ADVANCE by signify

LED Modules

Fortimo DLM Flex L2

84 G2 NA



Fortimo LED downlight module (DLM) Flex L2 G2 Dip Switch (DS) supersedes its predecessors by offering lumen packages up to 13,000lm* or a high efficacy up to 180lm/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 DLM Flex L2 84 G2 NA

Features

- Wide lumen output range: up 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 Advance Xitanium LED drivers with SimpleSet technology
- Lifetime > 50,000hrs[1] (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 3,000lm[2]
  - No additional heat sink needed[3]

* 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 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 testing[3]
- 5-year limited system warranty with Advance Xitanium LED drivers[4]

Application

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

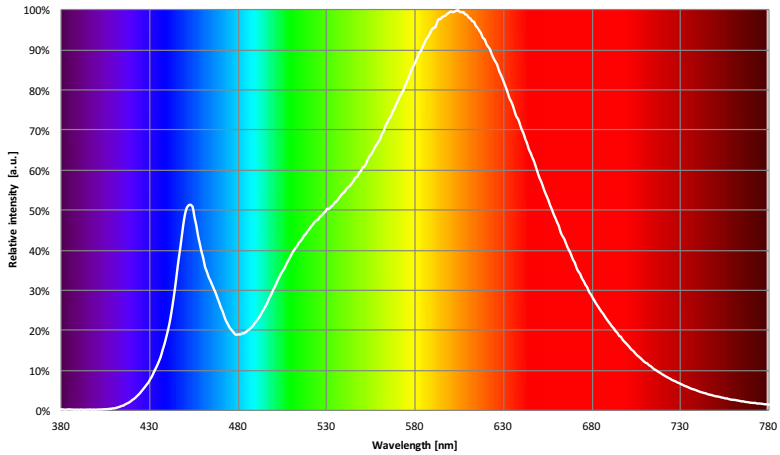
Optical Characteristics – Table per CCT

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

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



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%.



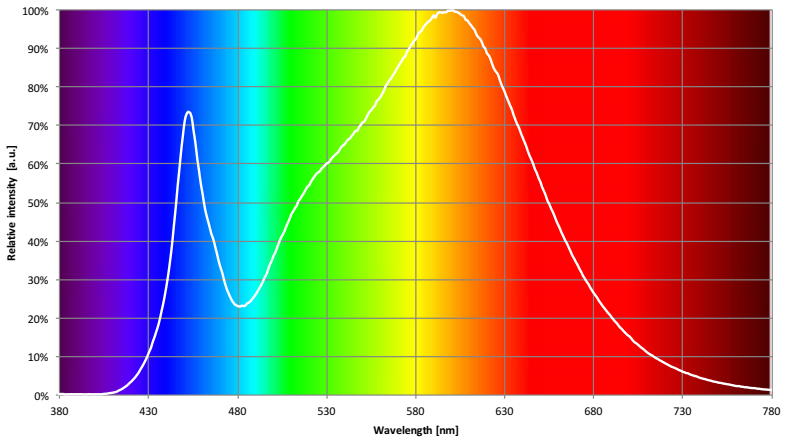
1. Average rated life is based one engineering data testing and probability analysis. The hours are at the B50, L70 point - 50,000 hours life with 70% lumen maintenance at Tc point when used with Advance produced cover and when Advance ESD protection guidelines are followed. Please refer to the design-in-guide 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 details and restrictions at http://www.usa.lighting.philips.com/support/support/warranty. Please note that the warranty is subjected to adherence to Advance ESD guidelines which are embedded in the design-in guide.

