LINEARlight FLEX®

Advanced and Short Pitch Flexible Indoor LED Modules

Key Features & Benefits

- Flexible circuit board with self adhesive backing allows for easy installation into straight runs or curved surfaces with a radius as tight as 0.78in
- Modules can be field cut at designated cut points to achieve a customized fit
- Dimmable by pulse width modulation, a method that maintains consistent color and controls lumen output
- 120° Beam angle
- Long life: up to 50,000 hours (L_{70}) minimizing maintenance frequency
- The provided light has uniform brightness along the entire length of the module
- Entire reel can be powered from a single feed
- Mercury free
- No UV or IR emissions

The LINEARlight FLEX LED linear modules, offered in 2700K, 3000K and 4000K color temperatures, have a color variation within a 3-step MacAdam ellipse and a CRI of >80. At 32.8 feet, the Advanced Family has a lumen output of 119 to 129 per foot with an efficiency of 81-88 LPW. The Advanced Family has the ability to support sections as short as 4 inches (6 LEDs) and to cut at every one to two LEDs at designated cut points.

Similarly, at 19.7 feet, the Short Pitch Family has a lumen output of 238 to 258 per foot with an efficiency of 81-88 LPW. The product supports sections as short as 2 inches (6 LEDs).

The LINEARlight FLEX family offers tremendous flexibility in luminaire design. The major benefit is the module's ability to supply uninterrupted power from a single feed point through the entire reel. These LED modules mimic traditional fluorescent light sources. They are ideal for backlighting, border lighting, display lighting, cove lighting, under cabinet and edge lighting in straight runs or curves with a radius as tight as 0.78in. These modules are optimally paired for operation on OPTOTRONIC® 24Vdc power supplies and controls, and such systems are covered by a 5-year system warranty.

Product Offering

Ordering Abbreviation	Family	Wattage	Color Temperature
L48LFE/24V/840/ADV/G3/A	Advanced	48	4000K
L48LFE/24V/830/ADV/G3/A	Advanced	48	3000K
L48LFE/24V/827/ADV/G3/A	Advanced	48	2700K
L58LFE/24V/840/SP	Short Pitch	58	4000K
L58LFE/24V/830/SP	Short Pitch	58	3000K
L58LFE/24V/827/SP	Short Pitch	58	2700K

Application Information

Applications

- Backlighting
- Border lighting
- Cove lighting
- Display shelves
- Edge lighting
- Path and contour marking
- Recessed lighting

Specifications and Certifications

The LINEARlight FLEX is UL8750 recognized for the US and Canada Class 2 Unit (UL File # E320662)

The LINEARlight FLEX is UL2108 listed for the US and Canada Class 2 Unit (UL File # E247649)

Specification Data

Catalog #	Type
Project	
Comments	
Prepared by	

Ordering Information

Item Number	Ordering Abbreviation	Module Length (feet)	No. of LEDs	Power (W)	Input Voltage (V_{DC})	Current Draw (Amps)	Color Temperature	Lumens (lm)	Lumens per foot	Watts per foot	LPW
71308	L48LFE/24V/840/ADV/G3/A	32.8	600	48	24	2.0	4000K	4230	129	1.5	88
71309	L48LFE/24V/830/ADV/G3/A	32.8	600	48	24	2.0	3000K	3900	119	1.5	81
71310	L48LFE/24V/827/ADV/G3/A	32.8	600	48	24	2.0	2700K	3900	119	1.5	81
71388	L58LFE/24V/840/SP	19.7	720	58	24	2.4	4000K	5076	258	2.9	88
71389	L58LFE/24V/830/SP	19.7	720	58	24	2.4	3000K	4680	238	2.9	81
71390	L58LFE/24V/827/SP	19.7	720	58	24	2.4	2700K	4680	238	2.9	81

Note: All lumen and wattage values are typical values.

