

Product Document

Handling of the OSRAM OSTAR® Projection Cube

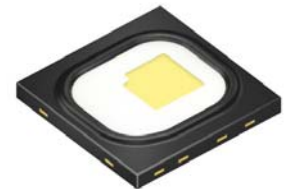
Application Note



Valid for:
OSRAM OSTAR® Projection Cube
(LCG H9RM / LCG H9RN)

Abstract

This application note provides information on the handling of the OSRAM OSTAR® Projection Cube LEDs.



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Table of contents

A. OSRAM OSTAR® Projection Cube – LCG H9Rx2
 B. Handling3

A. OSRAM OSTAR® Projection Cube – LCG H9Rx

The LCG H9Rx LEDs are especially developed for use as high flux green light source unit in projection applications with focus on slim design.

The construction of the LED (Figure 2) consists of an epoxy molded package with a metal lead-frame on which a highly efficient semiconductor chip is mounted and electrically connected. To obtain green light the chip is covered with a converter tile and finally encapsulated with a white embedding material.

The electrical contacts of the leadless package are located on the bottom surface of the LED, similar to QFN packages, whereas the exposed cathode serves as thermal pad coevally (Figure 1). The LED is protected by an ESD device, which is connected in parallel to the die and provides ESD resistance of up to 8 kV according to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B).

As with all LEDs from OSRAM Opto Semiconductors, the LCG H9Rx also fulfills the current RoHS guidelines (European Union & China), and therefore contains no lead or other defined hazardous substances.

Figure 1: Dimensions of LCG H9Rx

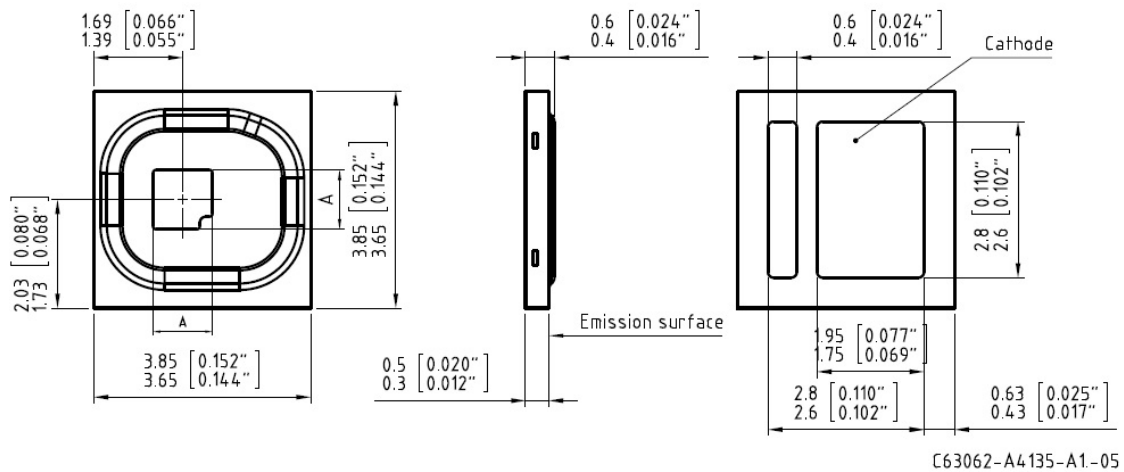
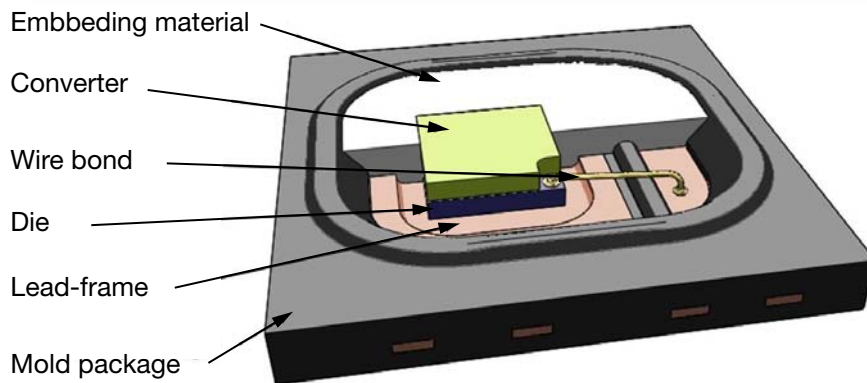


Figure 2: Design of the LCG H9Rx



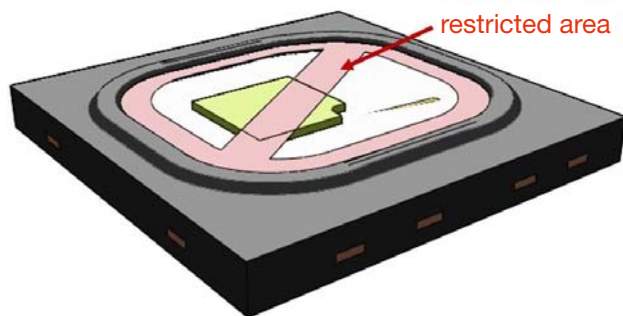
Due to the slim package design and the permitted tolerance of the encapsulating it is in some cases possible to recognize a part of the wire bond. This does not result in any impairment of the functionality or lifetime of the LED, as was also confirmed in tests and examination at OSRAM Opto Semiconductors.

