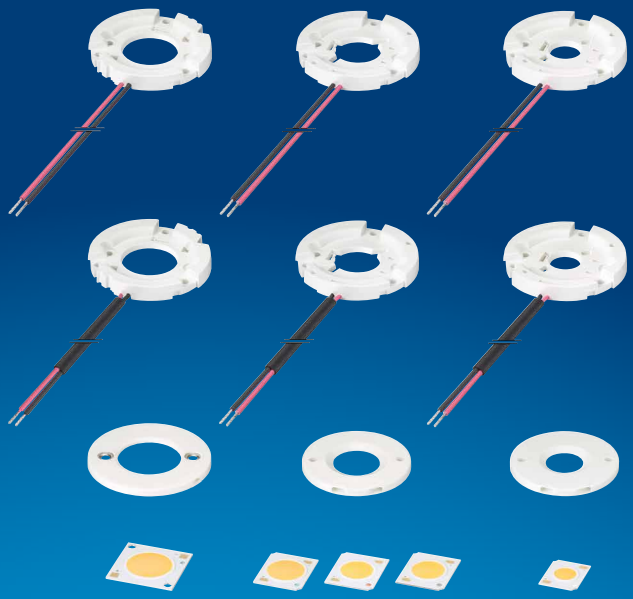
PHILIPS

Fortimo

LED system

SLM CW Gen5



Datasheet

Experience **bright and vivid** colors

Fortimo SLM CrispWhite Gen5

Fortimo LED SLM Gen5 continues to focus on the combination of Quality of Light and performance. By offering the CoB separate from the holder, even more flexibility in possible system combinations and specifications is achieved. This results in an extensive portfolio of lumen ranges, CCTs and spectras. Please also check the online Easy Design-in Tool for your perfect system combination (www.easydesignintool.com)

Key features and benefits

- High quality of white light
- Small LES for narrow beam angles and small reflector designs
- Flexibility to select a different lumen output between 700 and 6000 lm
- High energy efficacy of up to 147 lm/W or even higher
- System proposition (CoB + Holder + driver)
- Xitanium window drivers with SimpleSet for maximum flexibility
- Mini drivers for smallest possible luminaire designs
- Five years system warranty
- Over 50,000 hours lifetime
- Three dedicated product lines:
  - SLM Gen5 Premium White
  - SLM Gen5 CrispWhite
  - SLM Gen5 Food

October 2015

This product is available in the following options. It is possible to combine these with any of the holders from the portfolio. The customer has full flexibility to tune the CoB to get the required lumen output and/or efficacy. More details can be found further on in the document.

Ordering data

Commercial product name	EOC	12NC
Fortimo SLM C 930 CW 1203 L09 1619 G5	6947939 117758 00	9290 009 84480
Fortimo SLM C 930 CW 1204 L13 2024 G5	6947939 118076 00	9290 009 85580
Fortimo SLM C 930 CW 1205 L13 2024 G5	6947939 118250 00	9290 009 86480
Fortimo SLM C 930 CW 1208 L15 2024 G5	6947939 118472 00	9290 009 87380
Fortimo SLM C 930 CW 1211 L19 2828 G5	6947939 118496 00	9290 009 88280

Drive currents and case temperatures

Parameter	CoB	Nominal*	Life**	Max***
I (current through the LED module	1203	300	300	510
	1204	300	300	780
	1205	500	500	1050
	1208	950	950	1500
	1211	1200	1200	1500
Tc (Case temperature at Tc point)	1203	85	85	95
	1204	85	85	95
	1205	85	85	95
	1208	85	85	95
	1211	85	85	95

* Nominal value at which typical performance is specified.
** Value at which lifetime is specified.
*** Maximum value for safe operation, do not operate above this value.

Electrical Characteristics

Parameter	CoB	Min	Typ	Max	Unit
Forward Voltage	1203		35.2	37.7	V
	1204		34.1	36.6	V
	1205		34.7	37.2	V
	1208		35.4	37.9	V
	1211		35.4	37.9	V
Power consumption	1203		10.6	11.3	W
	1204		10.2	11	W
	1205		17.4	18.6	W
	1208		33.6	36	W
	1211		42.4	45.4	W

Specifications stated at Tc-nom and I-nom.

Absolute Maximum Ratings

Parameter	Min	Typ	Max	Unit
Case temperature (Tc-max)			95	°C
Power at rated Tc-max and I-max - 1203			18.9	W
Power at rated Tc-max and I-max - 1204			29.3	W
Power at rated Tc-max and I-max - 1205			39.7	W
Power at rated Tc-max and I-max - 1208			55.5	W
Power at rated Tc-max and I-max - 1211			53.9	W
ESD Human Body Model (HBM) Class 3A JESD22-A114-E 8 kV			8	kV
ESD Machine Model (MM) Class B JESD22-A115-B			400	kV
Ambient temperature	-20		40	°C
Storage temperature	-40		80	°C

Optical characteristics

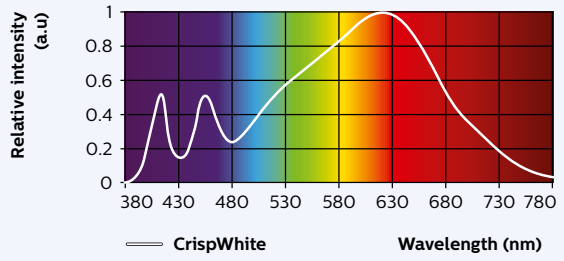
Fortimo SLM CW 1203 L9 G5

Parameter	Min	Typ	Max	Unit
Correlated color temperature (CCT) range		3000		K
Color Coordinates (CIEx, CIEy)		(0.430, 0.395)		-
CRI	90			-
Energy Efficiency Label		A+		-
Radiation angle		115		deg

Color consistency of 3 SDCM, averaged over the module.
Tolerance of ± 0.005 on x, y coordinates.

Operation point	1203	lm	lm/W
80% I-nom 240 mA	Tc 65 °C	790	94
	Tc-nom 85 °C	750	91
	Tc-max 95 °C	730	88
I-nom = I - life 300 mA	Tc 65 °C	960	90
	Tc-nom 85 °C	910	86
	Tc-max 95 °C	880	84
I-max 510 mA	Tc 65 °C	1450	75
	Tc-nom 85 °C	1370	72
	Tc-max 95 °C	1330	70

Tolerance for flux data is ±10%.
Tolerance for Vf data is ±10%.
Tolerance for efficacy data is dependent on the above mentioned tolerances.
Please refer to the warranty window to ensure that your operating conditions are covered.



Note: Performance above already considers 1-3% optical loss when holder is added to the COB. added to the COB.

Ri	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
92	93	95	94	90	92	93	91	84	64	86	89	84	93	96	92

Optical characteristics

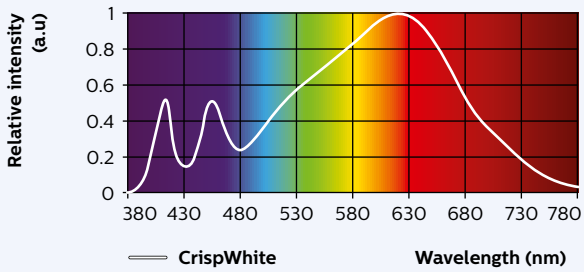
Fortimo SLM CW 1204 L13 G5

Parameter	Min	Typ	Max	Unit
Correlated color temperature (CCT) range		3000		K
Color Coordinates (CIEx, CIEy)		(0.430, 0.395)		-
CRI	90			-
Energy Efficiency Label		A+		-
Radiation angle		115		deg

Color consistency of 3 SDCM, averaged over the module.
Tolerance of ± 0.005 on x, y coordinates.

Operation point	1204	lm	lm/W
80% I-nom 240 mA	Tc 65 °C	810	100
	Tc-nom 85 °C	790	98
	Tc-max 95 °C	780	97
I-nom = I - life 300 mA	Tc 65 °C	990	96
	Tc-nom 85 °C	960	93
	Tc-max 95 °C	940	92
I-max 780 mA	Tc 65 °C	2170	73
	Tc-nom 85 °C	2060	70
	Tc-max 95 °C	2000	68

Tolerance for flux data is ±10%.
Tolerance for Vf data is ±10%.
Tolerance for efficacy data is dependent on the above mentioned tolerances.
Please refer to the warranty window to ensure that your operating conditions are covered.



