

PHILIPS

LED Modules

Fortimo DLM Flex L2

84 G2 NA



Philips Fortimo LED downlight module (DLM) Flex L2 G2 Dip Switch (DS)

supersedes it's predecessors by offering a variety of lumen packages ranging from 900 lm to 13,000 lm* with a high efficacy up to 180 lm/W. The new generation also brings the focus on quality of light by introducing CRI 90 range to the portfolio. The all in one DLM Flex L2 G2 provides the ease of switching defined flux levels via a dip switch on board while still allows tuning the models through Advance Xitanium LED Drivers with SimpleSet technology. We bring you the best in class and versatile portfolio which caters to numerous applications.

Commercial Product Name	12NC
FORTIMO LED DLM FLEX DS L2 830 84 G2 NA	929001729713
FORTIMO LED DLM FLEX DS L2 835 84 G2 NA	929001729813
FORTIMO LED DLM FLEX DS L2 840 84 G2 NA	929001729913
FORTIMO LED DLM FLEX DS L2 850 84 G2 NA	929001730013
FORTIMO LED DLM FLEX DS L2 927 84 G2 NA	929001730413
FORTIMO LED DLM FLEX DS L2 930 84 G2 NA	929001730513
FORTIMO LED DLM FLEX DS L2 935 84 G2 NA	929001730613
FORTIMO LED DLM FLEX DS L2 940 84 G2 NA	929001730713
Fortimo LED DLM Thermal Accessory G1	929000765413
Fortimo LED DLM Flex Cover NA	929000765313

For drivers' compatibility, please visit our Easy Design-In Tool:
<https://www.na.easydesignintool.philips.com/select-module/24;jsessionid=B48812A82EB79F03366908351B479626>

* Achieved with the 84up CRI80

Fortimo LED DLM L2 84 G2 NA

Features

- Wide lumen output range: From 900 to 13,000lm*
- Variation of color temperatures (2700K, 3000K, 3500K, 4000K, and 5000K*)
- Flexible output/performance when set through the dip switch on board and Philips Advance Xitanium LED drivers with SimpleSet technology
- Lifetime > 50,000hrs¹ (B50L70 at Tc 85°C)
- High color consistency:
 - 2 SDCM for CRI 90
 - 3 SDCM for CRI 80
- Various mechanical interface options
 - Enabling standard or slim designs
 - Self-cooled option for up to 3,000lm²
 - No additional heat sink needed³

* With 84up CRI80

Benefits

- High energy efficiency (up to 180lm/W at Tc 85°C), also enabling excellent thermal management
- Flexible output/performance when set through the Philips Advance Xitanium LED drivers with SimpleSet technology and the on-board dip switch
- Limited glare
- Integrated thermal protection, enabling universal voltage fixtures and low power consumption (compliant with UL SREC/991)
- Reduced effort with thermal design and testing³
- 5-year limited system warranty with Philips Advance Xitanium LED drivers⁴

Application

- Recessed downlights
 - Offices
 - Hospitality
 - Education
 - Retail
- High-bay
 - Warehouses
 - Industries
- Surface mount luminaries
 - Residential
 - Hospitality
 - Offices

Optical Characteristics – Table per CCT

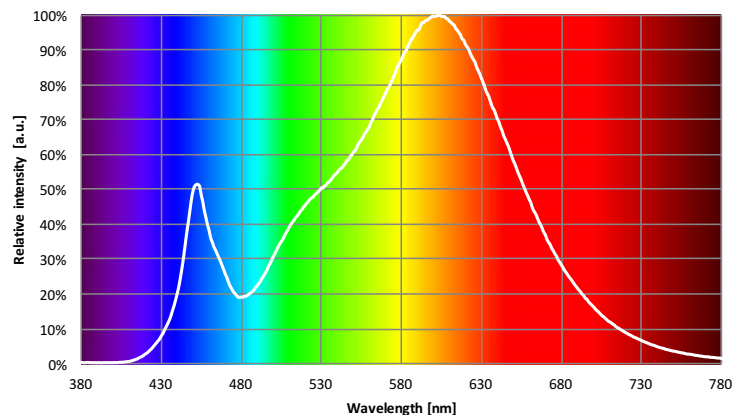
Fortimo LED DLM Flex DS L2 830 84 G2 NA

	DS4	DS3	DS2	DS1	Unit
Nominal Current	1763	1454	1189	1045	mA
Luminous Flux	8421	7125	5957	5296	lm
Luminous Flux with DLM Flex Cover	6989	5914	4944	4396	lm
Module Efficacy	136	142	147	151	lm/W
Module Efficacy with DLM Cover	113	118	122	125	lm/W
Correlated Color Temperature	3000				K
CRI	>80				-
Color Consistency	<3				SDCM
Radiation Angle	115				degrees
Radiation Angle with DLM Cover	110				degrees

Note: Specifications stated at Tc nom = 85°C.

Tolerance for flux data is -10% +20%. Tolerance for efficacy data is ±10%.

Measurement precision for flux +/- 5%, for CRI +/- 1.5, for efficacy +/- 6%.



