LINEARlight FLEX® POWER Tunable White

LF1200/2000/3000/4000TW-G3

Enjoy full flexibility in lighting design. Integrate light smoothly into architecture and lifestyle objects. Even select the color temperature when you switch on the light. The new LINEARlight FLEX Tunable White range of modules can deliver any color light from 2700K to 6500K to match the application or the mood.

Key Features & Benefits

- High-intensity linear LED light source
- Available in 1200, 2000, 3000 and 4000 lumens per meter
- Tunable white 2700K-6500K for dynamic white applications
- Long operational length per single power feed possible
- High efficiency for luminaire designs
- Extra strong self-adhesive backside for easy mounting
- 24V technology for easy dimensioning
- Recommended in system use with OPTOTRONIC® power supplies
- Current control technology for constant flux level along the module
- Flexible and cuttable every 2.95" (75mm)
- High quality single-piece PCB from continuous reel-to-reel production for improved reliability
- Extra-long lifetime: 60,000hrs ($L_{70}B_{50}$)
- Dimmable with PWM technology

Product Offering

Ordering Abbreviation	Wattage (W/ft)*	CCT
LF4000TW-G3-82765-02	11.22	2700-6500K
LF3000TW-G3-82765-03	9.15	2700-6500K
LF2000TW-G3-82765-03	5.64	2700-6500K
LF1200TW-G3-82765-09	3.20	2700-6500K

*Data is for both channels operating at 100% output.

Application Information

Applications

- Architectural integration
- Color tunable applications
- Display lighting
- Object integration
- Organic shaped luminaires
- Shop lighting
- Signage applications

Specifications and Certifications

The LINEARlight FLEX is UL8750 recognized for the US and Canada Class 2 Unit (UL File # E346592)

Light is OSRAM

Ordering Information

Ordering Abbreviation	Item Number	CCT Range (K)	CRI	V	W/m*	W/ft*	lm/m*	lm/ft*	lm/W*	Max. operable length/OT96 (in/mm)	Complete module length per reel (ft/m)	Beam Angle (°)
LF4000TW-G3-82765-02	57167	2700-6500	>80	24	36.8	11.22	3800	1159	103	73.8/1875	6.9/2.1	120
LF3000TW-G3-82765-03	57168	2700-6500	>80	24	30.0	9.15	3000	915	100	94.5/2400	9.3/3.0	120
LF2000TW-G3-82765-04	57169	2700-6500	>80	24	18.5	5.64	2000	610	108	159.5/4050	14.8/4.5	120
LF1200TW-G3-82765-09	57170	2700-6500	>80	24	10.5	3.20	1200	366	114	301.2/7650	29.5/9.0	120

*Data is for both channels operating at 100% output.

Technical data per channel

		All Channels (100%)			Channel 1			Channel 2		
Ordering Abbreviation	Item Number	CCT (K)	Lum. Fl. (lm/ft)	Watt. (W/ft)	CCT (K)	Lum. Fl. (lm/ft)	Watt. [W/ft]	CCT (K)	Lum. Fl. (lm/ft)	Watt. (W/ft)
LF4000TW-G3-82765-02	57167	4000	1159	11.22	6500	566	5.18	2700	593	6.04
LF3000TW-G3-82765-03	57168	4000	915	9.15	6500	451	4.27	2700	463	4.88
LF2000TW-G3-82765-04	57169	4000	610	5.64	6500	306	2.68	2700	303	2.96
LF1200TW-G3-82765-09	57170	4000	366	3.20	6500	186	1.52	2700	180	1.68

Specifications

General

Dimmable	Pulse width modulation (PWM)
Binning	3 steps MacAdam ellipse per single channel, resulting in combined values of up to 3.8 (LF1200TW, LF2000TW, LF3000TW) and 4.5 (LF4000TW)
Lifetime	60,000 h ($L_{70}B_{50}$, Tc max)
Adhesive tape on backside	3M RP16
Complementary systems	CONNECTsystem, SLIMCONNECTsystem, SLIM TRACK, OPTOTRONIC®
Certifications	UL8750, CE