Note: Performance above already considers 1-3% optical loss when holder is added to the COB. added to the COB.

Ri	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
92	93	95	94	90	92	93	91	84	64	86	89	84	93	96	92

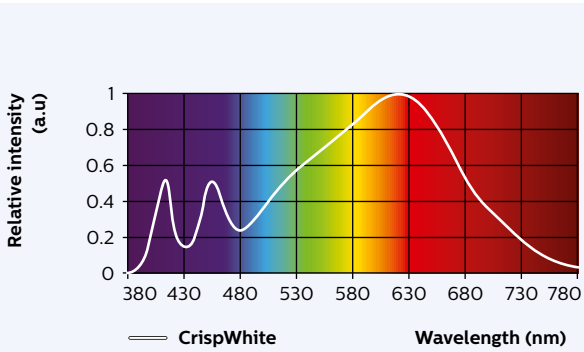
Fortimo SLM CW 1205 L13 G5

Parameter	Min	Typ	Max	Unit
Correlated color temperature (CCT) range		3000		K
Color Coordinates (CIEx, CIEy)		(0.430, 0.395)		-
CRI	90			-
Energy Efficiency Label		A+		-
Radiation angle		115		deg

Color consistency of 3 SDCM, averaged over the module.
Tolerance of ± 0.005 on x, y coordinates.

Operation point	1205	lm	lm/W
80% I-nom 400 mA	Tc 65 °C	1360	98
	Tc-nom 85 °C	1300	95
	Tc-max 95 °C	1260	93
I-nom = I - life 500 mA	Tc 65 °C	1650	94
	Tc-nom 85 °C	1570	90
	Tc-max 95 °C	1530	89
I-max 1050 mA	Tc 65 °C	2980	74
	Tc-nom 85 °C	2840	71
	Tc-max 95 °C	2760	70

Tolerance for flux data is ±10%.
Tolerance for Vf data is ±10%.
Tolerance for efficacy data is dependent on the above mentioned tolerances.
Please refer to the warranty window to ensure that your operating conditions are covered.



Note: Performance above already considers 1-3% optical loss when holder is added to the COB. added to the COB.

Ri	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
92	93	95	94	90	92	93	91	84	64	86	89	84	93	96	92

Optical characteristics

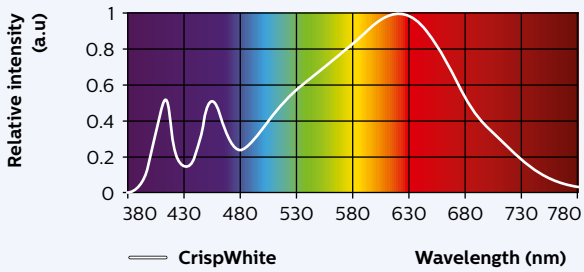
Fortimo SLM CW 1208 L15 G5

Parameter	Min	Typ	Max	Unit
Correlated color temperature (CCT) range		3000		K
Color Coordinates (CIEx, CIEy)		(0.430, 0.395)		-
CRI	90			-
Energy Efficiency Label		A		-
Radiation angle		115		deg

Color consistency of 3 SDCM, averaged over the module.
Tolerance of ± 0.005 on x, y coordinates.

Operation point	1208	lm	lm/W
80% I-nom 760 mA	Tc 65 °C	2430	91
	Tc-nom 85 °C	2310	87
	Tc-max 95 °C	2240	85
I-nom = I - life 950 mA	Tc 65 °C	2930	86
	Tc-nom 85 °C	2770	82
	Tc-max 95 °C	2680	80
I-max 1500 mA	Tc 65 °C	4170	74
	Tc-nom 85 °C	3940	71
	Tc-max 95 °C	3810	69

Tolerance for flux data is ±10%.
Tolerance for Vf data is ±10%.
Tolerance for efficacy data is dependent on the above mentioned tolerances.
Please refer to the warranty window to ensure that your operating conditions are covered.



Note: Performance above already considers 1-3% optical loss when holder is added to the COB. added to the COB.

Ri	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
92	93	95	94	90	92	93	91	84	64	86	89	84	93	96	92

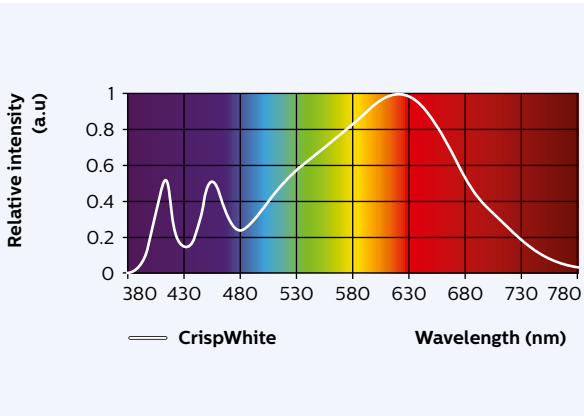
Fortimo SLM CW 1211 L19 G5

Parameter	Min	Typ	Max	Unit
Correlated color temperature (CCT) range		3000		K
Color Coordinates (CIEx, CIEy)		(0.430, 0.395)		-
CRI	90			-
Energy Efficiency Label		A+		-
Radiation angle		115		deg

Color consistency of 3 SDCM, averaged over the module.
Tolerance of ± 0.005 on x, y coordinates.

Operation point	1211	lm	lm/W
80% I-nom 960 mA	Tc 65 °C	3170	94
	Tc-nom 85 °C	3000	90
	Tc-max 95 °C	2900	87
I-nom = I - life 1200 mA	Tc 65 °C	3820	89
	Tc-nom 85 °C	3610	85
	Tc-max 95 °C	3490	83
I-max 1500 mA	Tc 65 °C	4560	84
	Tc-nom 85 °C	4300	80
	Tc-max 95 °C	4160	77

Tolerance for flux data is ±10%.
Tolerance for Vf data is ±10%.
Tolerance for efficacy data is dependent on the above mentioned tolerances.
Please refer to the warranty window to ensure that your operating conditions are covered.

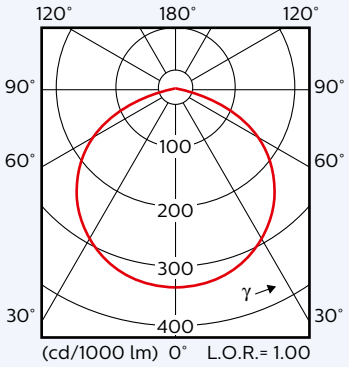


Note: Performance above already considers 1-3% optical loss when holder is added to the COB. added to the COB.

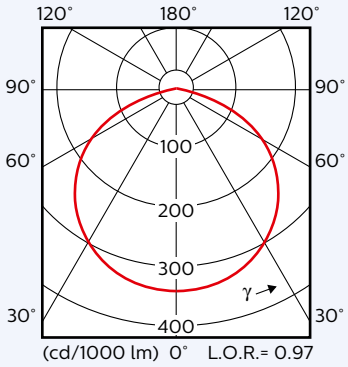
Ri	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
92	93	95	94	90	92	93	91	84	64	86	89	84	93	96	92

Beam shape

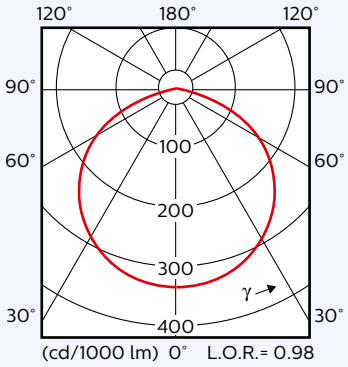
The Philips LED module generates a Lambertian beam shape, which is a pragmatic starting point for OEMs wishing to design secondary optics.