Dip switch settings		
	1	2
DS1	ON	ON
DS2	OFF	ON
DS3	ON	OFF
DS4	OFF	OFF



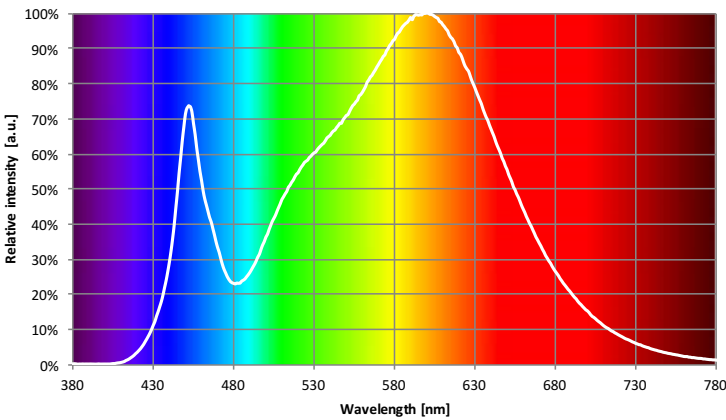
1. Average rated life is based on engineering data testing and probability analysis. The hours are at the B50, L70 point - 50,000 hours life with 70% lumen maintenance at Tc point when used with Philips produced cover and when Philips ESD protection guidelines are followed. Please refer to the design-in-guide for more information.
2. When combined with Fortimo LED thermal accessory G1. Please refer to product design-in guide for design instructions and restrictions.
3. When combined with the Fortimo thermal accessory G1, the need for an external heat sink is eliminated (for up to 3,000lm, according to the product design-in guide rules), resulting in simplified thermal management design and testing. The Fortimo DLM flex design-in guide is available at <http://www.usa.lighting.philips.com/products/oem-components/led-modules-literature.html>.
4. View limited warranty at <http://www.usa.lighting.philips.com/support/support/warranty> for details and restrictions. Warranty is applicable when Philips ESD guidelines are strictly followed. View Philips ESD guidelines at:

Fortimo LED DLM L2 84 G2 NA

Optical Characteristics – Table per CCT

Fortimo LED DLM Flex DS L2 835 84 G2 NA					
	DS4	DS3	DS2	DS1	Unit
Nominal Current	1763	1454	1189	1045	mA
Luminous Flux	8723	7380	6170	5485	lm
Luminous Flux with DLM Flex Cover	7240	6125	5121	4553	lm
Module Efficacy	141	147	153	156	lm/W
Module Efficacy with DLM Cover	117	122	127	129	lm/W
Correlated Color Temperature	3500				K
CRI	>80				-
Color Consistency	<3				SDCM
Radiation Angle	115				degrees
Radiation Angle with DLM Cover	110				degrees

Note: Specifications stated at Tc nom = 85°C.
Tolerance for flux data is -10% +20%. Tolerance for efficacy data is ±10%.
Measurement precision for flux +/- 5%, for CRI +/- 1.5, for efficacy +/- 6%.



Dip switch settings		
	1	2
DS1	ON	ON
DS2	OFF	ON
DS3	ON	OFF
DS4	OFF	OFF

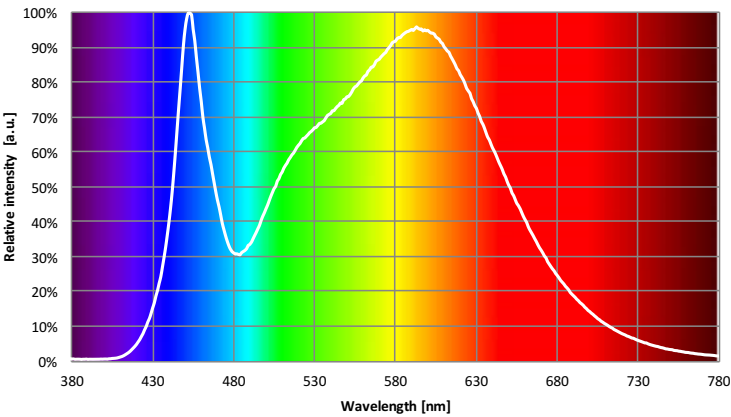


Fortimo LED DLM L2 84 G2 NA

Optical Characteristics – Table per CCT

Fortimo LED DLM Flex DS L2 840 84 G2 NA					
	DS4	DS3	DS2	DS1	Unit
Nominal Current	1763	1454	1189	1045	mA
Luminous Flux	9024	7635	6382	5674	lm
Luminous Flux with DLM Flex Cover	7490	6337	5297	4709	lm
Module Efficacy	146	152	158	161	lm/W
Module Efficacy with DLM Cover	121	126	131	134	lm/W
Correlated Color Temperature	4000				K
CRI	>80				-
Color Consistency	<3				SDCM
Radiation Angle	115				degrees
Radiation Angle with DLM Cover	110				degrees

Note: Specifications stated at Tc nom = 85°C.
Tolerance for flux data is -10% +20%. Tolerance for efficacy data is ±10%.
Measurement precision for flux +/- 5%, for CRI +/- 1.5, for efficacy +/- 6%.



