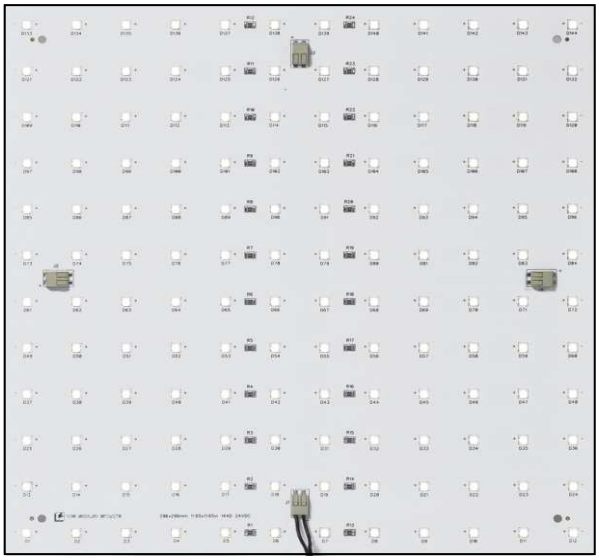
US SOLID STATE

Technical Data / **Premium LED Module - Nichia**

5000K LED Module



Description:	
Size, Quantity of LEDs, Power, Brightness:	~6 x 6 x 0.28-in, 36 LEDs, 8-watts, ~780 lm ~6 x 6 x 0.28-in, 49 LEDs, 17-watts, ~1570 lm ~12 x 12 x 0.28-in, 36 LEDs, 16-watts, ~1600 lm ~12 x 12 x 0.28-in, 144 LEDs, 33-watts, ~3150 lm ~12 x 12 x 0.28-in, 196 LEDs, 65-watts, ~6280 lm
Voltage:	24-vdc [Constant Voltage]
Dimming:	Pulse Width LED dimmer
CRI:	>90 (92 Typical)
Color (Kelvin):	~5000K +/- 200
LED Luminescent Maintenance L_{70} [1]	100,000+ hours to a 30% decrease in brightness
Construction:	Aluminum Printed circuit board, Nichia LEDs
Weight (oz): 6x6-inches 12x12-inches	 ~ 4 ~ 15
Certification:	UL Recognized Component, (UL8750) File # E358479
Origin:	Manufactured in the United States [imported Components] by US Solid State, LLC., Shreveport, Louisiana

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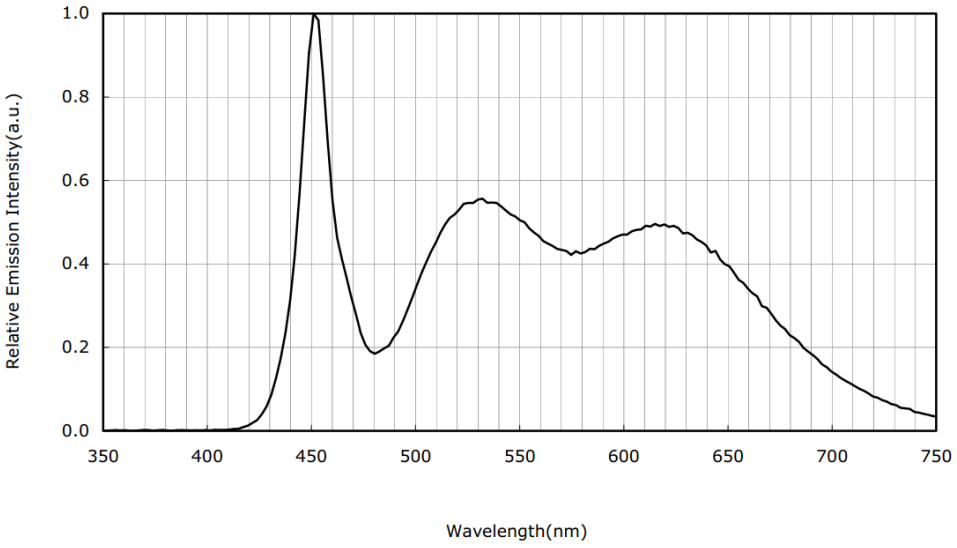
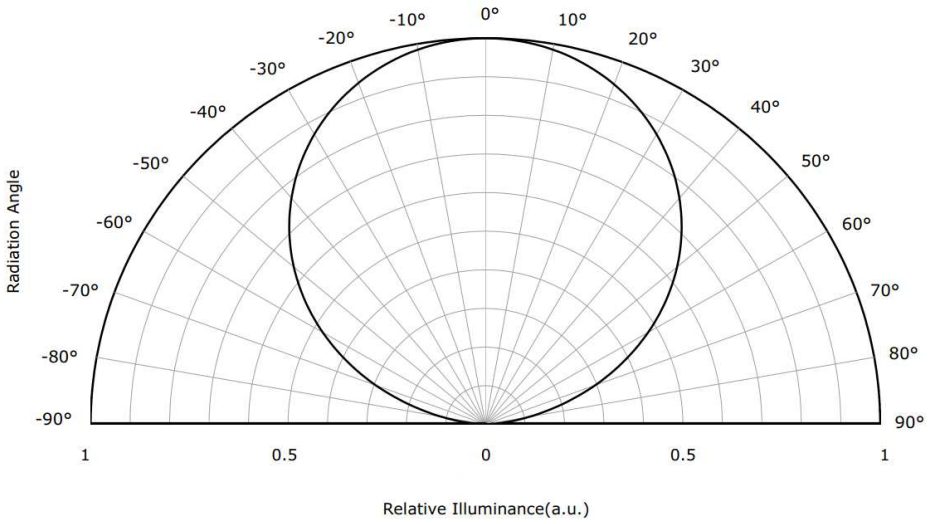
Typical Photometric Data*

5000K





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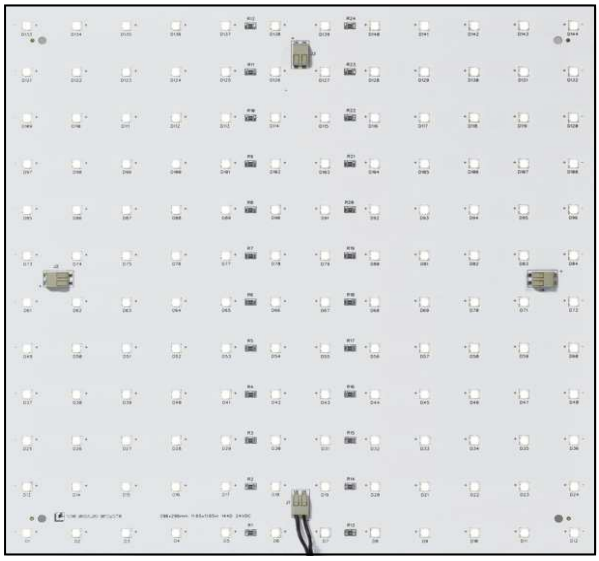
4000K LED Module



