



Datasheet

DS001014

EGA2000-940-N

Industrial High-Power Flood Illuminator

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Abstract

The EGA2000-940-N is a small form factor surface mount infrared laser illuminator enabling a variety of use cases for industrial mass market applications.

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1 General Description

1.1 Key Benefits & Features

The EGA2000-940-N module is specifically designed for monochromatic, infrared, high-power, uniform illumination.

The compact modules are assembled with **ams** state-of-the-art component manufacturing processes and are reflow solderable. Those modules, using laser illumination, allow improved efficiency, reduced footprint, and overall improved system performance.

Figure 1:
Added Value Overview

Benefits	Features
Small package size	4.1 mm x 4.1 mm x 1.38 mm ±0.100 mm
Power efficient	High power conversion efficiency
Easy component mounting	Standard lead-free solder reflow compatible
Uniform power distribution	100% tested for uniformity in the far field
Full traceability	Unit level track with 2D barcode

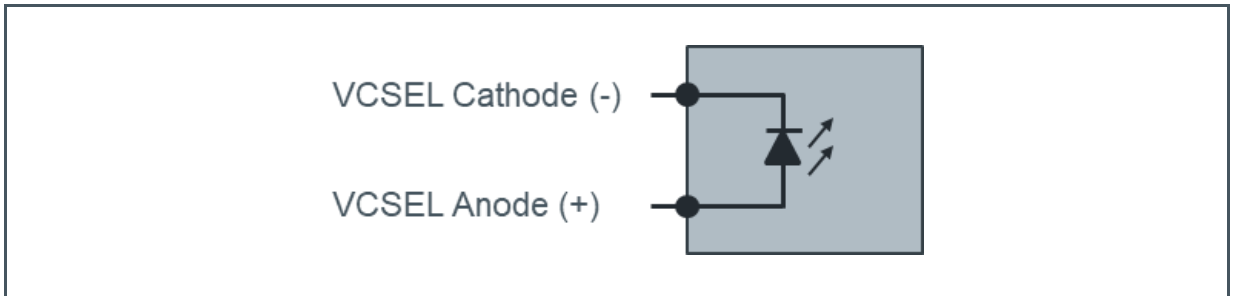
1.2 Applications

- Industrial applications using 3D Time-of-Flight and 2D NIR systems
- Machine vision
- Automated guided vehicles (AGV)
- Autonomous robots
- e-payment POS (Point of Sales)
- Night vision

1.3 Block Diagram

The functional block of this device is shown below:

Figure 2 :
Functional Block of EGA2000-940-N



1.4 Other General Characteristics

Some additional features of this device are shown below:

Figure 3:
Additional Characteristics

Parameter	Value
Light Source	VCSEL
Electrical Contacts	Anode/Cathode on backside
Number of Electrical Contacts	1x Cathode ; 1x Anode
Assembly Type	Reflow Compatible