Dip switch settings		
	1	2
DS1	ON	ON
DS2	OFF	ON
DS3	ON	OFF
DS4	OFF	OFF

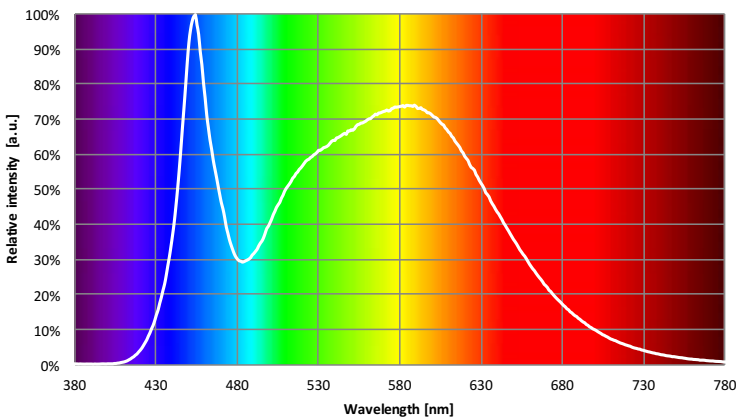


Fortimo LED DLM L2 84 G2 NA

Optical Characteristics – Table per CCT

Fortimo LED DLM Flex DS L2 850 84 G2 NA					
	DS4	DS3	DS2	DS1	Unit
Nominal Current	1116	638	408	332	mA
Luminous Flux	6024	3584	2337	1910	lm
Luminous Flux with DLM Flex Cover	5000	2975	1940	1585	lm
Module Efficacy	160	171	178	180	lm/W
Module Efficacy with DLM Cover	133	142	148	149	lm/W
Correlated Color Temperature	5000				K
CRI	>80				-
Color Consistency	<3				SDCM
Radiation Angle	115				degrees
Radiation Angle with DLM Cover	110				degrees

Note: Specifications stated at Tc nom = 85°C.
Tolerance for flux data is -10% +20%. Tolerance for efficacy data is ±10%.
Measurement precision for flux +/- 5%, for CRI +/- 1.5, for efficacy +/- 6%.



Dip switch settings		
	1	2
DS1	ON	ON
DS2	OFF	ON
DS3	ON	OFF
DS4	OFF	OFF



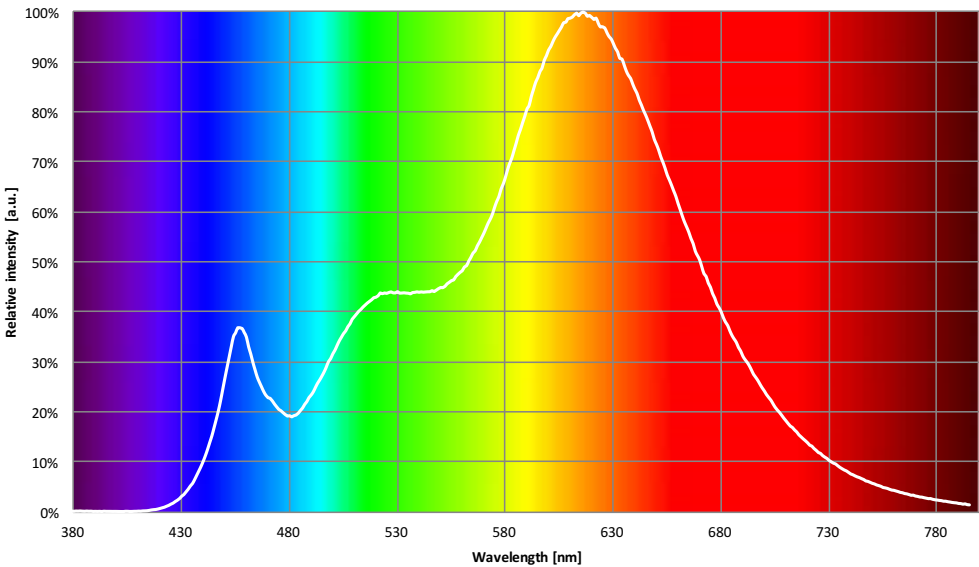
Fortimo LED DLM L2 84 G2 NA

Optical Characteristics – Table per CCT

Fortimo LED DLM Flex DS L2 927 84 G2 NA					
	DS4	DS3	DS2	DS1	Unit
Nominal Current	1864	1492	987	878	mA
Luminous Flux	6927	5791	4071	3670	lm
Luminous Flux with DLM Flex Cover	5749	4807	3379	3046	lm
Module Efficacy	105	112	123	125	lm/W
Module Efficacy with DLM Cover	87	93	102	104	lm/W
Correlated Color Temperature	2700				K
CRI	>90				-
Color Consistency	<2				SDCM
Radiation Angle	115				degrees
Radiation Angle with DLM Cover	110				degrees

Note: Specifications stated at Tc nom = 85°C.
Tolerance for flux data is -10% +20%. Tolerance for efficacy data is ±10%.
Measurement precision for flux +/- 5%, for CRI +/- 1.5, for efficacy +/- 6%.

