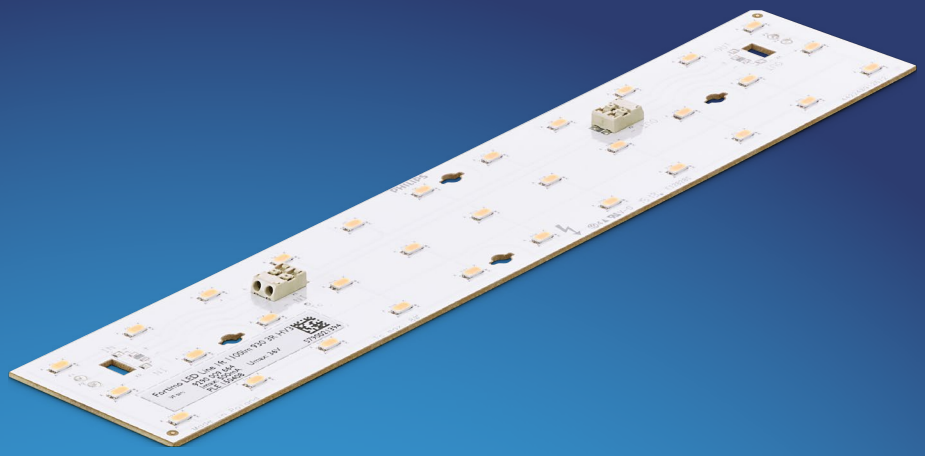
PHILIPS

Fortimo

LED system

LED Line 1 ft
1100 lm 9xx 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:

Zhaga

June 2015

Ordering data

Commercial product name	EOC	12NC
Fortimo LED Line 1ft 1100lm 930 3R HV3	8718696 481141 00	9290 009 66406
Fortimo LED Line 1ft 1100lm 940 3R HV3	8718696 413616 00	9290 009 22606

Drive currents and case temperatures

Parameter	Nominal*	Life**	Max***	Unit
I (current through the LED module)	260	400	400	mA
Tc (case temperature at Tc point)	45	80	85	°C

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

Optical characteristics - table per color (CCT)

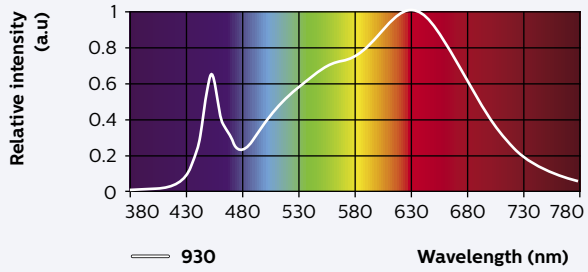
Fortimo LED Line 1ft 1100 lm 930 3R HV3

Parameter	Min	Typ	Max	Unit
Correlated color temperature (CCT)		3000		K
Color coordinates (CIEx, CIEy)		(0.431 , 0.397)		-
CRI*	90			-
Radiation angle		120		deg

Color consistency of 3 SDCM, averaged over the module.

Operation point	3000K	lm	lm/W
80% I-nom 208 mA	Tc 25 °C	834	128
	Tc-nom 45 °C	812	126
	Tc-life 80 °C	765	121
I-nom 260 mA	Tc 25 °C	1017	125
	Tc-nom 45 °C	**990**	**123**
	Tc-life 80 °C	933	118
I-life 400 mA	Tc 25 °C	1501	117
	Tc-nom 45 °C	1462	115
	Tc-life 80 °C	1377	110

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



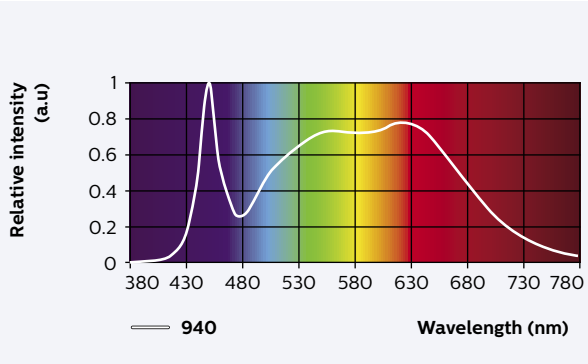
Fortimo LED Line 1ft 1100 lm 940 3R HV3

Parameter	Min	Typ	Max	Unit
Correlated color temperature (CCT)		4000		K
Color coordinates (CIEx, CIEy)		(0.379 , 0.374)		-
CRI*	90			-
Radiation angle		120		deg

Color consistency of 3 SDCM, averaged over the module.