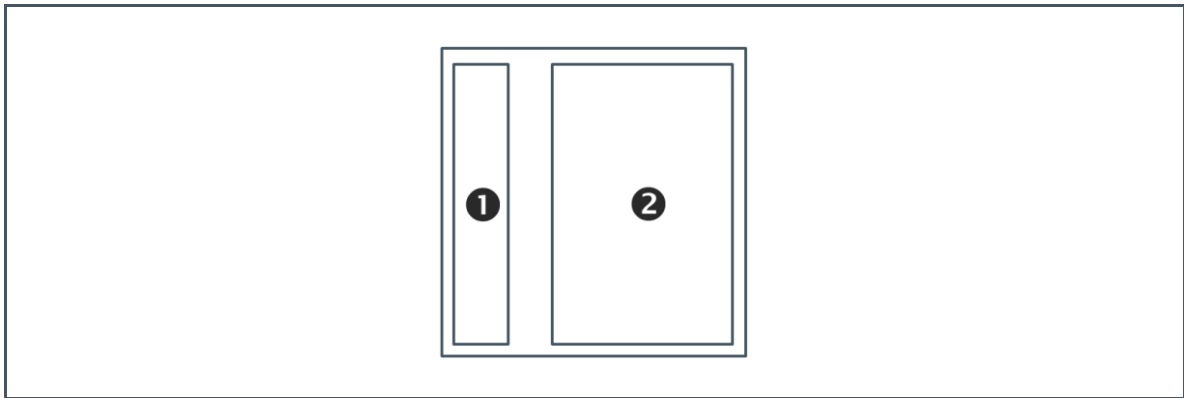
2 Ordering Information

Ordering Code	Description	Delivery Form	Delivery Quantity
ATBX-00	EGA2000-940-N	Tape & Reel	4000 pcs/reel

3 Pin Assignment

3.1 Pin Diagram

Figure 4:
Pin Diagram: Module Bottom View



3.2 Pin Description

Figure 5:
Pin Description of EGA2000-940-N

Pin Number	Pin Name	Description
1	Anode	VCSEL Power
2	Cathode	VCSEL Power

4 Absolute Maximum Ratings

Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only. Functional operation of the device at these or any other conditions beyond those indicated under “Operating Conditions” is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Figure 6
Absolute Maximum Ratings of EGA2000-940-N

Symbol	Parameter	Min	Max	Unit	Comments
Temperature Ranges and Storage Conditions					
T _A	Operating Ambient Temperature	-40	105	°C	
T _{STRG}	Storage Temperature Range	-40	125	°C	
RH _{NC}	Relative Humidity (non-condensing)		85	%	
MSL	Moisture Sensitivity Level		3		JESD22-A113D

5 Performance Characteristics

All limits are guaranteed. The parameters with Min and Max values are guaranteed with production tests or SQC (Statistical Quality Control) methods.

5.1 Electrical Characteristics

Figure 7:
Electrical Parameters

Parameter	Conditions	Min	Typ	Max	Unit
Optical Output Power ⁽¹⁾	Pulse width=100 μs, Duty cycle = 2%, @ 5 A @ 25 °C	3.1		4.3	W
Operating Voltage ⁽¹⁾	Pulse width=100 μs, Duty cycle = 2%, @ 5 A @ 25 °C	1.9		2.6	V

(1) Depending on driving conditions and thermal management

5.2 Optical Characteristics

Figure 8:
Optical Parameters

Parameter	Condition	Min	Typ	Max	Unit
Wavelength	Pulse width=100 μs, Duty cycle = 2%, @ 4 A @ 25 °C	932	940	948	nm

Figure 9:
Field of Illumination (FOI)

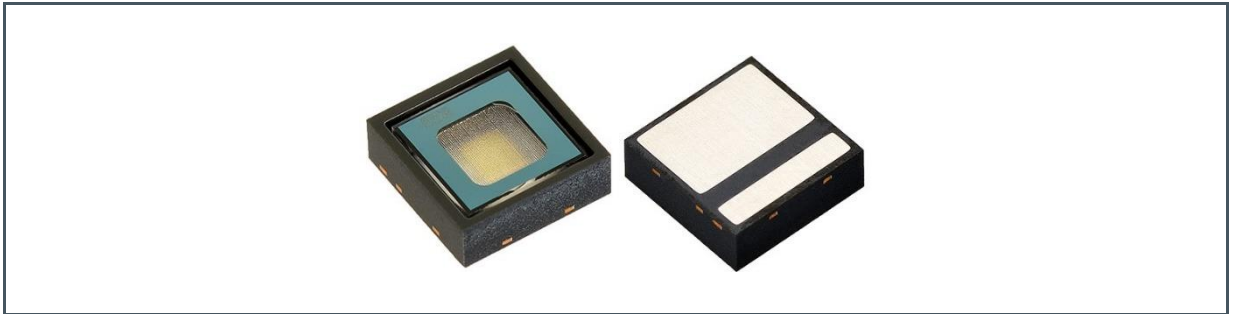
Parameter	Condition	Min	Typ	Max	Unit
Horizontal FOI ⁽¹⁾⁽²⁾	Pulse width = 100 μ s, Duty cycle = 2%, @ 4 A @ 25 °C	55	58	61	deg
Vertical FOI ⁽¹⁾⁽²⁾	Pulse width = 100 μ s, Duty cycle = 2%, @ 4 A @ 25 °C	38	41	44	deg

- (1) Angle at 50% level normalized to the centroid (FWHM)
- (2) Irradiance (W/m²)

6 Package Drawings

The picture below is showing the EGA2000-940-N module.

