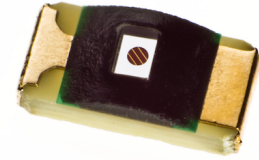


C4L-CL300HRE

Circular LED hyperred (635 nm, high pulse power)



The black Circular LED is designed for applications, where an extremely small emission point is needed and stray light needs to be avoided. There is no bond wire in the optical path. The LED is produced by using a high efficiency LED chip mounted in a small black FR4 based package to minimize reflections. The Circular LED is easy to handle and IR-reflow solderable. The chip placement accuracy relative to the package is very high. Additionally the LED is categorized by radiant power and peak wavelength and is capable of high pulse currents.



Features

- Small circular emission point
- High pulse capability up to 1A
- No bond wire in optical path
- Black package
- High optical precision
- Very low reflections inside package
- High optical efficiency

Applications

- High pulse applications
- Industrial applications
- Sensor applications
- Light grids
- Data communication
- Triangulation

Ordering information

TYPE	PEAK WAVELENGTH	RADIANT POWER
C4L-CL300HRE-03yL	630 ... 650 nm	1,6 ... 8 mW



C 4 L Chips 4 Light
C Circular LED 300
L Low current
3 0 0 300 μ m chip size
H R Hyper red
E InGaAlP extraordinary high efficiency chip
0 Peak wavelength min.: 630 nm
3 Peak wavelength max.: 650 nm
y Radiant power min.: 1,6 mW
L Radiant power max.: 8 mW

Customers' special wishes are also welcome.

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Electro-optical characteristics ($T_A = 25^\circ\text{C}$)¹

PARAMETER	SYMBOL	CONDITION	MIN.	TYP. ²	MAX.	UNIT
Forward voltage	V_F	$I_F = 20\text{ mA}$	1,7		2,4	V
Peak wavelength	λ_{peak}	$I_F = 20\text{ mA}$	630		650	nm
Radiant power ³	Φ_e	$I_F = 20\text{ mA}$	1,6		8	mW
Spectral bandwidth	$\Delta\lambda$	$I_F = 20\text{ mA}$		20		nm
Viewing angle	$2\Theta_{1/2}$			120		°

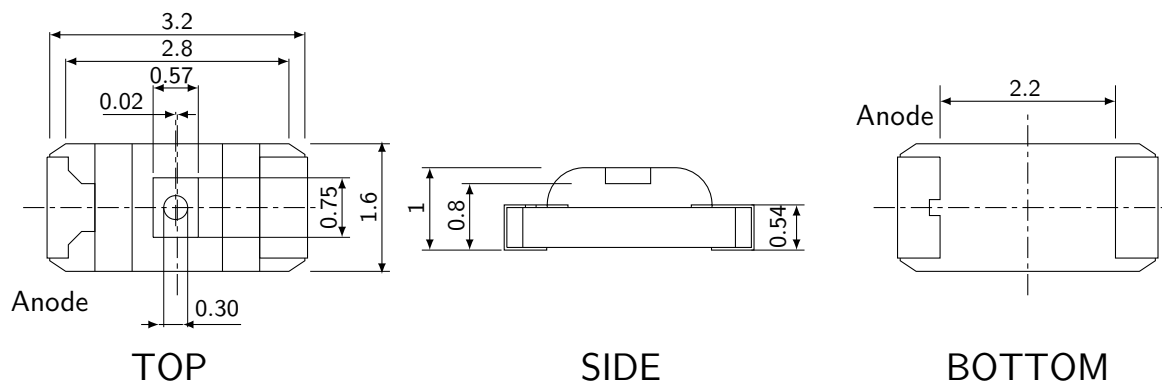
Maximum ratings ($T_A = 25^\circ\text{C}$)⁴

PARAMETER	SYMBOL	MINIMUM	MAXIMUM	UNIT
Operating temperature range	T_{op}	-40	125	°C
Storage temperature range	T_{stg}	-40	125	°C
Forward current	I_F		50	mA
LED junction temperature	T_j		125	°C
Reverse voltage	V_R		5	V
Power dissipation	P_D		150	mW