Ordering Guide

Advanced

L	48	LFE	/	24V	/	8	27	/	ADV	/	G3	/	A
Technology	Power	Type		Voltage		CRI	Color Temperature		Advanced FLEX®		3rd Generation		Architectural
L = LED	48 = 48 Watts	LFE = Linear Flexible Engine				>80	27 = 2700K						

Short Pitch

L	58	LFE	/	24V	/	8	27	/	SP
Technology	Power	Type		Voltage		CRI	Color Temperature		Short Pitch
L = LED	58 = 58 Watts	LFE = Linear Flexible Engine				>80	27 = 2700K		

Power Supply Information

	OT20 (51804)	OT50 (51598)	OT75 (51514)	OT96 (51520, 51522, 51626)	OT240* (51627)
Advanced	38c = 12.47'	90c = 29.7'	135c = 44.5 ' (1.4r)	173c = 57.1' (1.7r)	144c = 47.4' (1.4r)
Short Pitch	38c = 6.2'	90c = 14.8'	135c = 22.3 ' (1.1r)	174c = 28.5' (1.5r)	144c = 23.7' (1.2r)

Notes:
1. In the above chart, “c” = coupon, “r” = reel
2. A coupon is the Smallest Electrical Unit (SEU) independent sub-section of the module. Reference this bulletin's "Assembly Diagram" for details.
3. The module is designed to work with Constant Voltage power supplies only. Reference the Power Supply PIB # ECS050 for product specific information.
4. To accurately determine the maxiumum LED load for the application refer to “Remote Mounting Distances” Application Note (LED126).
5. Parallel runs may be required to achieve the numbers listed above. Please reference this bulletin’s “Wiring Diagram” for product specific wiring instructions.

* The OT240 has 3 channels at 80W each. Values represented in chart are “per channel”.

Minimum and Maximum Ratings

Parameter	Values
Operating Temperature at Tc point	-30 to +75°C (-22 to +167°F)
Storage Temperature Range	-40 to +85°C (-40 to +185°F)
Voltage Range	23 – 25V_{DC}
Reverse Voltage	25V_{DC}

Notes:

1. Exceeding maximum ratings for operating and storage temperature will reduce expected lifetime or destroy the LED module.
2. Exceeding maximum ratings for operating voltage will cause hazardous overload and will likely destroy the LED module.
3. 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 example location of Tc point, see drawing on next page.

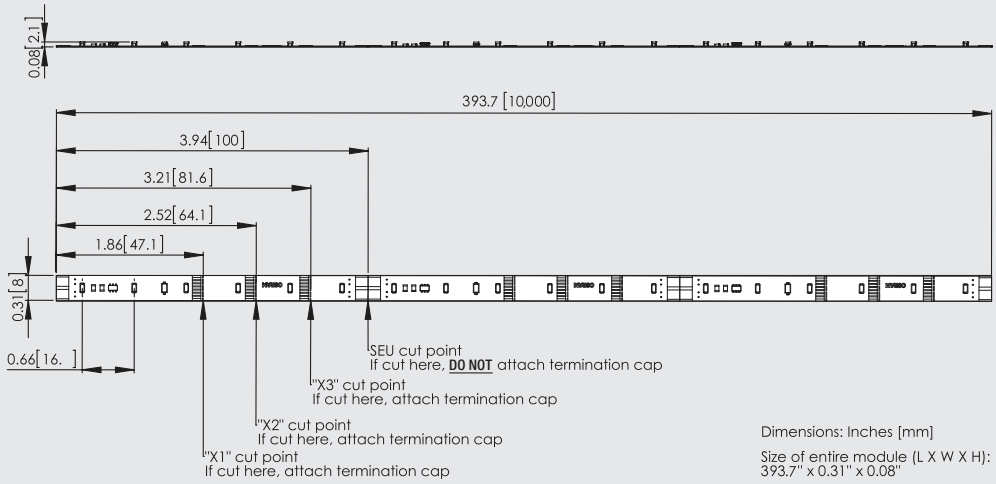
Accessories

Item Number	Ordering Abbreviation	European Part Number	Description	Length (inches)	Case Qty.	Order Qty.
Track Accessories						
72356	LAC-T/STS/7FT	LF-LTS-2100	6.9' aluminium track	83	40	1
72357	LAC-M/STS/CLIP	LF-LTS-MB	Optional mounting bracket for track	1.1	280	35
72360	LAC-T/STS-COV/C/7FT	LF-LTS-COVER-CLEAR	6.9' clear cover for track	83	40	1
72358	LAC-T/STS-COV/D/7FT	LF-LTS-COVER-DIFFUSE	6.9' diffused cover for track	83	40	1
72359	LAC-S/STS/ENDCAP	LF-LTS-ENDCAP	End cap used only with 72358	0.8	160	20
72361	LAC-T/STS-COV/SP/7FT	LF-LTS-COVER-SHORTPITCH	6.9' diffused cover specifically designed for short pitch product	83	40	1
Connection Accessories						
71428	LAC-C/TP/TERMCAP	LF-2TERM FLEX	Termination Cap	-	200	10
72671	LF-CONN Flex SC	LF-CONN Flex SC	Board to board connector piece	0.35	250	25
72947*	LF-WIRE-30 FLEX SC	LF-WIRE-30 FLEX SC	30mm connector wire	1.1	10,000	100
72948*	LF-WIRE-150 FLEX SC	LF-WIRE-150 FLEX SC	150mm connector wire	5.9	5000	50
72946	LF-2PIN Flex SC	LF-2PIN Flex SC	Input connector	20	250	10