Fortimo DLM Flex 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

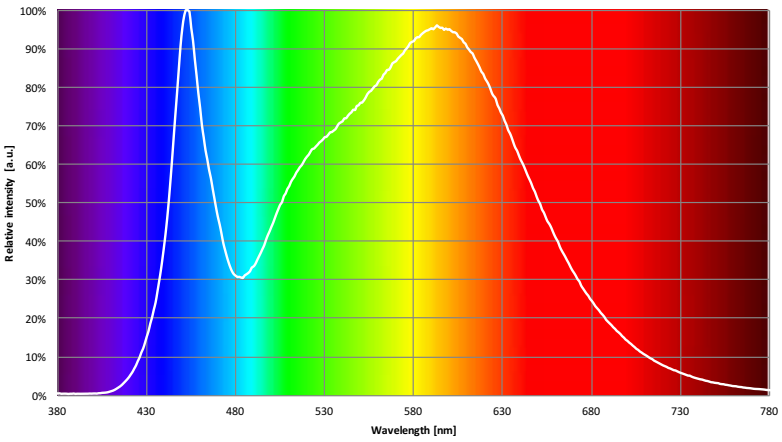


Fortimo DLM Flex L2 84 G2 NA

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

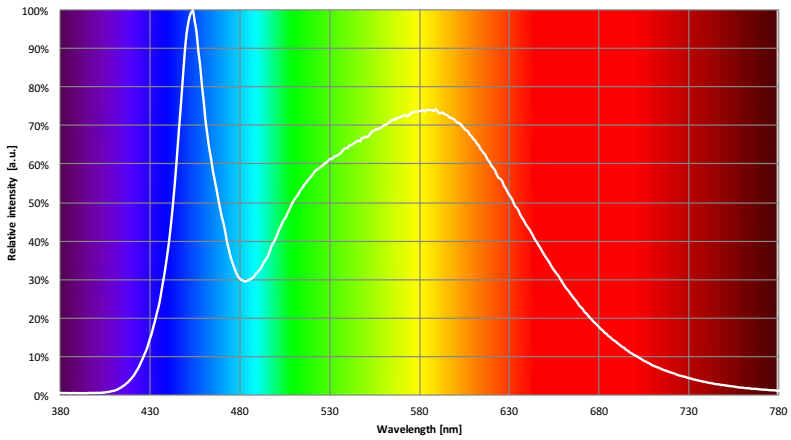


Fortimo DLM Flex L2 84 G2 NA

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

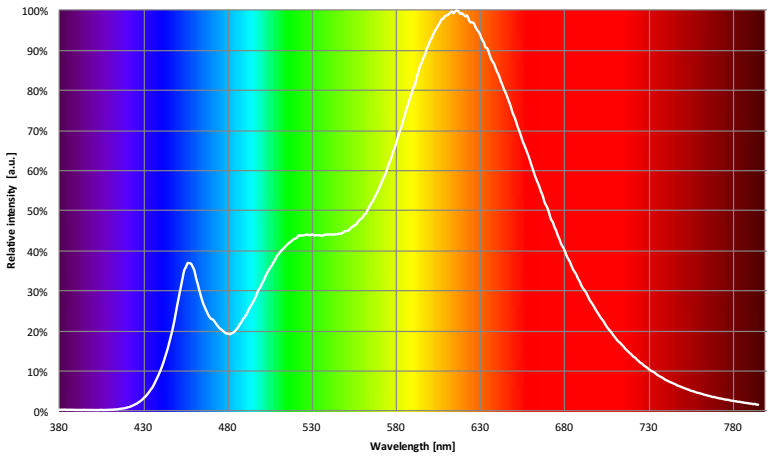


Fortimo DLM Flex L2 84 G2 NA

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	7042	5881	4127	3719	lm
Luminous Flux with DLM Flex Cover	5845	4881	3425	3087	lm
Module Efficacy	107	114	124	127	lm/W
Module Efficacy with DLM Cover	89	94	103	105	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 = 80°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

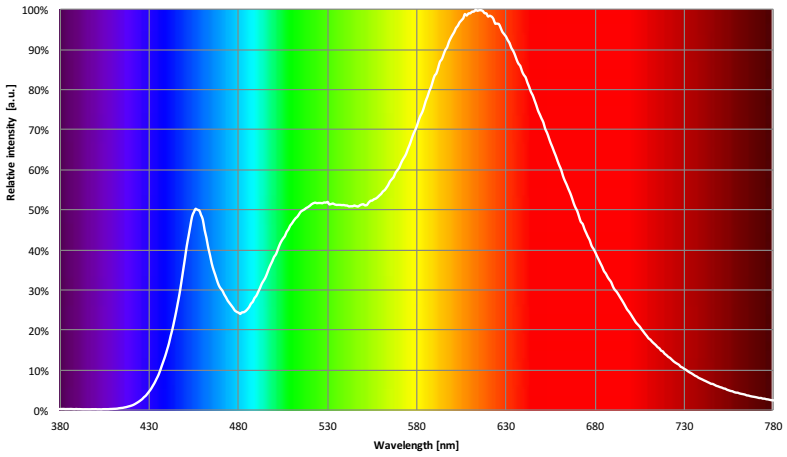


Fortimo DLM Flex L2 84 G2 NA

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	7334	6124	4297	3873	lm
Luminous Flux with DLM Flex Cover	6087	5083	3567	3215	lm
Module Efficacy	111	118	129	132	lm/W
Module Efficacy with DLM Cover	92	98	107	110	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 = 80°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