CoB without a holder



CoB with a standard/ down-light holder



CoB with a poke-in holder

Lifetime

1203 CW

Operation point	Lifetime x 1000 hours	L70			L80			L90		
		B50	B20	B10	B50	B20	B10	B50	B20	B10
80% I-nom 240 mA	Tc 65 °C	>50	>50	>50	>50	>50	>50	46	30	24
	Tc-nom 85 °C	>50	45	36	43	28	23	20	13	11
	Tc-max 95 °C	48	31	25	30	20	16	14	9	7
I-nom = I - life 300 mA	Tc 65 °C	>50	>50	>50	>50	>50	44	40	26	21
	Tc-nom 85 °C	>50	40	32	38	25	20	18	12	9
	Tc-max 95 °C	42	28	22	26	17	14	12	8	7
I-max 510 mA	Tc 65 °C	>50	>50	41	49	32	26	23	15	12
	Tc-nom 85 °C	37	25	20	23	15	12	11	7	6
	Tc-max 95 °C	27	17	14	17	11	9	8	5	4

Please refer to the warranty window to ensure that your operating conditions are covered.

1204 CW

Operation point	Lifetime x 1000 hours	L70			L80			L90		
		B50	B20	B10	B50	B20	B10	B50	B20	B10
80% I-nom 240 mA	Tc 65 °C	>50	>50	>50	>50	>50	>50	>50	34	27
	Tc-nom 85 °C	>50	>50	41	49	32	26	23	15	12
	Tc-max 95 °C	>50	35	28	33	22	18	16	10	8
I-nom = I - life 300 mA	Tc 65 °C	>50	>50	>50	>50	>50	>50	47	31	25
	Tc-nom 85 °C	>50	47	38	45	29	23	21	14	11
	Tc-max 95 °C	49	32	26	31	20	16	15	10	8
I-max 780 mA	Tc 65 °C	>50	42	34	40	26	21	19	13	10
	Tc-nom 85 °C	31	21	17	20	13	10	9	6	5
	Tc-max 95 °C	23	15	12	14	9	7	7	4	4

Please refer to the warranty window to ensure that your operating conditions are covered.

Lifetime

1205 CW

Operation point	Lifetime x 1000 hours	L70			L80			L90		
		B50	B20	B10	B50	B20	B10	B50	B20	B10
80% I-nom 400 mA	Tc 65 °C	>50	>50	>50	>50	>50	>50	>50	36	29
	Tc-nom 85 °C	>50	>50	42	>50	33	27	24	16	13
	Tc-max 95 °C	>50	36	29	34	23	18	16	11	9
I-nom = I - life 500 mA	Tc 65 °C	>50	>50	>50	>50	>50	>50	>50	33	26
	Tc-nom 85 °C	>50	49	39	46	31	24	22	14	12
	Tc-max 95 °C	>50	33	27	32	21	17	15	10	8
I-max 1050 mA	Tc 65 °C	>50	>50	>50	>50	39	31	28	18	15
	Tc-nom 85 °C	45	29	23	28	18	15	13	9	7
	Tc-max 95 °C	31	21	17	20	13	10	9	6	5

Please refer to the warranty window to ensure that your operating conditions are covered.

1208 CW

Operation point	Lifetime x 1000 hours	L70			L80			L90		
		B50	B20	B10	B50	B20	B10	B50	B20	B10
80% I-nom 760 mA	Tc 65 °C	>50	>50	>50	>50	>50	48	43	28	23
	Tc-nom 85 °C	>50	43	34	41	27	22	19	13	10
	Tc-max 95 °C	45	30	24	28	19	15	13	9	7
I-nom = I - life 950 mA	Tc 65 °C	>50	>50	>50	>50	>50	41	37	24	19
	Tc-nom 85 °C	>50	37	30	35	23	19	17	11	9
	Tc-max 95 °C	39	26	21	25	16	13	12	8	6
I-max 1500 mA	Tc 65 °C	>50	>50	40	47	31	25	22	15	12
	Tc-nom 85 °C	36	24	19	23	15	12	11	7	6
	Tc-max 95 °C	26	17	14	16	11	8	8	5	4

Please refer to the warranty window to ensure that your operating conditions are covered.

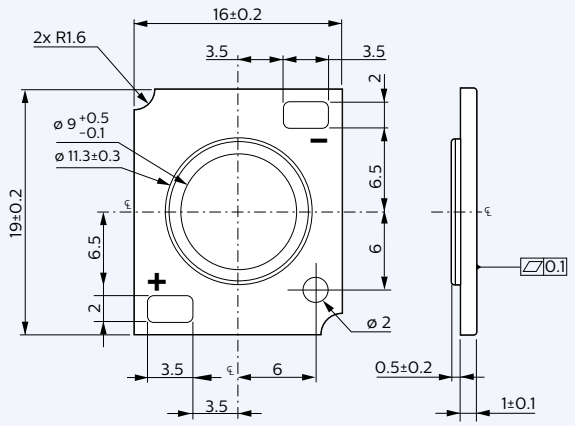
1211 CW

Operation point	Lifetime x 1000 hours	L70			L80			L90		
		B50	B20	B10	B50	B20	B10	B50	B20	B10
80% I-nom 960 mA	Tc 65 °C	>50	>50	>50	>50	>50	>50	46	30	24
	Tc-nom 85 °C	>50	45	36	43	28	23	20	13	11
	Tc-max 95 °C	47	31	25	30	19	16	14	9	7
I-nom = I - life 1200 mA	Tc 65 °C	>50	>50	>50	>50	>50	44	40	26	21
	Tc-nom 85 °C	>50	40	32	38	25	20	18	12	9
	Tc-max 95 °C	42	28	22	26	17	14	12	8	7
I-max 1500 mA	Tc 65 °C	>50	>50	>50	>50	46	37	33	22	17
	Tc-nom 85 °C	>50	34	27	32	21	17	15	10	8
	Tc-max 95 °C	36	23	19	22	15	12	11	7	6

Please refer to the warranty window to ensure that your operating conditions are covered.

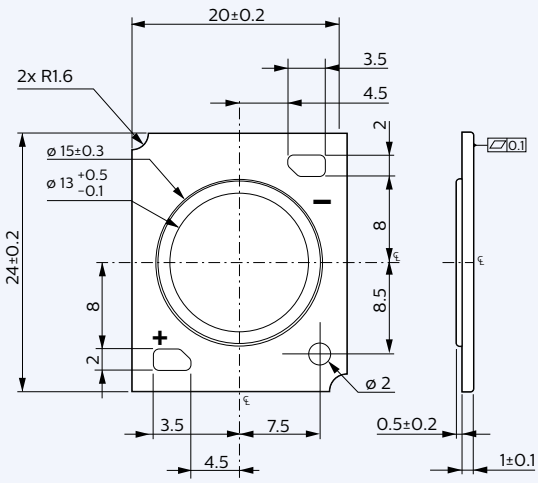
Mechanical characteristics

1203 CW



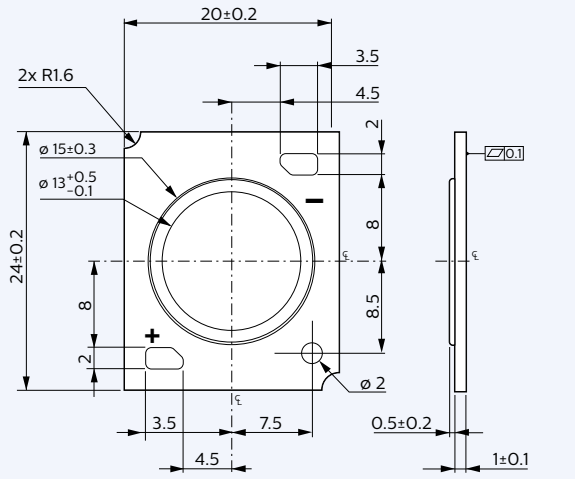
Dimensions in mm.

1204 CW



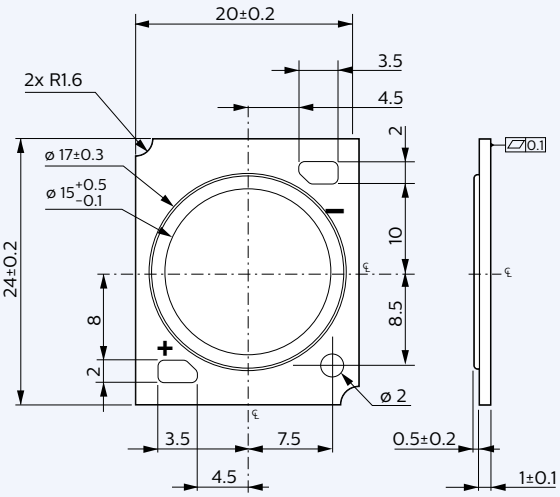
Dimensions in mm.

