Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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Thomas Research Products

Rev 8-31-2017

22.7" Narrow Linear Module

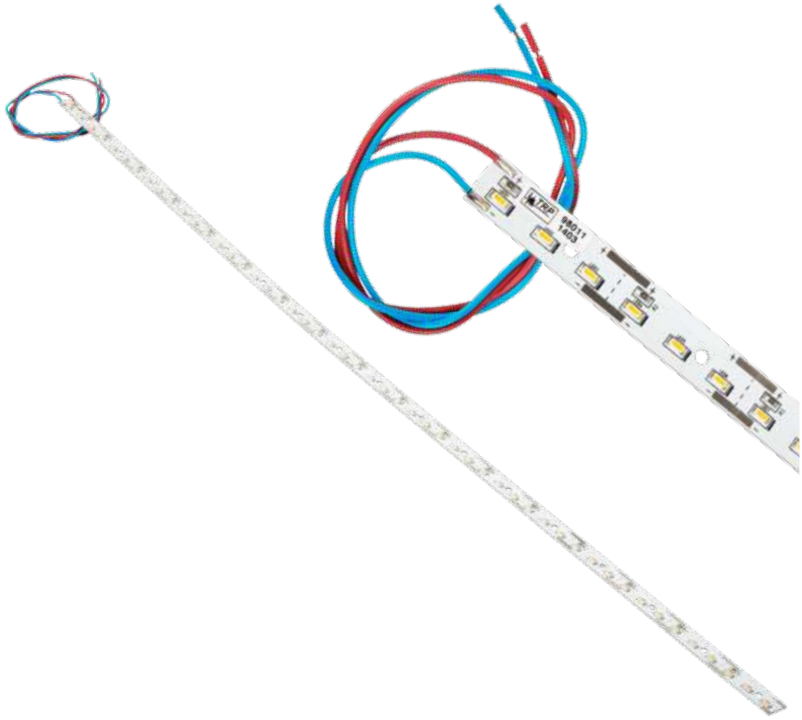
LED Light Engines with 51 Nichia LEDs

Intelligent Device ECOSYSTEM classic

Electrical Specifications

Driver Type:	12V Constant-Voltage
Drive Current:	445mA total (26mA per section)
DriveVoltage:	12V
Total Board Power:	5.3W ±5%
Life:	50,000 Hrs @70% lumen maint., if used as specified (current & heat)
Max Junction Temp:	90°C
Max Test Point Temp:	80°C
Operating Temp:	-40ºC to +60ºC Ambient
Storage Temp:	-40ºC to +80ºC
Viewing Angle (FWHM):	120° Lambertian distribution
CRI:	83 typical

- 12V Constant-Voltage Array, 3 LED Series x 17 Sections
- Can be cut to length in 1.33" increments
- Designed for easy use in standard luminaires
- Tight LED pitch eliminates pixelization
- Color: ¼ ANSI Binning, 3 Step MacAdam Ellipse
- Suggested Applications:
  Cove or Undercabinet Lighting, Sign Lighting
- Customizable: Engines can be modified to your application. Contact us.
- Engineered by Norlux
- 5 yr. Warranty