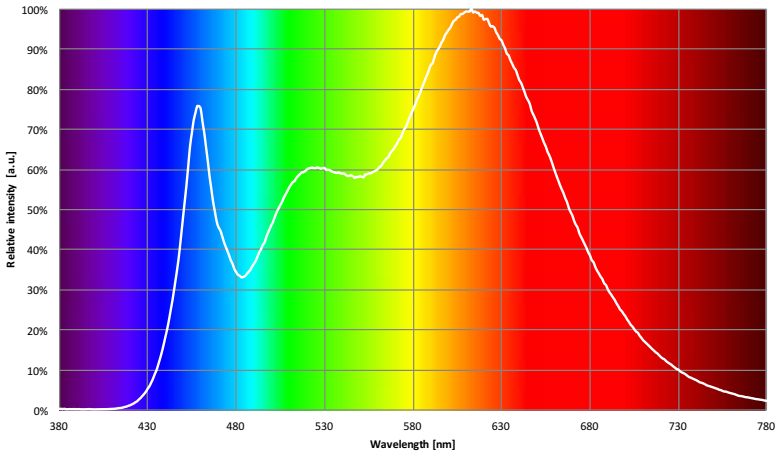


Fortimo DLM Flex L2 84 G2 NA

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	7544	6299	4420	3983	lm
Luminous Flux with DLM Flex Cover	6262	5228	3668	3306	lm
Module Efficacy	114	122	133	136	lm/W
Module Efficacy with DLM Cover	95	101	110	113	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 = 80°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

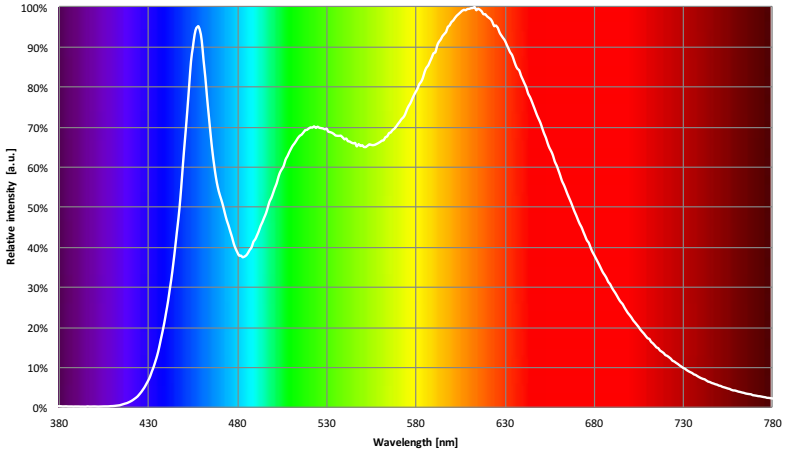


Fortimo DLM Flex L2 84 G2 NA

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	7710	6437	4516	4070	lm
Luminous Flux with DLM Flex Cover	6399	5343	3748	3378	lm
Module Efficacy	117	124	136	139	lm/W
Module Efficacy with DLM Cover	97	103	113	115	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 = 80°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