Figure 10:
Top and Bottom View

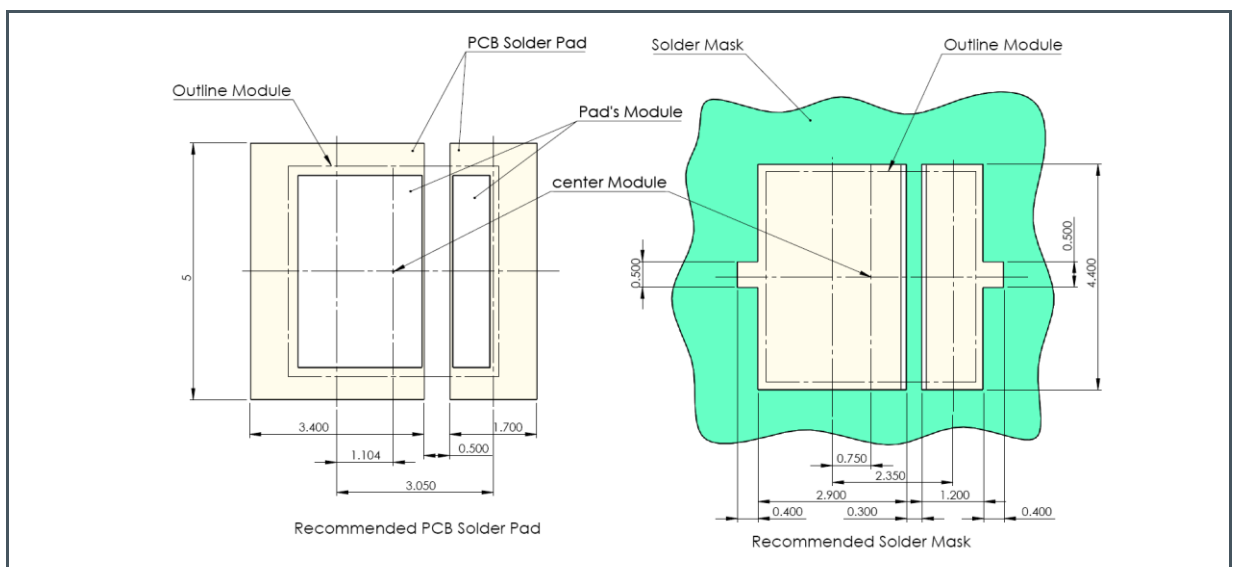


7 Application Information

7.1 PCB Pad Layout and Solder Mask Recommendation

The drawing below is showing a recommendation for pad layouts and solder mask. This is only to be used as guide and not to be considered as a firm specification.

Figure 11:
Recommended PCB Pad Layout (top view)⁽¹⁾



(1) All dimensions in mm.

7.2 Orientation of the Field of Illumination

The drawings below are showing the emitting area of the EGA2000-940-N module.