Operation point	4000K	lm	lm/W
80% I-nom 208 mA	Tc 25 °C	926	143
	Tc-nom 45 °C	902	140
	Tc-life 80 °C	850	135
I-nom 260 mA	Tc 25°C	1130	139
	Tc-nom 45 °C	**1100**	**137**
	Tc-life 80 °C	1036	131
I-life 400 mA	Tc 25 °C	1668	130
	Tc-nom 45 °C	1624	128
	Tc-life 80 °C	1530	122

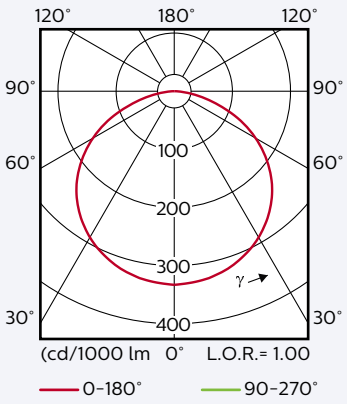
Tolerance for flux data is ±7.5%.
Tolerance for efficacy data is ±10%.



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		260		mA
Forward voltage	29.6	31.0	32.4	V
Power consumption	7.7	8.1	8.4	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 208 mA	Tc 25 °C	>50	>50	>50	>50	>50	>50	>50	>50	>50
	Tc-nom 45 °C	>50	>50	>50	>50	>50	>50	>50	>50	>50
	Tc-life 80 °C	>50	>50	>50	>50	>50	>50	35	34	33
I-nom 260 mA	Tc 25 °C	>50	>50	>50	>50	>50	>50	>50	>50	>50
	Tc-nom 45 °C	>50	>50	>50	>50	>50	>50	>50	>50	>50
	Tc-life 80 °C	>50	>50	>50	>50	>50	>50	35	34	33
I-life 400 mA	Tc 25 °C	>50	>50	>50	>50	>50	>50	>50	>50	>50
	Tc-nom 45 °C	>50	>50	>50	>50	>50	>50	>50	>50	>50
	Tc-life 80 °C	>50	>50	>50	>50	>50	>50	31	30	30

Values in the table are based on available LM80 LED data (8000h). Lumen maintenance will be updated once additional measurement data becomes available.
50k hours claim is based on extrapolating raw LM80-data to lower temperatures and currents by using statistical techniques.

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)			400	mA
Case temperature (Tc-max)			85	°C
Power rated at U-max and I-max			14.4	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

