



Datasheet

DS001027

EGA2000-850-W

Industrial High Power Flood Illuminator

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Abstract

The EGA2000-850-W 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 EGA2000-850-W 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 |

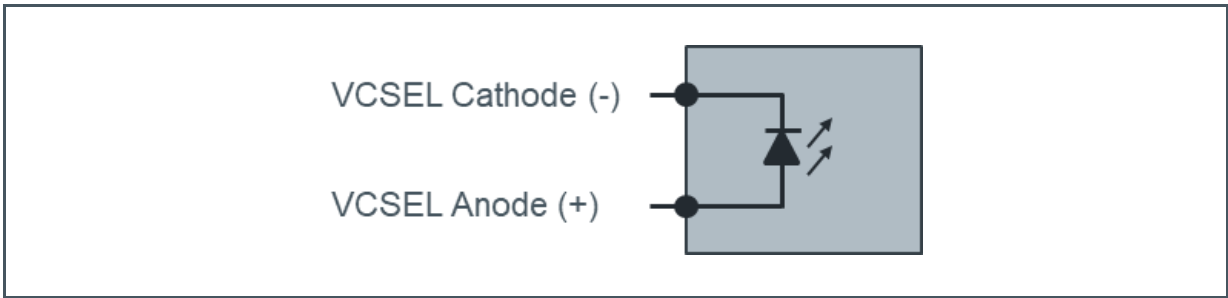
1.2 Applications

- Industrial applications using 3D Time-of-Flight and 2D NIR systems
- Machine vision
- Logistics automation
- Dimension weighting systems
- Autonomous robots

1.3 Block Diagram

The functional block of this device is shown below:

Figure 2 :
Functional Block of EGA2000-850-W



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 |

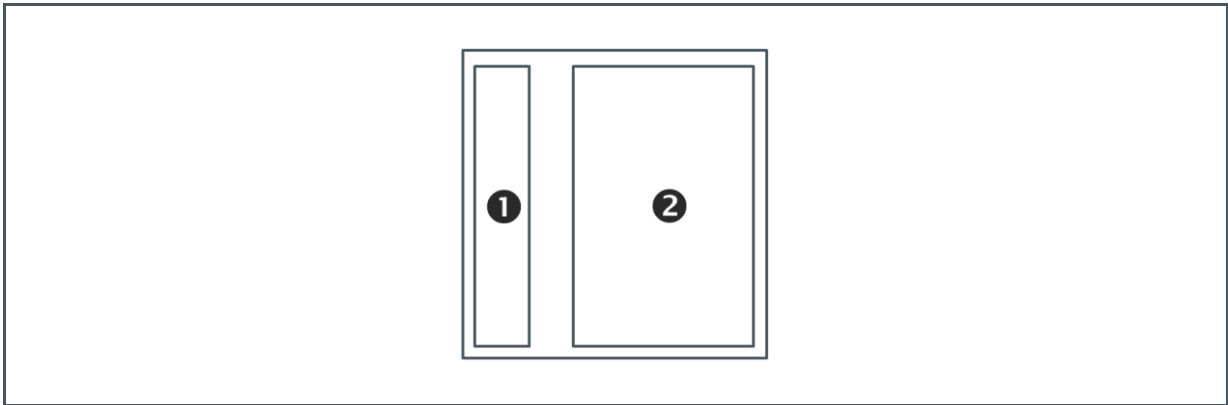
2 Ordering Information

| Ordering Code | Description | Delivery Form | Delivery Quantity |
|---------------|---------------|---------------|-------------------|
| ASBX-00 | EGA2000-850-W | 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 EGA2000-850-W

| 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 EGA2000-850-W

| 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 μ s, Duty cycle = 2%, @ 5 A @ 25 °C | 3.62 | | 4.82 | W |
| Operating Voltage ⁽¹⁾ | Pulse width=100 μ s, 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 μ s, Duty cycle = 2%, @ 4 A @ 25 °C | 842 | 850 | 858 | nm |

Figure 9:
Field of Illumination (FOI)

