ADVANCE
by signify

LED Modules

Fortimo LED Strip Performance FlexTune LV5

23.7in 2200lm

Fortimo LED strip performance FlexTune LV5 modules are the preferred light source for the Advance FlexTune system; which provides new level of design flexibility, control precision, and simplicity in tunable white lighting systems for commerical office, healthcare, hospitality, and education applications.

Fortimo LED strip performance FlexTune LV5 modules comes with a multitude of performance and product advancements that include higher efficacy, higher lumen output, increased lumen maintenance, additional mechanical designs and CRI options when compared to the the previous generation (LV4). The modules also feature connectors at both ends to enable daisy chaining, and a high (>8kV) ESD rating for easy handling.

Commercial Product Name	12NC
FO Strip PR FT 23.7in 2200lm 927-965 LV5	929001765113

Features

- Pairs with Advance Xitanium SR FlexTune LED driver to provide: digital wireless control designed to provide precise CCT tuning and dimming control from 2700-6500K
- 3 SDCM color consistency
- (TM21) of L90 36,000 hours
- Connectors at both ends and tight Vf binning
- High Flux density of up to 2000lm/ft
- Narrow width of 20mm

Benefits

- Enables digital tuning of color temperature for tuneable white applications
- High energy efficacy and long lifetime[1]
- Low total cost of ownership
- Slim width and varied lengths provide excellent design flexibility
- 5-year limited system warranty with Advance Xitanium LED drivers[2]
- Specifications enable DLC Premium category[3]

Applications

- Retail
- Hospitality
- Office
- Education

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.
2. View limited warranty at www.signify.com/warranties for details and restrictions.
3. Fortimo LED strip LV5 is not a DesignLights Consortium™ (DLC) qualified product. It is an OEM component that meets certain performance specifications that are geared toward meeting DLC Standard Tier (v4.0) in a fully assembled fixture. The customer is liable for proper design, manufacturing, testing and qualification according to DLC requirements.

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Drive Currents

Parameter at I_{life}	Nominal*	Life**	Max***	Unit
FO Strip PR FT 23.7in 2200lm 9xx LV5	**308**	650	700	mA

Module Temperatures

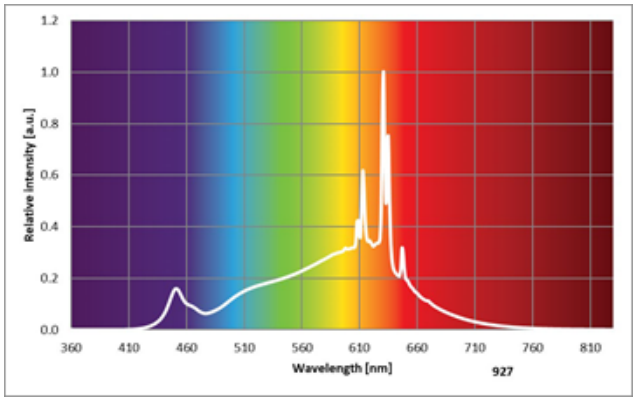
Parameter at I_{life}	Nominal*	Life**	Max***	Unit
T_c (case temperature at T_c point)	**45**	85	95	°C

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

Optical Characteristics – Table per CCT

FO Strip PR FT 23.7in 2200lm 927 LV5				
Parameter	**Min. (@ Inom)**	**Typ. (@ Inom)**	**Max. (@ Inom)**	**Unit**
Luminous Flux	1810	1960	2110	Lm
Module Efficiency	142	158	174	Lm/W
Correlated Color Temperature (CCT) Target		2700		K
Color coordinates (CIEx, CIEy)		(0.457, 0.406)		-
Color consistency			3	SDCM
CRI	90			-

Operation point	Tc	lm	lm/W
245 mA	25°C	1615	165
	45 °C	1580	163
	85°C	1480	155
308 mA	25 °C	2005	161
	45 °C	1960	158
	85 °C	1835	150
650 mA	25 °C	3955	140
	45 °C	3865	138
	85 °C	3610	130