Dip switch settings		
	1	2
DS1	ON	ON
DS2	OFF	ON
DS3	ON	OFF
DS4	OFF	OFF



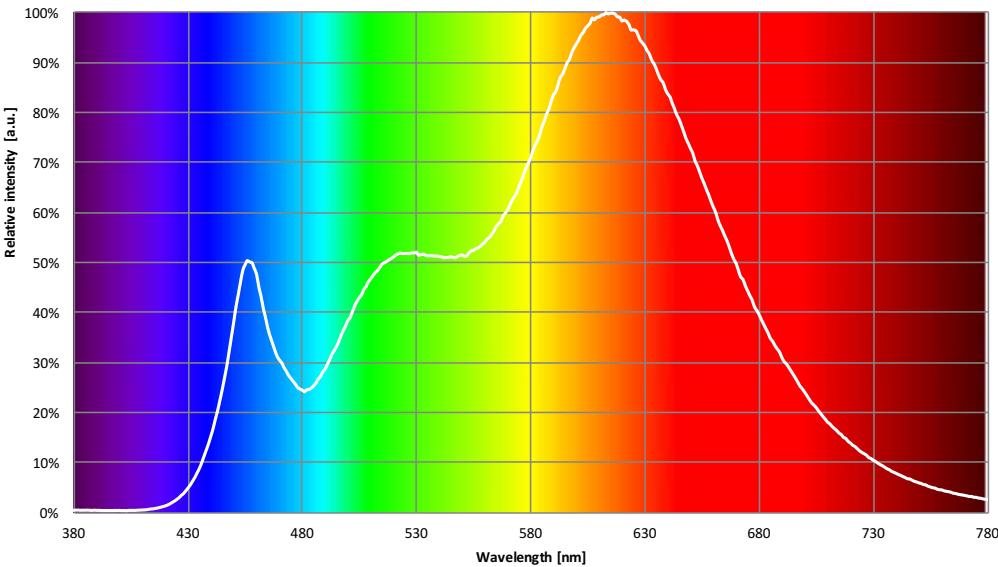
Fortimo LED DLM L2 84 G2 NA

Optical Characteristics – Table per CCT

Fortimo LED DLM Flex DS L2 930 84 G2 NA					
	DS4	DS3	DS2	DS1	Unit
Nominal Current	1864	1492	987	878	mA
Luminous Flux	7215	6031	4239	3822	lm
Luminous Flux with DLM Flex Cover	5988	5006	3518	3172	lm
Module Efficacy	110	117	128	131	lm/W
Module Efficacy with DLM Cover	91	97	106	109	lm/W
Correlated Color Temperature	3000				K
CRI	>90				-
Color Consistency	<2				SDCM
Radiation Angle	115				degrees
Radiation Angle with DLM Cover	110				degrees

Note: Specifications stated at Tc nom = 85°C.
Tolerance for flux data is -10% +20%. Tolerance for efficacy data is ±10%.
Measurement precision for flux +/- 5%, for CRI +/- 1.5, for efficacy +/- 6%.

Dip switch settings		
	1	2
DS1	ON	ON
DS2	OFF	ON
DS3	ON	OFF
DS4	OFF	OFF



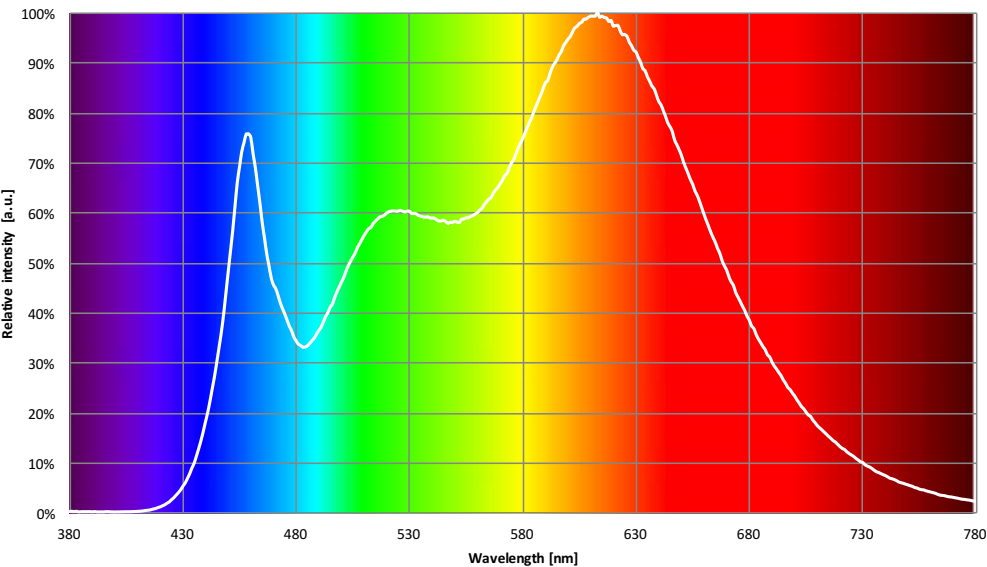
Fortimo LED DLM L2 84 G2 NA

Optical Characteristics – Table per CCT

Fortimo LED DLM Flex DS L2 935 84 G2 NA					
	DS4	DS3	DS2	DS1	Unit
Nominal Current	1864	1492	987	878	mA
Luminous Flux	7421	6204	4360	3930	lm
Luminous Flux with DLM Flex Cover	6159	5149	3619	3262	lm
Module Efficacy	113	120	132	134	lm/W
Module Efficacy with DLM Cover	94	100	110	111	lm/W
Correlated Color Temperature	3500				K
CRI	>90				-
Color Consistency	<2				SDCM
Radiation Angle	115				degrees
Radiation Angle with DLM Cover	110				degrees

Note: Specifications stated at Tc nom = 85°C.
Tolerance for flux data is -10% +20%. Tolerance for efficacy data is ±10%.
Measurement precision for flux +/- 5%, for CRI +/- 1.5, for efficacy +/- 6%.

