

Brilliant Light!

DK-2000 SERIES

LED DISCOVERY KIT

Lamina Light Engines

As the market leader in the development and manufacture of super-bright LED arrays, Lamina brings solid state lighting to applications which until now were possible only with traditional lighting sources.

Lamina's LED arrays are manufactured by combining high brightness LEDs from industry-leading LED manufacturers with Lamina's proprietary packaging technology, multilayer Low Temperature Co-Fired Ceramic on Metal (LTCC-M). LTCC-M is a breakthrough in thermal performance for LED packaging technology, a key factor in determining LED life and reliability. Unmatched thermal performance coupled with package interconnectivity allows Lamina to densely cluster multiple LEDs to achieve exceptionally high luminous intensity in very small footprints. Lamina's arrays are available in white, RGB and monochrome, from 1W to 1000W, and are also available in custom packages.

- HIGH LUMINOUS FLUX IN SMALL FOOTPRINT
- SUPERIOR THERMAL PERFORMANCE FOR IMPROVED RELIABILITY
- LONG LIFE AND HIGH LUMEN MAINTENANCE
- NO MERCURY OR LEAD
- CUSTOM SIZES AND SHAPES AVAILABLE

Lamina's DK-2000 LED Discovery Kit allows users to "discover" the world of solid state lighting. The kit is designed to enable the rapid prototyping of LED lighting solutions in fixtures or applications. This kit contains all elements, from the light engine to the wires and heat sinks, which are necessary to realize the power of Lamina super-bright arrays. With the use of a standard soldering iron (not supplied), the user can assemble and illuminate a solid state light source prototype within minutes.



Typical Applications

GENERAL ILLUMINATION

ARCHITECTURAL LIGHTING

- DECORATIVE AND ACCENT
- WALLWASHERS

LCD BACKLIGHT

- COMPUTER DISPLAYS
- HEADS UP DISPLAYS

SIGNALS & SIGNAGE

- AIRFIELD TAXIWAY
- TRAFFIC
- SECURITY
- BEACONS

TASK LIGHTING

MACHINE VISION

AUTOMOTIVE

- FORWARD LIGHTING

DK-2000 Kit Contents Data

Part # DK-2000-0303	Qty	Color	PN
Super-Bright Light Engine	1	Red	BL-21A0-0121
Super-Bright Light Engine	1	Amber	BL-21E0-0131
Super-Bright Light Engine	1	Blue	BL-22B1-0140
Super-Bright Light Engine	1	Green	BL-22C1-0141
Super-Bright Light Engine	1	White	BL-22D0-0130
Custom Designed Heat sinks	2	-	210-0082-1
24W AC/DVC Power Supply	1	-	210-0085
Multi-purpose DC Regulator Board	1	-	800-0252
jumper configurable for all BL-2000 super-bright light engines			
Jumper Wires	10	White	210-0083-1
Jumper Wires	10	Black	210-0083-2
Thermal Interface Tape	10	-	210-0084
Fillister Head Mounting Screws	8	-	302-0045
Solder	1	-	212-0013
Reversible Screwdriver	1	-	210-0087

1. Soldering Wires to the Light Engine

This step is to be performed prior to attachment to a heat sink.

There are 4 (four) solder terminals on each BL-2000 light engine, however only 2 (two) are used for electrical connection. All devices in this kit use terminal "1" as positive and terminal "3" as negative. This kit includes wire, solder (SN62), and white and black pre-stripped (not pre-tinned) lead wire.

1a. With a soldering iron set to a tip temperature not exceeding 700°C, apply heat to the terminal 1 and terminal 3 and apply solder directly to the pad. Allow solder to flow until pad is covered with a small mound of solder. Remove heat.

1b. Remove shielding from a black and a white pre-stripped jumper wire and with the soldering iron apply heat to the solder applied in Step 1a and allowing the solder to melt. When solder liquifies place the black wire (positive) onto the solder pad. Hold in position and remove heat from terminal. When solder cools and hardens the wire should be firmly affixed in the solder pad.

1c. Repeat Step 1b for the white wire (negative) attachment to terminal 3.

Additional information and detailed support can be found in our application notes on our website at www.laminaceramics.com.

Notes

ESD PROTECTION

Lamina LED arrays must be handled using Electrostatic Discharge (ESD) damage control precautions. LEDs are static sensitive and susceptible to ESD damage.

HANDLING PRECAUTION

Lamina LED arrays must be handled by the sides. Contact with the silicone based encapsulant on the surface of the light engine must be avoided to prevent damage. Do not apply pressure to the silicone based encapsulant or allow it to come into contact with sharp objects.

ATTACHMENT

Warning: Improper attachment of the light engine to the heat sink can result in catastrophic failure of the light engine and/or potential burns to the user.

ELECTRICAL CONNECTION

Warning: Improper electrical connection of the light engine to the regulator can result in premature failure or diminished light output for the light engine.

2. Heat Sink Assembly

Solder wires onto the light engine before performing this step.

This discovery kit contains 2 (two) heat sinks specifically designed for the BL-2000 light engine. The ideal configuration is to deposit thermal grease (not supplied) or thermal interface tape (provided) between the back of the BL-2000 light engine and the heat sink and then screw the light engine down by centering the light engine between the four screw holes and the pre-tapped heat sink holes. The screws should be tightened down to apply slight pressure on the light engine which will exert pressure on the thermal interface tape. Do not exceed a maximum torque of 4 inch pounds on the screw or potential damage to the threads or ceramic can occur. Additional information and detailed support can be found in our application notes on our website at www.laminaceramics.com.