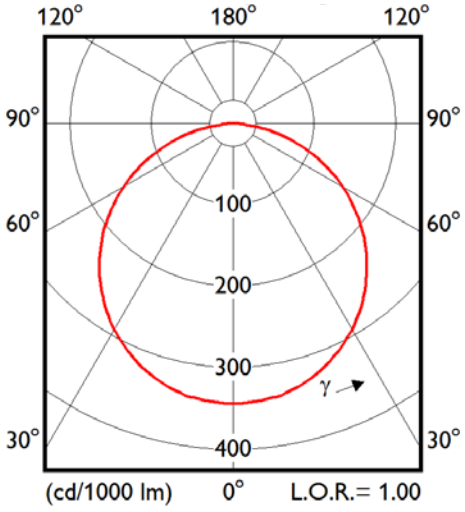


Fortimo DLM Flex L2 84 G2 NA

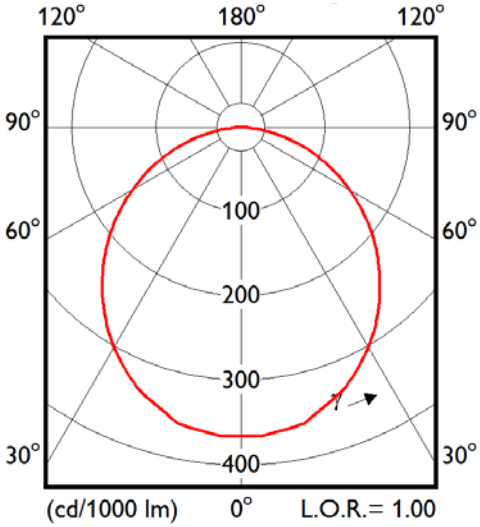
Beam Shape

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

Polar Intensity Diagram
DLM Flex L2 84 G2



Polar Intensity Diagram
DLM Flex L2 84 G2 with DLM Flex Cover



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

Note: Specifications stated at Tc nom = 80°C.
Measurement precision for Vf +/-3%, for Power +/-3.3%

Lifetime

Parameter	Min	Unit
Lumen Maintenance B50L70	50,000	hrs

Note: Lifetime stated at Tc nom = 85°C, refer to lumen maintenance graphs

Parameter	Nominal[5]	Max[6]	Max. Current[7]
Tc [°C] CRI 80	85	95	85
Tc [°C] CRI 90	80	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 DLM Flex L2 84 G2 NA

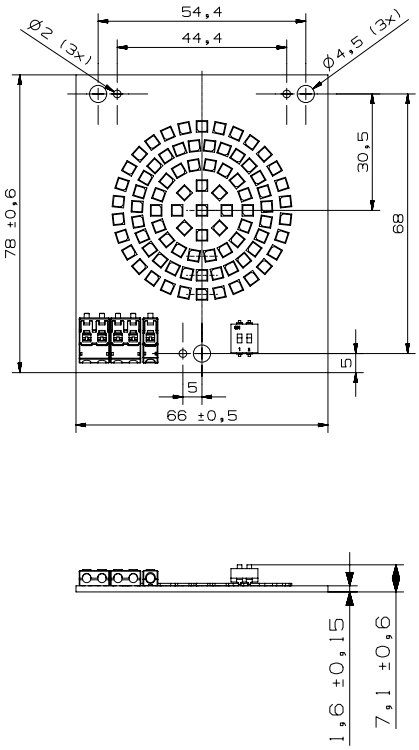
Abs Max Ratings

Parameter	Min	Typ	Max	Unit
Current Through the LED module (I-max)			2800	mA
Case Temperature (Tc-max)			95	°C
ESD IEC6100-4-2 (direct)			2 (CRI 80)*	kV
			8 (CRI 90)*	kV
Storage Temperature	-40		100	°C
Storage at humidity <95%, non-condensing				