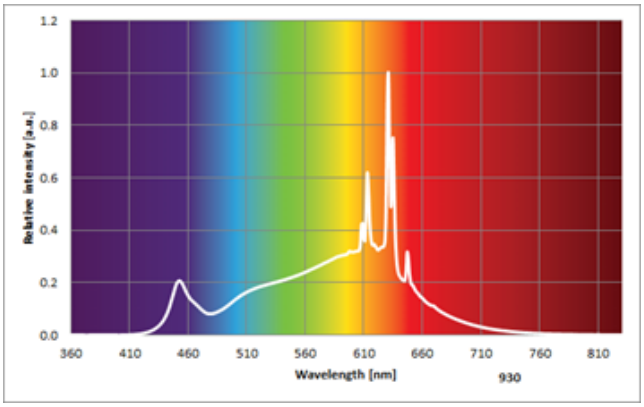
R9>0, Measurement precision ± 5% for the flux data and ± 6% for the efficacy data. Measurement precision for color coordinates ± 0.005. Measurement precision for CRI ± 1.5.

Fortimo LED Strip Performance FlexTune LV5
23.7in 2200lm

Optical Characteristics – Table per CCT

FO Strip PR FT 23.7in 2200lm 930 LV5				
Parameter	**Min. (@ Inom)**	**Typ. (@ Inom)**	**Max. (@ Inom)**	**Unit**
Luminous Flux	1810	1960	2110	Lm
Module Efficiency	146	162	178	Lm/W
Correlated Color Temperature (CCT) Target		3000		K

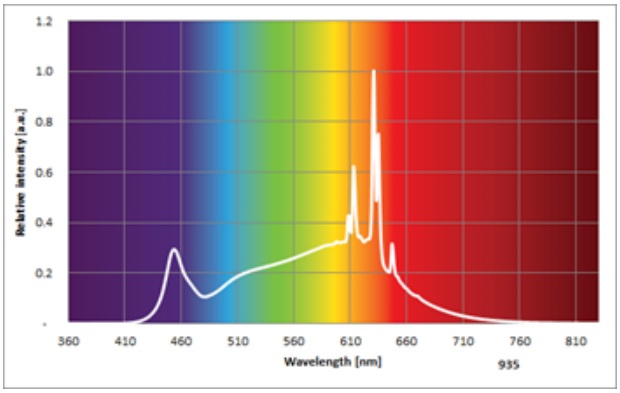
Operation point	Tc	Im	Im/W
245 mA	25 °C	1615	169
	45 °C	1580	167
	85 °C	1480	158
308 mA	25 °C	2005	165
	45 °C	1960	162
	85 °C	1835	154
650 mA	25 °C	3955	144
	45°C	3865	142
	85°C	3610	134



Using the Advance Xitanium SR Flextune LED driver, set to constant light output. R9>0, Measurement precision ± 5% for the flux data and ± 6% for the efficacy data. Measurement precision for color coordinates ± 0.005. Measurement precision for CRI ± 1.5.

FO Strip PR FT 23.7in 2200lm 935 LV5				
Parameter	**Min. (@ Inom)**	**Typ. (@ Inom)**	**Max. (@ Inom)**	**Unit**
Luminous Flux	1810	1960	2110	Lm
Module Efficiency	147	164	180	Lm/W
Correlated Color Temperature (CCT) Target		3500		K

Operation point	Tc	Im	Im/W
245 mA	25°C	1615	172
	45°C	1580	170
	85 °C	1480	161
308 mA	25 °C	2005	168
	45 °C	1960	165
	85 °C	1835	157
650 mA	25°C	3955	147
	45 °C	3865	144
	85°C	3610	137



Using the Advance Xitanium SR Flextune LED driver, set to constant light output. R9>0, Measurement precision ± 5% for the flux data and ± 6% for the efficacy data. Measurement precision for color coordinates ± 0.005. Measurement precision for CRI ± 1.5.

