

# PHILIPS

## LED Modules

### Fortimo LML SE

#### 2ft 1400lm 1R LV1



Fortimo LED LML Slim Efficiency systems are designed to replace conventional lighting in both fixed and dimmable luminaires. Slim board design enables compact fixture design and creates a high degree of design freedom. The Fortimo LED LML Slim Efficiency enables the use of a wide variety of optics, resulting in beams ranging from batwing to tight beam distribution, making it the better choice for the illumination of vertical surfaces.

Commercial Product Name	12NC
Fortimo LML SE 2ft 1400lm 830 1R LV G1	9290 009 16908
Fortimo LML SE 2ft 1400lm 835 1R LV G1	9290 009 17008
Fortimo LML SE 2ft 1400lm 840 1R LV G1	9290 009 17108
Fortimo LML SE 2ft 1400lm 850 1R LV G1	9290 009 17208

# Fortimo LML SE 2ft 1400lm 1R LV1

## Features

- High energy efficiency of up to 141 lm/W
- Variation of color temperatures (3000K, 3500K, 4000K, and 5000K)
- Lumen levels of 700 lm/ft and 1,400 lm/2ft
- High quality white light
- Long lifetime – 50,000 hrs<sup>1</sup>
- Push-in connectors enabling easy wiring

## Benefits

- Enables most economic and flexible fixture design
- High degree of design freedom allowing slim and compact fixture design
- Flexible system design due to pairing with Philips Advance Xitanium window drivers with SimpleSet technology
- 5-year limited system warranty with Philips Advance Xitanium LED Drivers<sup>2</sup>

## Application

- Office
- Industry
- Retail

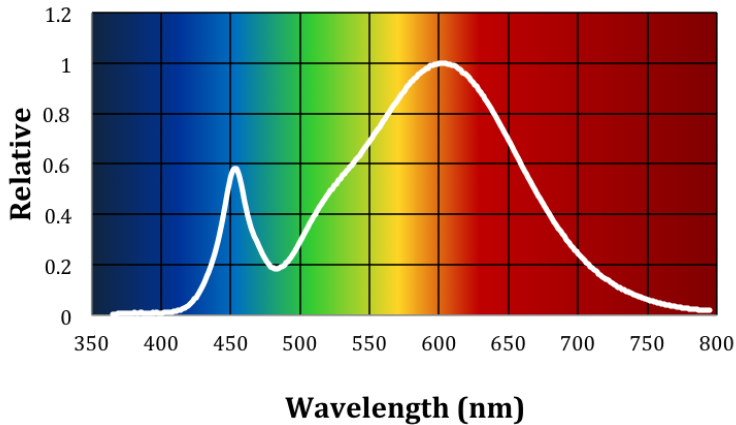
<sup>1</sup> Average rated life is based on engineering data testing and probability analysis. The hours are at the B50, L70 point – 50,000 hours life with 70% lumen maintenance at Tc point.

## Optical Characteristics – Table per CCT

Fortimo LML SE 2ft 1400lm 830 1R LV G1				
Parameter	Min	Typ	Max	Unit
Luminous Flux		1300		lm
Lumen Efficiency		127		lm/W
Forward Current		280		mA
Forward Voltage	35.4	36.6	38.0	V
Correlated Color Temperature (CCT) Target <sup>3</sup>		3000		K
Color Consistency		3.5 <sup>4</sup>		SDCM
CRI	80			-
Radiation Angle		120		deg

Color consistency of 3.5 SDCM, averaged over the module.  
Tolerance for flux data is ±7.5 %.  
Tolerance for efficacy data is ±10 %.

## Spectrum



See footnotes on last page.