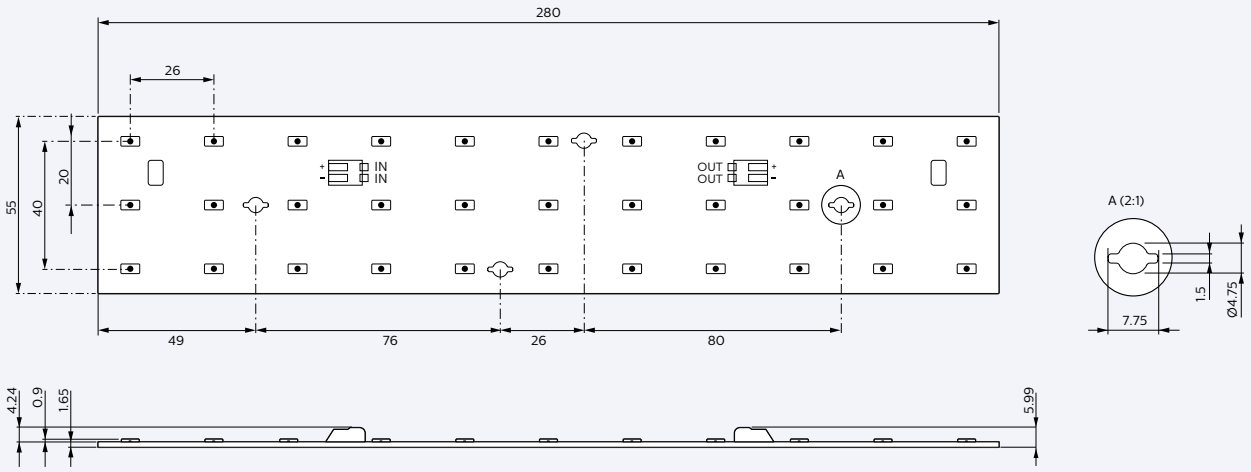
Specification item	Value	Unit	Condition
Input wire cross-section	0.2...0.75	mm^2	Solid
	18...24	AWG	
	0.3..0.5	mm^2	Stranded
	20..22	AWG	
Input wire strip length	7.5..8.5	mm	
Tested cable length	4000	mm	Total length of wiring including LED modules, one way

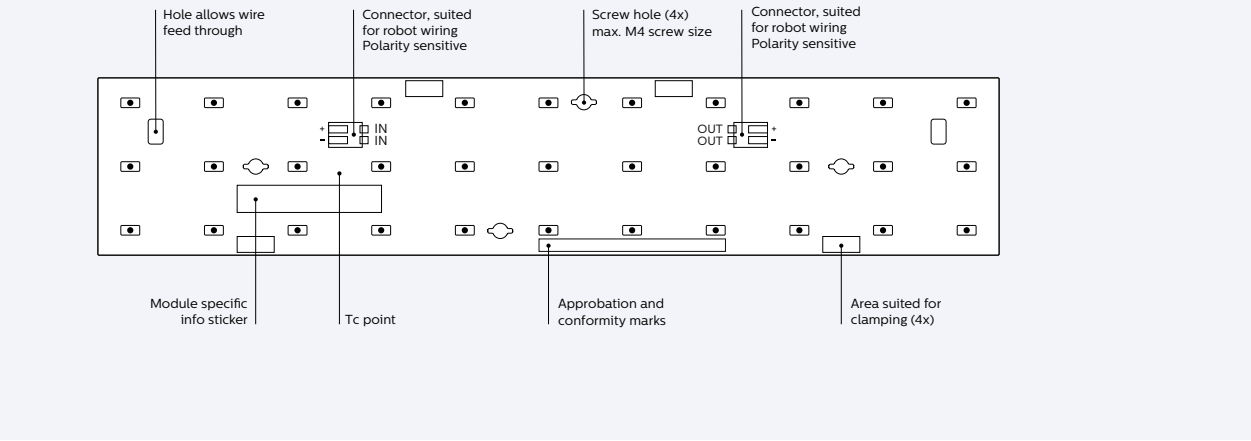
Connector suited for robot wiring.

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	mm

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

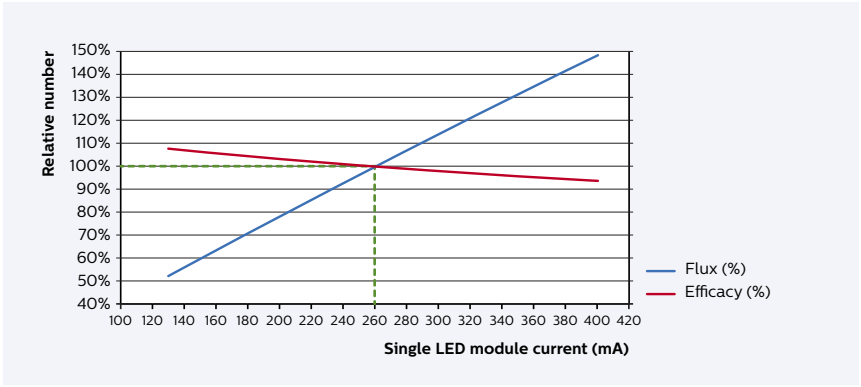
Zhaga	
Designation of the Book-7 LLE category	L28W6
Luminous Flux category	C011
CCT category	3000 K, 4000 K
CRI	90
The position of the temperature measurement point tp	Same as Tc point
The value of tp,max	45