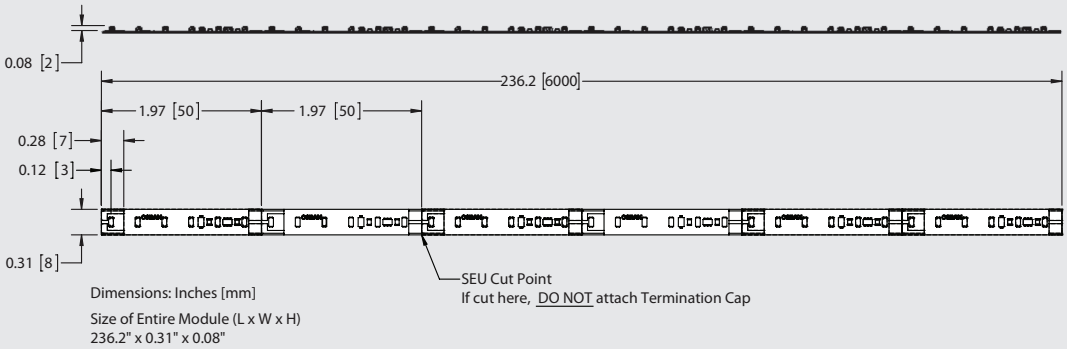
*Use with 72671

Assembly Diagram

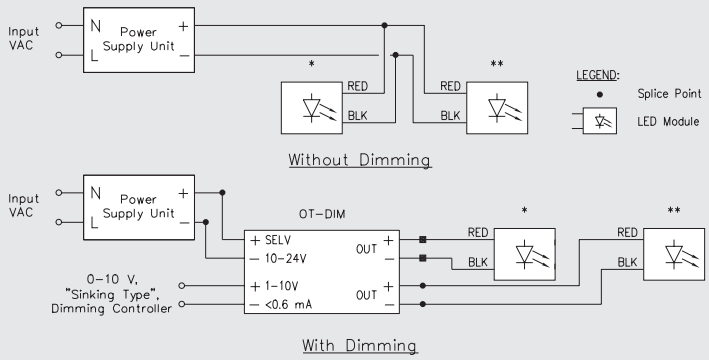
Advanced



Short Pitch



Wiring Diagram



The maximum operable length on a single feed is 1 full reel.Remaining load must be connected on subsequent power feeds.Reference the “Power Supply Information” section of this PIB for module load per power supply requirements.To help reduce the effects of any potential voltage drop, if possible, it is best to locate the power supply near the middle of the run.

Safety Information

WARNING: ONLY QUALIFIED PERSONNEL SHOULD PERFORM INSTALLATION. TO AVOID ELECTRICAL SHOCK OR COMPONENT DAMAGE, DISCONNECT POWER BEFORE ATTEMPTING INSTALLATION OF THE POWER SUPPLIES AND/OR MODULES.

Failure to install the power supplies and/or LED modules in accordance with the National Electric Code (NEC), all applicable Federal, State and local electric codes as well as the specific Underwriters Laboratories (UL) safety standards for the installation, location and application may cause serious personal injury, death, property damage and/or product malfunction.