Dip switch settings		
	1	2
DS1	ON	ON
DS2	OFF	ON
DS3	ON	OFF
DS4	OFF	OFF

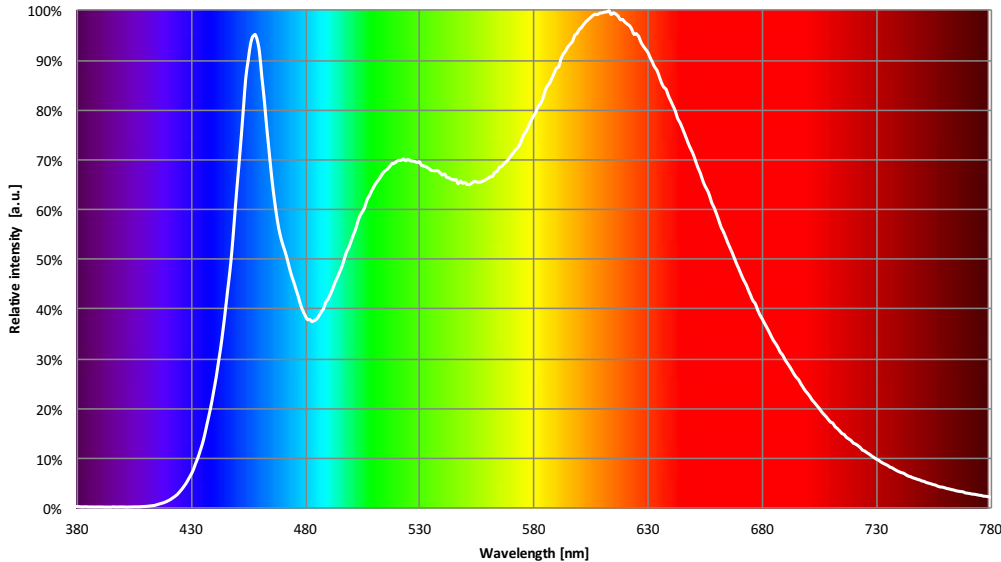


Fortimo LED DLM L2 84 G2 NA

Optical Characteristics – Table per CCT

Fortimo LED DLM Flex DS L2 940 84 G2 NA					
	DS4	DS3	DS2	DS1	Unit
Nominal Current	1864	1492	987	878	mA
Luminous Flux	7584	6340	4455	4016	lm
Luminous Flux with DLM Flex Cover	6295	5262	3698	3333	lm
Module Efficacy	115	123	134	137	lm/W
Module Efficacy with DLM Cover	95	102	111	114	lm/W
Correlated Color Temperature	4000				K
CRI	>90				-
Color Consistency	<2				SDCM
Radiation Angle	115				degrees
Radiation Angle with DLM Cover	110				degrees

Note: Specifications stated at Tc nom = 85°C.
Tolerance for flux data is -10% +20%. Tolerance for efficacy data is ±10%.
Measurement precision for flux +/- 5%, for CRI +/- 1.5, for efficacy +/- 6%.



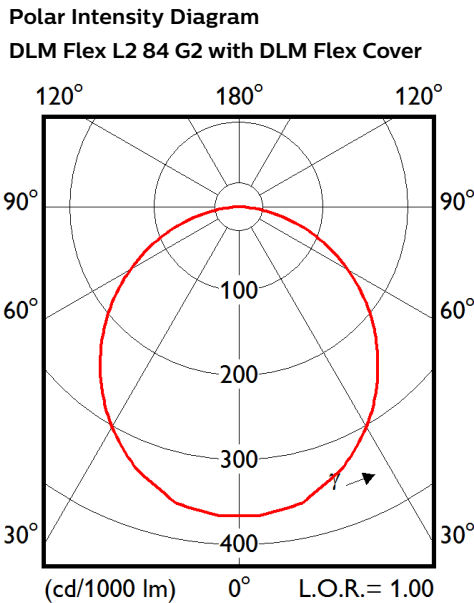
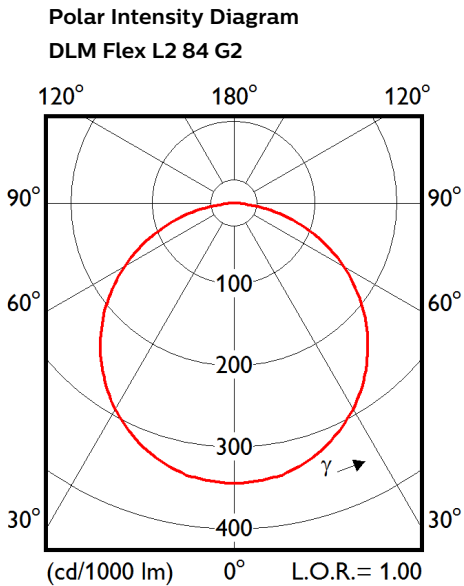
Dip switch settings		
	1	2
DS1	ON	ON
DS2	OFF	ON
DS3	ON	OFF
DS4	OFF	OFF



Fortimo LED DLM L2 84 G2 NA

Beam Shape

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



Electrical Characteristics

Fortimo LED DLM Flex DS L2 84 G2 CRI 80				
Parameter	Min	Typ	Max	Unit
Current		1763		mA
Forward Voltage	33.9	35.1	36.3	V
Power Consumption	59.8	61.9	64.0	W

Note: Specifications stated at Tc nom = 85°C.
Measurement precision for Vf +/-3%, for Power +/-3.3%

