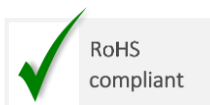


LOAE-LSI1: Lens for 16-Pin DIP Package



For any additional inquiries, please contact us at <https://www.pixart.com>

Description

The LOAE-LSI1 lens is designed for use with PixArt Imaging's high performance navigation chips, in the form of a 16-pin molded lead-frame DIP package (as referenced by the respective chip product datasheets). The LOAE-LSI1 lens provides direct illumination and the imaging lens necessary for the proper operation of the chips.

The LOAE-LSI1 lens is a precision molded optical component and should be handled with care to avoid scratches and / or contamination of the optical surfaces. The lens is made of polycarbonate, thus cyanoacrylate based adhesives should not be used as they potentially will degrade the lens material.

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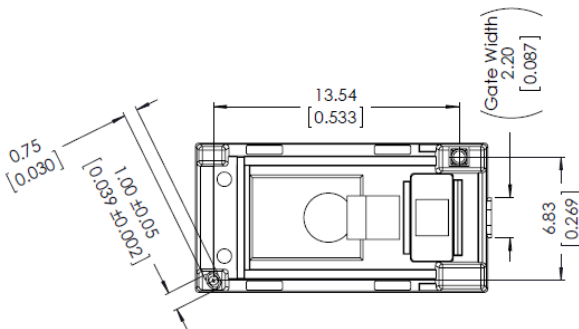
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1.0 Lens Outline Drawing



Notes:

1.0 Dimension in millimeters
[inches]

2.0 General dimension tolerance: $\pm 0.10\text{mm}$
unless specified otherwise

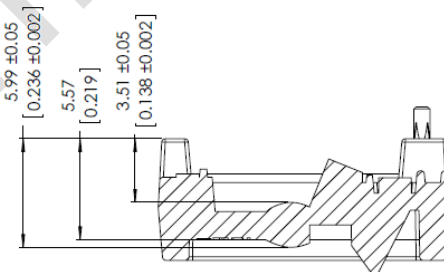
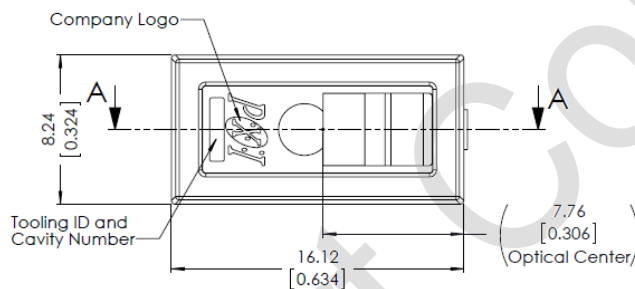
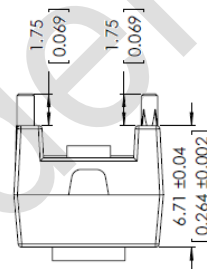
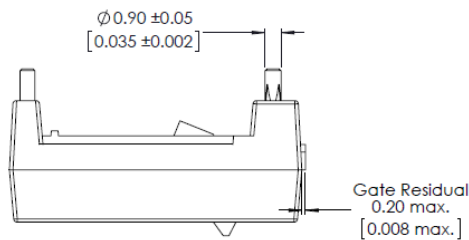
3.0 Angular tolerance: $\pm 3.0^\circ$

4.0 Maximum flash: 0.20mm

5.0 Bracket () indicates reference dimension

6.0 Optical details removed

7.0 Document Number: L0AE-LSI1-G8_001



SECTION A-A

Figure 1. Lens Outline Drawing

2.0 Mechanical Assembly Requirement

Table 1. Mechanical Assembly Requirement

Description	Symbol	Min.	Typ.	Max.	Unit
Distance from Lens Reference Plane to Tracking Surface	Z	2.2	2.4	2.6	mm

Note: Unless stated otherwise in specific chip product datasheets.