Operating Conditions

Operating temperature at Tc-Point [°C]	-20°C to +85°C
Storage temperature [°C]	-40°C to +85°C
Ambient temperature (rated)	25°C
Ambient temperature Ta (range)	-20°C to +50°C
Voltage range [VDC]	23-25
Reverse Voltage [VDC]	25

- Exceeding maximum ratings for operating and storage temperature will reduce expected life time or destroy the LED Module.
- Exceeding maximum ratings for operating voltage will cause hazardous overload and will likely destroy the LED Module.
- The temperature of the LED module must be measured at the Tc-point according to EN60598-1 in a thermally constant status with a temperature sensor or a temperature sensitive label. For exact location of the Tc-point see drawing on page 3.
- Temperature ramping for environmental test acc. EN 62717 performed at 1 K/min.

Power Supply Information

Maximum OPTOTRONIC Power Supply Loading*

Product	OT20[5] (51804)	OT50[5] (51598)	OT96[5] (51520, 51522, 51626)
LF4000TW-G3-82765-02	5c = 14.76"	13c = 38.39"	25c = 73.8"
LF3000TW-G3-82765-03	6c = 17.72"	16c = 47.24"	32c = 94.5"
LF2000TW-G3-82765-04	11c = 32.48"	28c = 82.68"	54c = 159.5"
LF1200TW-G3-82765-09	21c = 62.01"	53c = 156.5"	102c = 301.2"

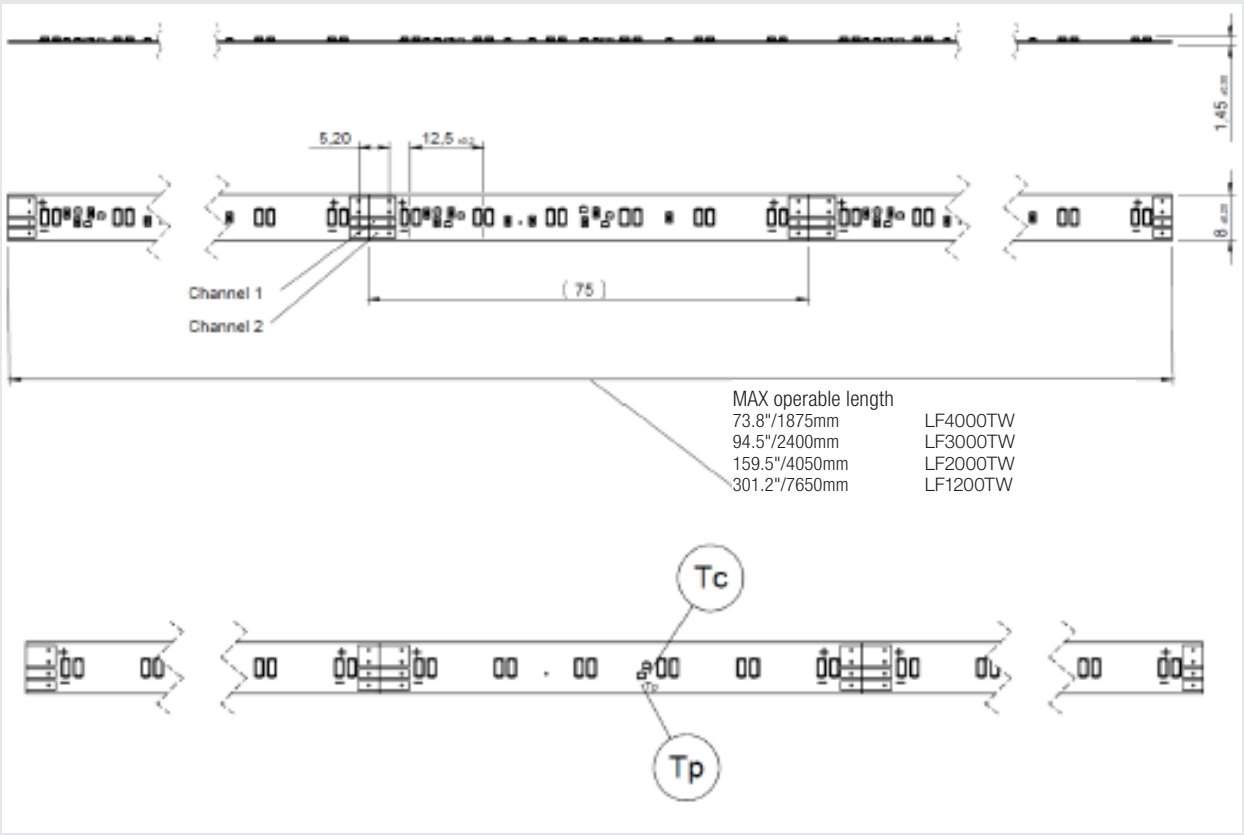
Notes:
1. In the above chart, "c" = coupon
2. A coupon is the Smallest Electrical Unit (SEU) independent sub-section of the module. For this product one SEU is 1.97" (50mm). Reference this bulletin's "Technical Drawings" for details.
3. The module is designed to work with 24VDC Constant Voltage power supplies only. Reference the Power Supply PIB # ECS050 for product specific information.
4. To accurately determine the maximum LED load for the application refer to "Remote Mounting Distances" Application Note (LED126).
5. The maximum load is dependent on the power supply wattage and in many cases is less than one full reel.
6. Please reference this bulletin's "Wiring Diagram" for product specific wiring instructions.