1. The LED module itself and all its components shall not be subjected to mechanical stress and assembly must not damage or destroy conducting paths on the circuit board.
2. Observe correct electrical polarity, incorrect polarity may destroy the module. (Depending on the product, incorrect polarity may lead to emission of red or no light.)
3. Ensure the power supply is of adequate power to operate the total load.
4. Electrostatic Discharge (ESD) precautions shall be incorporated when handling or installing the module. (For more information, reference document # LED093 ESD Protection for LED Systems.)
5. Installation of LED modules shall be made with regard to all applicable electrical and safety standards. Only qualified personnel should be allowed to perform installations.
6. Modules may be hot to the touch. Use caution when handling.
7. Damage by corrosion and improper heat sinking will not be honored as a materials defect claim. It is the user's responsibility to ensure adequate heat sink and protection against corrosive agents such as moisture, condensation and other harmful elements.
8. Avoid looking directly into the light beam as the high brightness may damage eyes.
9. 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 complete all module modification first (cutting, wiring) and then apply a conformal coating in the final stages of installation.

Assembly Information

1. The LINEARlight FLEX® must be mounted on an appropriate metal heat sink.
2. The Smallest Electrical Unit can be removed by cutting with scissors before or after the designated solder pad.
3. The module may also be cut at points X1 or X2 (reference "Assembly Diagram" for locations). The following must be observed when making cuts at these locations:
    a. Observe the correct orientation of the module: The power feed must come from the side indicated in the technical drawing.
    b. The module must not be cut before the first two LEDs, which have the Tc Point in between them. This part would emit no light.
    c. To operate the desired subunits, the termination LF-2TERM must be applied. Disengage the terminations locking mechanism, slide it over the open contacts and press the locking mechanism back in place.
4. The mounting of the module is facilitated by means of the double-sided adhesive on the back-surface of the module. Care must be taken to provide a clean and dry mounting surface, free of oils or silicone coatings as well as dirt particles. The mounting substrate must have sufficient structural integrity. Take care to completely remove the adhesive backing. Once the module is appropriately positioned, press on the module with about 20N/cm2 (refer to application techniques of 3M adhesive transfer tapes).
5. Solder connections should only be performed on designated solder pads (marked "24V +/-"). During soldering, do not exceed the maximum soldering time of 10 seconds and the maximum soldering temperature of 260°C.
6. Connecting soldered wires to an un-mounted module: Solder pads must not be pre-tinned. However, the wires must be pre-tinned at a max. 4 sec. at 300°C. Allow solder points to completely cool down before performing the next soldering. Prevent shear, or peel forces.
7. Connecting soldered wires to a module mounted on a heat sink: Pre-tin solder pads and wires and solder for max. 3 sec. at 350°C. Allow solder points to completely cool down before performing the next soldering. Prevent shear, or peel forces.
8. For applications involving exposure to humidity and dust, the module must be protected by a fixture, or housing with a suitable protection class.
9. The module can be protected against condensation 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 15-30 x 10^-6cm/cm/K
    d. Low permeability of steam for all climate conditions
    e. Resistance against corrosive environment

Note: Since this module's connectors are "Dry Location Only" rated, they must not be used as a connection means when conformal coating becomes necessary. Soldered wires are the appropriate connection means used in conjunction with conformal coating. Any of the necessary steps 2, 3, 5, 6, & 7 must be completed before conformal coating can be applied.

Assembly Information (Continued)

10. The minimum bending radius is 0.78 in. The module may be bent over a smaller radius but only in regions of the circuit board containing no electronic components. Such bends should be made only once and fixed in position to avoid cyclic fatigue.
11. The thermal expansion coefficient along the length of the module is 17 x 10^-6cm/cm/K. When installing in environments with large variations in temperature (e.g. outdoor applications) and operating length of more than 2m, the use of metallic mounting surfaces is necessary. Otherwise it is advisable to use an additional thicker adhesive tape to absorb the stress of any mismatch in expansion coefficients.
12. Parallel connection is highly recommended as safe electrical mode. Serial connection is not recommended. Unbalanced voltage drop can cause hazardous overload and damage the LED module.
13. The maximum length of a coherently operable unit is one full reel. By two-pole feed in the middle or from both ends the length can be doubled.
14. When mounting on metallic or otherwise conductive surfaces, there needs to be electrical isolation at soldering points between module and mounting surface.

Warranty

OSRAM LED products are covered by our LED Module, OPTOTRONIC® Power Supply or Control Warranty.
The LINEARlight FLEX® is covered under warranty as long as the temperature at the Tc point does not exceed 75°C; exceeding this temperature will void all warranties.
For additional information or to download the warranty registration form, refer to the latest version of the warranty available in the Literature section of www.osram-americas.com/LED.

Module Warranty: 3 years
System Warranty: 5 years

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