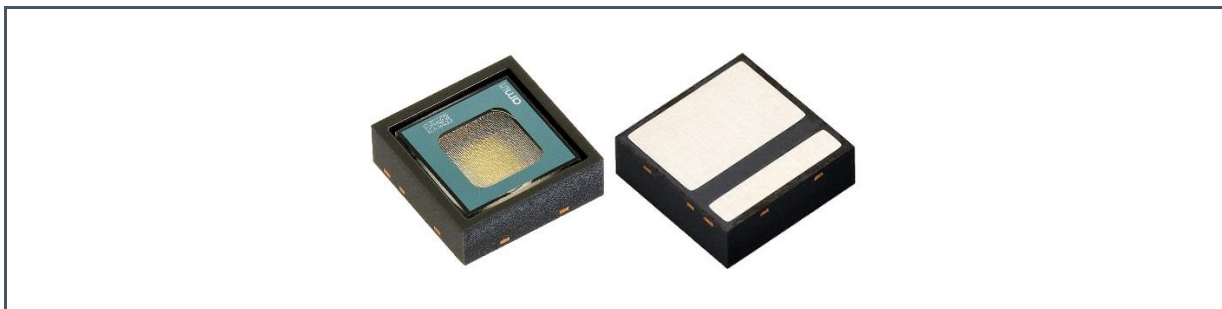
| Parameter | Condition | Min | Typ | Max | Unit |
|----------------------------------|--|-----|-----|-----|------|
| Horizontal FOI ⁽¹⁾⁽²⁾ | Pulse width = 100 μ s, Duty cycle = 2%, @ 4 A @ 25 °C | 75 | 79 | 83 | deg |
| Vertical FOI ⁽¹⁾⁽²⁾ | Pulse width = 100 μ s, Duty cycle = 2%, @ 4 A @ 25 °C | 52 | 56 | 60 | deg |

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

6 Package Drawings

The picture below is showing the EGA2000-850-W module.

Figure 10:
Top and Bottom View



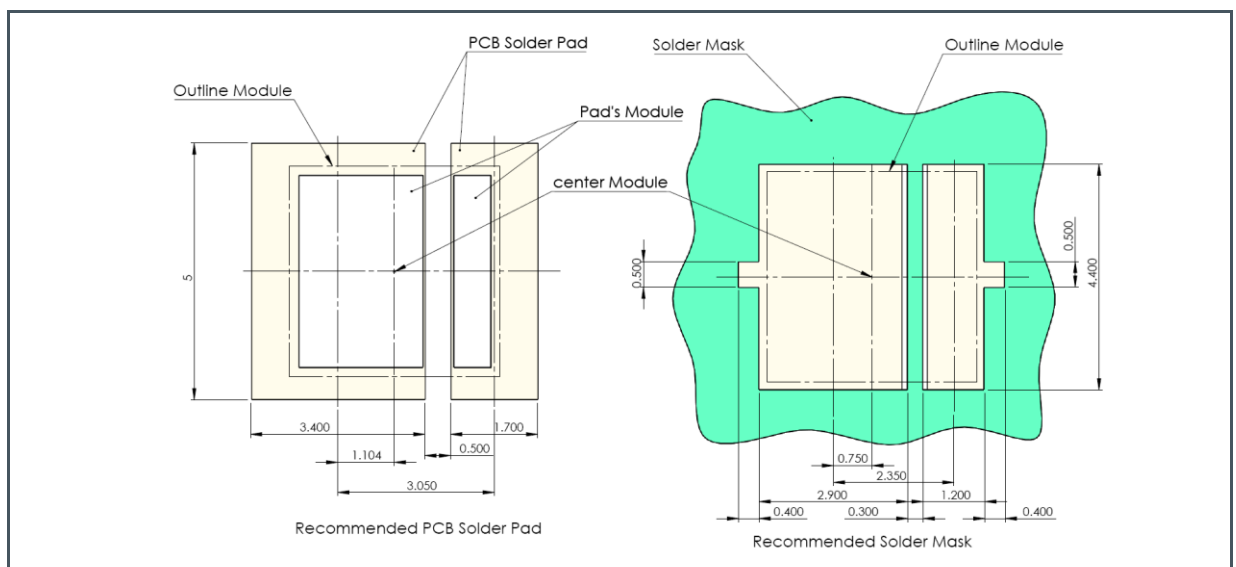
(1) All dimensions in mm

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 EGA2000-850-W module.