Description:	
Size, Quantity of LEDs, Power, Brightness:	~6 x 6 x 0.28-in, 36 LEDs, 8-watts, ~720 lm ~6 x 6 x 0.28-in, 49 LEDs, 17-watts, ~1420 lm ~12 x 12 x 0.28-in, 36 LEDs, 16-watts, ~1450 lm ~12 x 12 x 0.28-in, 144 LEDs, 33-watts, ~2880 lm ~12 x 12 x 0.28-in, 196 LEDs, 65-watts, ~5680 lm
Voltage:	24-vdc [Constant Voltage]
Dimming:	Pulse Width LED dimmer
CRI:	>80
Color (Kelvin):	~4000K +/- 200
LED Luminescent Maintenance L_{70}[1]	100,000+ hours to a 30% decrease in brightness
Construction:	Aluminum Printed circuit board, Nichia LEDs
Weight (oz): 6x6-inches 12x12-inches	 ~ 4 ~ 15
Certification:	UL Recognized Component, (UL8750) File # E358479
Origin:	Manufactured in the United States [imported Components] by US Solid State, LLC., Shreveport, Louisiana

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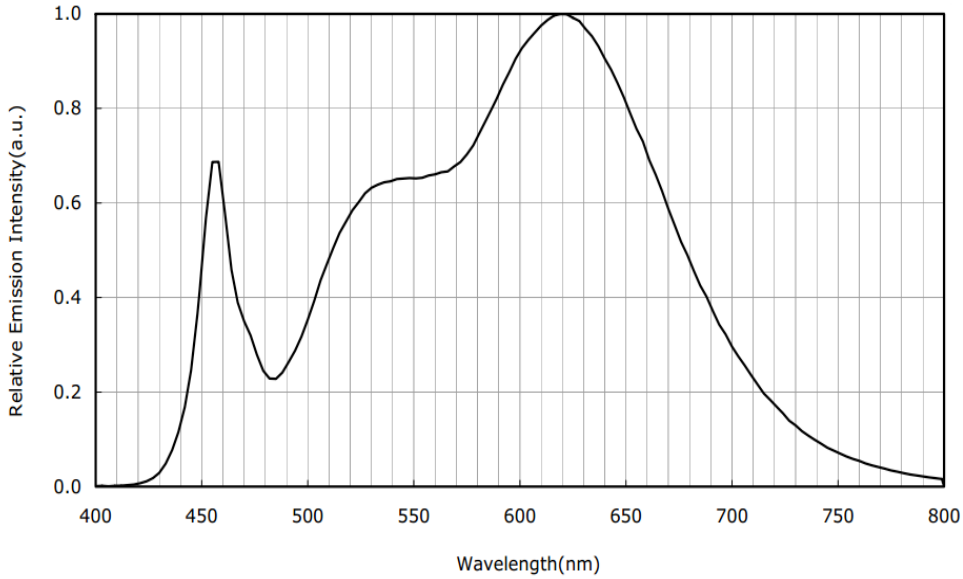
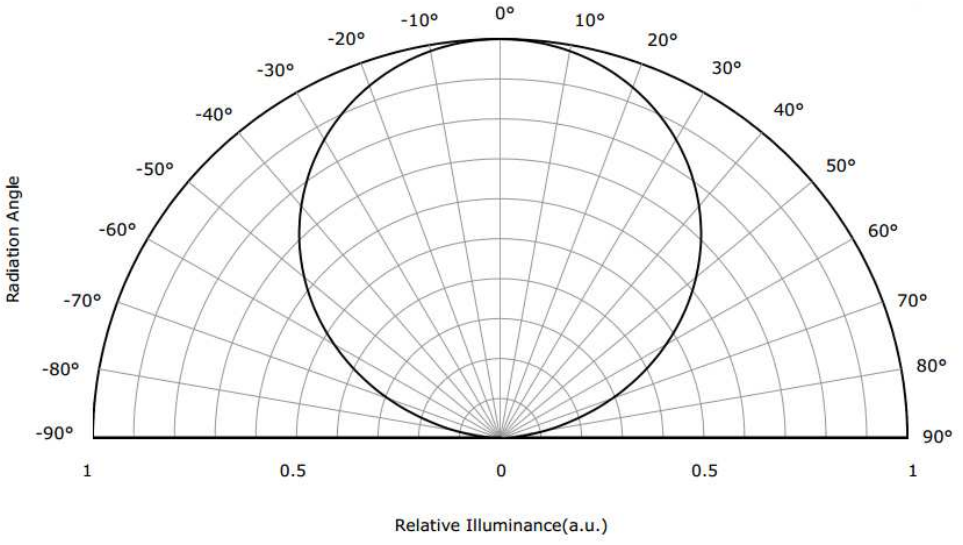
Typical Photometric Data*

4000K





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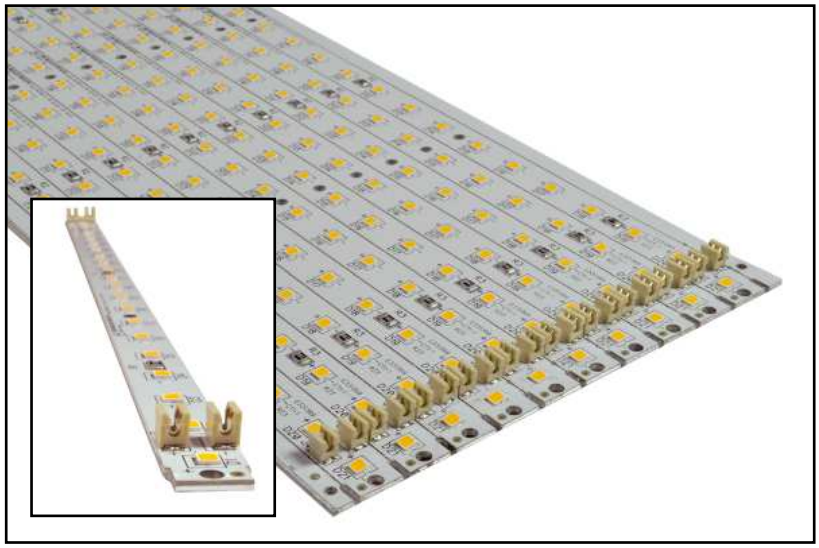
0.5 x 12-inch LED Module



Description:	
Size, Quantity of LEDs, Power, Brightness:	~0.5 x 12 x 0.28-in, 21 LEDs, 4-watts, 480 lm ~0.5 x 12 x 0.28-in, 21 LEDs, 10-watts, 1,000 lm
Voltage:	24-vdc [Constant Voltage]
Dimming:	Pulse Width LED dimmer
CRI:	>90
Color (Kelvin):	3,000, 4,000, 5,000K +/- 300
LED Luminescent Maintenance L_{70}[1]	100,000+- hours to a 30% decrease in brightness
Construction:	Aluminum Printed circuit board, Nichia LEDs
Weight (oz):	~ 1
Certification:	Pending
Connector: Option: Order module without connectors allows soldering leads directly to the module.	AVX Corp., 9176 Series, Required tool-18-20 AWG: Part #: 069176701601000 Universal Handle: Part #: 067000773001000
Origin:	Manufactured in the United States [imported Components] by US Solid State, LLC., Shreveport, Louisiana