Figure 12:
FOI Orientation Regarding Module Footprint

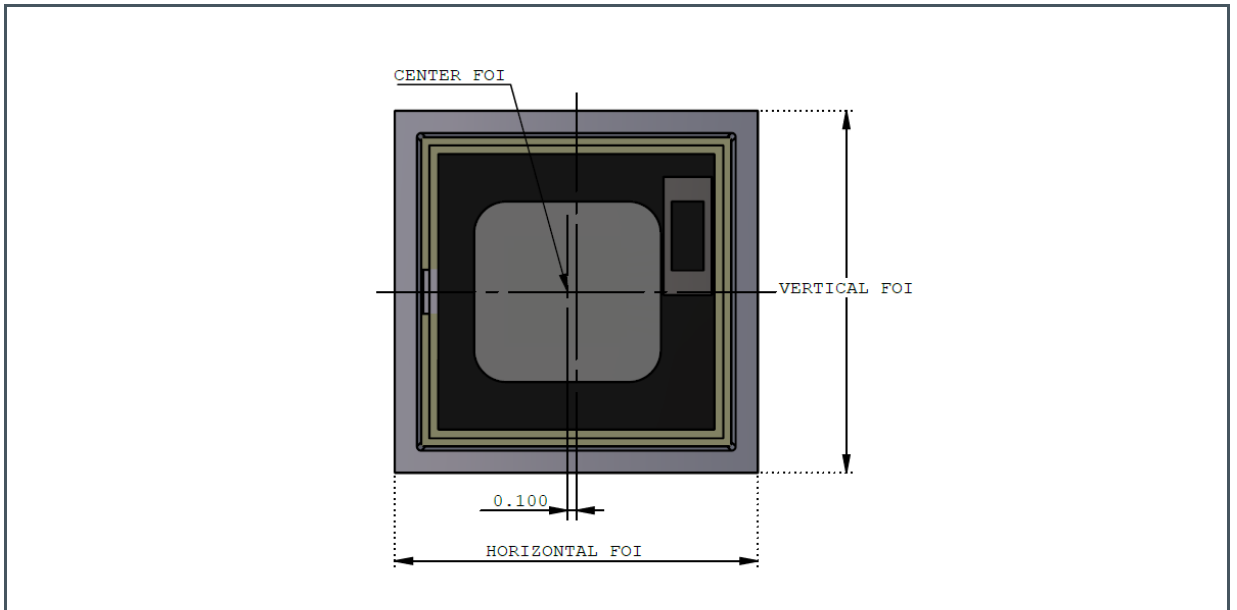
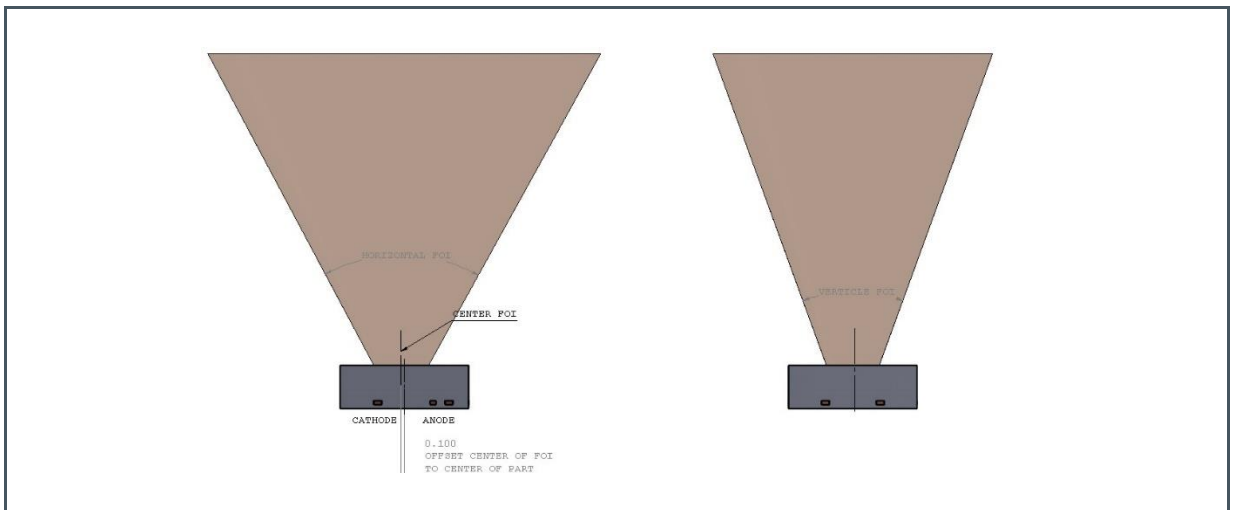