Fortimo LED DLM Flex DS L2 84 G2 CRI 90				
Parameter	Min	Typ	Max	Unit
Current		1864		mA
Forward Voltage	34.8	35.3	36.6	V
Power Consumption	64.9	65.8	68.2	W

Lifetime

Parameter	Min	Unit
Lumen Maintenance B50L70	50,000	hrs

Note: Lifetime stated at Tc nom = 85°C and nominal current of module

Parameter	Nominal ⁵	Max ⁶	Max. Current ⁷
Tc [°C] CRI 80	85	95	85
Tc [°C] CRI 90	85	95	75

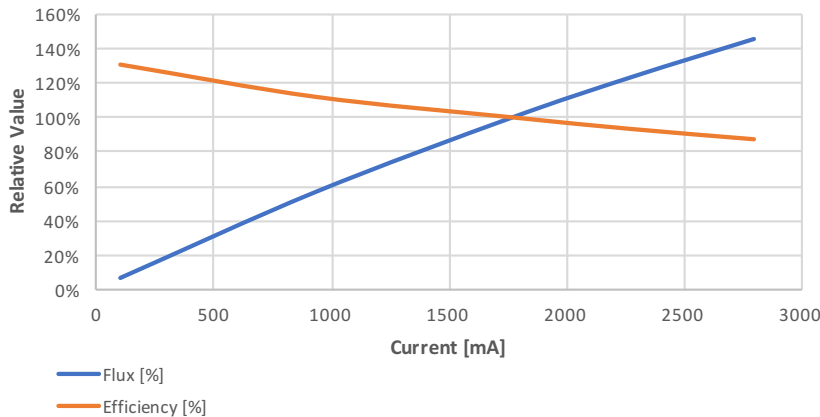
Refer to the warranty windows

5. Nominal value at which performance is specified.
6. Maximum value for safety.
7. Maximum TC allowed at maximum current within warranty window.

Fortimo LED DLM L2 84 G2 NA

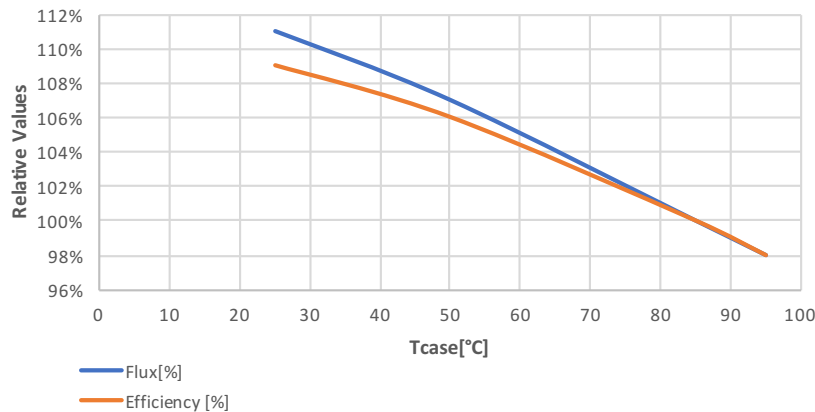
Tuning Information

Flux and Efficacy versus Current (at Nominal Temperature) DLM Flex L2 84 G2 - CRI 80



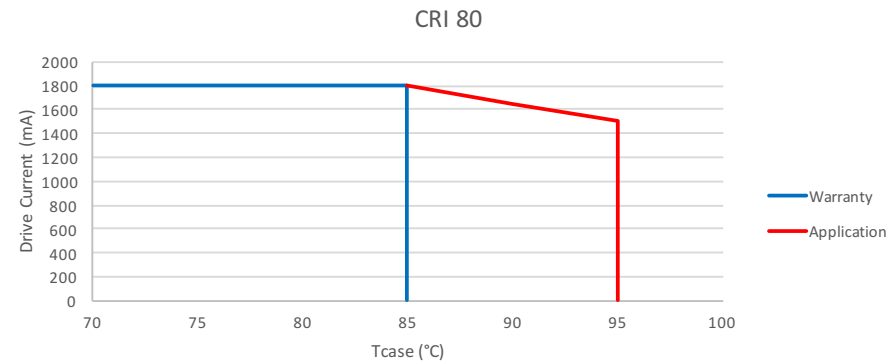
Current [mA]	Flux [%]	Efficiency [%]
100	7%	131%
932	57%	112%
1763	100%	100%
2282	124%	93%
2800	146%	87%

Flux and Efficacy versus Temperature at Tc (at Nominal Current) DLM Flex L2 84 G2 - CRI 80



Tcase [°C]	Flux[%]	Efficiency [%]
95	98%	98%
85	100%	100%
50	107%	106%
25	111%	109%

Warranty Window

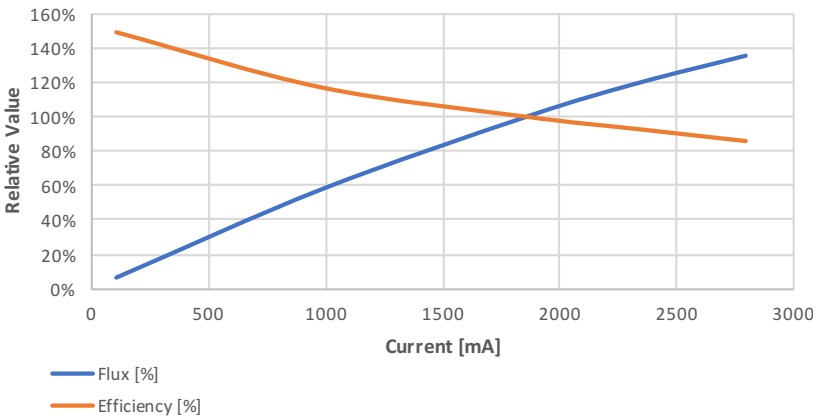


Warranted Number of Full Thermal Product Cycles @ 25°C Ambient Temperature CRI 80