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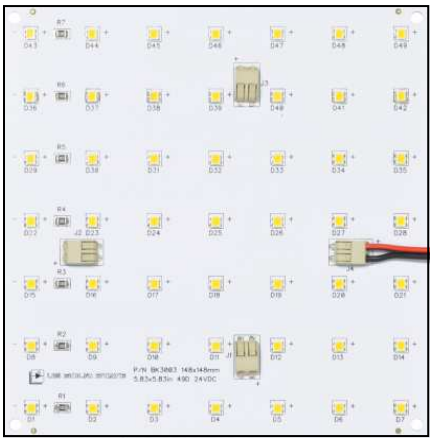
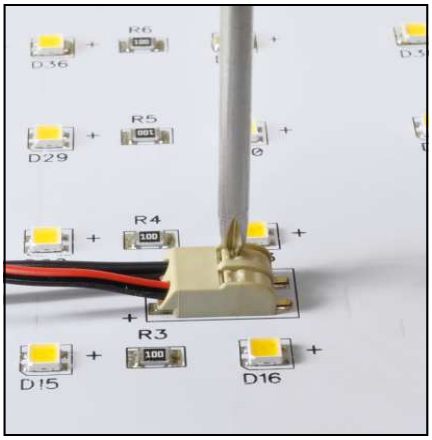
Electrical Connections



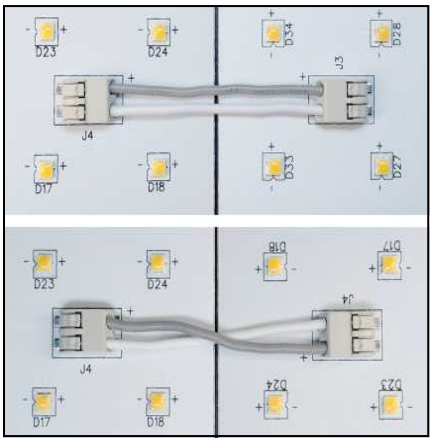
DC power can be supplied to the module at any of the Wago #2060 terminal blocks.

The positive [+] side of the connector is marked with a [+]

Always note polarity of each terminal block when making electrical connections.



To release tension on the wire, gently press down, as shown. Too much pressure will damage the terminal block.



Modules are easily connected to each other with 18 AWG wire. Solid copper wire is easier to insert into the terminal block than stranded. Remove about 5/16-inch of the insulation and insert, as shown.

The total load on any single terminal block should not exceed 6 amps, or 144-watts.

Important: Always note polarity of terminal block when making electrical connections.

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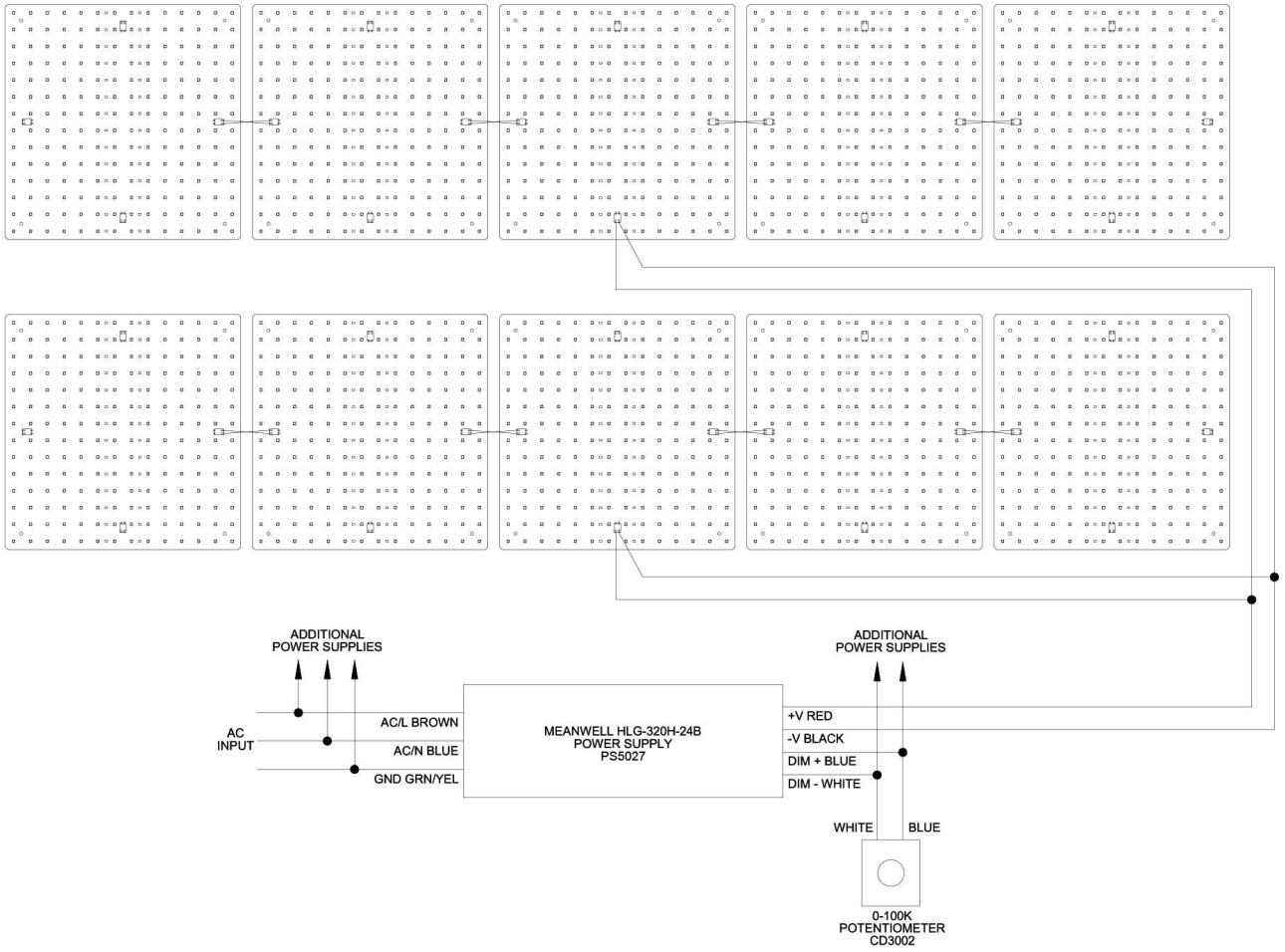
Electrical Wiring Example

The following is one example of the many ways our LED modules can be electrically connected to each other.

To calculate the required power supply size, determine the total power (watts) for all the panels to be connected to the power supply then add 20%.