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

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

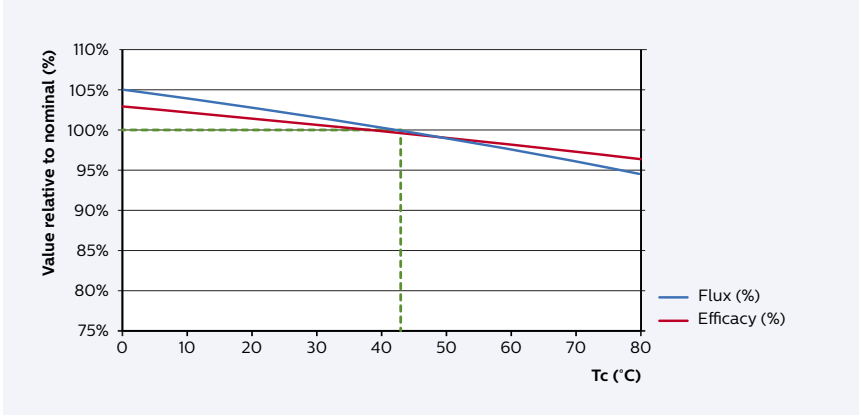
Case temperature Tc [°C]	**Amount of cycles**
35	14,600
40	14,600
45	14,600
50	14,600
55	14,600
60	14,600
65	14,600
70	14,600
75	14,600
80	14,600
85	14,600

Tuning information



Flux and efficacy versus current

	I [mA]	Flux [%]	Efficacy [%]
50% I nom	130	52%	107%
	140	56%	107%
	150	60%	106%
	160	63%	106%
	170	**67%**	**105%**
	180	71%	104%
	190	75%	104%
	200	78%	103%
80% Inom	210	82%	103%
	220	86%	102%
	230	89%	102%
	240	93%	101%
	250	96%	101%
Inom	**260**	**100%**	**100%**
	270	104%	99%
	280	107%	99%
	290	111%	98%
	300	114%	98%
	310	117%	97%
	320	121%	97%
	330	124%	97%
	340	128%	96%
	350	131%	96%
	360	135%	95%
	370	138%	95%
	380	141%	94%
	390	145%	94%
I Life	400	148%	93%