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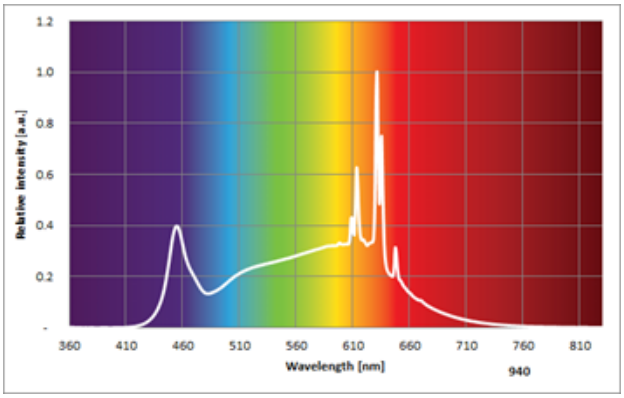
Optical Characteristics – Table per CCT

FO Strip PR FT 23.7in 2200lm 940 LV5

Parameter	Min. (@ Inom)	Typ. (@ Inom)	Max. (@ Inom)	Unit
Luminous Flux	1810	1960	2110	Lm
Module Efficiency	149	166	183	Lm/W
Correlated Color Temperature (CCT) Target		4000		K

Operation point	Tc	Im	Im/W
245 mA	25 °C	1615	175
	45°C	1580	172
	85 °C	1480	163
308 mA	25 °C	2005	170
	45 °C	1960	166
	85 °C	1835	159
650 mA	25 °C	3955	149
	45 °C	3865	147
	85 °C	3610	139

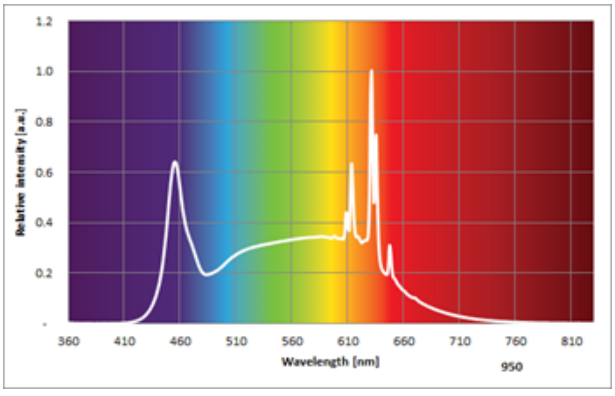


Using the Advance Xitanium SR Flextune LED driver, set to constant light output. R9>0, Measurement precision ± 5% for the flux data and ± 6% for the efficacy data. Measurement precision for color coordinates ± 0.005. Measurement precision for CRI ± 1.5.

FO Strip PR FT 23.7in 2200lm 950 LV5

Parameter	Min. (@ Inom)	Typ. (@ Inom)	Max. (@ Inom)	Unit
Luminous Flux	1810	1960	2110	Lm
Module Efficiency	152	169	186	Lm/W
Correlated Color Temperature (CCT) Target		5000		K

Operation point	Tc	Im	Im/W
245 mA	25°C	1615	178
	45 °C	1580	175
	85 °C	1480	166
308 mA	25°C	2005	173
	45 °C	1960	169
	85 °C	1835	161
650 mA	25°C	3955	152
	45°C	3865	150
	85 °C	3610	142

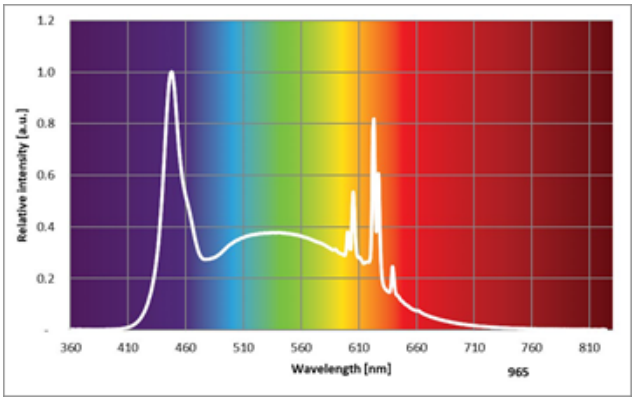


Fortimo LED Strip Performance FlexTune LV5
23.7in 2200lm

Optical Characteristics – Table per CCT

FO Strip PR FT 23.7in 2200lm 965 LV5				
Parameter	**Min. (@ Inom)**	**Typ. (@ Inom)**	**Max. (@ Inom)**	**Unit**
Luminous Flux	1950	2110	2370	Lm
Module Efficiency	156	173	190	Lm/W
Correlated Color Temperature (CCT) Target		6500		K
Color coordinates (CIEx, CIEy)		(0.312, 0.325)		-
Color consistency			3	SDCM
CRI	90			-

