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## **GREEN LED LIGHT ENGINE**

Light Emitting Diodes (LEDs) offer many advantages over traditional incandescent lamps. Lamina's innovative LED arrays provide a revolutionary improvement in the LED market by creating the highest density packaging of discrete LED die. Developed using Lamina's multilayer Low Temperature Co-Fired Ceramic on Metal (LTCC-M) technology, Lamina LED array packages feature:

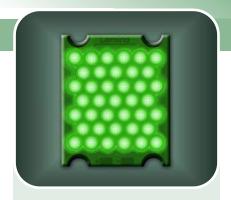
- Superior Thermal Performance
- THE MOST LIGHT AVAILABLE IN ONE SQUARE INCH
- Available in Several Colors Including UV and IR
- Low Profile Design

Thermal performance is the key to achieving high luminous densities, high reliability and long life. Lamina's LTCC-M packaging allows LED devices (die) to be mounted directly to an engineered metal core without submounts. This creates the optimum thermal path to conduct heat away from the LED device. The result is that multiple devices can be located in close proximity while maintaining target LED junction temperatures.

Standard arrays are available in several different colors and light intensity outputs. Terminals are supplied with a solderable surface finish to enable users to connect arrays to driver circuitry or other arrays in a series or parallel circuit. The BL-3000 Series is the most powerful LED array on the market.



Lamina Ceramics, 120 Hancock Lane, Westampton, NJ 08060 1-800-808-LTCC (5822) www.laminaceramics.com



### **Typical Applications**

#### ARCHITECTURAL LIGHTING

- DECORATIVE AND ACCENT
- Cove and Under-shelf
- GARDEN AND PATHWAY

#### **LCD BACKLIGHT**

- COMPUTER DISPLAYS
- HEADS UP DISPLAYS

#### SIGNALS & SIGNAGE

- AIRFIELD TAXIWAY
- TRAFFIC
- SECURITY
- BEACONS

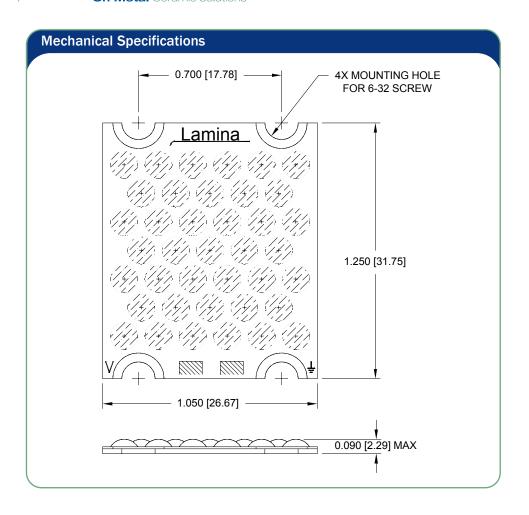
#### TASK LIGHTING

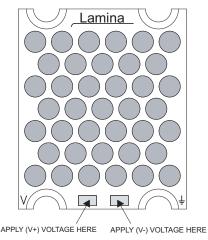
• MEDICAL LIGHTS

To see how you can realize all these design benefits, to request a sample, or to speak with an engineer about your design, contact Lamina Ceramics at 800.808.LTCC (5822) or visit laminaceramics.com.



On Metal Ceramic Solutions







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#### **Notes**

## OPTICAL RECOMMENDATIONS

Lamina's BL Series Light
Engines project a Lambertain
radiation pattern, with
projection angles built into
the package cavity at
approximately 150°. It will be
necessary for users to create
an optical reflector and lens
structure that meet their light
dispersion requirements.
Please contact Lamina
Application Engineering for
support with your optical
needs.

#### HEAT SINK RECOMMENDATIONS

Lamina's BL Series Light Engines are created with a heat spreader fabricated into the ceramic package. This heat spreader provides the most efficient thermal path from the die junction to the heat sink. The operational die junction temperature must not be allowed to exceed 125°C and should ideally be maintained as close to 25°C as possible. With increasing power levels, die junction temperature will rise and light output efficiency will drop. These variables must be taken into consideration when selecting a light engine for your application. Please contact **Lamina Application Engineering for support with** your thermal management needs.

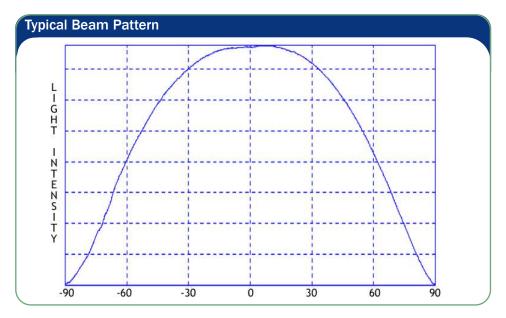
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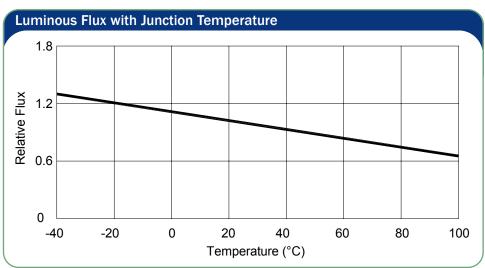


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Technical Data					
Part # BL-32C1-0144	Symbol	Min	Typical	Max	Unit
Wavelength	λ	515	-	535	nm
Voltage*	$V_{F}$	-	10	-	V
Drive Current	I <sub>F</sub>	-	2.34	-	Α
Power*	Р	-	23.40	-	W
Luminous Flux*	$\Phi_{V}$	282	348	-	lm
Thermal Resistance	$T_{R}$	-	0.66	0.88	°C/W

\*Note 1. Optical and Electrical specifications are given for the specified drive current at a 25°C junction temperature.





#### **Notes**

#### ATTACHMENT RECOMMENDATIONS

Lamina's BL Series Light
Engines are configured with
solder pads compatible with
Sn63 or Sn62 solder. As
with many electrical devices,
non-acid RMA type solder
flux should be used to
prepare the solder pads
before application of solder.
If attachment is performed
with a soldering iron, care
must be taken to minimize
heat transfer to the die and
minimize leaching of the
solderable pads.

## ASSEMBLY RECOMMENDATIONS

Lamina's BL Series Light
Engines, are designed for
attachment to heatsinks with
conductive epoxy or screw
down for flange mount
devices with thermal grease
in the joint. In limited cases,
thermal transfer tape can be
used, but will generally result
in higher than desired
thermal resistance creating
excessive heat and reducing
light output and die life.



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Specifications subject to change without notice.

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