Case Temperature Tcase[°C]	Number of Cycles
85	7,500
80	10,000
75	12,500
70	>12,500
65	>12,500
55	>12,500

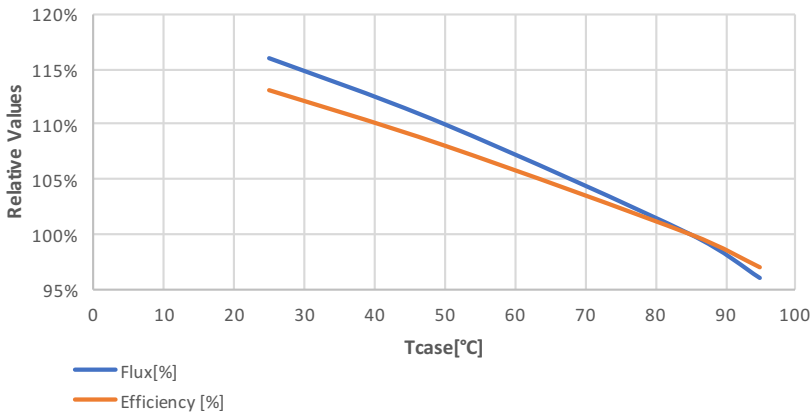
Fortimo LED DLM L2 84 G2 NA

Flux and Efficacy versus Current (at Nominal Temperature) DLM Flex L2 84 G2 - CRI 90



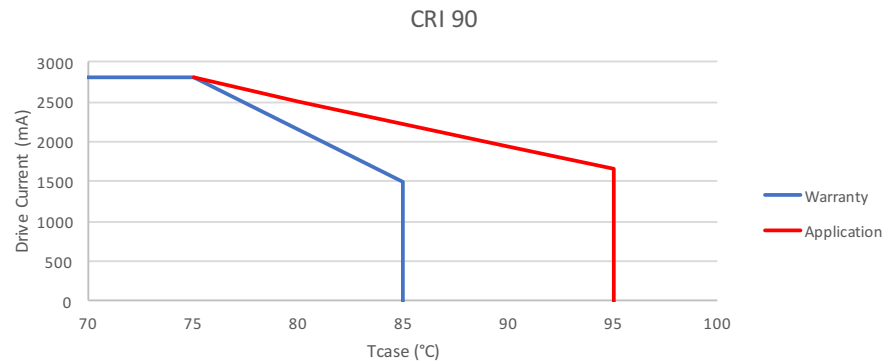
Current[mA]	Flux [%]	Efficiency [%]
100	7%	149%
982	58%	117%
1864	100%	100%
2332	119%	93%
2800	135%	86%

Flux and Efficacy versus Temperature at Tc (at Nominal Current) DLM Flex L2 84 G2 - CRI 90



Tcase [°C]	Flux[%]	Efficiency [%]
95	96%	97%
85	100%	100%
50	110%	108%
25	116%	113%

Warranty Window



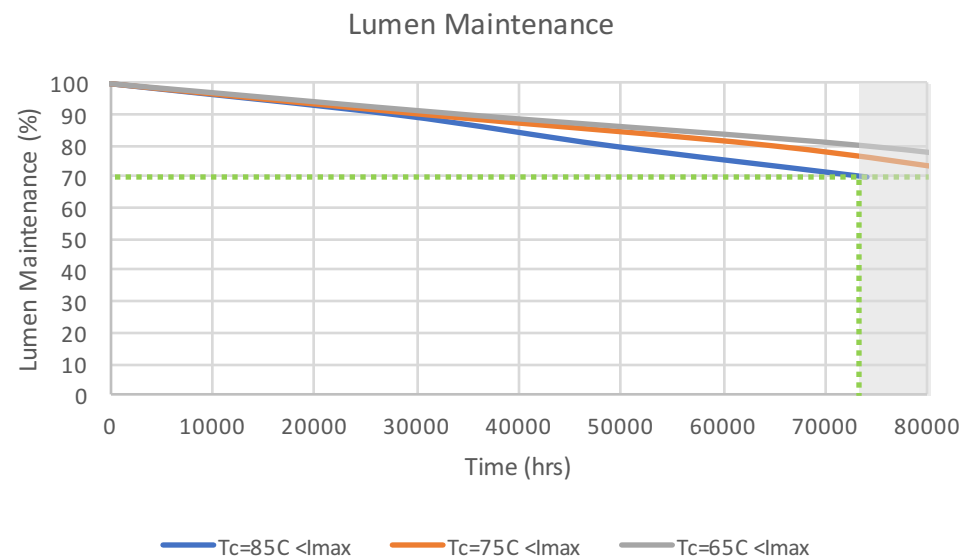
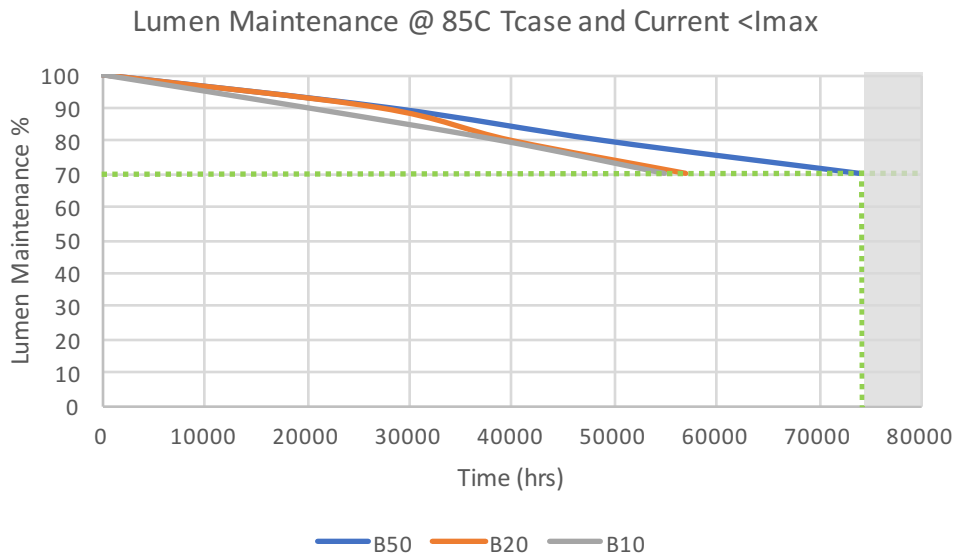
Warranted Number of Full Thermal Product Cycles @ 25°C Ambient Temperature CRI 90