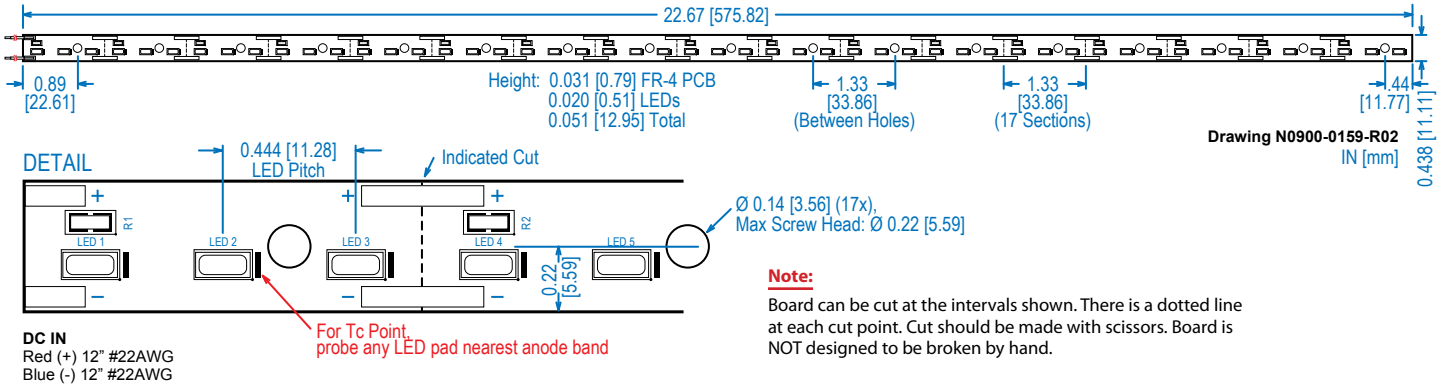
22.7 Inch Narrow Linear DC LED Module

Model	Color Temp (K)	Total Current (mA)	Total Board Power (W)	Lumens (± 15%)	Board LPW
98010	3000	445	5.3	465	88
98011	3500	445	5.3	465	88
98012	4000	445	5.3	504	95
98030	5000	445	5.3	510	95

Connectivity Options

Suffix	Connection
(blank)	12 IN, #22 AWG Stranded Leads
-01	No Leads

Dimensions



DC IN
Red (+) 12" #22AWG
Blue (-) 12" #22AWG

Note:
Board can be cut at the intervals shown. There is a dotted line at each cut point. Cut should be made with scissors. Board is NOT designed to be broken by hand.

★MADE IN USA★
Of Imported And Domestic Components

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CIE Chromaticity Coordinates

3000K
3 Step Macadams Ellipse

X	Y
0.4325	0.4101
0.4452	0.4146
0.4244	0.3923
0.4362	0.3965

3500K
3 Step Macadams Ellipse

X	Y
0.4045	0.3975
0.4189	0.4044
0.3989	0.3819
0.412	0.3875

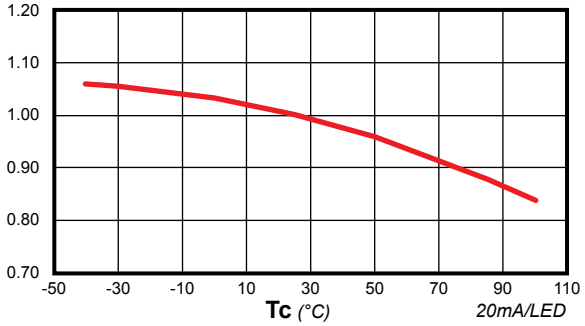
4000K
3 Step Macadams Ellipse

X	Y
0.3783	0.3836
0.3909	0.3906
0.3746	0.3687
0.3864	0.3757

5000K
3 Step Macadams Ellipse

X	Y
0.3408	0.3461
0.3485	0.3520
0.3416	0.3585
0.3499	0.3644

Relative Luminous Flux / Tc Temperature



Step Dimming:

This Light Engine can be step-dimmed, with a recommended TRP dimmable driver and SD series step-dimming module. See the SD2 or SD3 data sheet for wiring information.

Compatible TRP Drivers:

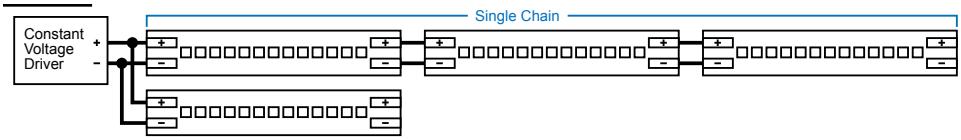
The drivers listed here are all compatible with this module. Choose the best driver for your application.