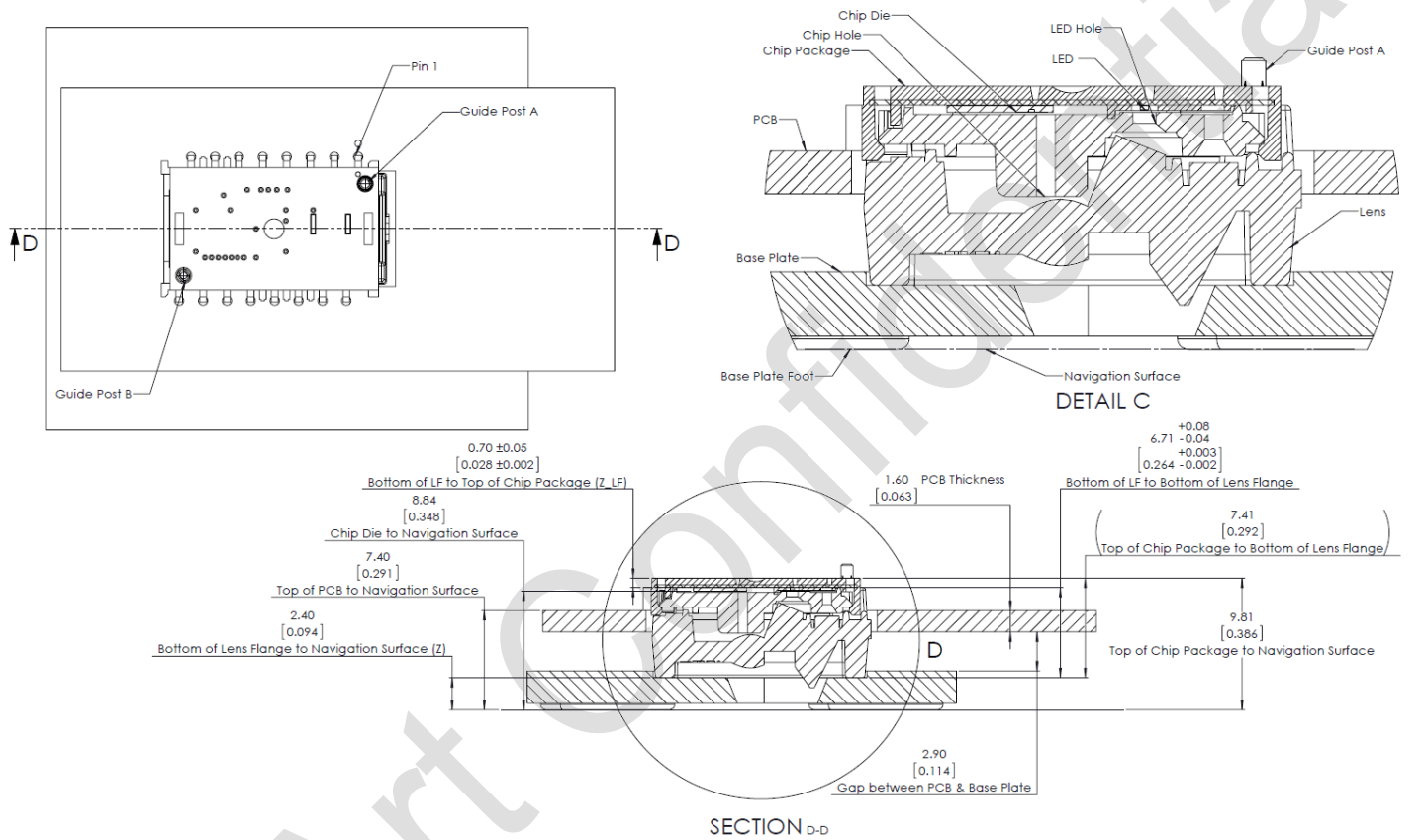


Figure 2. Assembly drawing and distance from Lens Reference Plane to Tracking Surface (Z)

3.0 Lens Optical Specification

Table 2. Lens Optical Specification

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Wavelength	λ	840	855	870	nm	
Index of Refraction	N		1.581			$\lambda = 855 \text{ nm}$