For example- 10 modules x 25 watts = 250 watts + 20% = 300 watts



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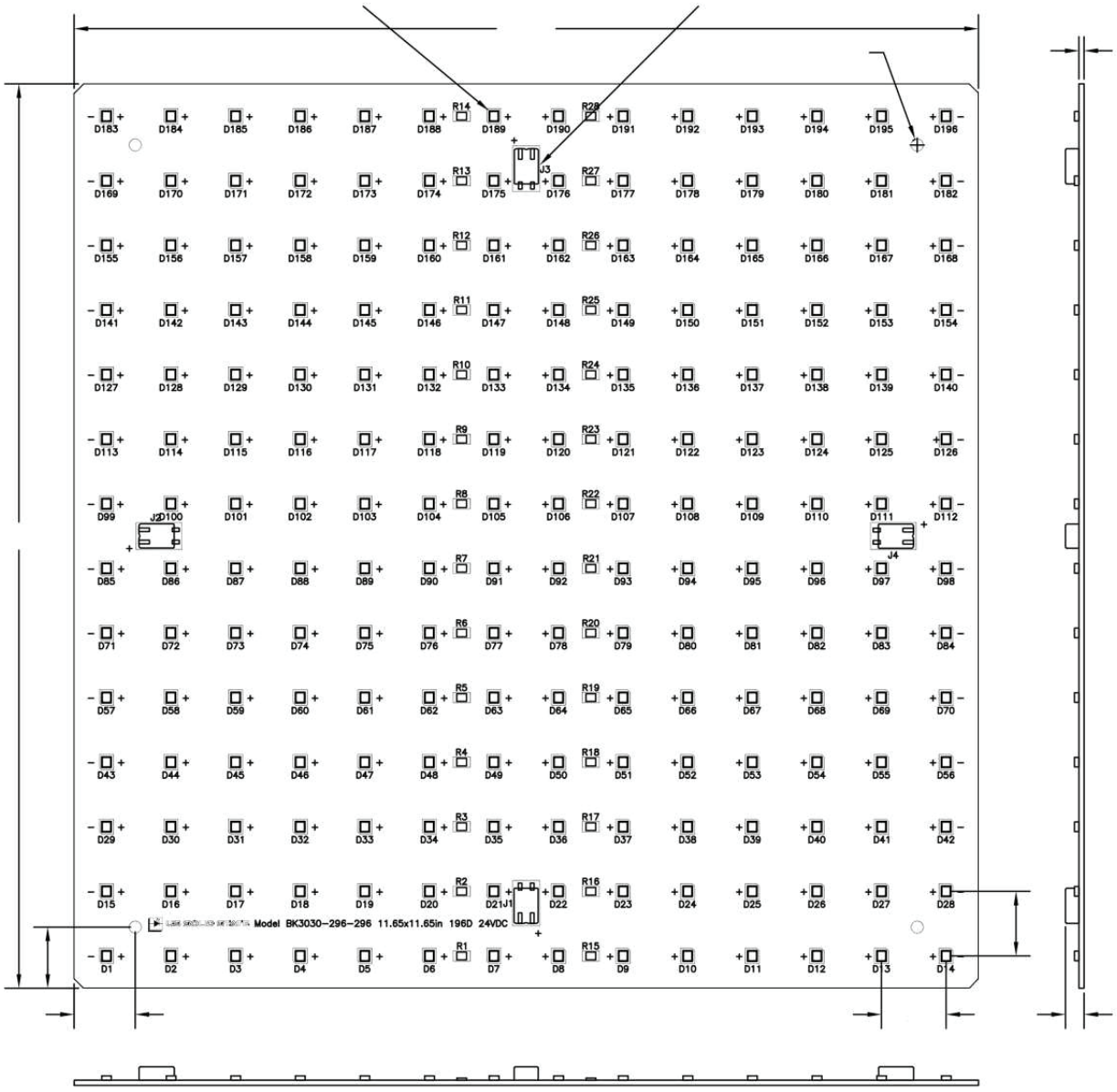
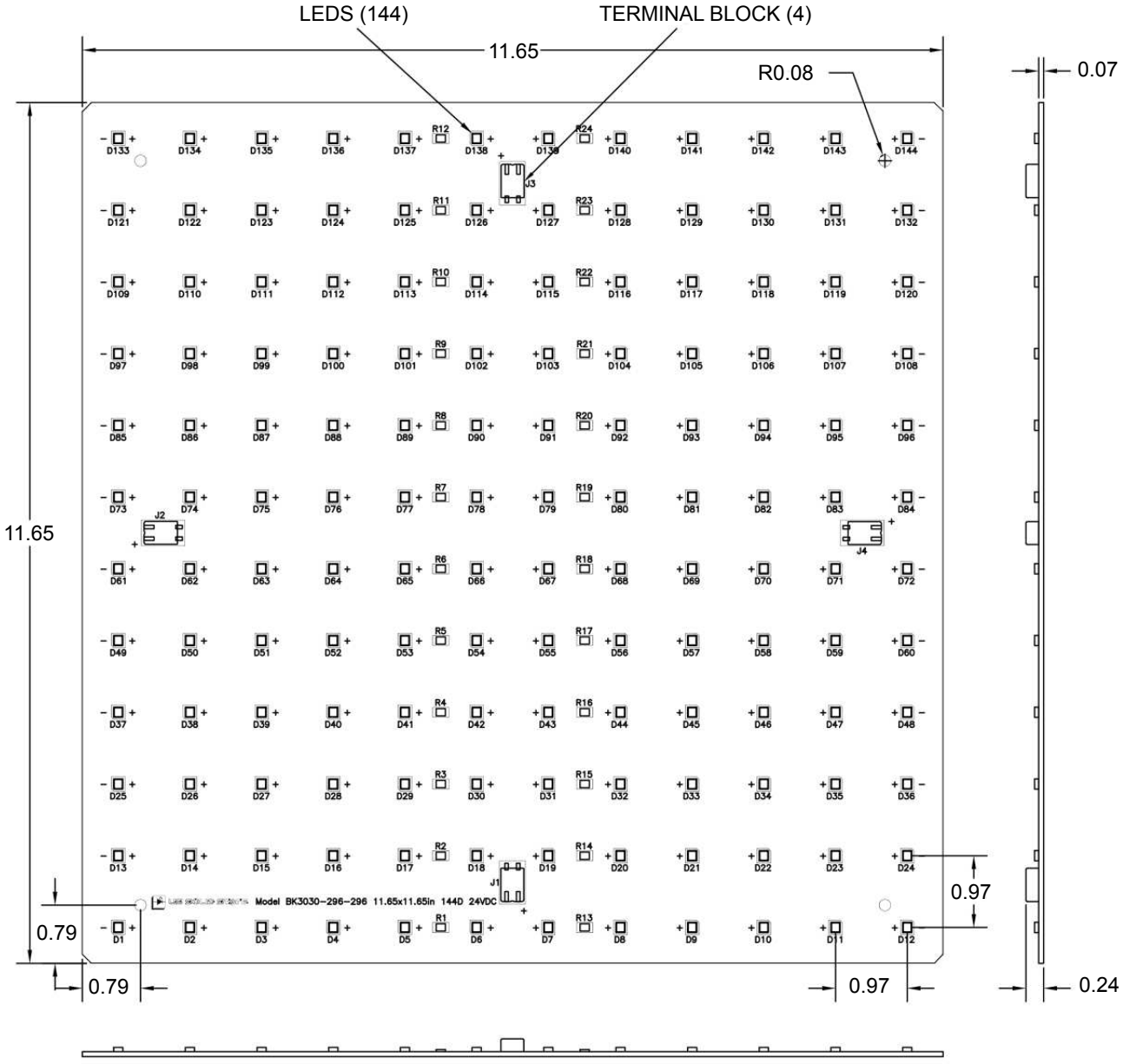