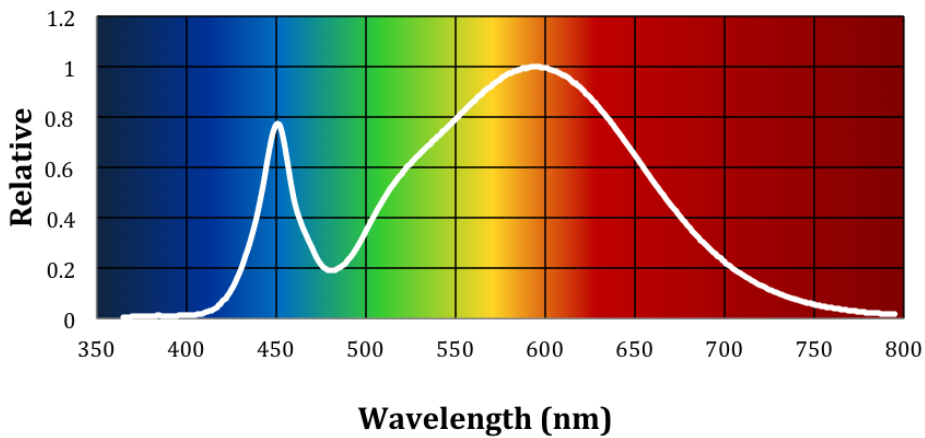
# Fortimo LML SE 2ft 1400lm 1R LV1

## Optical Characteristics – Table per CCT

Fortimo LML SE 2ft 1400lm 835 1R LV G1				
Parameter	Min	Typ	Max	Unit
Luminous Flux		1340		lm
Lumen Efficiency		131		lm/W
Forward Current		280		mA
Forward Voltage	35.4	36.6	38.0	V
Correlated Color Temperature (CCT) Target <sup>3</sup>		3500		K
Color Consistency		3.5 <sup>4</sup>		SDCM
CRI	80			-
Radiation Angle		120		deg

Tolerance for flux data is  $\pm 7.5\%$ .  
Tolerance for efficacy data is  $\pm 10\%$ .

### Spectrum



See footnotes on last page.

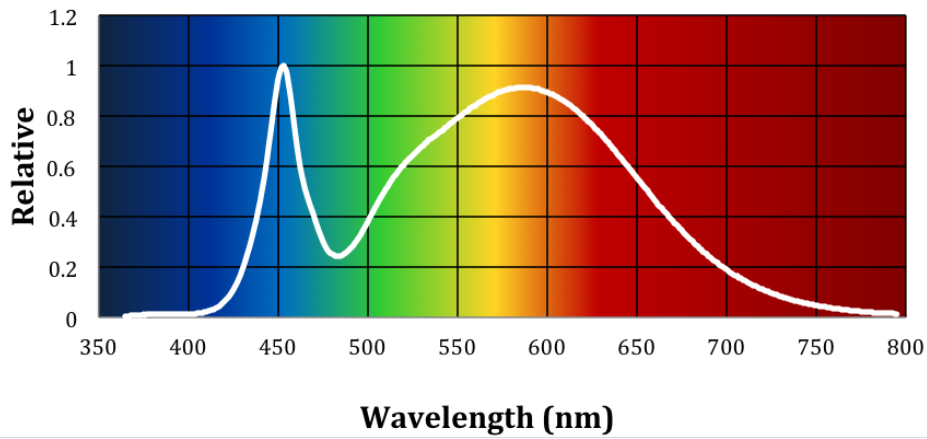
# Fortimo LML SE 2ft 1400lm 1R LV1

## Optical Characteristics – Table per CCT

Fortimo LML SE 2ft 1400lm 840 1R LV G1				
Parameter	Min	Typ	Max	Unit
Luminous Flux		1400		lm
Lumen Efficiency		136		lm/W
Forward Current		280		mA
Forward Voltage	35.4	36.6	38.0	V
Correlated Color Temperature (CCT) Target <sup>3</sup>		4000		K
Color Consistency		3.5 <sup>4</sup>		SDCM
CRI	80			-
Radiation Angle		120		deg

Tolerance for flux data is  $\pm 7.5\%$ .  
Tolerance for efficacy data is  $\pm 10\%$ .

### Spectrum



See footnotes on last page.