1205 CW



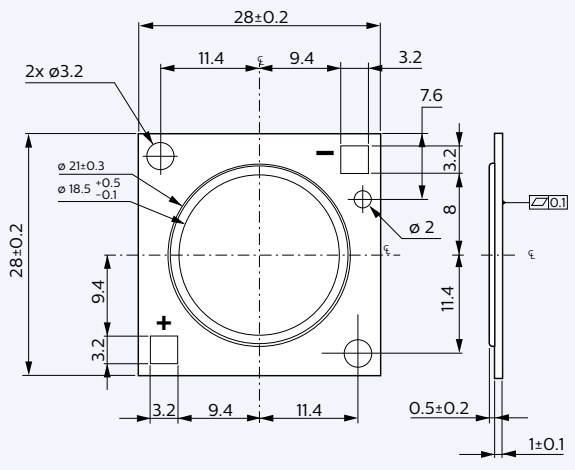
Dimensions in mm.

1208 CW



Dimensions in mm.

1211 CW



Dimensions in mm.

Application information

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

Environmental
RoHS/REACH

Photobiological safety

Item	Result: Risk group
Actinic UV	Exempt
Near-UV	Exempt
Retinal Blue Light	Risk Group 1
Retinal thermal	Exempt
Infrared Eye	Exempt
Thermal skin	Pass

Environmental
RoHS/REACH

IP rating	No IP Rating
Overheating protection	No Protection

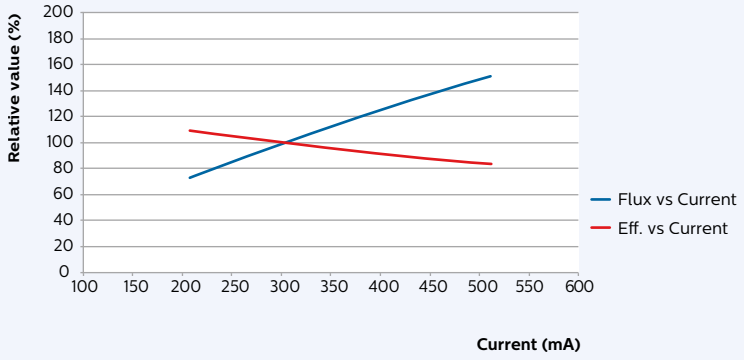
Tuning information

1203 CW

Flux and efficacy versus current (at Tc = 85 °C).

I [mA]	Flux [%]	Efficacy [%]
207	73.3%	109.1%
270	91.7%	102.8%
300	**100.0%**	**100.0%**
360	115.7%	94.8%
450	137.4%	87.9%
500	148.7%	84.5%
510	150.8%	83.8%

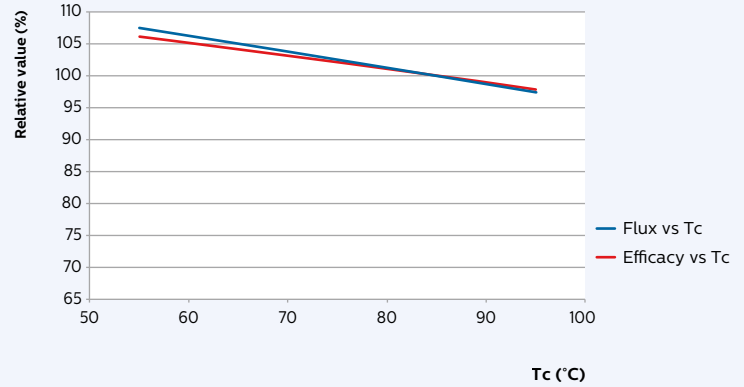
Note: Performance above already considers 1-3% optical loss when holder is added to the COB.



Flux and efficacy versus temperature (at I = 300 mA).

Tc [°C]	Flux [%]	Efficacy [%]
95	97.1%	97.7%
85	**100.0%**	**100.0%**
75	102.8%	102.2%
65	105.5%	104.4%
55	108.3%	106.5%

Note: Performance above already considers 1-3% optical loss when holder is added to the COB.



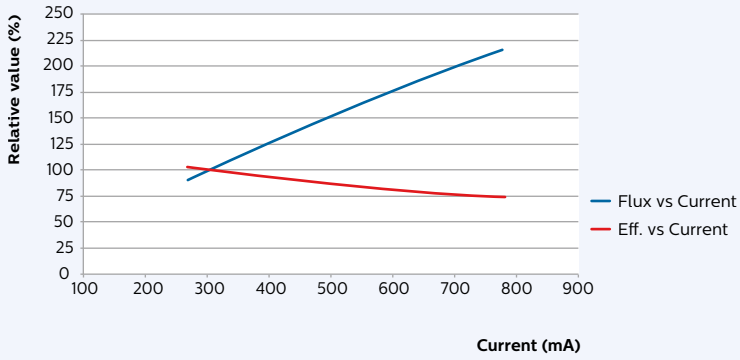
Tuning information

1204 CW

Flux and efficacy versus current (at Tc = 85 °C).

I [mA]	Flux [%]	Efficacy [%]
270	91.5%	102.3%
300	**100.0%**	**100.0%**
360	116.5%	95.8%
450	139.8%	90.2%
500	152.2%	87.5%
600	175.9%	82.5%
750	209.3%	76.2%
780	215.7%	75.1%

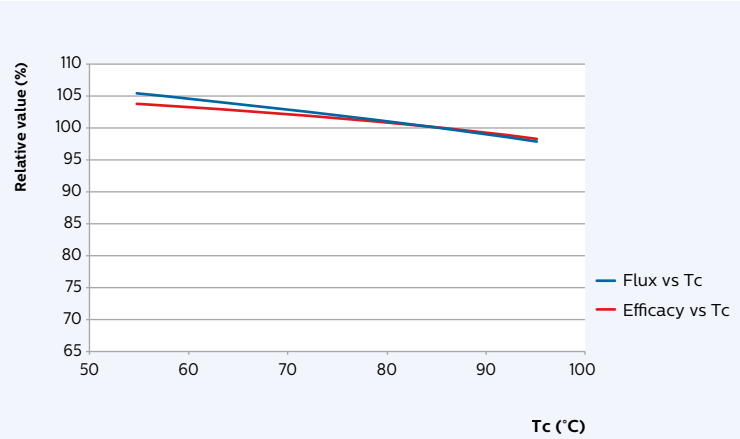
Note: Performance above already considers 1-3% optical loss when holder is added to the COB.



Flux and efficacy versus temperature (at I = 300 mA).

Tc [°C]	Flux [%]	Efficacy [%]
95	97.9%	98.5%
85	**100.0%**	**100.0%**
75	102.0%	101.4%
65	103.8%	102.6%
55	105.3%	103.5%

Note: Performance above already considers 1-3% optical loss when holder is added to the COB.



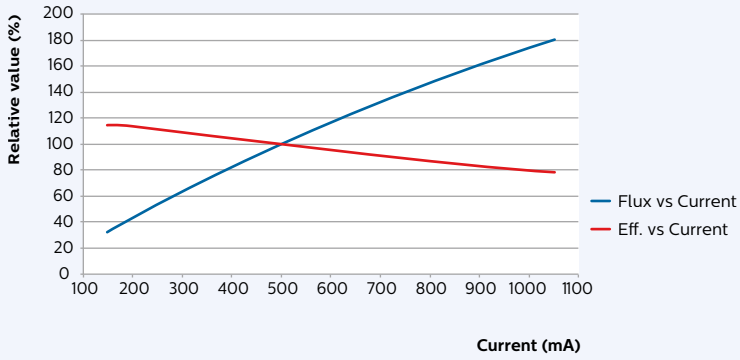
Tuning information

1205 CW

Flux and efficacy versus current (at Tc = 85 °C).