*In order to drive OSRAM LED-Modules safely, it is absolutely necessary to operate them with an electronically stabilized power supply protecting against short circuits, overload and overheating. Please see the relevant OPTOTRONIC brochure for more detailed information. OSRAM OPTOTRONIC control gear complies with all relevant standards and ensures safe operation.

Accessories

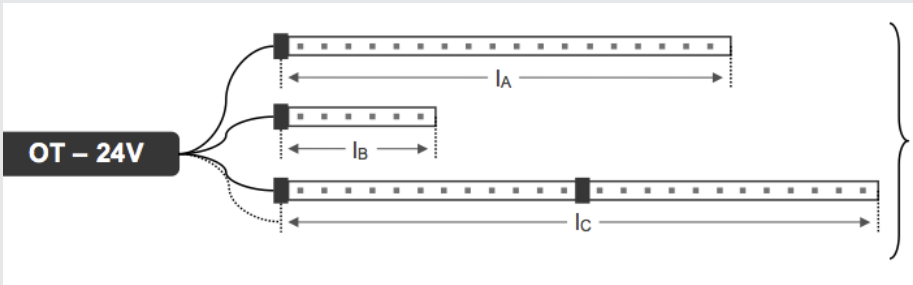
Description	Ordering Abbreviation	Item Number	Minimum Order Qty.
SLIMCONNECT SYSTEM			
3-pin Input connector for feeding power from the left end of module	FX-SC08-G2-CT3PF-0500HF	57831 (1 piece)	Multiple of 20
3-pin Input connector for feeding power from the right end of module	FX-SC08-G2-CT3PE-0500HF	57832 (1 piece)	Multiple of 20
Jumper (board-to-board)	FX-SC08-G2-CT4PJ	57103 (1 piece)	Multiple of 25
Extension wire 30mm (use with 57103)	FX-SC08-G1-FW4P-LIN-0030	72947 (1 piece)	Multiple of 100
Extension wire 150mm (use with 57103)	FX-SC08-G1-FW4P-LIN-0150	72948 (1 piece)	Multiple of 50
SLIMTRACK SYSTEM			
SLIMTRACK (6.9')	LF-LTS-2100 SLIM TRACK	72356	1
Mounting Bracket for SLIMTRACK	LF-LTS-MB	72357	Multiple of 35
Clear SLIMTRACK Cover (6.9')	LF-LTS COVER C	72360	1
High Profile Diffuse SLIMTRACK Cover (6.9')	LF-LTS-COVER-DIFFUSE	72358	1
Endcap for Diffuse Cover (for use only with 72358)	LF-LTS-ENDCAP	72359	Multiple of 20

Technical Drawings



Wiring Diagram

Please consider that lengths may differ if further controls are installed.