Figure 13:
FOI Projection



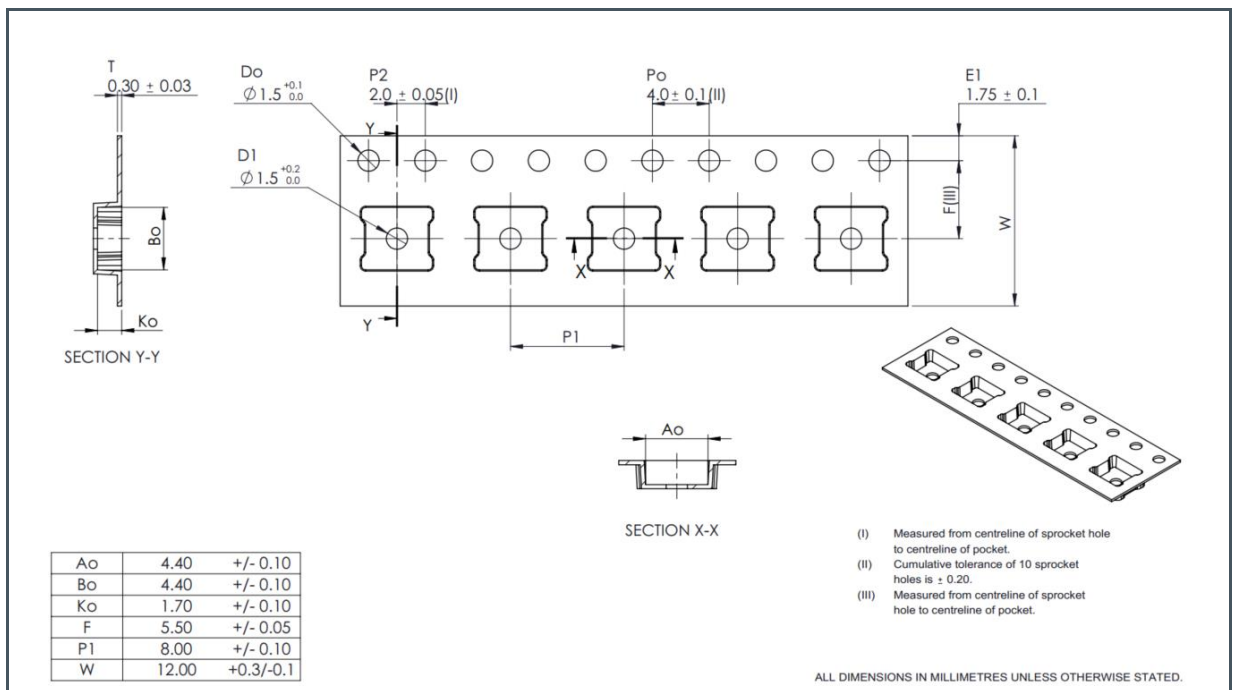
8 Tape & Reel Information

8.1 Overview

Sampling Shipments: The modules are shipped in tape & reel

MP Shipments: The modules are shipped in tape & reel

Figure 14:
Carrier Tape Dimensions and Overview (1)(2)(3)



- (1) Cover tape dimensions are 9.3 mm.
- (2) Device pin 1 oriented towards tape holes.
- (3) Reference material: Polystyrene carrier and Polyester clear tape