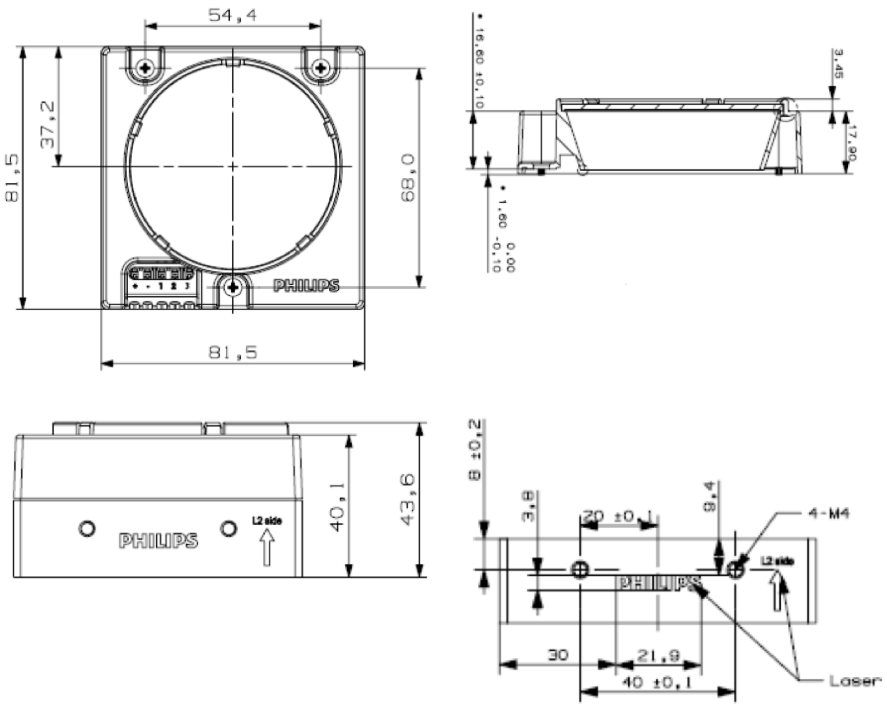
* Please refer to design-in guide for ESD guidelines.