Maximum length per OT:

$I_A + I_B + I_B + \ldots \rightarrow I_{max/OT}$

Maximum length per strip:

I_A	≤	LX
I_B	≤	LX
I_C	≤	LX
I…	≤	LX

	Lx
LF1200TW	301.2"/7650mm
LF2000TW	159.5"/4050mm
LF3000TW	94.5"/2400mm
LF4000TW	73.8"/1875mm

Safety Information

1. The LED module itself and all its components must not be mechanically stressed.
2. Assembly must not damage or destroy conducting paths on the circuit board.
3. Installation of LED modules (with power supplies) needs to be made with regard to all applicable electrical and safety standards. Only qualified personnel should be allowed to perform installations.
4. Observe correct polarity! Depending on the product incorrect polarity will lead to emission of red or no light. The module can be destroyed! Correct polarity immediately! (see "reverse voltage", page 2).
5. Parallel connection is highly recommended as safe electrical operation mode. Serial connection is not recommended. Unbalanced voltage drop can cause hazardous overload and damage the LED module.
6. Please ensure that the power supply is of adequate power to operate the total load.
7. When mounting on metallic or otherwise conductive surfaces, there needs to be an electrical isolation at soldering points between module and the mounting surface.
8. Maximum length of a coherently operable unit: 73.8" for LF4000TW, 94.5" for LF3000TW, 159.5" for LF2000TW, 301.2" for LF1200TW.
9. Pay attention to standard ESD precautions when installing and handling the module.
10. The module, as manufactured, has no conformal coating and therefore offers no inherent protection against corrosion. The ability to customize the length of the module by cutting at specifically marked points is a key feature of the product and hence the reason for no factory installed conformal coating. For these reasons, it is recommended that the user completes all module modifications first (cutting and wiring) and then apply a conformal coating in the final stages of installation.
11. Damage by corrosion will not be honored as a materials defect claim. It is the user's responsibility to provide suitable protection against corrosive agents such as moisture and condensation and other harmful elements.
12. For applications involving exposure to humidity and dust the module must be protected by a fixture or housing with a suitable protection class. The module can be protected against condensation water by treatment with an appropriate circuit board grade conformal coating. The conformal coating should have the following features:
    a. Optical transparency
    b. UV-resistance
    c. Thermal expansion matching the thermal expansion of the module
    d. Low permeability of steam for all climatic conditions
    e. Resistance against corrosive environments

Assembly Information

1. Connection with soldering wires on unmounted module: Do not pre-tin the solder pads but pre-tin the wires and solder for max 4s at 300°C. Allow solder points to completely cool down before the next soldering. Prevent shear or peel forces.
2. Soldering of wires with the module mounted on a heatsink: Pre-tin solder pads and wires and solder for max 3s at 350 °C. Allow solder points to completely cool down before the next soldering. Prevent shear or peel forces.
3. The smallest unit (75mm- 6 LED-bundles) can be removed by cutting with scissors between the designated solder pads.
4. Mounting of the module is facilitated by the double-sided adhesive tape on the back-surface of the module.
5. Mounting surface must be clean and dry, free of oils or silicone coatings as well as dirt particles.
6. The mounting substrate must have sufficient structural integrity. Take care to completely remove the protective backing. Once the module is appropriately positioned, press on the module with about 20N/cm² (refer to application techniques of 3M adhesive transfer tapes). In difficult cases the use of a primer may help.
7. The minimum bending radius is 0.8" (2cm). The module may be bent over a smaller radius but only in regions of the circuit board not containing electronic components and such bends should be made once and fixed in position to avoid cyclic fatigue.
8. When installing in environments with large variations in temperature (e.g. outdoor applications) and operating length of more than 6.5' (2m), the use of adequate mounting surfaces is necessary. Otherwise it is advisable to use an additional thicker adhesive tape to absorb the stress of any mismatch in expansion.

Warranty

Warranty documentation is available at www.osram.us.

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