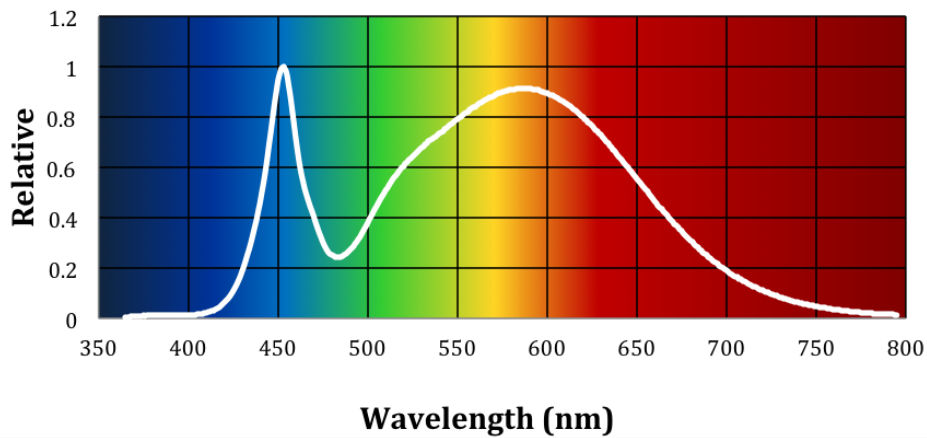
# Fortimo LML SE 2ft 1400lm 1R LV1

## Optical Characteristics – Table per CCT

Fortimo LML SE 2ft 1400lm 850 1R LV G1				
Parameter	Min	Typ	Max	Unit
Luminous Flux		1460		lm
Lumen Efficiency		141		lm/W
Forward Current		280		mA
Forward Voltage	35.4	36.6	38.0	V
Correlated Color Temperature (CCT) Target <sup>3</sup>		5000		K
Color Consistency		3.5 <sup>4</sup>		SDCM
CRI	80			-
Radiation Angle		120		deg

Tolerance for flux data is  $\pm 7.5\%$ .  
Tolerance for efficacy data is  $\pm 10\%$ .

### Spectrum

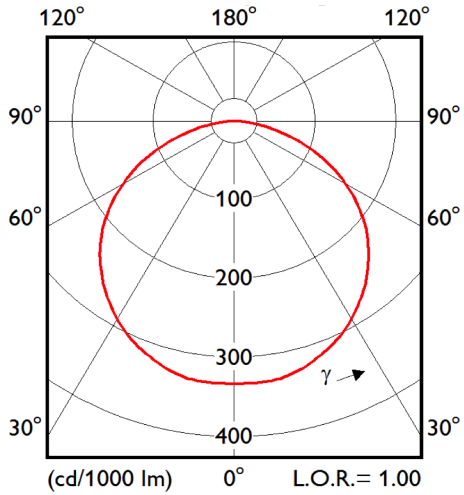


See footnotes on last page.

# Fortimo LML SE 2ft 1400lm 1R LV1

## Beam Shape

The Philips Fortimo LML SE 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		280	320	mA
Forward Voltage	35.4	36.6	38.0	V
Forward Voltage Bins		E/F		
Power Consumption	9.9	10.2	10.6	W

Note: Specifications stated at Tc nom = 45°C and I nom = 280mA

## Lifetime

Parameter	Nominal <sup>11</sup>	Life <sup>12</sup>	Max <sup>13</sup>
Tc [°C]	45	65	80
Current [mA]	280	320	360

