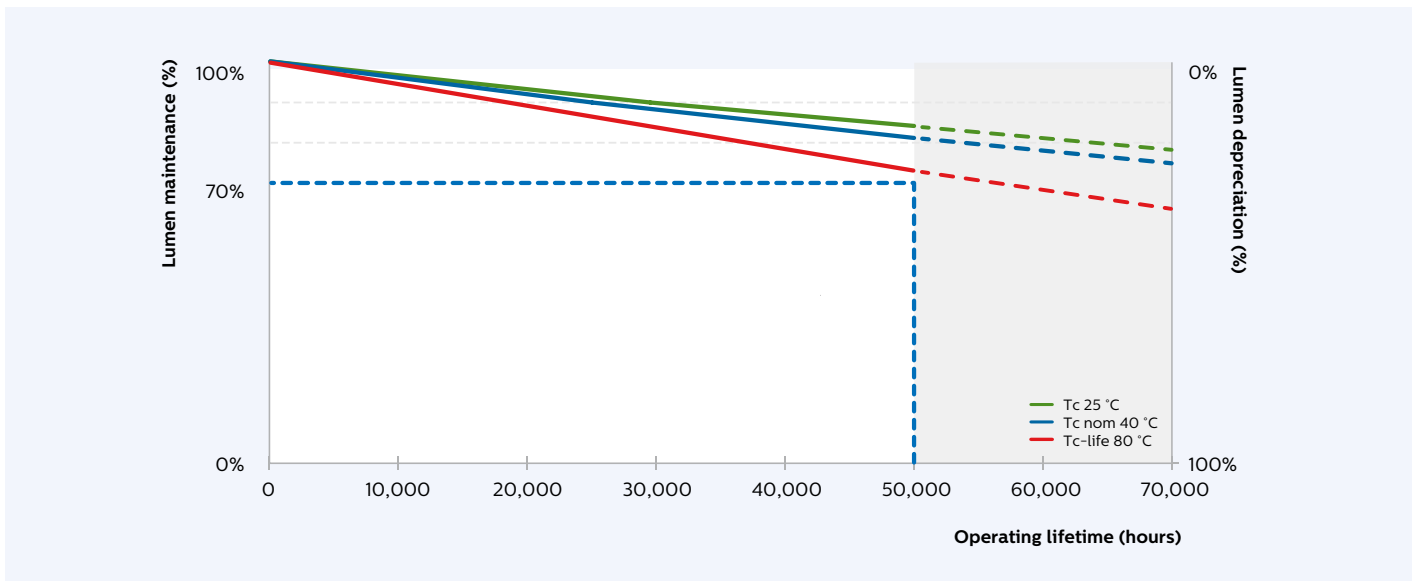
Lumen maintenance

Lumen maintenance at I-life and Tc-life conditions



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

Lumen maintenance for B50 at current I-life conditions



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

Wiring schematic

Examples