Operation point	Tc	Im	Im/W
245 mA	25°C	1740	181
	45 °C	1700	178
	85 °C	1590	168
308 mA	25°C	2165	176
	45 °C	2110	173
	85°C	1970	164
650 mA	25 °C	4310	156
	45°C	4200	153
	85 °C	3915	144



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Absolute Ratings

Parameter	Min.	Typ.	Max.	Unit
Current through the LED module (I-max)			700	mA
Working voltage			44	V_{dc}
Isolation breakdown voltage	700			V_{dc}
Ambient Temperature	-20[4]			°C

4. There cannot be any ice/fog/mist on any part of the module surface during the application at -20°C.

System Chain Limits for Same Length Modules

Total length (in)	Total current limit (A)
48	0.9
72	0.6
96	0.44

Please review the design-in guide or contact the Design-in team for further information.

Application Information

Compliance and Approval

UL & cUL - UL8750

Environmental

RoHS / REACH

IP Rating	No IP rating
Overheating Protection	No protection
Luminaire Class	UL Class 2

Estimated Number of Full Thermal Product Cycles @ 25°C Ambient Temperature

Case Temperature Tc [°C]	Amount of Cycles
45	>100K
55	>100K
65	88K
75	36K
85	16K

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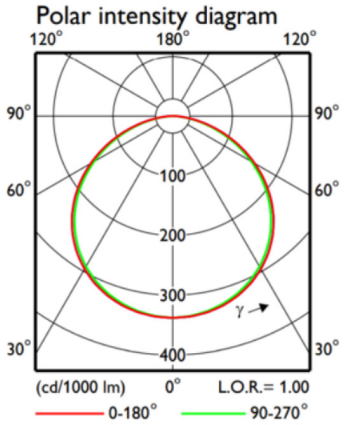
Beam Shape

The Fortimo LED strip 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
Forward voltage; If = 308mA, Tc = 45°C	39.15	39.65	40.15	V
Thermal power; If = 308mA, Tc = 45°C		6.2		W

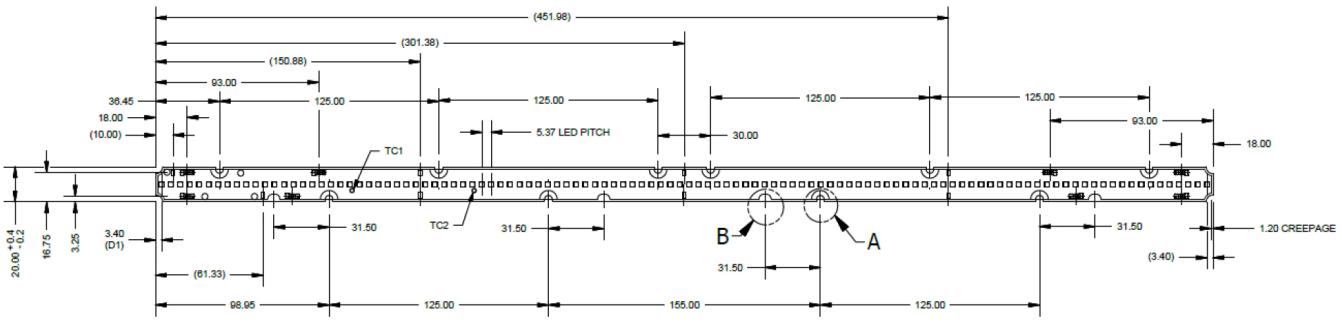
Wiring

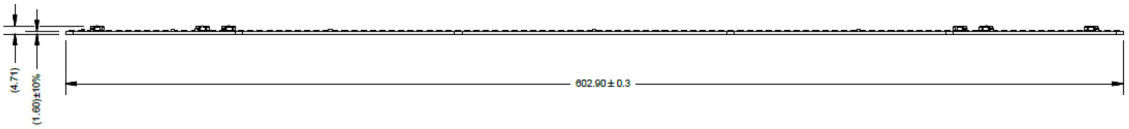
Specification Item	Value	Unit	Condition
Input Wire Cross-Section	0.2...0.8	mm^2	Solid
	18...24	AWG	
	0.45...0.7	mm^2	Stranded
	20...22	AWG	
Input Wire Strip Length	4.5...5.5	mm	