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

Note: Specifications stated while Tc < 65°C and I < 320 mA

11. Nominal value at which performance is specified

12. Value at which lifetime is specified (max current for warranty)

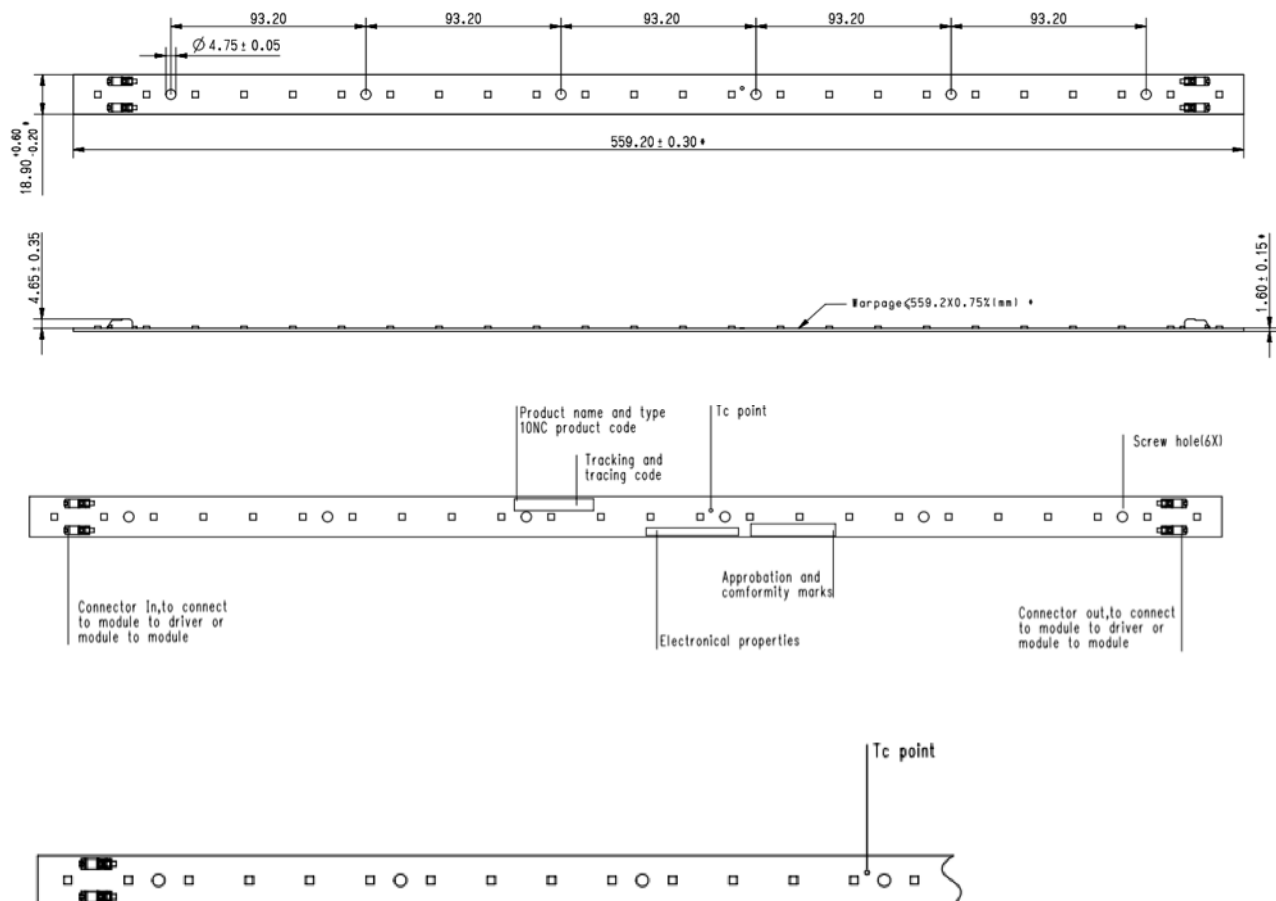
13. Maximum value for safety

# Fortimo LML SE 2ft 1400lm 1R LV1

## Mechanical Characteristics

Parameter	Min	Typ	Max	Unit
Length	558.9	559.2	559.5	mm
Width	18.7	18.9	19.5	mm
Height Excl. Connector	1.45	1.60	1.75	mm
Height Incl. Connector	5.65	6.00	6.35	mm
Warpage (IPC-TM-650)			2.1	mm

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



# Fortimo LML SE 2ft 1400lm 1R LV1

## Abs Max Ratings

Parameter	Min	Typ	Max	Unit
Current I <sub>max</sub>			360	mA
Case temperature T <sub>c</sub> max			80	°C
ESD (direct contact)			4	kV
ESD (air)			8	kV
Isolation breakdown voltage	500			Vdc
Ambient temperature	-20			°C
Number of Modules per Chain			4	

## Wiring

Specification item	Value	Unit	Condition
Input Wire Cross-section	0.2...0.75	mm <sup>2</sup>	solid and fine stranded
	18...24	AWG	
Input Wire Strip Length	6..7	mm	

Note: Connector suited for robot wiring.

## Application Information

### Compliance and Approval

IEC / EN 62031, IEC / EN 62471, IEC / TR 62778, UL8750 (UL recognized)

### Environmental

RoHS / REACH

### Application Information

IP Rating	No IP rating
Overheating Protection	No protection
Luminaire Class	UL Class 2 / Class II or Class III