I [mA]	Flux [%]	Efficacy [%]
150	32.5%	115.3%
200	43.3%	114.1%
250	53.7%	112.1%
300	63.6%	109.8%
500	**100.0%**	**100.0%**
750	139.5%	89.2%
950	167.5%	81.9%
1050	180.6%	78.7%

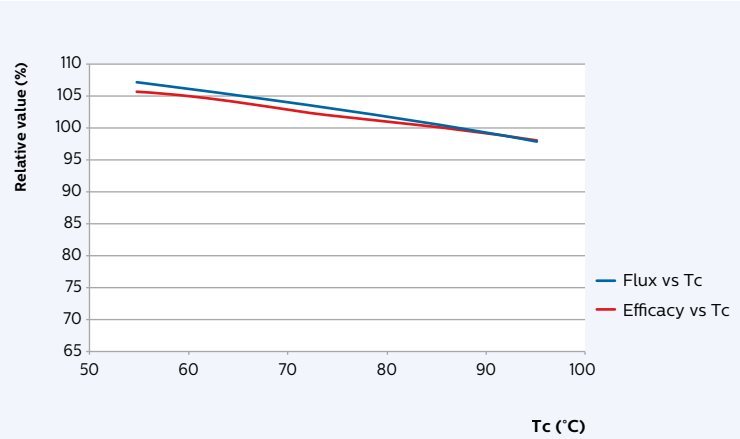
Note: Performance above already considers 1-3% optical loss when holder is added to the COB.



Flux and efficacy versus temperature (at I = 500 mA).

Tc [°C]	Flux [%]	Efficacy [%]
95	97.5%	97.9%
85	**100.0%**	**100.0%**
75	102.4%	102.0%
65	104.8%	103.9%
55	107.0%	105.6%

Note: Performance above already considers 1-3% optical loss when holder is added to the COB.



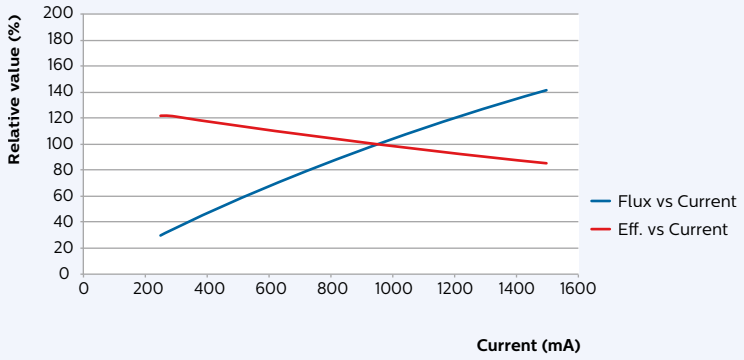
Tuning information

1208 CW

Flux and efficacy versus current (at Tc = 85 °C).

I [mA]	Flux [%]	Efficacy [%]
250	29,7%	122,6%
300	35,6%	121,7%
500	57,8%	115,2%
750	82,3%	106,4%
950	**100,0%**	**100,0%**
1050	108,3%	97,0%
1200	120,2%	92,9%
1500	142,1%	85,6%

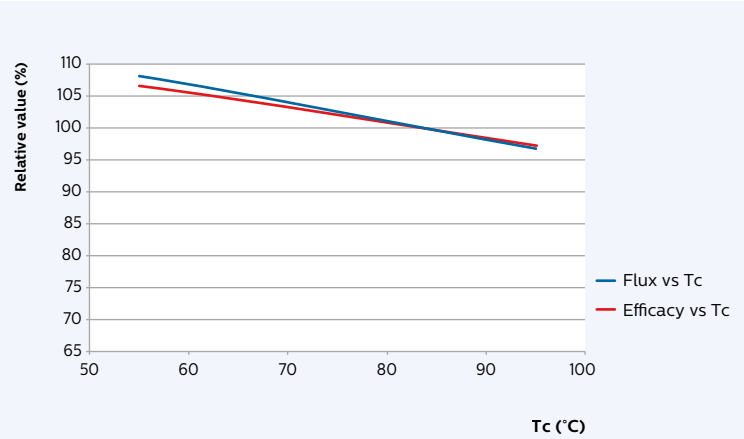
Note: Performance above already considers 1-3% optical loss when holder is added to the COB.



Flux and efficacy versus temperature (at I = 950 mA).

Tc [°C]	Flux [%]	Efficacy [%]
95	96.9%	97.3%
85	**100.0%**	**100.0%**
75	103.0%	102.4%
65	105.7%	104.7%
55	108.3%	106.8%

Note: Performance above already considers 1-3% optical loss when holder is added to the COB.



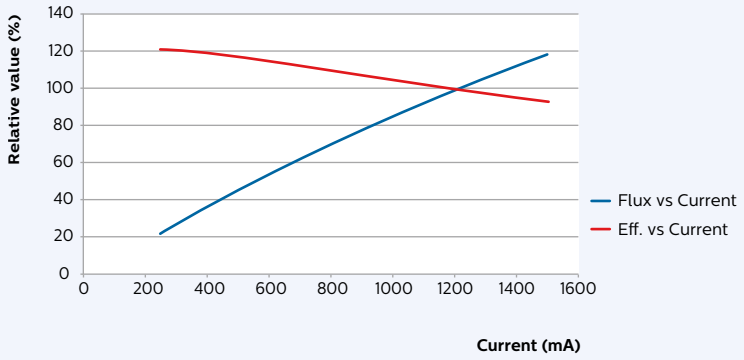
Tuning information

1211 CW

Flux and efficacy versus current (at Tc = 85 °C).

I [mA]	Flux [%]	Efficacy [%]
250	22.5%	122.0%
300	27.4%	121.0%
500	45.9%	117.7%
750	67.0%	111.2%
950	82.3%	106.0%
1050	89.6%	103.5%
1200	**100.0%**	**100.0%**
1400	113.1%	95.6%
1500	119.3%	93.6%

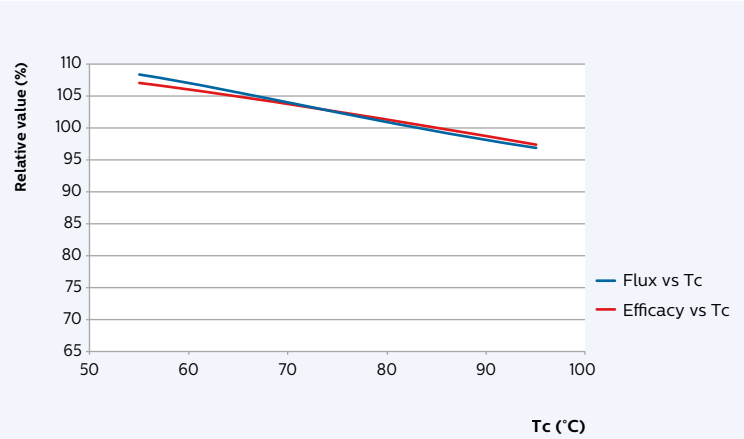
Note: Performance above already considers 1-3% optical loss when holder is added to the COB.



Flux and efficacy versus temperature (at I = 1200 mA).

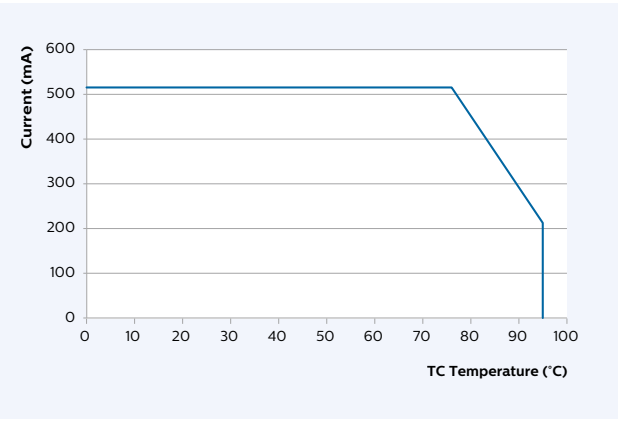
Tc [°C]	Flux [%]	Efficacy [%]
95	96.7%	97.2%
85	**100.0%**	**100.0%**
75	103.0%	102.7%
65	105.7%	104.9%
55	108.3%	106.9%

Note: Performance above already considers 1-3% optical loss when holder is added to the COB.