- LED12W-12 *(1-2 Boards Total)*
- LED17W-12 *(2-3 Boards Total)*
- LED20W-012 *(1-3 Boards Total)*
- LED25W-12 *(2-5 Boards Total)*
- LED25W-12-HL-B *(2-5 Boards Total)*
- LED25W-12-HL-S *(2-5 Boards Total)*
- LED30W-12 *(2-5 Boards Total)*
- LED40W-012 *(2-7 Boards Total)*
- LED50W-012 *(3-9 Boards Total)*
- LED60W-012 *(3-11 Boards Total)*
- PLED75W-12 *(3-14 Boards Total)*
- TRV-100S012ST *(1-18 Boards Total)*
- TRV-150S012ST *(1-28 Boards Total)*
- TRV-200S012ST *(1-33 Boards Total)*
- TRV-250S012ST *(1-41 Boards Total)*
- TRV-300S012ST *(1-51Boards Total)*

Parallel Configurations

The 22.7" Specialty Narrow Linear Board is designed for parallel connections only. For a single chain (end-to-end), the positive and negative of one board is connected to the respective positive and negative of the next. Current adds, so the supply must be 2x the current for 2 boards. Add currents for parallel chains also.

Parallel



Maximum Run Lengths

The max number of boards wired in a chain **(end-to-end/parallel)** is limited by the max current rating of the first board wired to the driver. The sum of the board currents, in the chain, funnels through the first board. Multiple chains can connect directly to the power supply in parallel. See table for max chain length.

Product	Series/Parallel	Max Allowable Uncut Boards	
		High Current *(Nom)*	Low Current
22.7" Narrow	Parallel	5	N/A

Mounting Notes

The LED assembly is supplied with mounting holes, per the dimensional drawing. It is important to mount the board in such a way as to maintain the Tc point below the max. The steady state thermals in application will dictate if the board needs to be mounted directly to metallic housing and/or include a thermal pad. For example fully enclosed recessed fixture will require better thermal mounting than an open air pendant.

Thermal Application Notes

This board may require additional heat sinking to run above 60°C ambient. Heat sink is also required when operated above specified drive currents.

Maximum Current

Max Current: 595mA
Voltage at max current: 13.63V, Power at max current: 8.11W
The total maximum current reflects the LED maximum forward current only, without considering thermal needs. Driving the LEDs this hard will likely violate their thermal limits, depending on the application. **Tc point must remain at or below the max temperature, or the warranty will be voided.** Temperature is directly correlated to LED current.

Static Sensitive Device

Handle only at static-safe work stations.

Packaging

50 per box standard.

Application Notes:

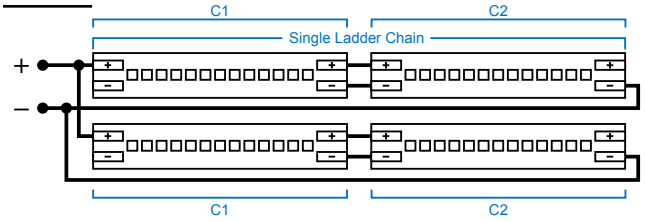
Series/Parallel Configurations

Board combinations can include mixing 5.5", 11" and 23" modules.

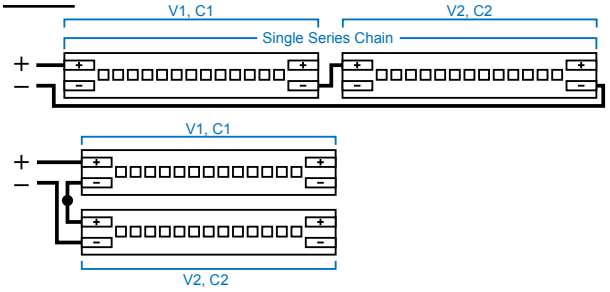
Parallel: The positive and negative of one board is connected to the respective positive and negative of the next. Current adds, so the supply must be current $C_1 + C_2$ for 2 boards in a chain, for example.