Mechanical Characteristics

Specification Item	Min	Typ	Max	Unit
Length	602.6	602.9	603.2	mm
Width	19.8	20.0	20.4	mm
Height Excl. Connector		2.3		mm
Height Incl. Connector		4.6		mm
Warpage			0.75	%

FO Strip PR FT 23.7in 2200lm 9xx LV5





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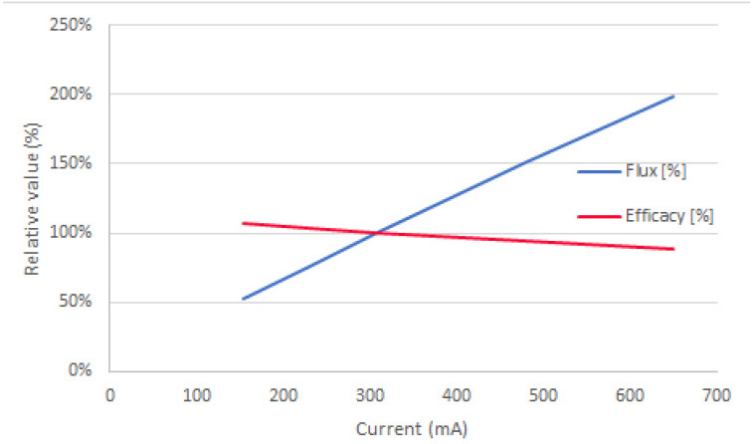
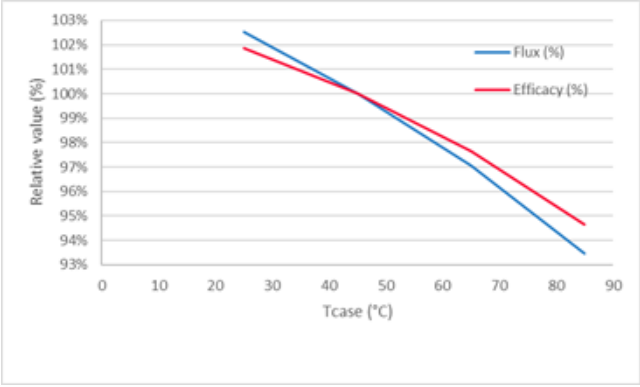
Tuning Information

Flux and Efficacy Vs. Current (at Nominal Temperature)



I [mA]	Flux [%]	Efficacy [%]
154	51%	107%
230	76%	103%
308	100%	100%
480	151%	94%
650	199%	88%

Flux and Efficacy Vs. Tc



Tc [°C]	Flux [%]	Efficacy [%]
85	93%	95%
65	97%	98%
45	100%	100%
25	103%	102%

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Lumen Maintenance Based on Theoretical TM21 Calculations

Operation point	Tc	L70	L80	L90
80% I-nom 245 mA	Tc-nom 25°C	>36K	**>36K**	>36K
	Tc 45°C	>36K	>36K	>36K
	Tc-life 85 °C	>36K	>36K	>34K
I-nom 308 mA	Tc-nom 25 °C	>36K	>36K	>36K
	Tc 45 °C	>36K	>36K	>36K
	Tc-life 85 °C	>36K	>36K	>34K
I-life 650 mA	Tc-nom 25 °C	>36K	>36K	>36K
	Tc 45 °C	>36K	>36K	>36K
	Tc-life 85 °C	>36K	>36K	>34K

Application limited to indoor applications (office/hospitality/educational).

The information presented in this document is not intended as any commercial offer and does not form part of any quotation or contract.

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