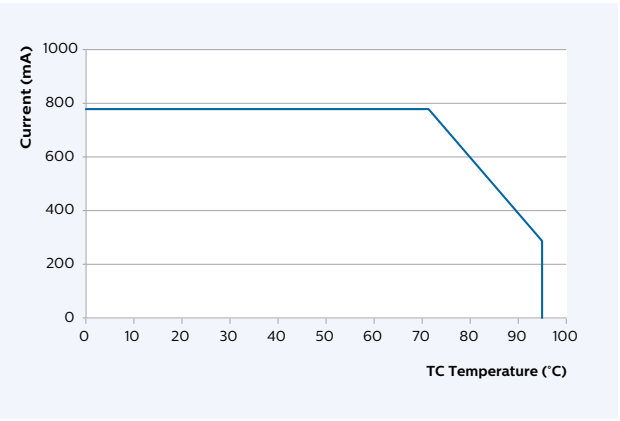


Warranty Windows

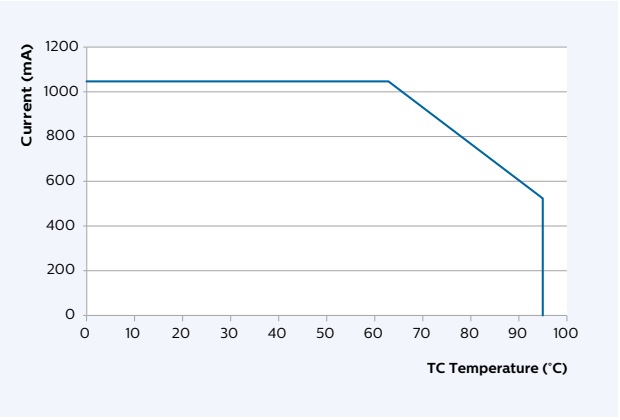
1203 CW



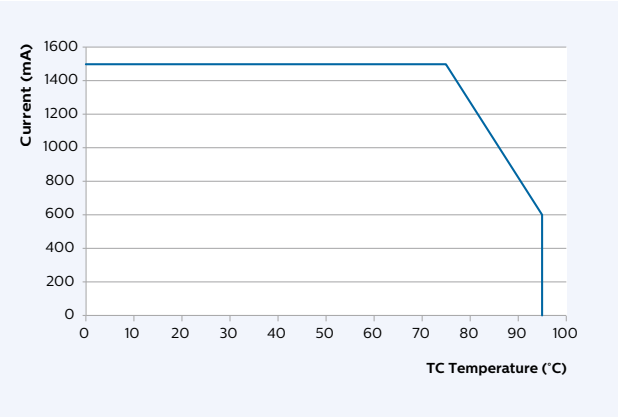
1204 CW



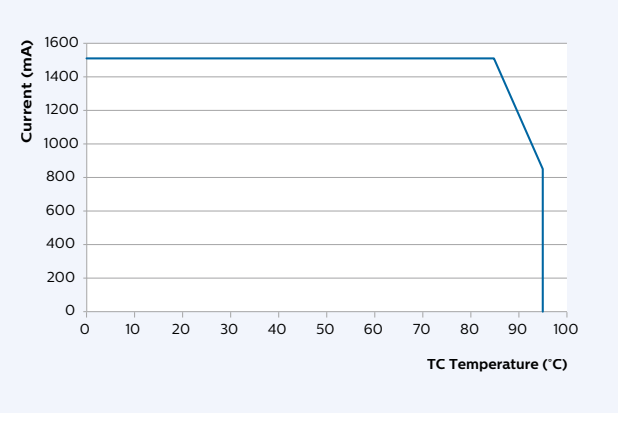
1205 CW



1208 CW



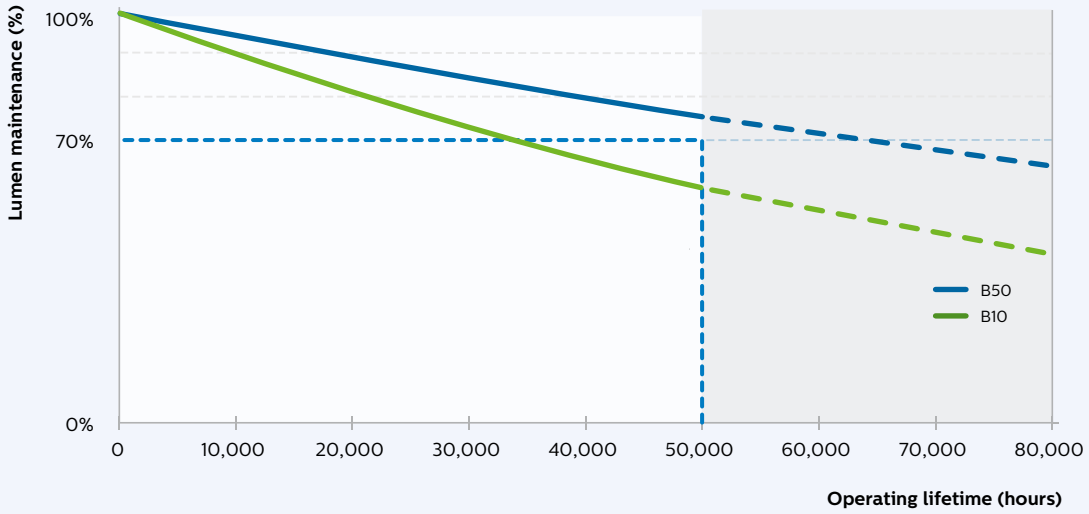
1211 CW



Lumen maintenance

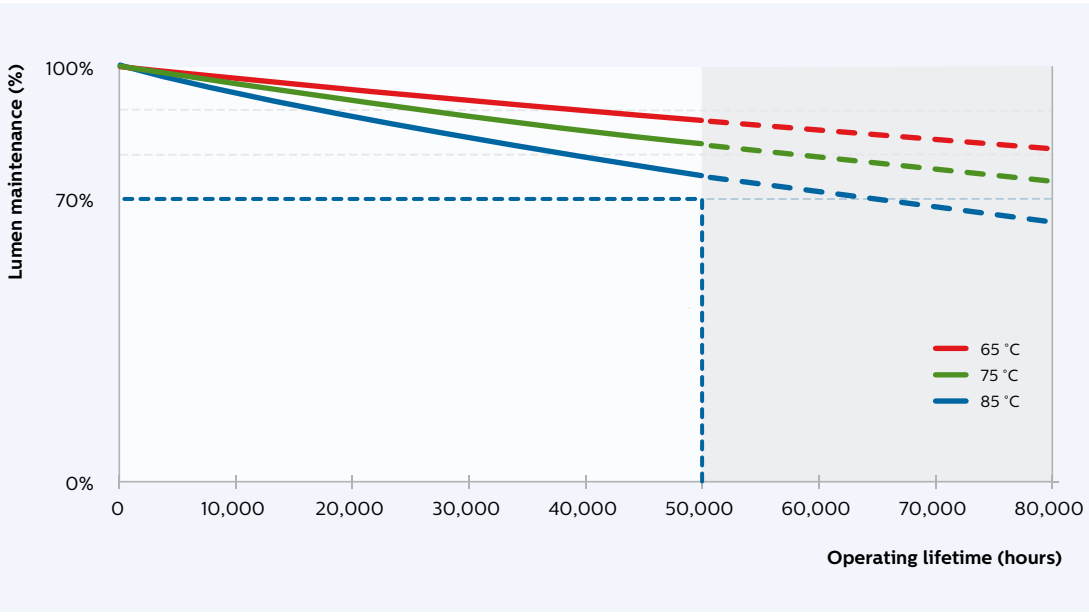
1203 CW

Lumen maintenance at I-life and Tc-life conditions



>50 k hours claim is based on extrapolating raw LM80-data by using statistical techniques.