Series: The negative of one board is connected to the positive of the next. Voltage adds, so the supply must handle voltage $V_1 + V_2$ for 2 boards.

Parallel



Series



Maximum Run Lengths

The max number of boards wired in a chain **(parallel or series)** is limited by the max current rating of the first board wired to the driver. The **sum of the board currents** in the chain funnels through the first board, when wired from one end. Multiple chains can connect directly to the power supply in parallel. See table for max chain length.

Improved wiring design for each parallel ladder chain should specify the positive and negative power connections at opposite ends of the chain to equalize current through each LED. Series ladder chains are naturally wired this way. Wiring from one end of the chain will create an uneven voltage across each section. The longer the ladder chain, the more important this becomes. Max current into each LED board section is 3.75A. The number of sections or chains wired in parallel directly from the driver is only limited by the supply wire size or driver capacity.

Product	Parallel or Series Ladder Chain	Max Allowable Boards	
		High Current *(Nom)*	Low Current
5.5" Linear	Parallel or Series Ladder	22 PCB	44 PCB
11" Troffer	Parallel or Series Ladder	11 PCB	22 PCB
23" Troffer	Parallel or Series Ladder	5 PCB	11 PCB
Combination	Parallel or Series Ladder	$(C_1 + C_2 + ... C_n) < 3.75A$ *Use currents listed on Pg 1*	

Static Sensitive Device

Handle only at static-safe work stations.

5.5" Compatible TRP Drivers:

Calculate wattage, voltage and current required when mixed with other LED boards. Choose the best driver for your application.

11" Compatible TRP Drivers:

The drivers listed here are all compatible with this module alone or in multiples. Choose the best driver for your application.

- LED12W-24-C0350
- LED12W-36-C0350

Packaging

50 per box standard.

Mounting Notes

The LED assembly is supplied with mounting holes, per the dimensional drawing. It is important to mount the board in such a way as to maintain the Tc point below the max. The steady state thermals in application will dictate if the board needs to be mounted directly to metallic housing and/or include a thermal pad. For example fully enclosed recessed fixture will require better thermal mounting than an open air pendant.

Thermal Application Notes

This board requires additional heat sinking to run above 55ºC ambient at nominal specifications. Heat sink is also required when operated above specified drive currents.

Maximum Current

5.5" Max Current: **360mA**
Voltage at max current: **20V**, Power at max current: **14.4W**

11" Max Current: **720mA**
Voltage at max current: **20V**, Power at max current: **14.4W**

23" Max Current: **1440mA**
Voltage at max current: **20V**, Power at max current: **28.8W**

The total maximum current reflects the LED maximum forward current only, without considering thermal needs. Driving the LEDs this hard will likely violate their thermal limits, depending on the application. **Tc point must remain at or below the max temperature, or the warranty will be voided.** Temperature is directly correlated to LED current.

23" Compatible TRP Drivers:

The drivers listed here are all compatible with this module alone or in multiples. Choose the best driver for your application.

- LED12W-24-C0350
- LED12W-24-C0500
- LED17W-24-C0700
- LED20W-028-C0700
- LED20W-028-C0700-D
- LED20W-48-C0350
- LED20W-48-C0350-D
- LED20W-43-C0460
- LED20W-43-C0460-D
- LED20W-40-C0500
- LED20W-40-C0500-D
- LED25W-36-C0700
- LED25W-36-C0700-D
- LED25W-36-C0700-HL-B
- LED25W-36-C0700-HL-S
- LED25W-36-C0700-HL-BD
- LED25W-36-C0700-HL-SD
- LED25W-040-C0500
- LED25W-040-C0500-D
- LED25W-040-C0620
- LED25W-040-C0620-D
- LED30W-042-C0700
- LED30W-042-C0700-D