B. Handling

In addition to general guidelines for the handling of LEDs, additional care should be taken that mechanical stresses and strains (e.g. sheering forces) to the silicone or to the converter surface are avoided, since this can lead to an optical degradation or complete failure of the component.

This means, for example, that relevant LED must not be picked up or handled at the sensitive area, especially not with any type of sharp object (e.g. forceps, fingernails, etc.)

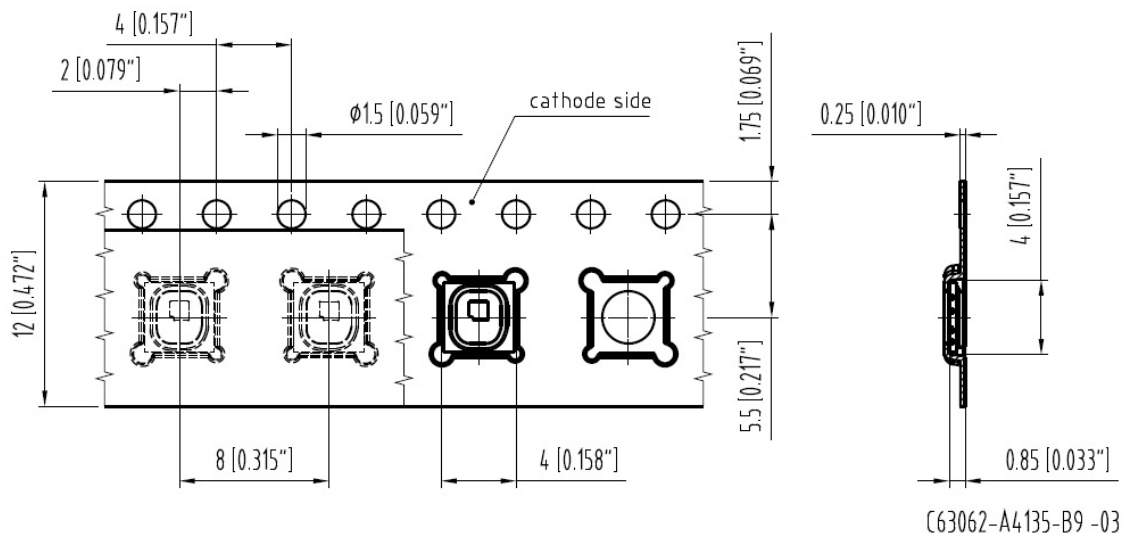
Figure 3: Sensitive and restricted area of the LCG H9Rx



When placing the LED into operation, it should be guaranteed that sufficient cooling is provided. Depending on the given circumstances, extended operation without heat dissipation can lead to overheating, damage or failure of the component.

As can be seen in Figure 4, the LCG H9Rx is packaged in the tape from below.

Figure 4: Position of the LED in the tape — method of taping



Removing the LED from the tape using simple tweezers should be avoided since one can slip and cause then damage to the housing.

For manual assembly and placement — in the production of prototypes, for example — the use of so-called vacuum tweezers is recommended (Figure 5).

Figure 5: Examples of vacuum styluses



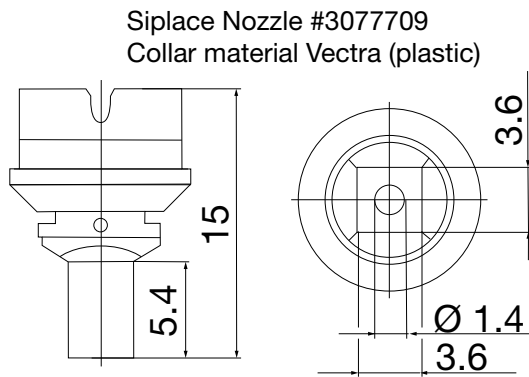
The effective mechanical stress on the LED is minimized by individually exchangeable soft rubber suction tips. If there is no alternative to the use of a forceps, the LED must be picked and handled only at the sides of the epoxy package.

When processing by means of automated placement machines, care should be taken to use an appropriate pick and place tool and to ensure that the process parameters conform to the package's characteristics. As a starting point a placement force of 2.0 N is recommended and should be minimized if possible.

Figure 6 shows the recommended design of the placement tool for damage-free processing of the LCG H9Rx.

Use of an unadapted tool (e.g. with too small dimensions) can lead to damage or failure of the component, especially when placing the LED.

Figure 6: Recommended design of the pick and place tool for the LCG H9Rx (dimensions in mm)



Since the LCG H9Rx is generally supplied in tape with dry pack in compliance with the OSRAM Opto Semiconductors standard, it should be factory-sealed when stored. The hermetic pack should only be opened for immediate mounting and processing, after which the remaining LEDs should be repacked.



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ABOUT OSRAM OPTO SEMICONDUCTORS

OSRAM, Munich, Germany is one of the two leading light manufacturers in the world. Its subsidiary, OSRAM Opto Semiconductors GmbH in Regensburg (Germany), offers its customers solutions based on semiconductor technology for lighting, sensor and visualization applications. OSRAM Opto Semiconductors has production sites in Regensburg (Germany), Penang (Malaysia) and Wuxi (China). Its headquarters for North America is in Sunnyvale (USA), and for Asia in Hong Kong. OSRAM Opto Semiconductors also has sales offices throughout the world. For more information go to www.osram-os.com.

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