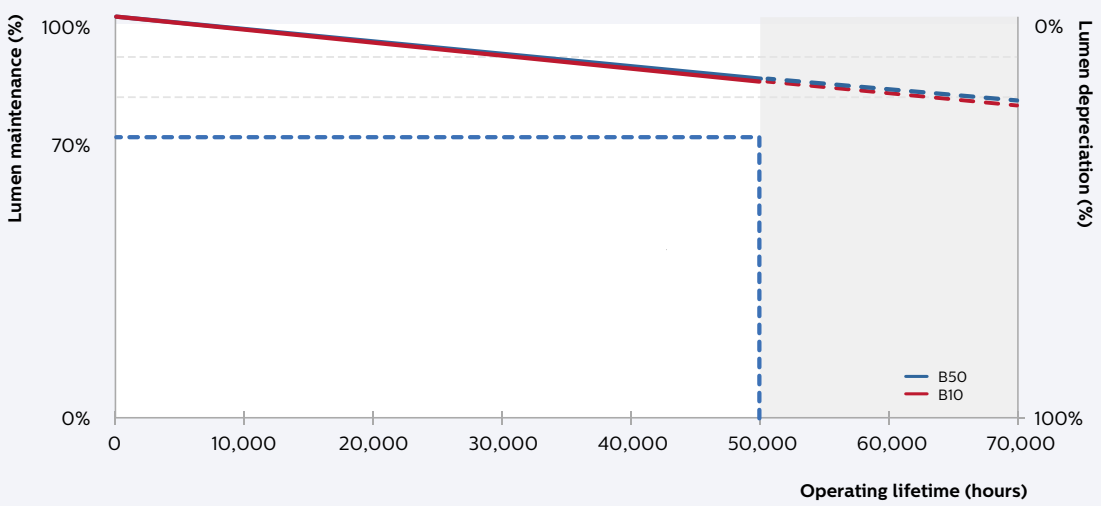


Flux and efficacy versus temperature at Tc

	Tc [°C]	Flux [%]	Efficacy [%]
	0	106%	103%
	15	104%	102%
	25	102%	101%
	35	**101%**	**100%**
Tc nom	**45**	**100%**	**99%**
	55	98%	99%
	65	97%	98%
	75	95%	97%
Tc Life	80	95%	96%