Figure 12:
FOI Orientation Regarding Module Footprint

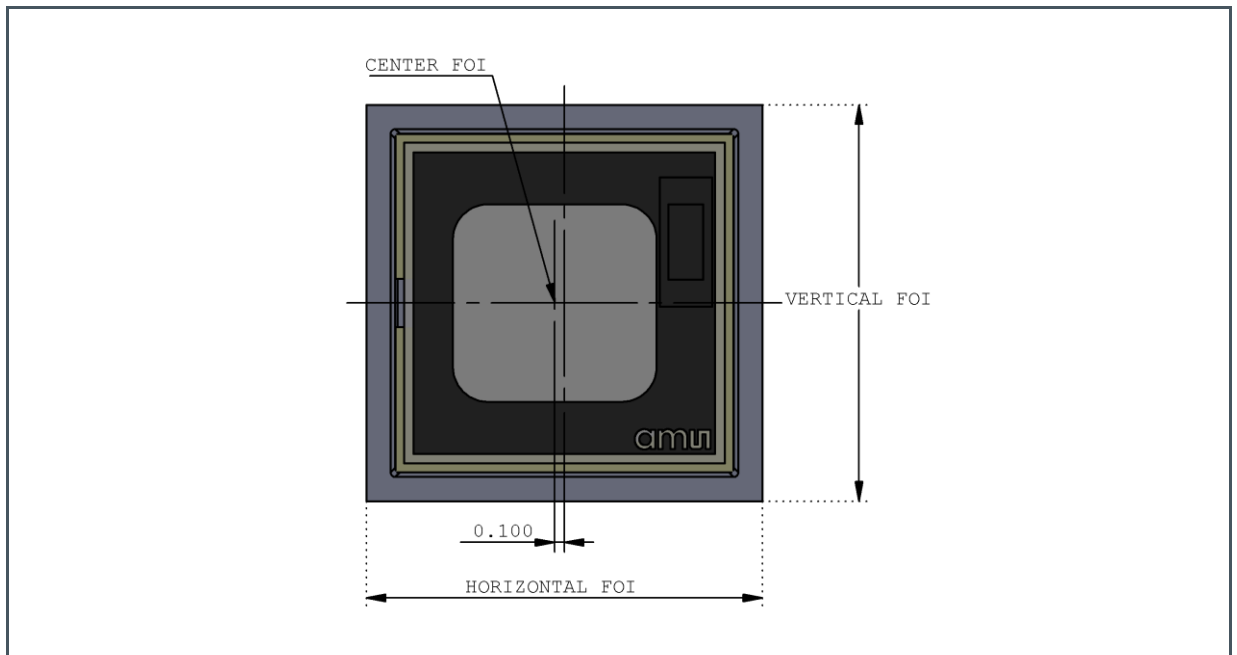
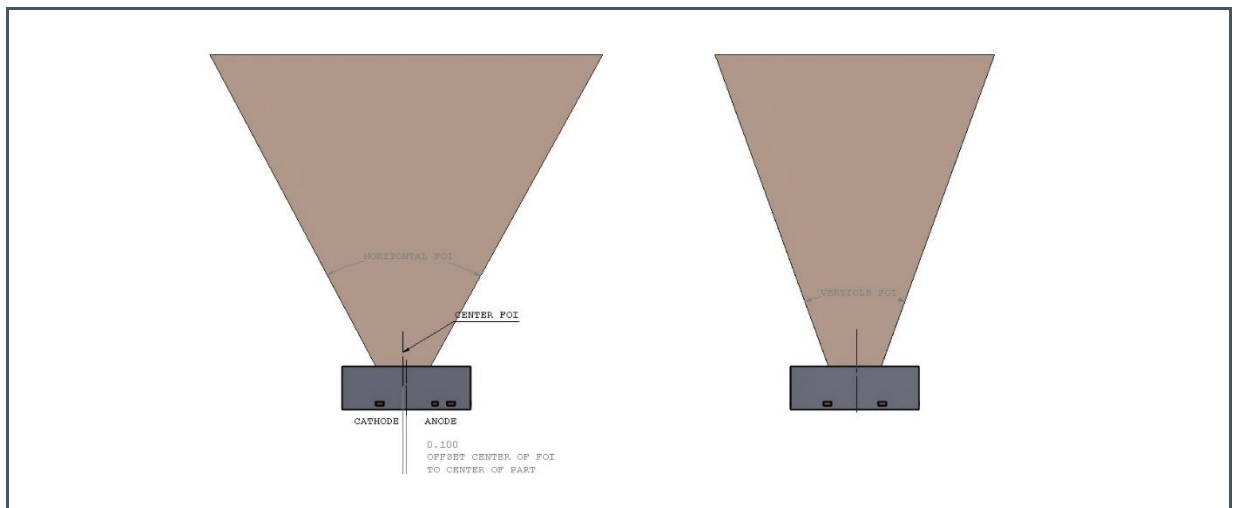