ALL DIMENSIONS ARE IN INCHES

Module Detail

12 X 12 - 144 LEDs



ALL DIMENSIONS ARE IN INCHES

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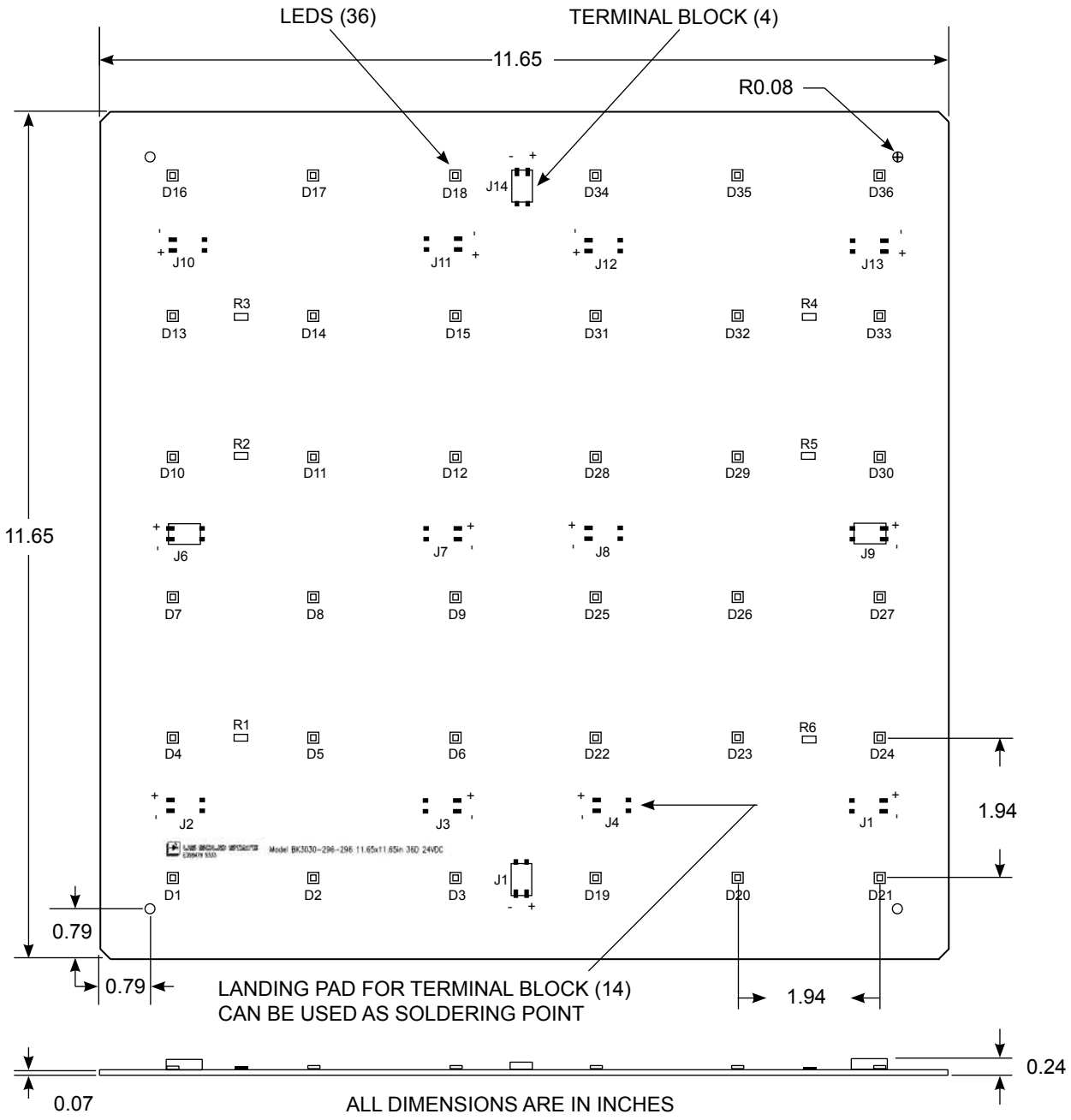
Module Detail

12 X 12 - 36 LEDs



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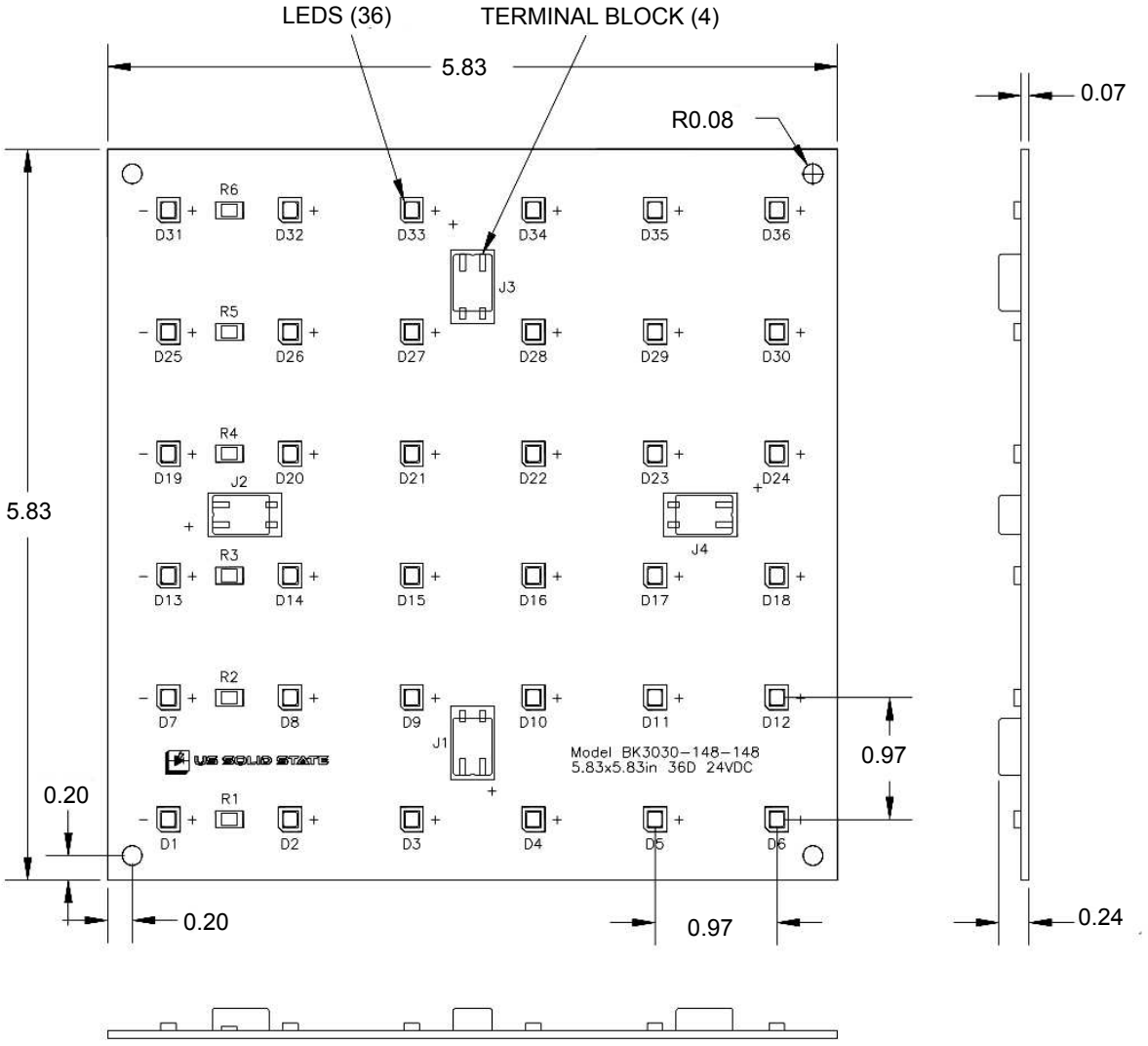
Module Detail