3. Electrical Attachment

Complete Steps 1 and 2 before performing this step.

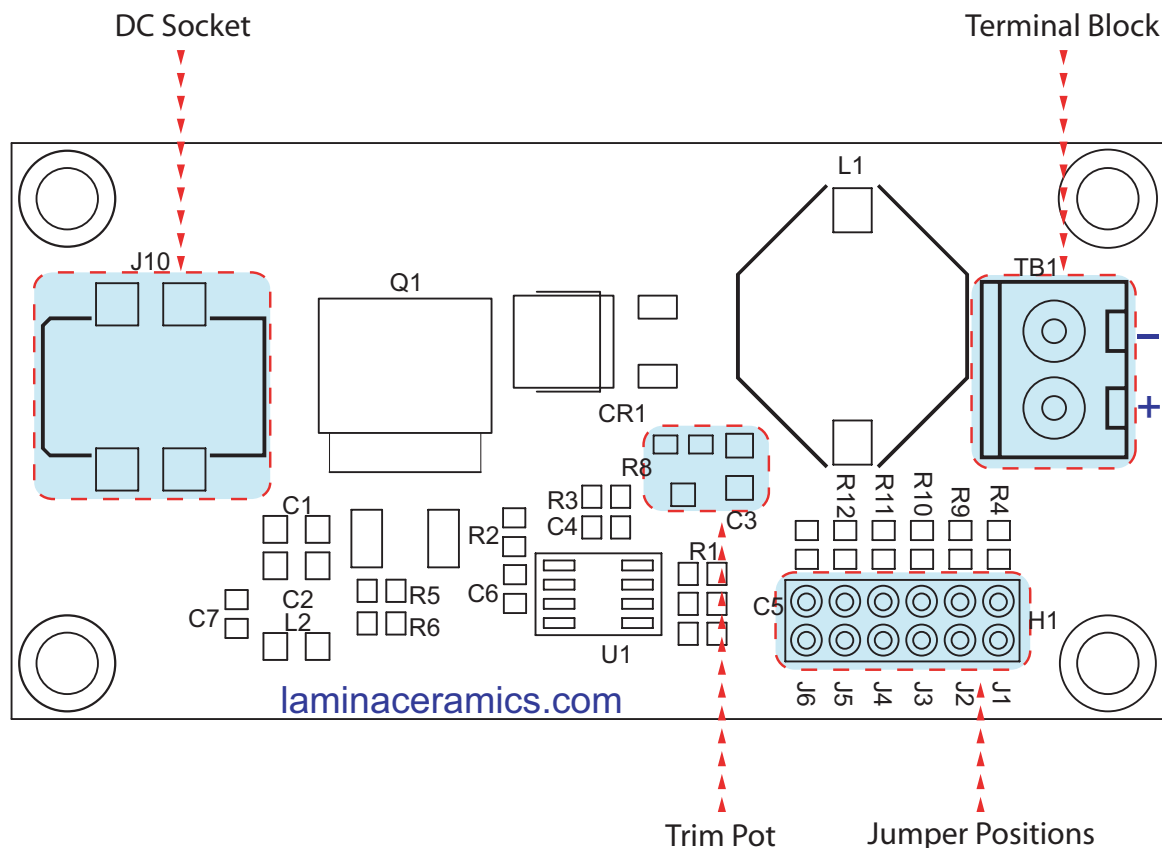
3a. Determine proper jumper setting for the light engine you are using (see Figure 1). Gently pull the black jumper from the pin headers and replace it over the pins designated as J1, J2, J3, etc. which correspond to your predetermined position.

3b. Using the supplied reversible screwdriver (slotted head position), loosen the screws in the terminal block on the supplied regulator. Insert the white wire into the negative terminal and tighten the screw. Insert the black wire into the positive terminal and tighten screw.

3c. Plug the power supply into the mains power and insert the DC plug into the socket on the regulator board.

3d. Using the screwdriver (Phillips head), adjust the trim pad to “tune” the current power rate to maximize brightness of the light engine.

Figure 1.



Jumper Detail

J-Location	Typical Peak (VDC)	Description
J1	9	Not Used in DK-2000
J2	7	BL-2000 Red, Amber
J3	12	BL-2000 Blue, Green, White
J4	21	Not Used in DK-2000
J5	3.5	Not Used in DK-2000
J6	23	Not Used in DK-2000

4. Attaching to Your Fixture or Assembly

The heat sink supplied can be mounted in several configurations. Ideal configuration would have the light source pointing directly down, thereby allowing the heat to radiate through the vertically oriented fins. Alternate assembly positions are possible. Holes can be drilled on the back or “foot” of the heat sink for flexible mounting options. The orientation of the fins will determine how efficiently the heat sink can dissipate the thermal energy.

Additional information and detailed support can be found in our application notes on our website at www.laminaceramics.com.

Notes

SOLDER GUIDELINES

Warning: Improper use of solder and solder iron temperature can result in fire or serious burns to the user. Please take all necessary precautions to avoid contact with all heat sources other than in the prescribed area of the light engine.

Lamina Ceramics
120 Hancock Lane
Westampton, NJ 08060

Specifications subject to change without notice.

© 2004 Lamina Ceramics