Lumen maintenance for B50 at current I-life conditions

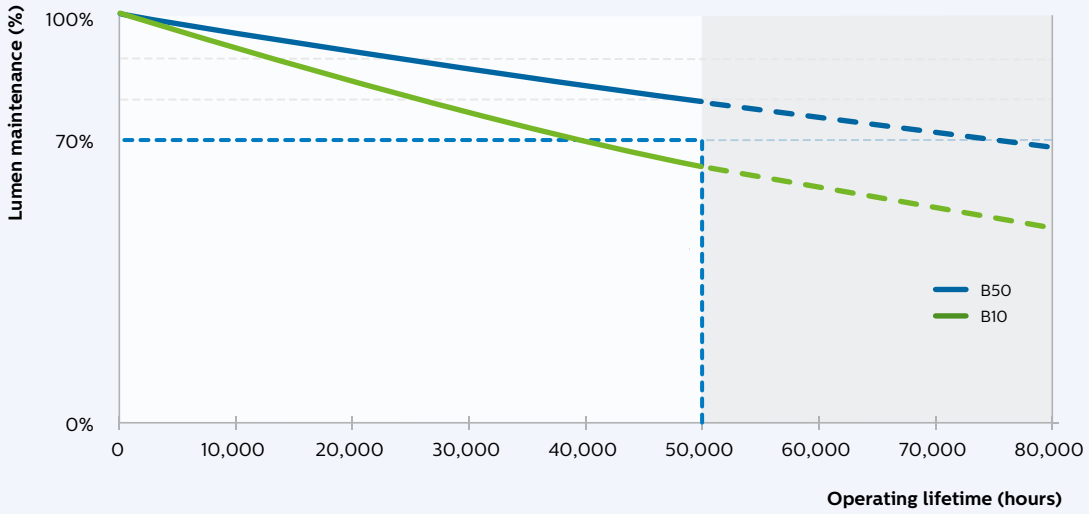


>50 k hours claim is based on extrapolating raw LM80-data by using statistical techniques.

Lumen maintenance

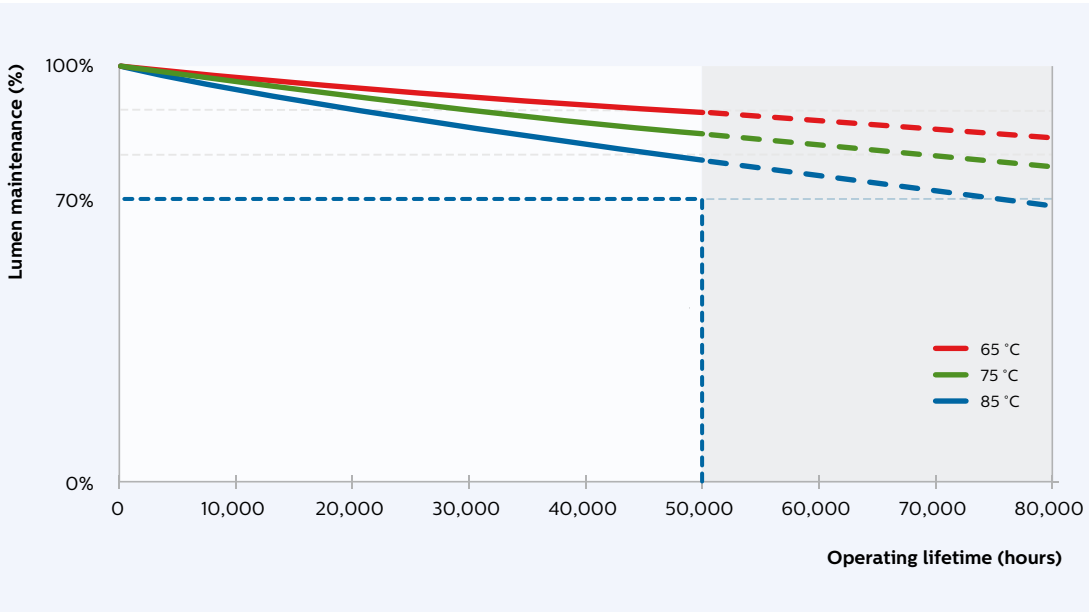
1204 CW

Lumen maintenance at I-life and Tc-life conditions



>50 k hours claim is based on extrapolating raw LM80-data by using statistical techniques.

Lumen maintenance for B50 at current I-life conditions

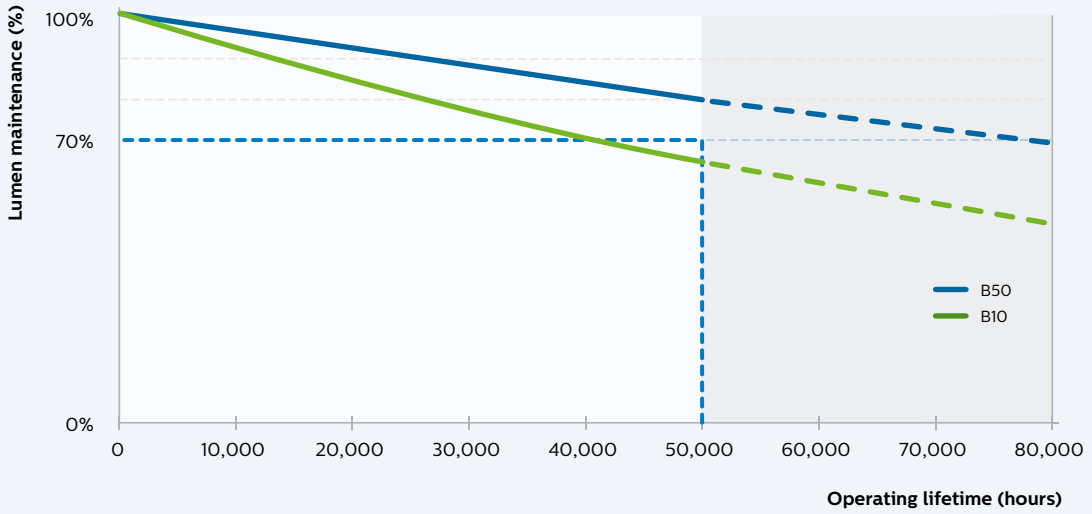


>50 k hours claim is based on extrapolating raw LM80-data by using statistical techniques.

Lumen maintenance

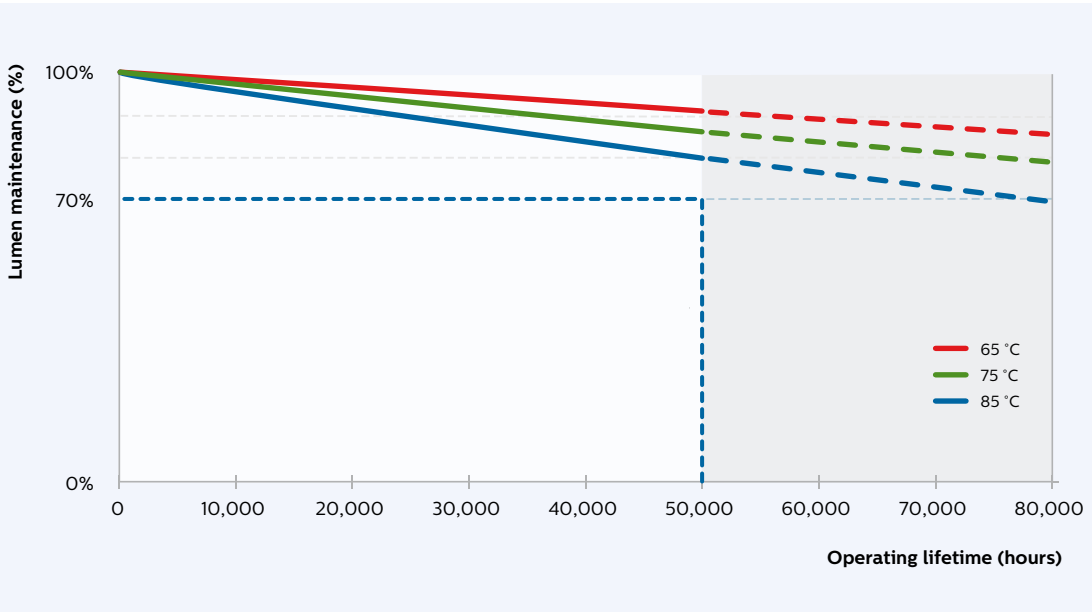
1205 CW

Lumen maintenance at I-life and Tc-life conditions



>50 k hours claim is based on extrapolating raw LM80-data by using statistical techniques.