Warranted number of full thermal product cycles @ 25°C ambient temperature

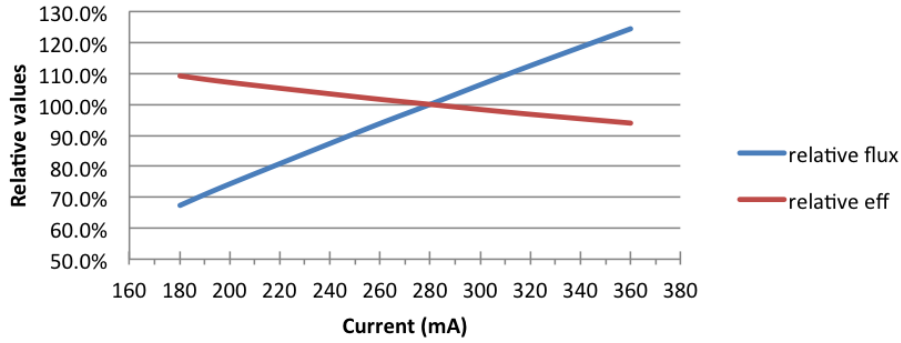
Case Temperature T <sub>c</sub> [°C]	Amount of Cycles
35	40,000
40	33,300
45	33,300
50	33,300
55	29,000
60	20,830
65	16,666



# Fortimo LML SE 2ft 1400lm 1R LV1

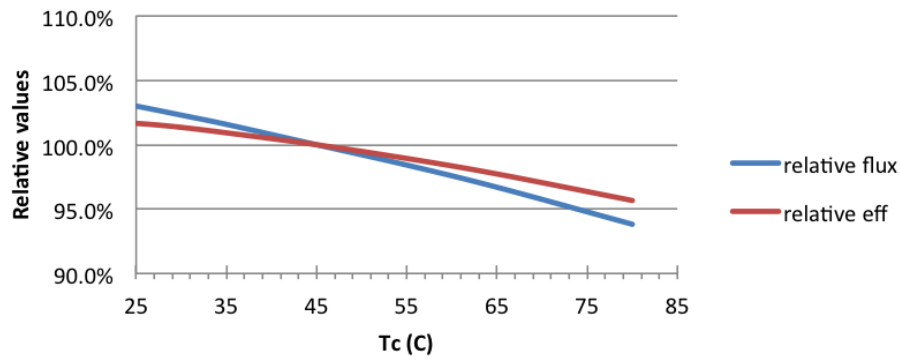
## Tuning Information

### Flux and Efficacy Versus Current



I [A]	Flux [%]	Efficacy [%]
180	67.4%	109.2%
200	74.3%	107.1%
240	87.4%	103.4%
260	93.8%	101.6%
<b>280</b>	<b>100.0%</b>	<b>100.0%</b>
300	106.3%	98.4%
<b>320</b>	<b>112.5%</b>	<b>96.8%</b>
360	124.4%	94.0%