6 X 6 - 36 LEDs



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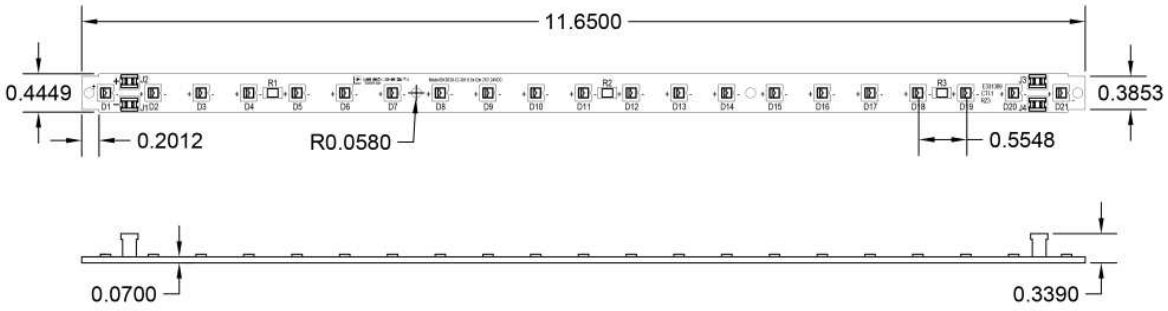
Module Detail

0.5 X 12 - 21 LEDs



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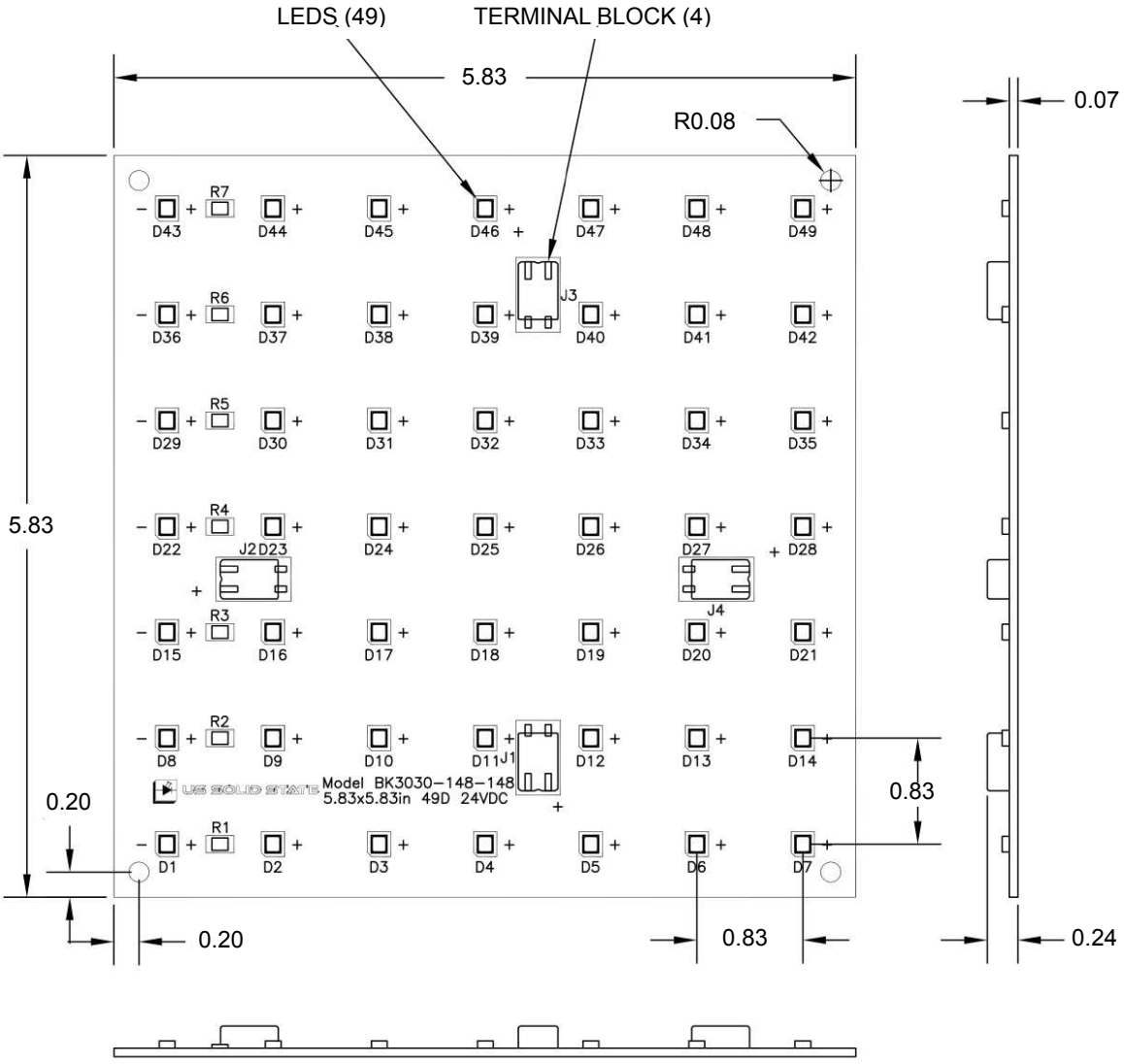
Module Detail