Lumen maintenance for B50 at current I-life conditions

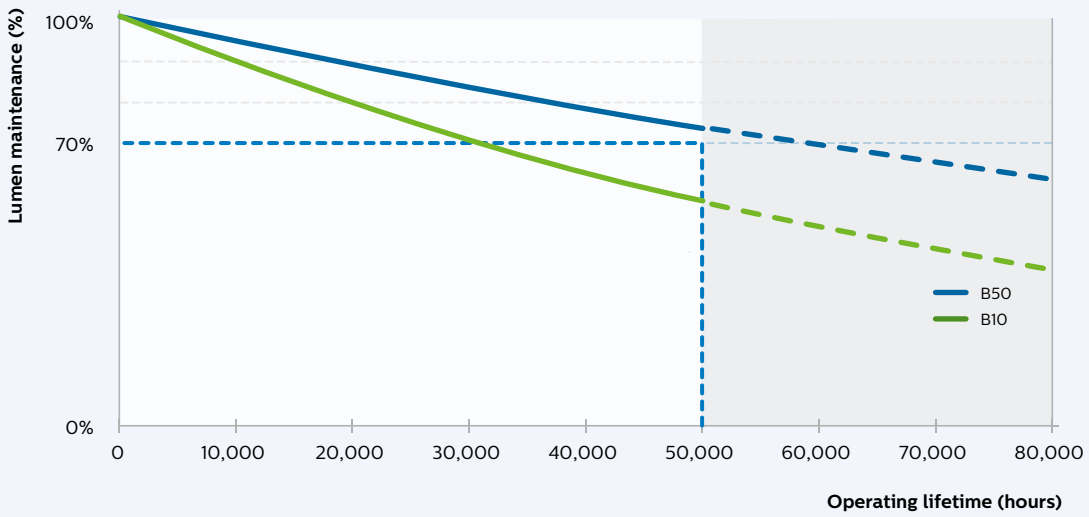


>50 k hours claim is based on extrapolating raw LM80-data by using statistical techniques.

Lumen maintenance

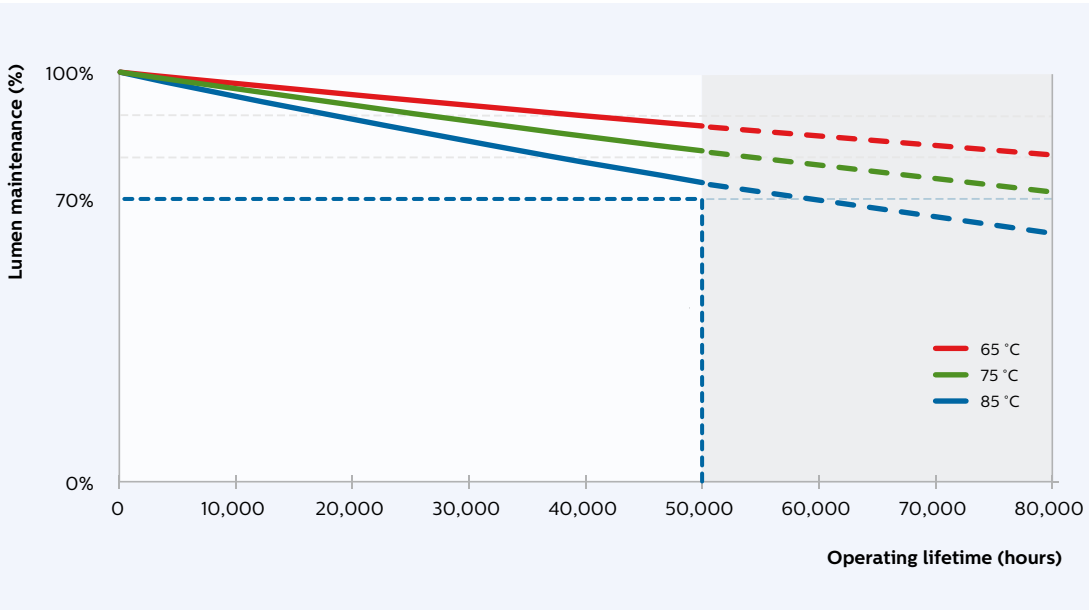
1208 CW

Lumen maintenance at I-life and Tc-life conditions



>50 k hours claim is based on extrapolating raw LM80-data by using statistical techniques.

Lumen maintenance for B50 at current I-life conditions

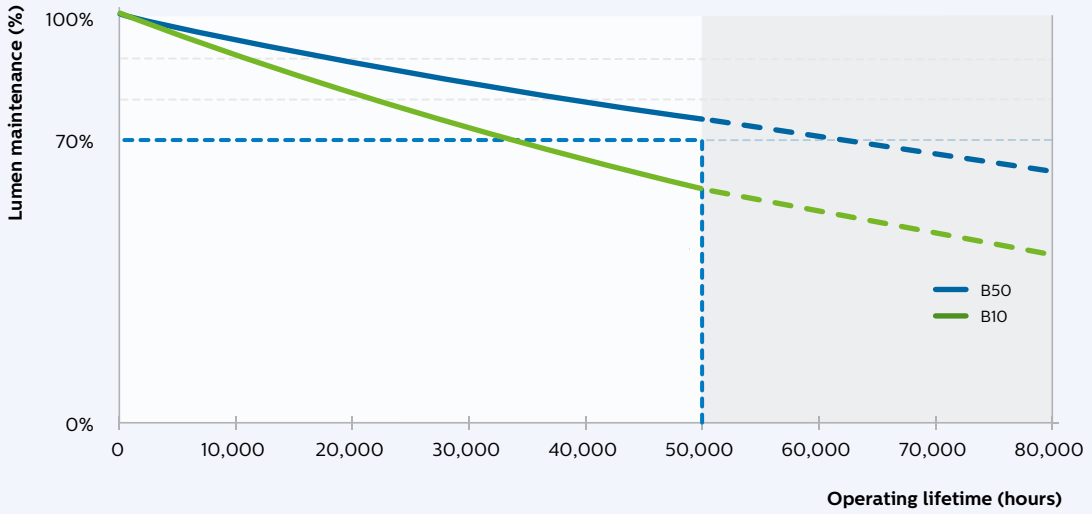


>50 k hours claim is based on extrapolating raw LM80-data by using statistical techniques.

Lumen maintenance

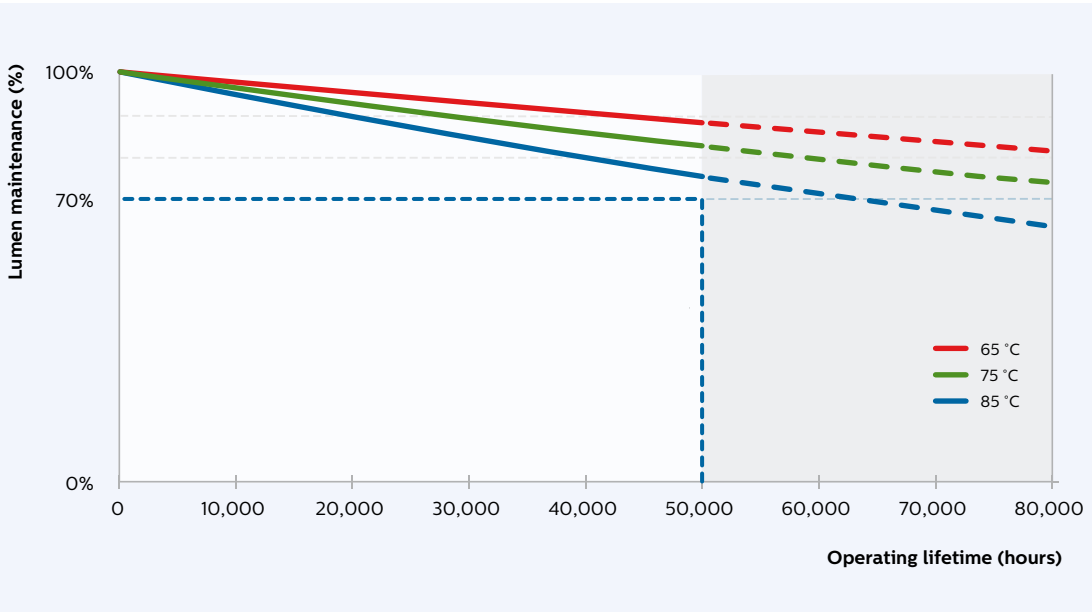
1211 CW

Lumen maintenance at I-life and Tc-life conditions



>50 k hours claim is based on extrapolating raw LM80-data by using statistical techniques.

Lumen maintenance for B50 at current I-life conditions



>50 k hours claim is based on extrapolating raw LM80-data by using statistical techniques.

© 2015 Koninklijke Philips N.V. All rights reserved. Philips reserves the right to make changes in specifications and/or to discontinue any product at any time without notice or obligation and will not be liable for any consequences resulting from the use of this publication.

10/2015
Data subject to change.

www.philips.com/technology