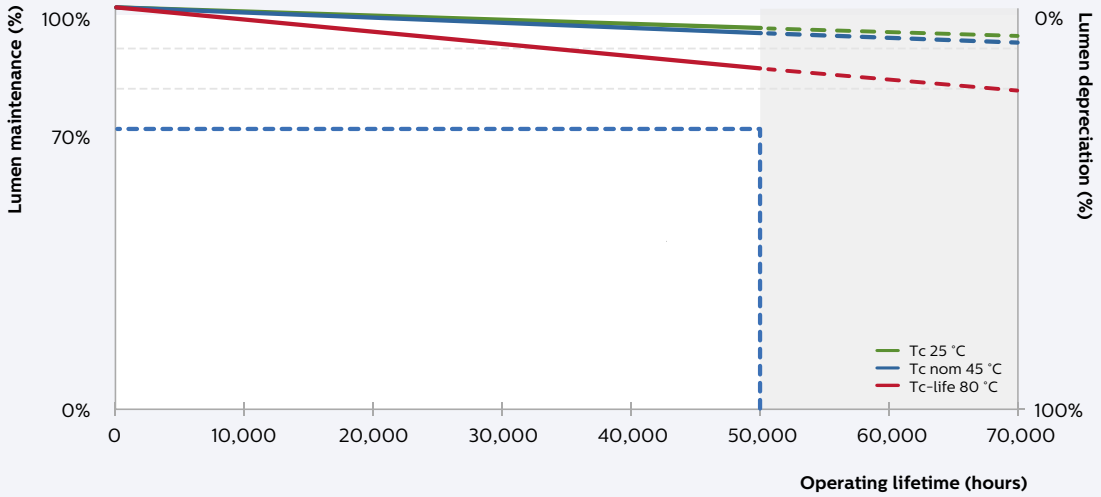
Lumen maintenance

Lumen maintenance at l-life and Tc-life conditions



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

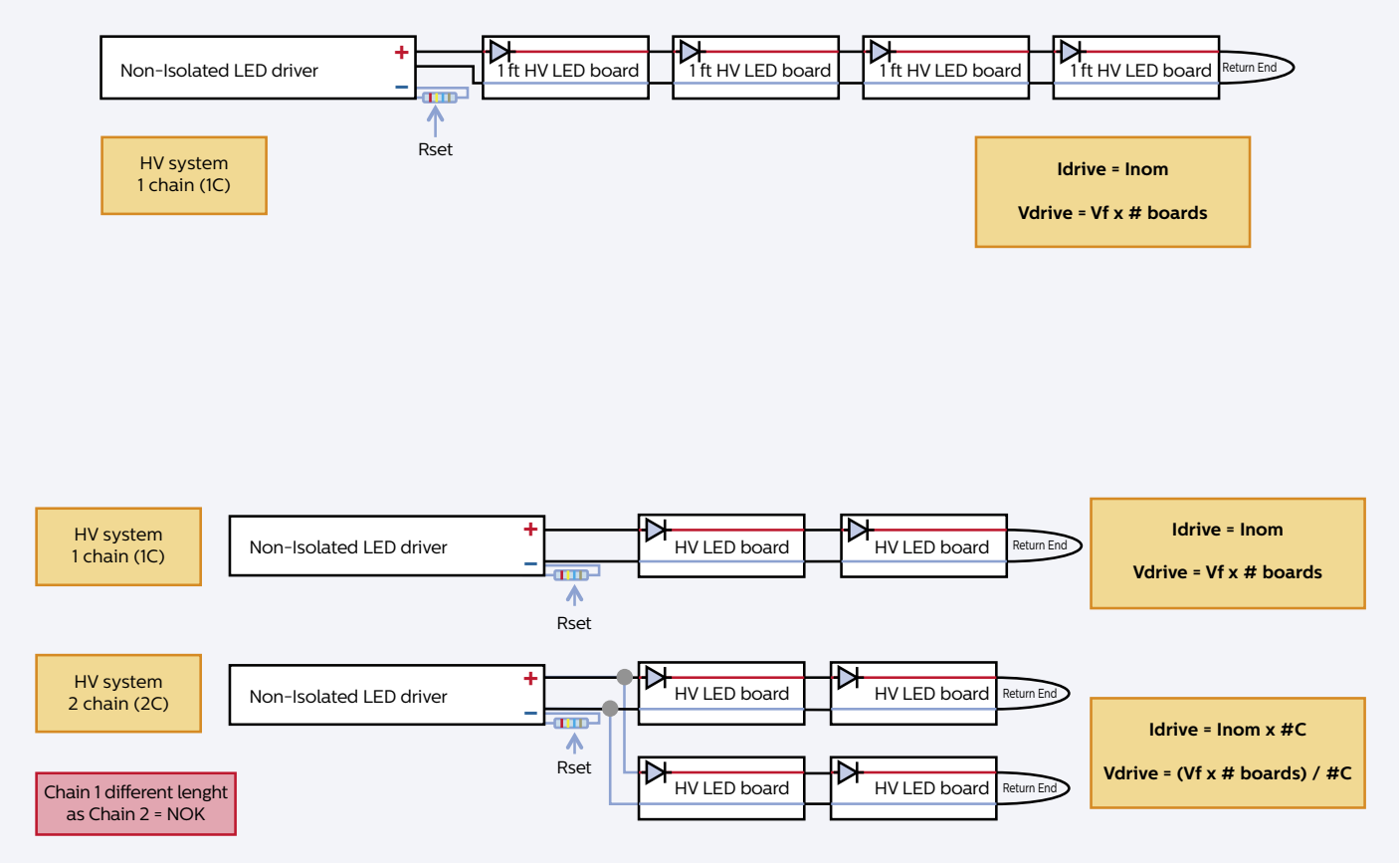
Lumen maintenance for B50 at current l-life conditions

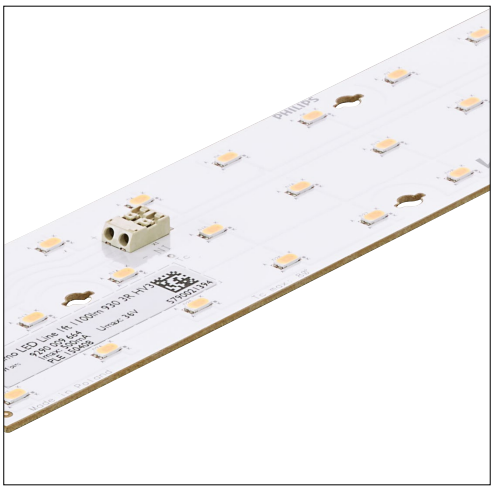


Lumen depreciation as a function of operating hours at different Tc values and l-life.

Wiring schematic

Examples





06/2015
Data subject to change

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