6 X 6 - 49 LEDs



ALL DIMENSIONS ARE IN INCHES

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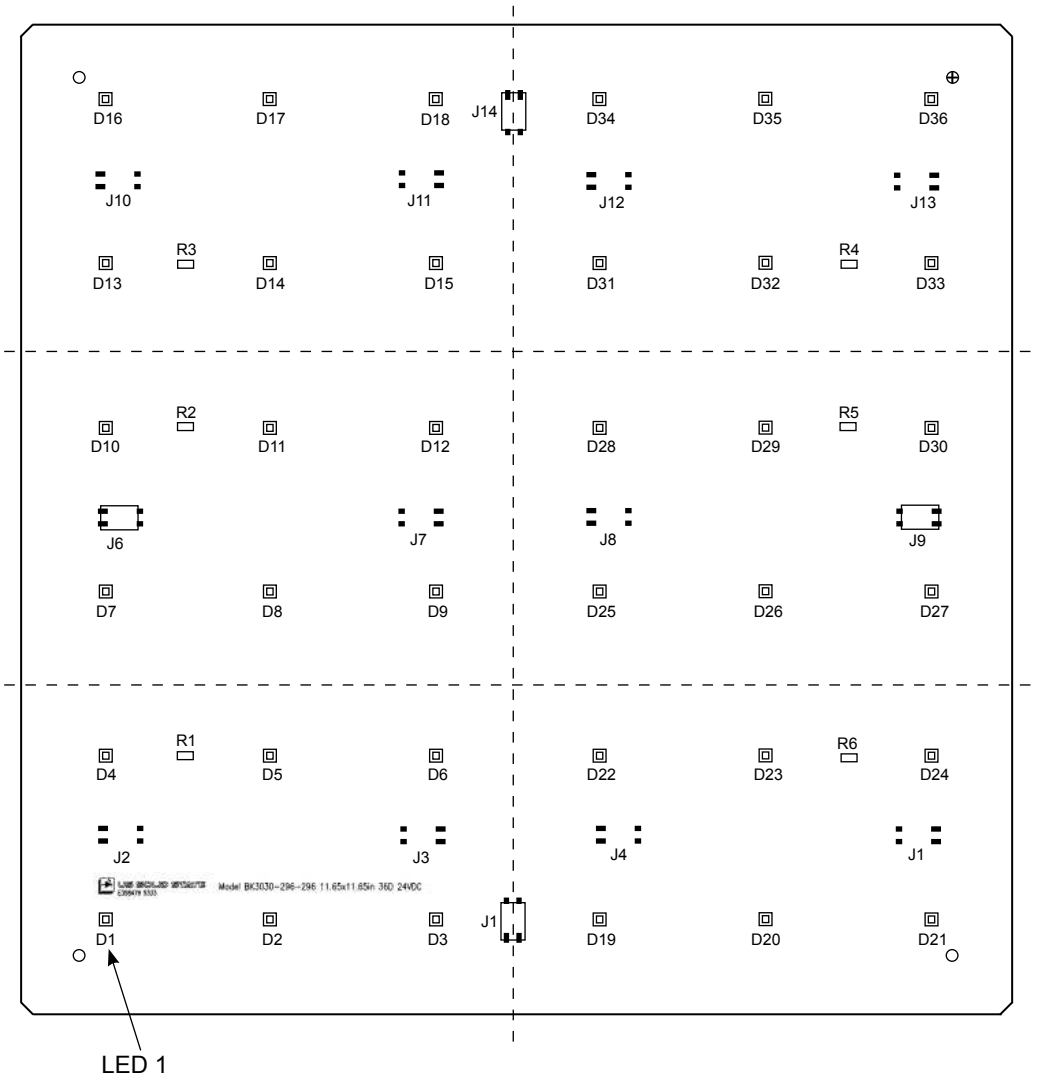
Cutting Instructions

12x12 (36) ONLY

A) Position modules as shown
B) Cuttable on dashed lines
C) Smooth rough edges
D) Cover cut edge with insulating material



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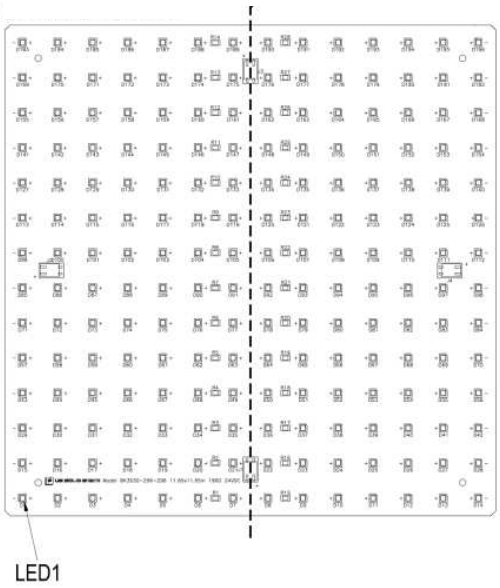
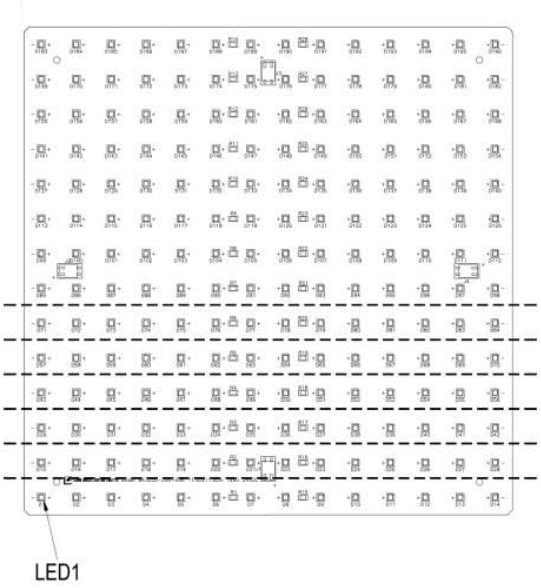
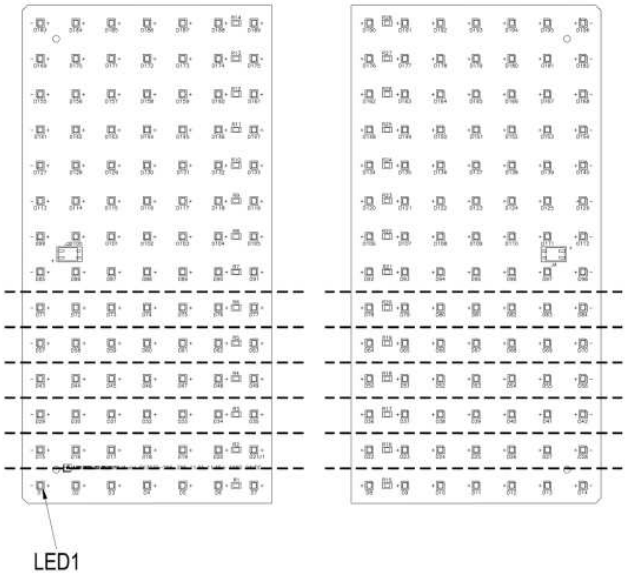
Cutting Instructions

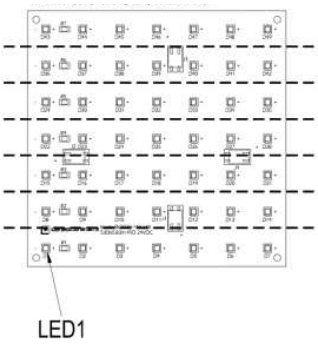
12x12 144, 196 and 6x6 36, 49

A) Position modules as shown
B) Cuttable on dashed lines
C) Smooth rough edges
D) Cover cut edge with insulating material









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UL 8750 Component

Why use a UL Component?