### Flux and Efficacy Versus Temperature at Tc

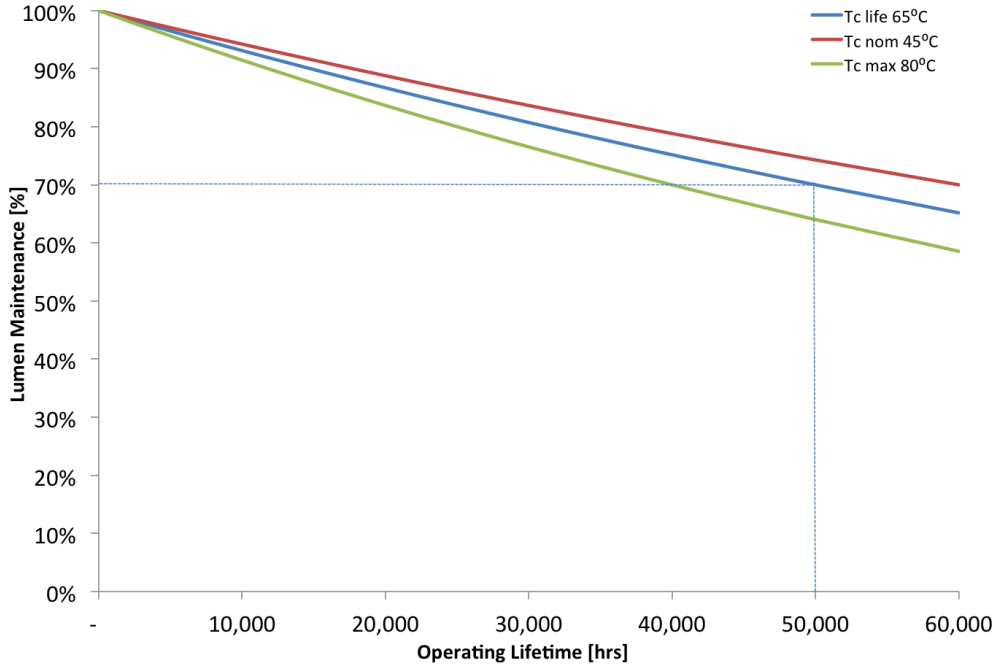


Tc [°C]	Flux [%]	Efficacy [%]
25	103.0%	101.7%
30	102.3%	101.3%
35	101.6%	100.9%
<b>45</b>	<b>100.0%</b>	<b>100.0%</b>
55	98.4%	98.9%
<b>65</b>	<b>96.7%</b>	<b>97.7%</b>

# Fortimo LML SE 2ft 1400lm 1R LV1

## Lumen Maintenance: at I Life and Tc Life Conditions

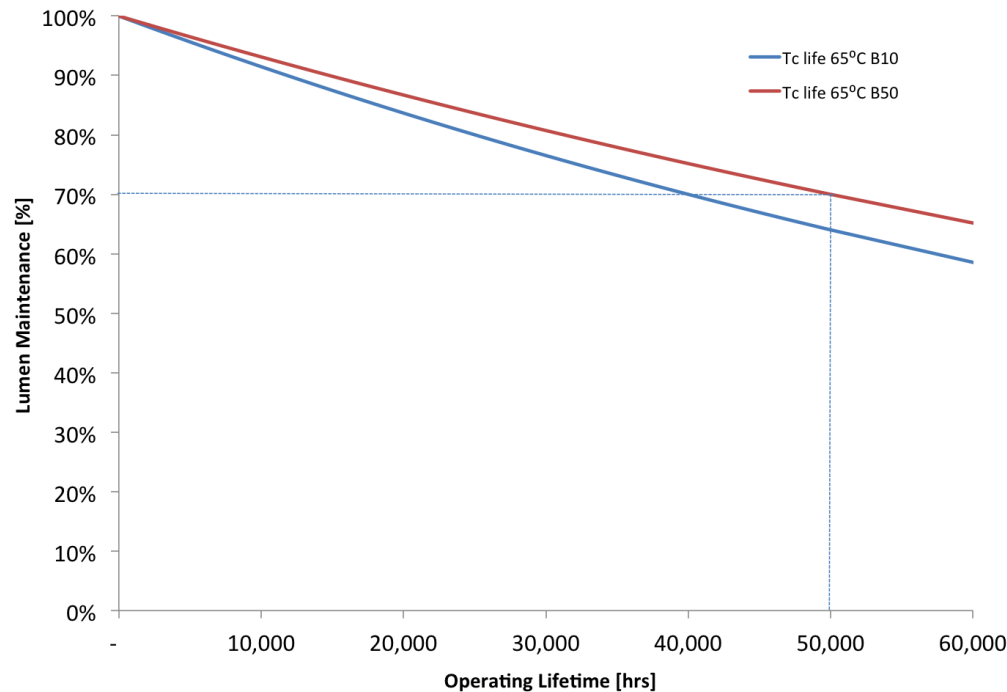
### Fortimo LML SE 2ft 1400lm 1R LV G1



Lumen depreciation as a function of operating hours for I-life and Tc-life.  
36,000 hours proven by certified laboratory.

## Lumen Maintenance at Current I Life

### Fortimo LML SE 2ft 1400lm 1R LV G1



Lumen depreciation as a function of operating hours for I-life and Tc-life.  
36,000 hours proven by certified laboratory.

# Fortimo LML SE 2ft 1400lm 1R LV1

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## Footnotes:

1. Average rated life is based on engineering data testing and probability analysis. The hours are at the B50, L70 point - 50,000 hours life with 70% lumen maintenance at Tc point.
2. View limited warranty at [http://www.usa.lighting.philips.com/connect/tools\\_literature/warranties.wpd](http://www.usa.lighting.philips.com/connect/tools_literature/warranties.wpd) for details and restrictions.
3. CCT for characterisation. Complies with ANSIC78.377A Specifications.
4. Note: 3.5 SDCM color consistency specification may not be sufficient for applications that are sensitive to color differences like wall washers, which typically require 2 SDCM.

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