Mechanical Characteristics

DLM Flex L2 84



DLM Flex Cover and DLM Thermal Accessory G1



Application Information

Compliance and Approval

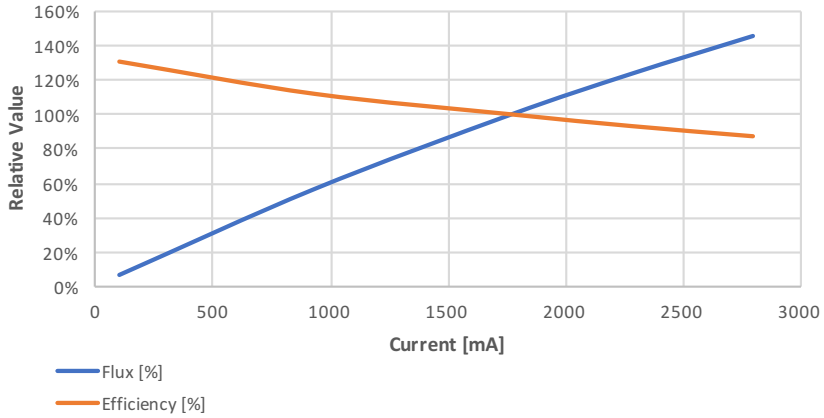
Application Information

CSA/ (UL CoA#: E336402)/ UL SREC

Overheating Protection	UL SREC
Luminaire Class	UL Class 2

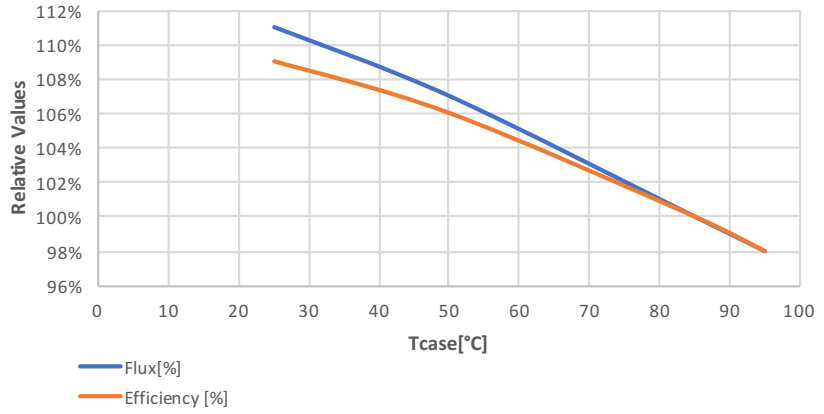
Tuning Information

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



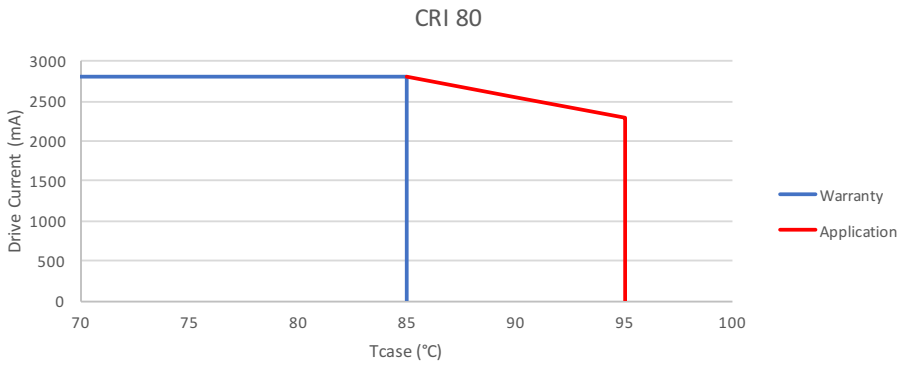
Current [mA]	Flux [%]	Efficiency [%]
100	7%	131%
932	57%	112%
1763	100%	100%
2282	124%	93%
2800	146%	87%

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

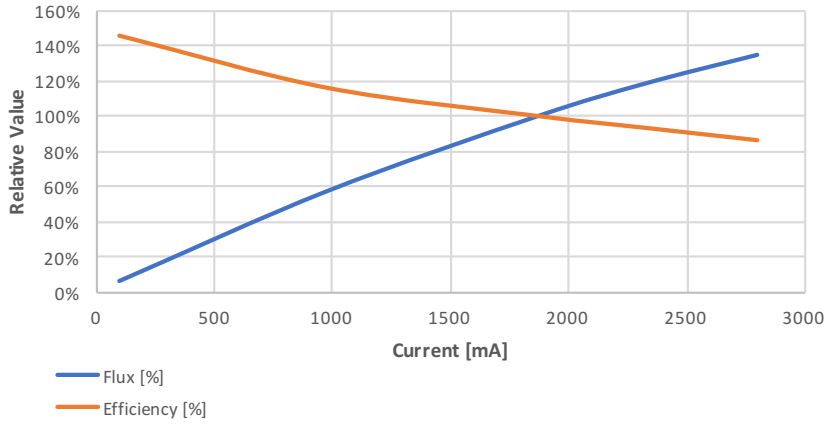


Warranted Number of Full Thermal Product Cycles within Warranty Window @ 25°C Ambient Temperature CRI 80

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

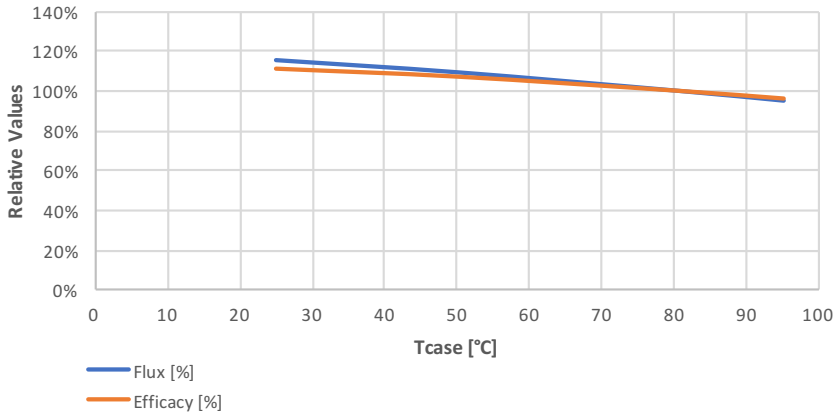
Fortimo DLM Flex L2 84 G2 NA

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



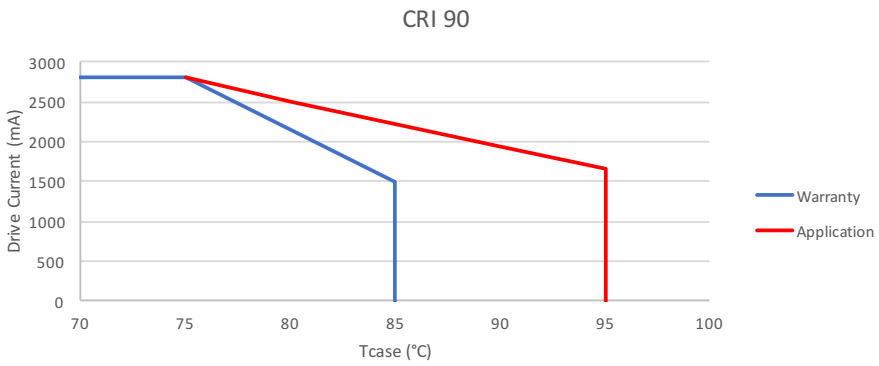
Current[mA]	Flux [%]	Efficiency [%]
100	7%	146%
982	58%	116%
1864	100%	100%
2332	119%	93%
2800	135%	86%