End-product manufacturers may eliminate redundant testing and surveillance for the commercially available components used in their products. UL's component certification programs also add confidence to supply chain integrity by having the component tested and surveillance conducted where the components are manufactured.

Using UL certified components during production helps reduce costs and time to market. Because the components have already been found to be in compliance with the applicable component requirements, costly redesign issues that may be identified during the certification process relating to components can be minimized.[1]

Premium LED Modules manufactured by **US Solid State, LLC** are a UL component and compliant with UL8750 standards.

A component is a part intended for use in manufacture of a finished product. The finished product will require final UL testing.

UL 8750 Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products

1 Scope

1.1 These requirements cover LED equipment that is an integral part of a luminaire or other lighting equipment and which operates in the visible light spectrum between 400 - 700 nm. These requirements also cover the component parts of light emitting diode (LED) equipment, including LED drivers, controllers, arrays, modules, and packages as defined within this standard.

1.2 These lighting products are intended for installation on branch circuits of 600 V nominal or less in accordance with the National Electrical Code (NEC), ANSI/NFPA 70, and for connection to isolated (non-utility connected) power sources such as generators, batteries, fuel cells, solar cells, and the like.

1.3 LED equipment is utilized in lighting products that comply with the end-product standards listed below. The requirements in this standard are intended to supplement those in other end-product standards. Included are:[2]

a) Electric Signs, UL 48,
b) Portable Electric Luminaires, UL 153,
c) Underwater Luminaires and Submersible Junction Boxes, UL 676,
d) Emergency Lighting and Power Equipment, UL 924,
e) Stage and Studio Luminaires and Connector Strips, UL 1573,
f) Track Lighting Systems, UL 1574,
g) Luminaires, UL 1598,
h) Direct Plug-In Nightlights, UL 1786,
i) Low Voltage Landscape Lighting Systems, UL 1838,
j) Self-Ballasted Lamps and Lamp Adapters, UL 1993,
k) Luminous Egress Path Marking Systems, UL 1994, and
l) Low Voltage Lighting Systems, UL 2108.

[1] UL.com
[2] http://ulstandardsinfonet.ul.com/scopes/scopes.fn=8750.html

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Handling Precautions of LED Products

Do Not:
View an operating LED for extended periods of time without proper eye protection.

Apply pressure to top or sides of the LED. LEDs are fragile and can be damaged.

Operate an LED module at a voltage greater than recommended.

Operate an LED module at extreme temperatures, LED die temperature should not exceed 120C.

Operate in an environment containing volatile organic compounds (VOCs). Some materials such as glue, conformal coating, O-rings, gaskets, potting compound and cardboard can offgas and degrade the performance of an LED.

Harmful chemicals (partial list)
- Chemicals that might outgas aromatic hydrocarbons (e.g., toluene, benzene, xylene)
- methyl acetate or ethyl acetate (i.e., nail polish remover)
- Cyanoacrylates (i.e., “Superglue”)
- glycol ethers (including Radio Shack® Precision Electronics Cleaner - dipropylene glycol monomethyl ether)
- Formaldehyde or butadiene (including ashland PLioBonD® adhesive)
- Dymax 984-LVUF conformal coating
- Loctite Sumo glue
- gorilla glue
- Clorox bleach
- Clorox Clean-Up Cleaner spray
- Loctite 384 adhesive
- Loctite 7387 activator
- Loctite 242 threadlocker

Use in a wet environment where the module will get splashed with water.

Clean with water, benzine or paint thinner.

Do:
For cleaning use ≥90% Isopropyl alcohol, gently wipe the module with a clean damp cloth.

Have adequate cooling so the LED chip temperature does not exceed 120C (248F).

Protect module from water and salt air, if used outdoors.

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Limited Warranty

US Solid State, LLC., (hereinafter 'Company'), provides the following limited warranty for LED lighting, by any Individual, Distributor, or OEM (hereinafter 'Purchaser'). This limited warranty applies as follows to new LED Products purchased by Purchasers in the United States or Canada, which are accompanied by this written warranty.

Subject to the exclusions contained below, Company warrants it's lighting products and accessories ("Products"), which are sold to Purchaser for the purpose of commercial and/or residential lighting uses, to be free from defects in materials and workmanship under normal usage for the period(s) stated below unless otherwise stated in product-specific documentation as longer or shorter term.

LED Modules Premium [Cree or Nichia LEDs] manufactured by US Solid State, LLC., 7-years

LED Modules Economy [Epistar LEDs] manufactured by US Solid State, LLC., 3-years

EXCLUSIONS
Normal Wear, Periodic Maintenance:
Repair and replacement of parts due to normal wear and tear are excluded from coverage.

Abuse & Misuse:
Defects or damage that result from: (a) improper operation, improper installation, storage, misuse or abuse, accident or neglect, to the product resulting from misuse; (b) contact with liquid, water, rain, extreme humidity, or dirt or the like, or extreme heat, or other extreme environmental conditions.

There is no warranty, expressed or implied, as to fitness of any product for a particular purpose, nor for any certain level or type of performance in any particular environment or application. Warranty coverage is limited to the sale price of the product, regardless of consequential or inconsequential damages that may be incurred.

GENERAL TERMS
Replacement Policy for Defective Products:
The Company will replace (either brand new or factory reconditioned) or repair defective products, upon our approved inspection of the defective product [in the case of LED lighting products: 10% defective LEDs in the unit]. US Solid State, LLC., reserves the right to deliver a similar (equivalent) type of product, if the type of the original product is no longer available at the time of complaint. The repair, replacement, or additional delivery of the product neither renews nor extends the period of the Limited Warranty. The replaced product will become the property of the Company.

Limited Warranty Claim:
The Company will repair or replace the defective product at the Company's discretion. Company reserves the right to examine any products and/or accessories to determine the cause of failure and patterns of usage. The date of the purchase and installation must be verified to validate the elapsed operating hours if a warranty claim is made. If product life is not validated, the product date code will be used to establish elapsed time based on Company's estimate of usage. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state. Warranty coverage does not include original or return freight costs. If warranty service is needed, contact Knema, LLC., 7288 Greenwood Road, Shreveport, Louisiana 71119 USA. You will receive instructions on how to ship the Product(s), at your expense, to the Company. To obtain the benefits of this warranty service, you must include a copy of your receipt, bill of sale or other comparable proof of purchase.

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