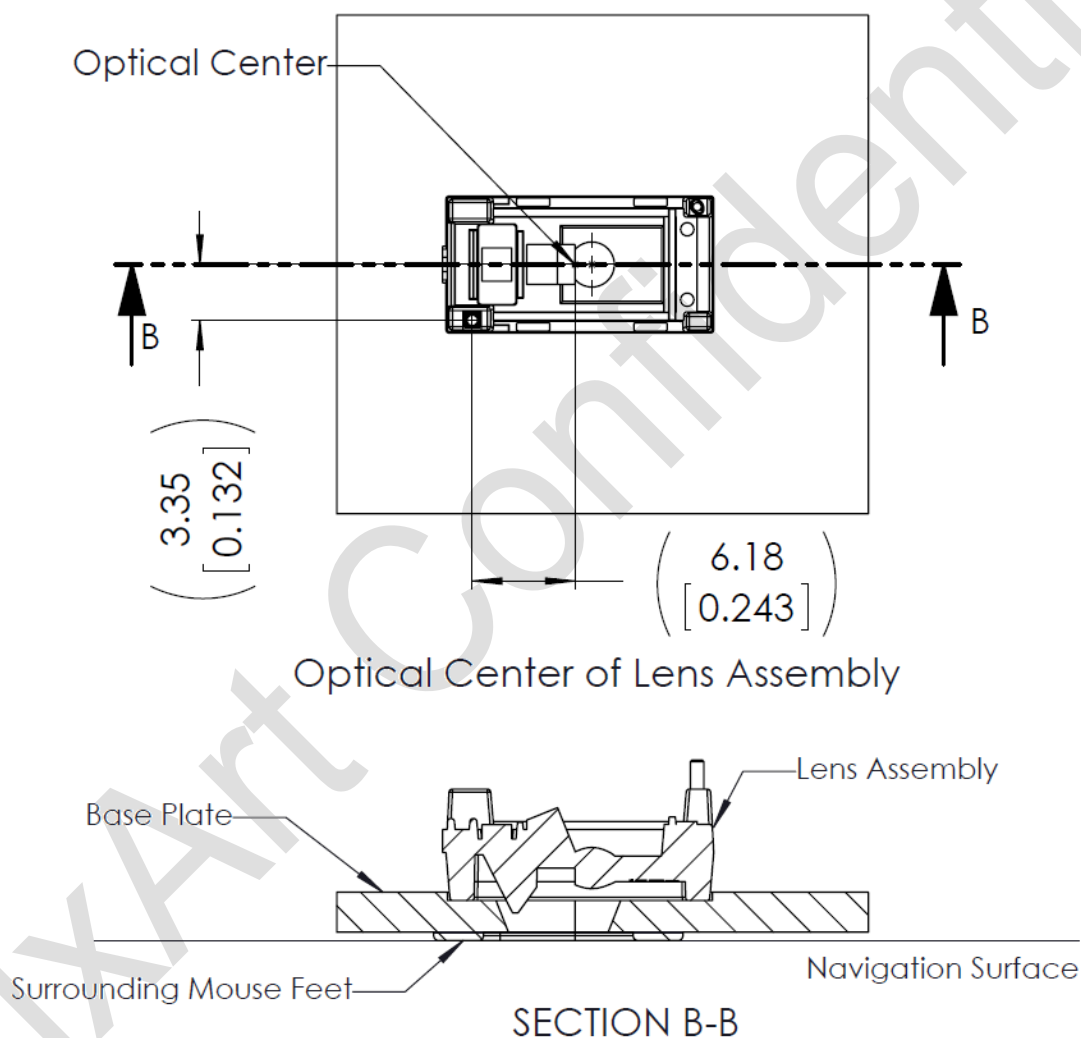


Figure 3. Cross section view of lens assembly

Refer below figure for the recommended base plate design to ensure proper positioning and alignment of the L0AE-LS11 lens when assembled with the 16-pin DIP package.



5.0 Assembly Recommendation

1. Insert the integrated chip and all other electrical components onto PCB.
2. Wave-solder the entire assembly in a no-wash solder process utilizing solder-fixture. A solder-fixture is required to protect the chip from flux spray and wave solder.
3. Avoid getting any solder flux onto the chip's body as there is potential for flux to seep into the chip package. The solder fixture should be designed to expose only the package leads to flux spray & molten solder while shielding the chip's body and optical apertures. The fixture should also set the chip at the correct position and height on the PCB.
4. Place the lens onto the base plate. Care must be taken to avoid contamination on the optical surfaces.
5. Remove the protective kapton tapes from optical apertures of the chip. Care must be taken to prevent contaminants from entering the apertures.
6. Do not place the PCB with the chip facing up during the entire product assembly process.
Note: Hold the PCB vertically when removing kapton tape.
7. Insert PCB assembly over the lens onto the base plate's aligning post to secure PCB assembly in place. The chip package will self-align to the lens via the guide posts. The optical's reference position for the PCB is set by the base plate and lens.
Recommendation: The lens can be permanently secured to the chip package by melting the lens' guide posts over the chip with heat staking process while maintaining pressing force of approximately 0.3kgf.