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



Tcase [°C]	Flux[%]	Efficiency [%]
95	95%	96%
80	100%	100%
50	109%	107%
25	115%	111%

Warranty Window

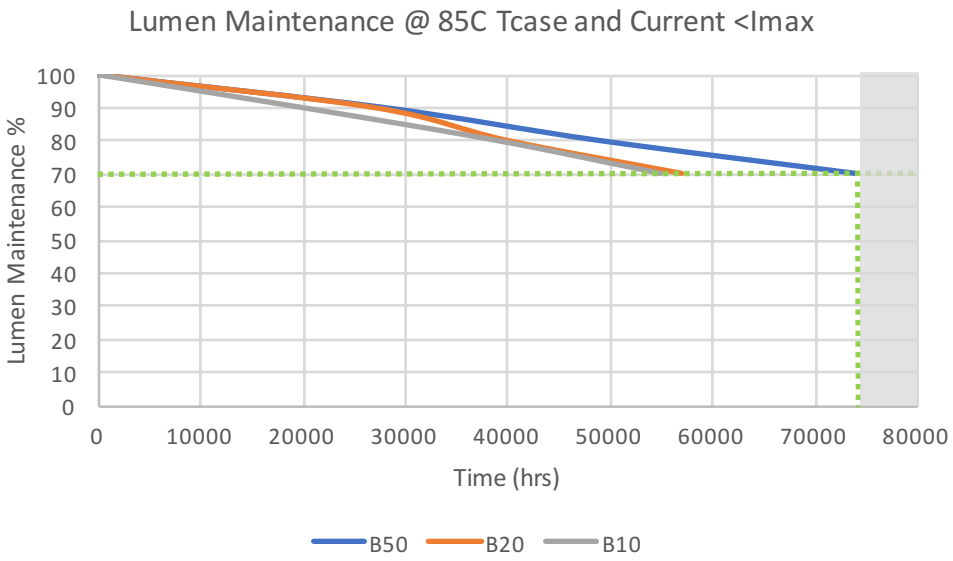


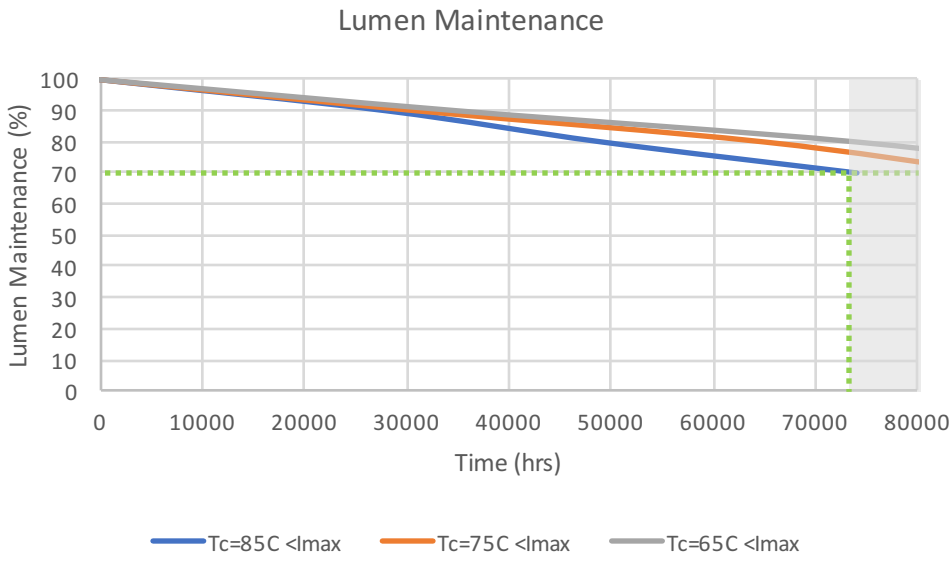
Warranted Number of Full Thermal Product Cycles within Warranty Window @ 25°C Ambient Temperature CRI 90