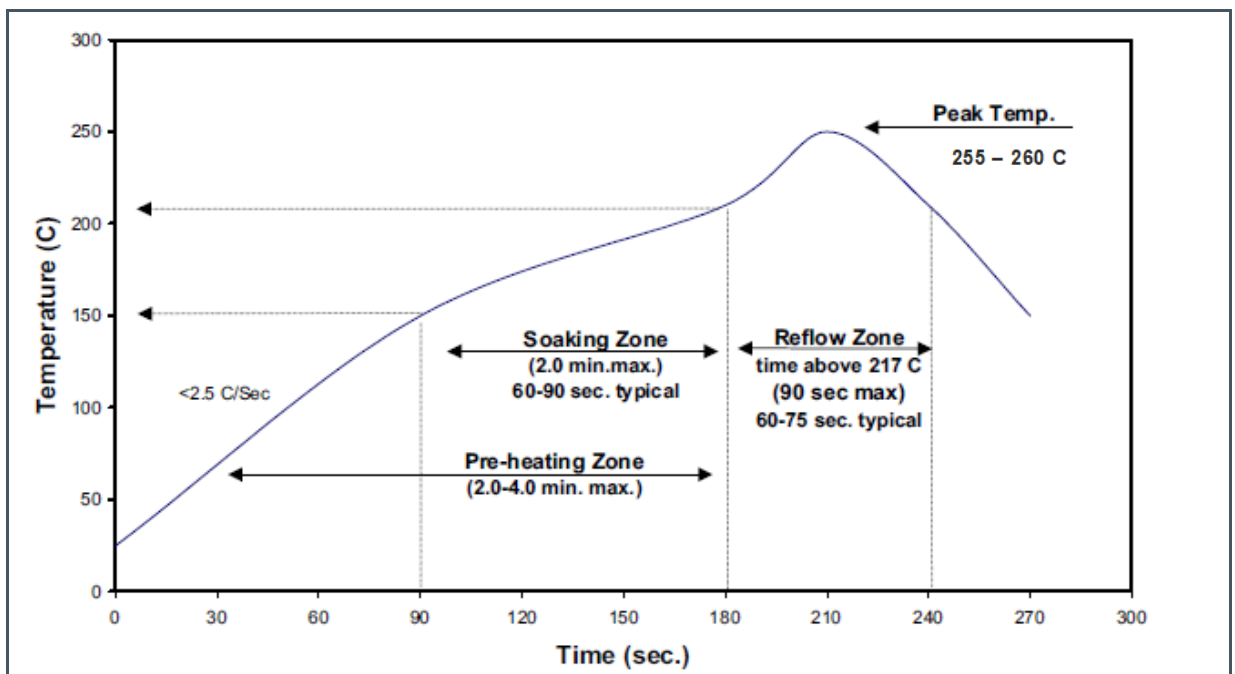
9 Soldering & Storage Information

9.1 Soldering Information

The EGA2000-940-N modules have been tested for lead-free solder reflow compatibility with peak temperatures up to 260 °C.

Although an example reflow profile is provided in the following figure, the exact reflow profile may depend on exact solder used.

Figure 15:
Solder Reflow Profile Graph Example (for reference only)