6.0 Lens Handling Consideration

Care should be taken when handling the LOAE-LSI1 lens to ensure optimum performance when used with PixArt Imaging's high performance navigation chips. Below are the dos and don'ts when handling the LOAE-LSI1 lens.

6.1 Dos

1. Do use appropriate protection gear such as anti-static surgical rubber glove when handling the lens to avoid contamination.
2. Do assemble and handle the lens in a clean industrial environment.
3. Do perform close monitoring of the in-line process during lens assembly and exercise caution to avoid introducing dust and unnecessary substances.
4. Do use clean dry compressed air to blow the lens, if lens cleaning is required.
5. Do replace contaminated lens, if the contamination cannot be removed by blowing clean dry air over it.

6.2 Don'ts

1. Do not perform any contact or liquid / chemical cleaning of the lens, as it will induce contamination and scratches.
2. Do not use any cloth-type materials to clean the lens to avoid dust, lint or debris contaminating the lens.
3. Do not handle the lens using sharp objects, to avoid scratches or other damages to the lens.
4. Do not touch the optical area of the lens when handling the lens.

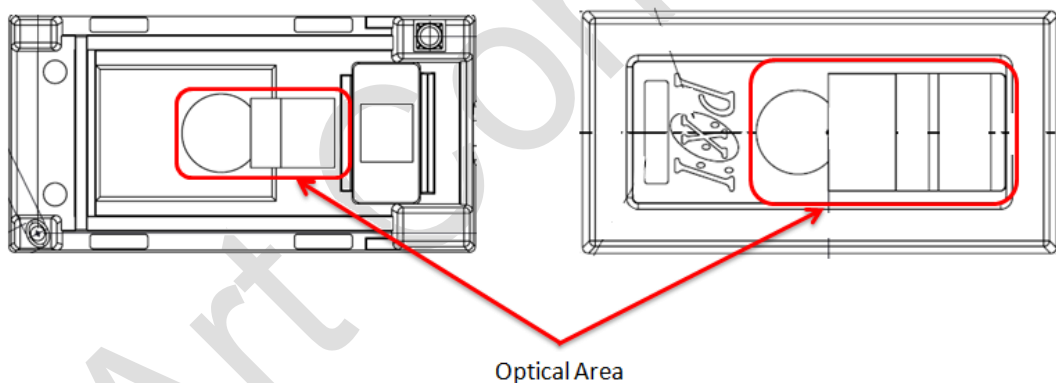


Figure 5. Optical area of LOAE-LSI1 lens

7.0 ESD Prevention

Below are procedures to note in order to prevent electrostatic destruction of semiconductor devices.

The following basic rules must be adhered:

1. Equalize potentials of terminals during transportation or storage.
2. Equalize the potentials of every electronic devices, work station, and operator's body that may come in contact with the chips.
3. Prepare an environment that does not generate static electricity. One method is by keeping relative humidity in the work area to ~50%.

Operator:

1. Operators should wear wrist straps. Wrist strap needs to be in contact with bare skin.
2. Wear cotton or anti-static treated materials, clothing and gloves.
3. Wear conductive shoes whenever a conductive mat is used.
4. Do not touch the chip's leads. Hold the body of the chip instead.

Equipment and Tools:

1. Any electrical equipment and tool placed on the work table must be isolated from the work table's surface, and need to be grounded properly.
2. Conductive mat (or conductive material) must be used on work table's surface. These conductive materials should be grounded using a 1 MOhm resistor.

Transportation, Storage & Packing:

1. Use conductive or shielding bags to store chips.

Soldering Operation:

1. Use a soldering iron with a grounding wire.
2. During manual soldering operation, the operator should wear wrist straps.
3. Do not use the de-soldering pump when removing chips from PCB. Use a solder wick or equivalent tool.