Case Temperature Tcase [°C]	Number of Cycles
85	8,000
80	10,000
75	10,000
70	12,500
65	>12,500
55	>12,500

Fortimo LED DLM L2 84 G2 NA

Lumen Maintenance

Fortimo LED DLM Flex L2 84 G2 NA - CRI 80

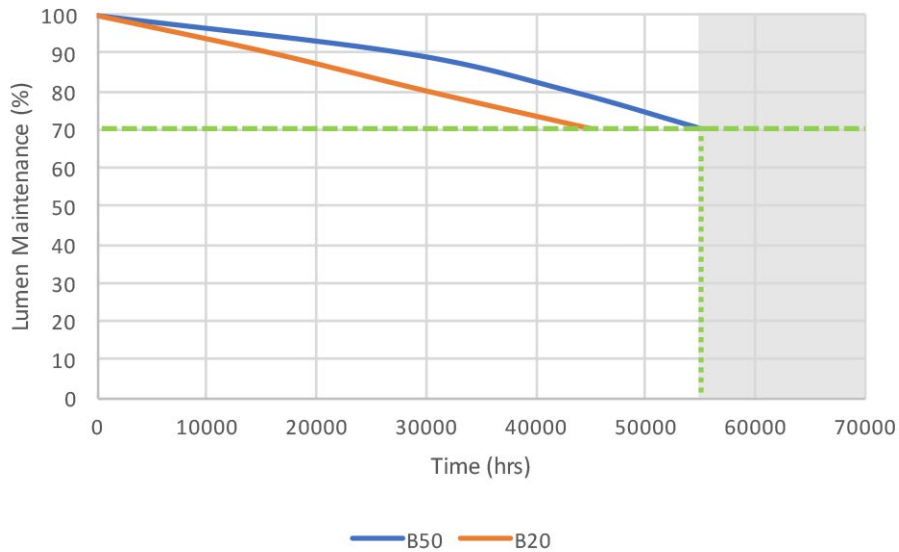


Fortimo LED DLM L2 84 G2 NA

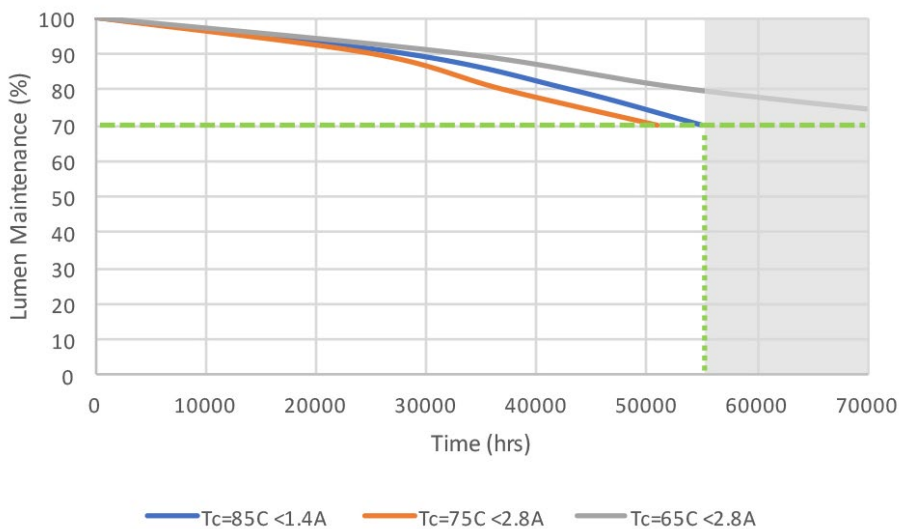
Lumen Maintenance

Fortimo LED DLM Flex L2 84 G2 NA - CRI 90

Lumen Maintenance @ 85C Tcase and Current <1.4A



Lumen Maintenance



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