Attention

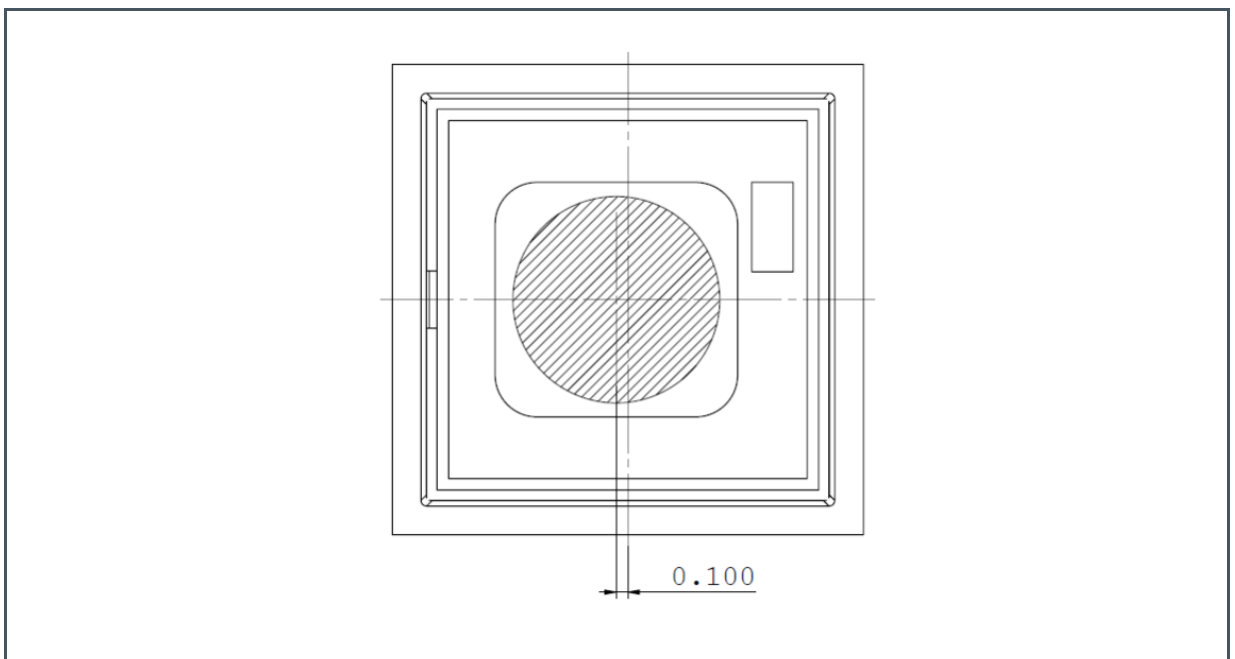
- It is not advised to proceed to cleaning after SMT reflow process.
- The modules **MUST NOT** be cleaned using ultrasonic cleaning.
- We suggest to use “no clean solder paste” and not to clean after SMT.
- In case a cleaning is un-avoidable, rinse with DI water, followed by a 2h bake @70 °C.

10 Handling

10.1 Pick Up

Recommended pick up position on the top window (hatched area in the figure), touching directly the glass.

Figure 16:
Pick Up Location⁽¹⁾



(1) All dimensions in mm.

11 Appendix

11.1 RoHS Compliance

The EGA2000-940-N module is RoHS compliant.

11.2 Safety Advice

Depending on the operational use of the device, the modules can emit highly concentrated non-visible infrared light, which can be hazardous to the human eyes. Products incorporating these modules may have to follow the safety precautions described by IEC 60825-1 and IEC 62471.

This product emits infrared radiation and has not yet been classified under IEC 60825-1. All appropriate safety precautions should be exercised in the operation and use of this product.



CAUTION

- Avoid direct eye exposure except as may be determined and directed by purchaser.
- Appropriate protective eyewear should be worn when operating.
- Use of magnifying optical instruments with this component may increase eye hazard.
- Obstructing, redirecting or focusing the optical power back to the module is considered a device misuse and can potentially lead to a health hazard.



LASER PRODUCT

LASER RADIATION – AVOID DIRECT EYE EXPOSURE

WAVELENGTH: 940nm

MAXIMUM OUTPUT POWER: Depends on drive mode

WEAR PROTECTIVE GLASSES

11.3 Symbols and Abbreviations

Figure 21:
Symbols and Abbreviations Used in the Datasheet

Symbol/Abbreviation	Description
DI	Deionized
FOI	Field of Illumination
FWHM	Full Width at Half Maximum
ID	Identification
IR	Infrared
LD	Laser Diode
LI	Light-Current
LIV	Light-Current-Voltage
MP	Mass Production
MSL	Moisture Sensitivity Level
RoHS	Restriction of Hazardous Substances
SMT	Surface Mount Technology
VCSEL	Vertical Cavity Surface Emitting Laser

12 Revision Information

Document Status	Product Status	Definition
Product Preview	Pre-Development	Information in this datasheet is based on product ideas in the planning phase of development. All specifications are design goals without any warranty and are subject to change without notice
Preliminary Datasheet	Pre-Production	Information in this datasheet is based on products in the design, validation or qualification phase of development. The performance and parameters shown in this document are preliminary without any warranty and are subject to change without notice
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Changes from previous version to current revision v2-00	Page
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Updated content	

- Page and figure numbers for the previous version may differ from page and figure numbers in the current revision.
- Correction of typographical errors is not explicitly mentioned.

13 Legal Information

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