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

Lumen Maintenance

Fortimo LED DLM Flex L2 84 G2 NA - CRI 80

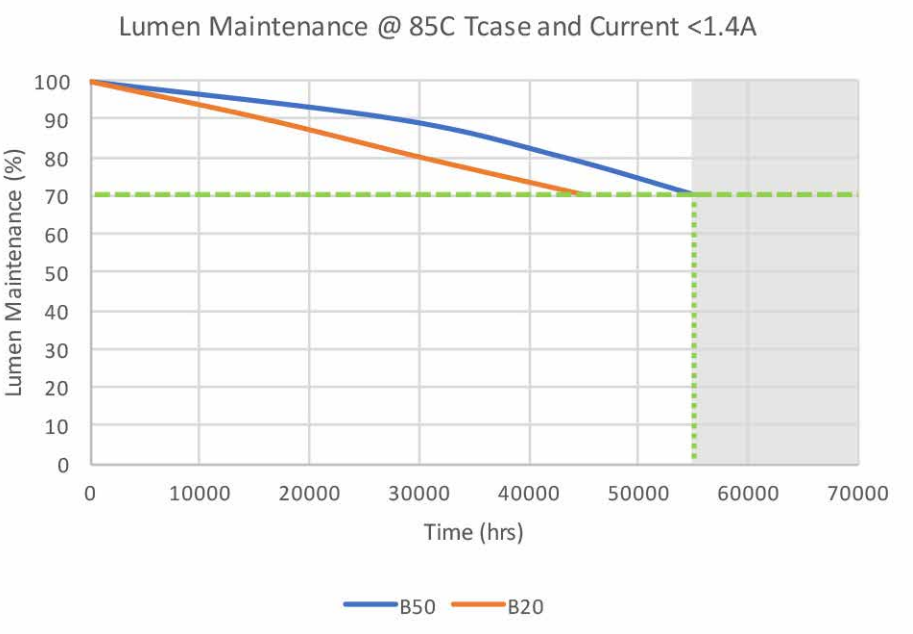


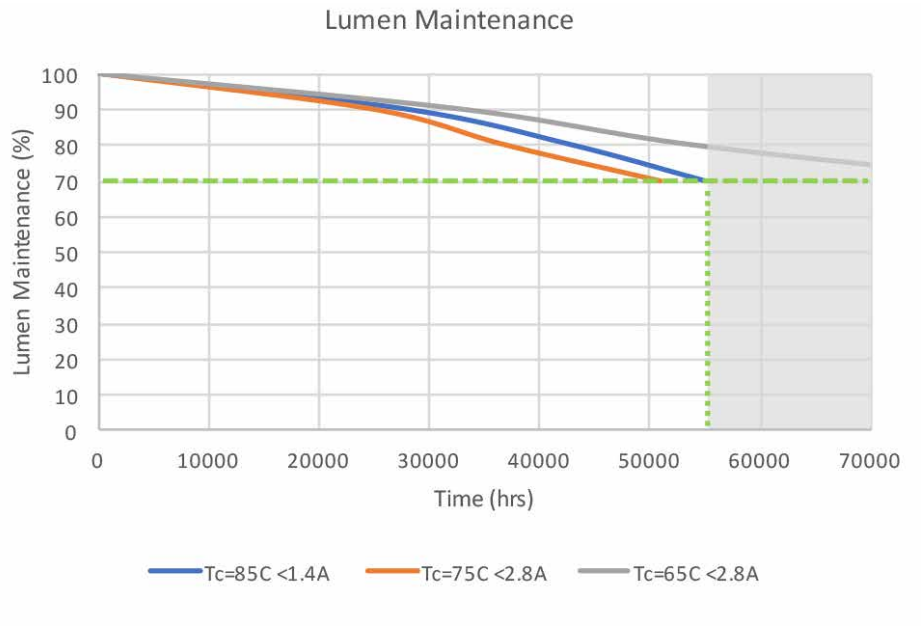


Fortimo DLM Flex L2 84 G2 NA

Lumen Maintenance

Fortimo LED DLM Flex L2 84 G2 NA - CRI 90





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