

Matrix Platform Custom L2 Technology

Assembly and Handling Information

Introduction

This application brief addresses the recommended assembly and handling procedures for L2 Matrix Platform PCBA Customization. These customized modules deliver high efficacy and quality of light for distributed light source applications in a compact and non-compact LES array. Proper assembly, handling, and thermal management, as outlined in this application brief, ensure high optical output and reliability of these customized modules.

Scope

The assembly and handling guidelines in this Application Brief apply to the following products:

L2aa-xyybbbRcccc FR4 based customization

L2aa-xyybbbMcccc Metal Core based customization

L2aa-xyybbbCcccc Super Cem 3 based customization

The letters a, b, c, x and y refer to variables as defined in the product nomenclature section of the datasheet. In the remainder of this document, the term “Matrix Platform Customized Module” refers to any product listed above.

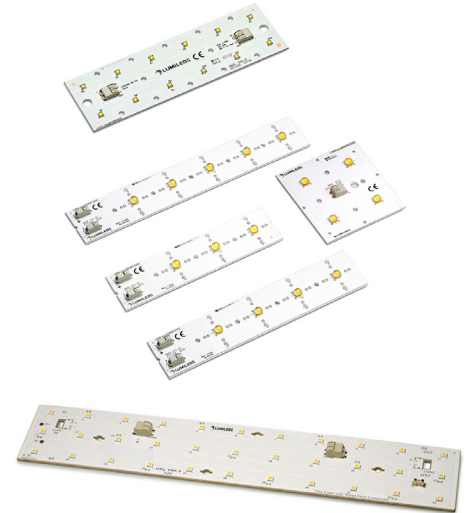


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1. Description

The Matrix Platform Customized Module consists of an array of LED chips that are mounted onto a printed circuit board (Metal Core, FR4 or Super Cem 3) with a mixture of active and passive component to facilitate assembly and handling. A high reflectivity white silicone coating is applied to the strip providing an initial reflectivity of ~90%. The PCBA contains a 2D barcode which includes a unique serial number for each board for traceability tracking.

2. Handling Precautions

The Matrix Platform Customized Module is designed to maximize light output and reliability. However, improper handling of the device may damage the module and affect the overall performance and reliability. In order to minimize the risk of damage to the Matrix Platform Customized Module, the following precautions need to be taken into consideration:

- The module should only be picked up from the side of the assembly package.
- Do not touch light emitting area of the LED, electrodes and components on the board. Excessive force may cause deformation or wire bond break.
- Do not touch the Cu trace area with sharp tip tweezers, as this may cause damage on insulation characteristics (MCPCB)
- Do not stack LED boards, as it may cause resin crack, chip, delamination, deformation or wire bond break, which could lead to LED failure.
- Do not place board top side down on any surface.

2.1 Cleaning

The Matrix Platform Customized Module should not be exposed to dust and debris. Excessive dust and debris may cause a drastic decrease in optical output. In the event that a Matrix Platform Customized Module requires cleaning, first try using a gentle, lint-free swab. If needed, a lint-free swab and isopropyl alcohol (IPA) can be used to gently remove dirt from the silicone coating. Do not use other solvents as they may adversely react with the Matrix Platform Customized Module. For more information regarding chemical compatibility, see Section 4.

2.2 ESD

It is highly recommended that you handle the LED board in an appropriate ESD environment. In order to avoid ESD stress, do not directly touch the electrodes.

3. Electrical Connection

Care must be taken to correctly identify the positive and negative connection points on the ends of the Matrix Platform Customized Module. The \pm marks are printed on the module as shown in Figure 1 below.

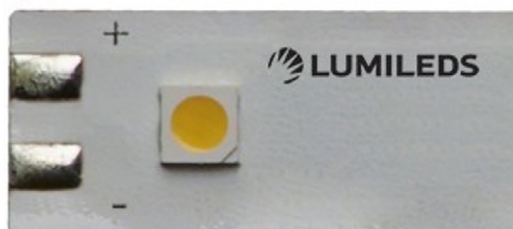


Figure 1 Identifying the +/- connection.

3.1 Electrical Isolation

The Matrix Platform Customized Module is electrically isolated from the LED cathode and anode.

4. Packaging Considerations—Chemical Compatibility

The Matrix Platform Customized Module contains an LED chip that extracts the maximum amount of light. As with most silicones used in LED optics, care must be taken to prevent any incompatible chemicals from directly or indirectly reacting with the silicone.

Table 1 provides a list of commonly used chemicals that should be avoided. Note that Lumileds does not warrant that this list is exhaustive since it is impossible to determine all chemicals that may affect LED performance that is populated on the module level.

The chemicals in Table 1 are typically not directly used in the final build of the Matrix Platform Customized Module. However, some of these chemicals may be used in intermediate manufacturing steps (e.g. cleaning agents). Consequently, trace amounts of these chemicals may remain on (sub) components, such as heatsinks. Lumileds, therefore, recommends the following precautions when designing your application:

- When designing secondary lenses to be used over an LED, provide a sufficiently large air-pocket and allow for “ventilation” of this air away from the immediate vicinity of the LED.
- Use mechanical means of attaching lenses and circuit boards as much as possible. When using adhesives, potting compounds and coatings, carefully analyze its material composition and go thorough testing of the entire fixture under High Temperature Over Life (HTOL) conditions.

Table 1. List of commonly used chemicals that will damage the silicone overcoat of the LUXEON emitter. Avoid using any of these chemicals in the housing that contains the LED package.

CHEMICAL NAME	NORMALLY USED AS
Hydrochloric Acid	Acid
Sulfuric Acid	Acid
Nitric Acid	Acid
Acetic Acid	Acid
Sodium Hydroxide	Alkali
Potassium Hydroxide	Alkali
Ammonia	Alkali
MEK (Methyl Ethyl Ketone)	Solvent
MIBK (Methyl Isobutyl Ketone)	Solvent
Toluene	Solvent
Xylene	Solvent
Benzene	Solvent
Gasoline	Solvent
Mineral Spirits	Solvent
Dichloromethane	Solvent
Tetracholorometane	Solvent
Castor Oil	Oil
Lard	Oil
Linseed Oil	Oil
Petroleum	Oil
Silicone Oil	Oil
Halogenated Hydrocarbons (containing F, Cl, Br elements)	Misc
Roisin Flux	Solder Flux ^[1]
Acrylic Tape	Adhesive

Note for Table 1:

1. Other than the use of no-clean solder paste qualified by customer. Avoid secondary solder flux, for example when manually soldering wires close to LUXEON emitter, the solder flux should not spit onto the LUXEON emitter surface or leaving excessive secondary solder flux residue onto the PCB when operating LEDs in an air tight enclosure or poorly ventilated enclosure.

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To learn more about our lighting solutions, visit lumileds.com.



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