Figure 13:
FOI Projection



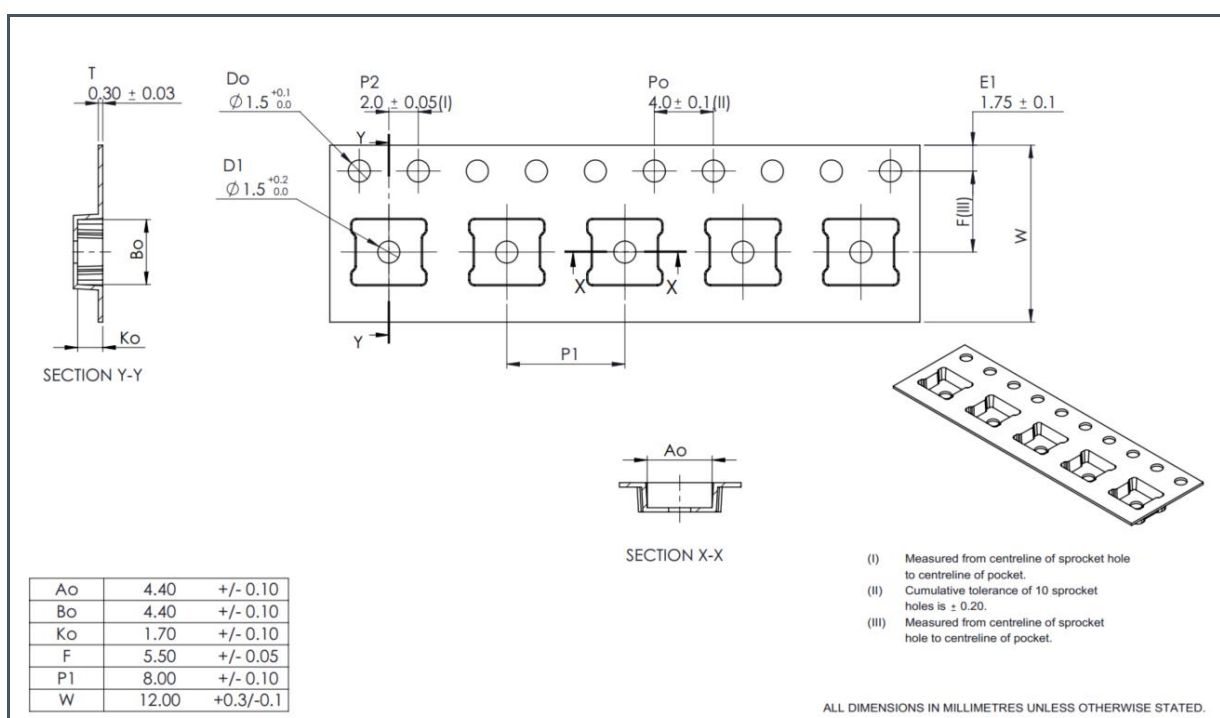
8 Tape & Reel Information

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

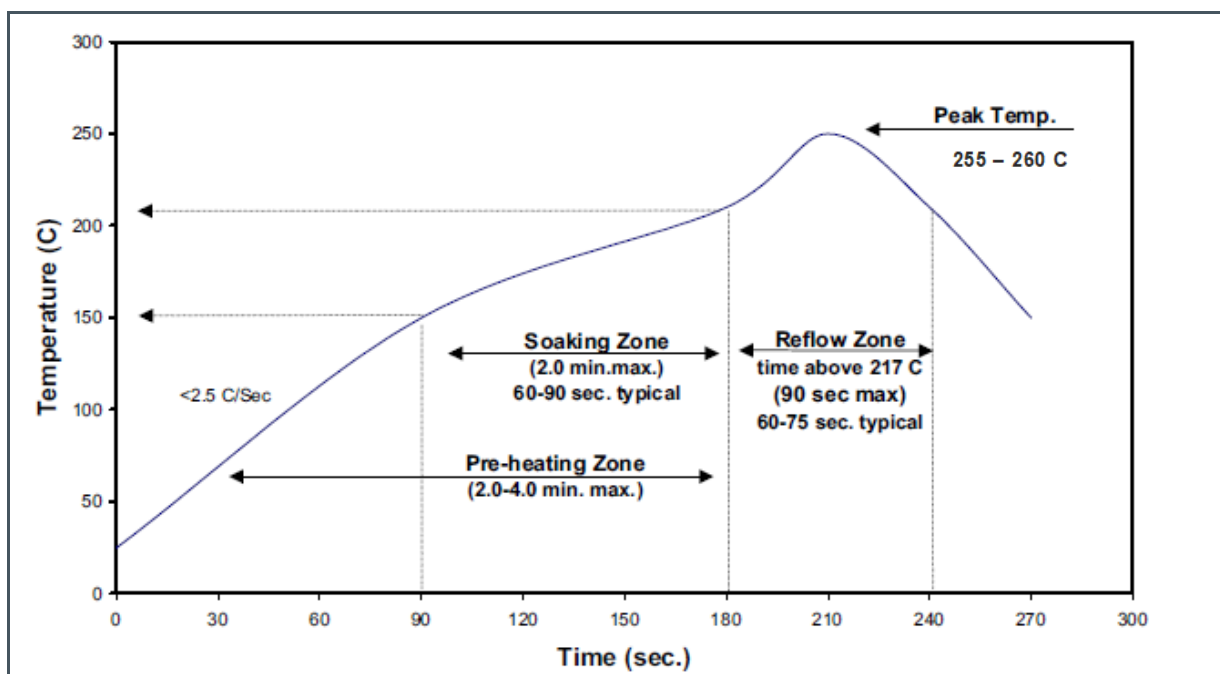
9 Soldering & Storage Information

9.1 Soldering Information

The EGA2000-850-W 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

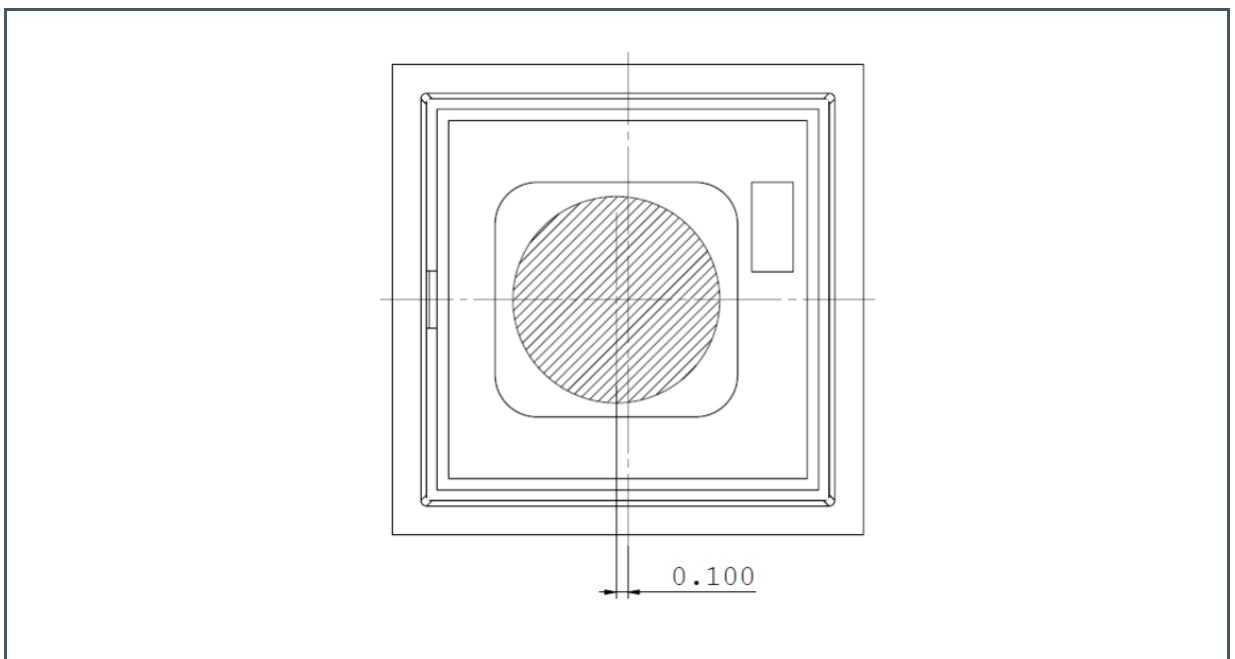
- It is not advised to proceed to cleaning after SMT reflow process.
- The modules MUST NOT be cleaned using ultrasonic cleaning.
- We suggest to use “no clean solder paste” and not to clean after SMT.
- In case a cleaning is un-avoidable, rinse with DI water, followed by a 2h bake @70 °C.

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 EGA2000-850-W 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.
- Avoid obstructing fully the optical path, due to risk for the lens to melt and cause 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: 850nm

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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