Thermal characteristics

PARAMETER	SYMBOL	VALUE	UNIT
Thermal resistance	$R\Theta_{J-Pin}$		K/W

Outline drawing



all dimensions in mm. Tolerance ± 0.1 except given ones

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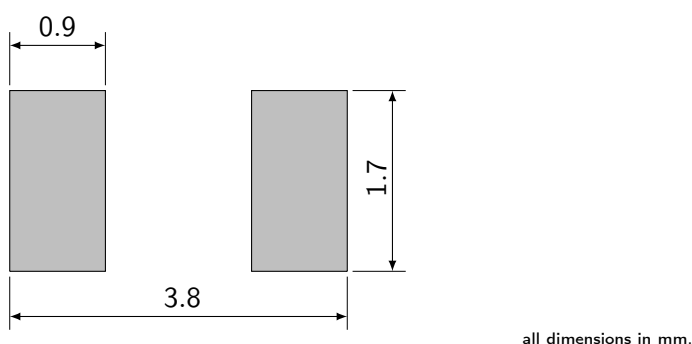
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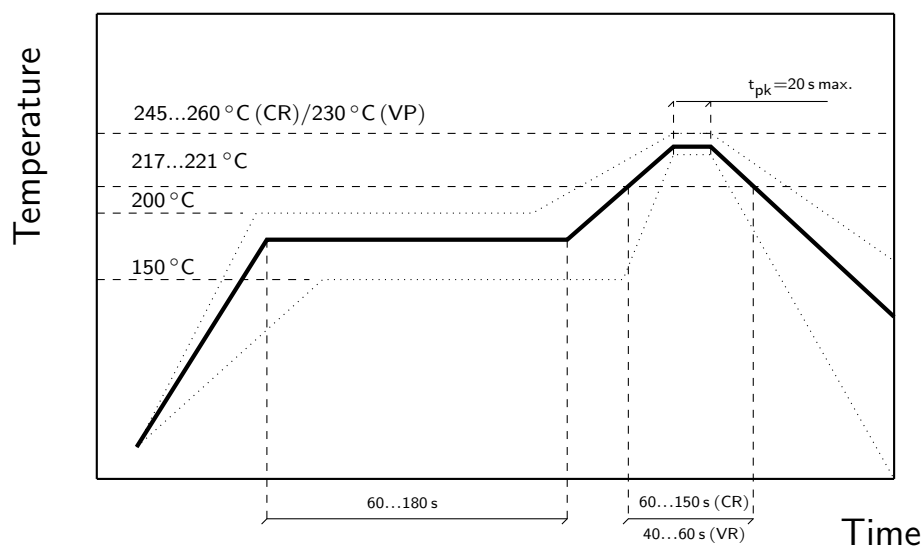
Packaging and Labelling

LEDs are packaged automatically into paperboard containers. Labels for identification with the lot data are placed on the box. The label shows company name and address, LED type, quantity, lot number, production date, machine number and the appropriate barcode. The box is hermetically sealed in a plastic bag for shipment.

Recommended Solderpad



Recommended Soldering Profile



Recommended reflow soldering conditions following IPS/JEDEC J-STD-020.

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	MAXIMUM
Temperature maintained between 150 and 200 °C	180 s
Temperature maintained above 217 °C, Convection Reflow (CR) 150 s	
Temperature maintained above 217 °C, Vapor Phase (VP)	60 s
Ramp-Up Rate	+3 °C/s
Peak Temperature (t_{pk}), Convection Reflow (CR)	245 to 260 °C
Peak Temperature (t_{pk}), Vapor Phase (VP)	230 °C
Time to Peak Temperature	8 min
Time within 5°C of actual Peak Temperature	20 s
Ramp-Down Rate	-6 °C/s

Actual solder profile may vary from the example given, and is very much depending on machine type and configuration, geometrical configuration, board shape etc. It is strongly recommended to optimize and evaluate the actual soldering conditions carefully for each individual project before releasing the soldering process.

General Precautions with moisture-sensitive devices

Plastic and COB-assembled LEDs are sensitive to temperature shocks and especially to reflow soldering (the popcorn effect).

The cause of the popcorn effect is the enclosed moisture which can lead to cracks in the package with a sudden rise in temperature. All shapes and sizes of package for surface-mounted components are sensitive to this effect. The sensitivity increases with the thermal stress from the respective soldering process.

Components delivered without any form of protection against moisture should therefore either be baked or stored permanently in a dry environment, in both cases until immediately prior to soldering. The user is responsible for the qualification of the preparation and further processing of the LEDs.

Notes:

- The usage of LEDs in life-support devices or systems has to be expressly and written authorized by the supplier!
- Lead free product - RoHS compliant.
- Care must be taken when handling products, particularly if an over-voltage exceeds the maximum rating. The overflow in energy may cause damage to the products. In addition these products are sensitive to static electricity. Customers must take care when handling the products to ensure that the handling process is fully protected against static generation. Ensure that products are grounded and that the facility has conductive mats, antistatic uniforms and shoes. Antistatic containers are considered to be a good insurance against static electricity. The soldering iron point should be properly grounded. An atmospheric ionizer is recommended for use in the facility where static could be

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- generated.
- Storage ambient conditions for all LEDs in sealed packages must be within $T_A = 10...40^{\circ}\text{C}$ and relative humidity $<60\%$. LEDs in opened packages must be used within 2 weeks after opening. Storage time under the conditions above in sealed packages must not exceed 24 months.
 - The information in this document is subject to change without notice and describes the product generally. It shall not be considered as assured characteristics or detailed specification.
 - Chips 4 Light GmbH does not warrant the accuracy, completeness or timeliness of the specification on this site and does not assume liability for any errors or omissions in the materials. The data specified is intended solely for the purpose of product description. No representations or warranties, either express or implied, of merchantability, fitness for a particular purpose or of any other nature are made hereunder with respect to information or specification or the products to which information refers and no guarantee with respect to compliance to the intended use is given. In particular, this also applies to the stated possible applications or areas of applications of the product.
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 - We understand suitable application of our published designs to be state-of-the-art technology which can no longer be classed as inventive under the stipulations of patent law. Our explicit application notes are to be treated only as mere examples of the many possible and extremely advantageous uses our products can be put to.
 - Please contact our sales office in case you have any questions concerning the information inside this document.

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www.chips4light.com
info@chips4light.com
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¹After 1 minute of operation.

²Typical (Typ) data are defined as long-term production mean values. These values are not specified and only given for information.

³Measurements are done with an accuracy of $\pm 15\%$. Correlation to customer's equipment and products is required.

⁴Not to be exceeded at any time.