Interface Control Document
for Coarse Sun Sensor:
CSS-10 and CSS-10S
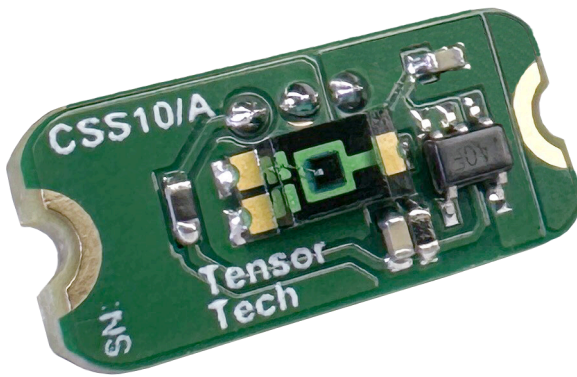
CSS-10
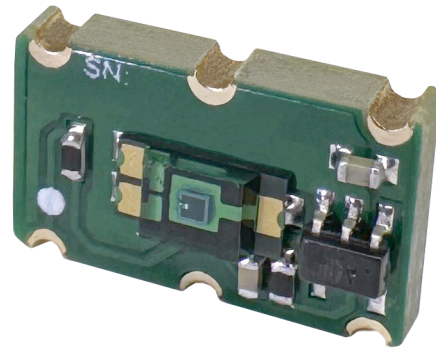
CSS-10S

Release Approval:

Reviser	Approver

V1.0.0a
Feb-2024 Revised

1. INTRODUCTION

The CSS-10, which includes two distinct versions for installation: CSS-10 and CSS-10S. CSS-10 is designed for direct mounting, while CSS-10S is intended for Surface Mount Technology (SMT) installation.
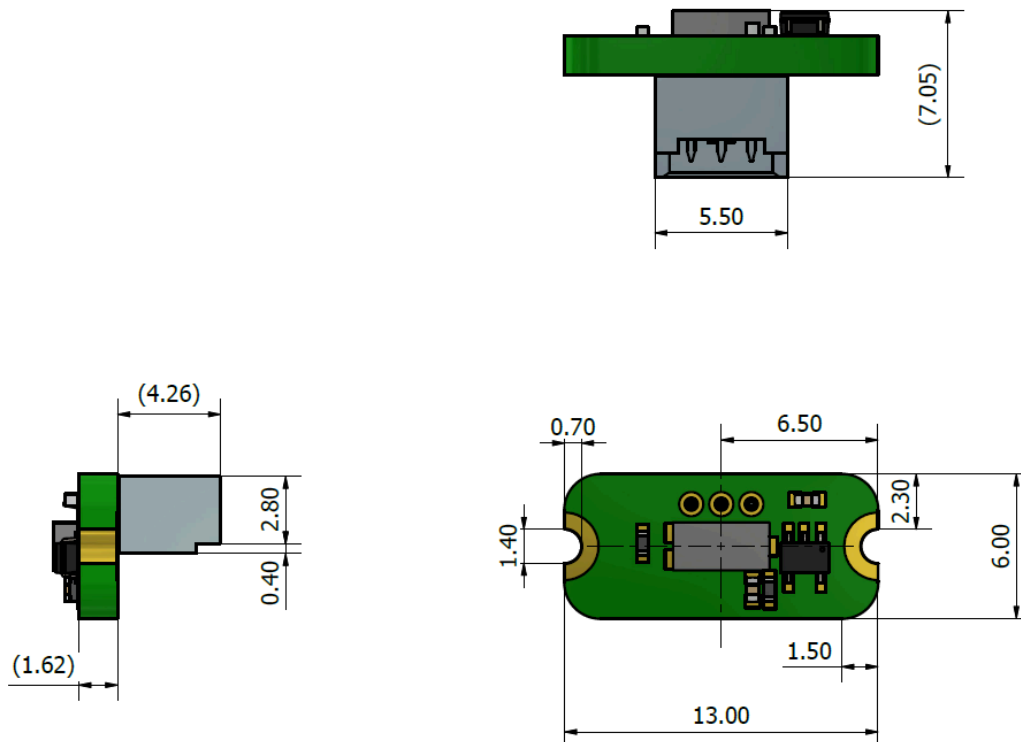
2. CSS-10

2.1 Mechanical Interface

CSS-10 facilitates direct mounting with two M1.4 screws securely installed on both sides within the semi-circular holes, shown in Fig. 2-1.

Noted:
When installing the M1.4 screws, it is recommended to use a torque wrench. The recommended torque value is 0.0578 N·m.

Dimensions without tolerance annotations all follow the "General Tolerance Table" in Ch.4.

Figure 2-1. Board Outline of CSS-10 (Unit: mm)

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2.1.1 Assembly and Mounting

Mounting Instruction:
- Two M1.4 screws are installed on both sides in the semi-circular Ø1.4 holes.
- The mounting screws must be secured to the satellite body using space-grade epoxy.
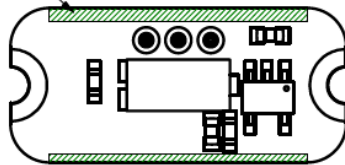- Once the screws are locked into both side recesses, apply epoxy to cover the screw tops.
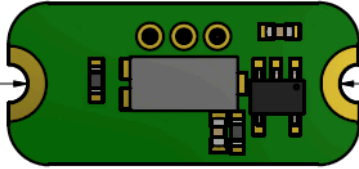
Top View
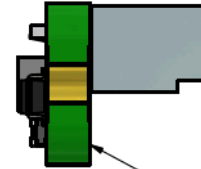
Mounting Surface

Epoxy Area

Epoxy Recommendation Area:

- To enhance robustness, apply the space-grade epoxy to the top surface, focusing on the suggested areas (the green areas as shown).
- Please be careful that the epoxy does not contact the solder joints (the golden metal areas) and the electrical components.

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2.2 Electrical Interface

This version facilitates direct mounting configured with a MOLEX connector (0530470360), with the recommended mating connector being MOLEX 510210300.
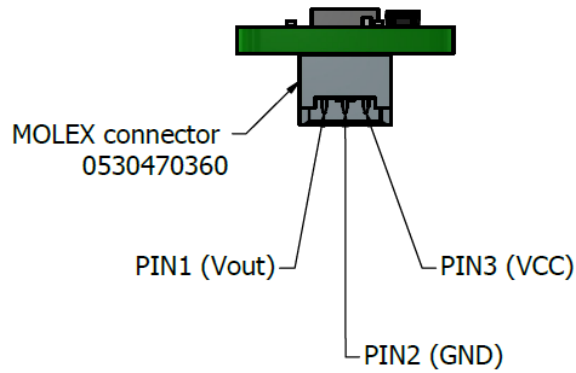

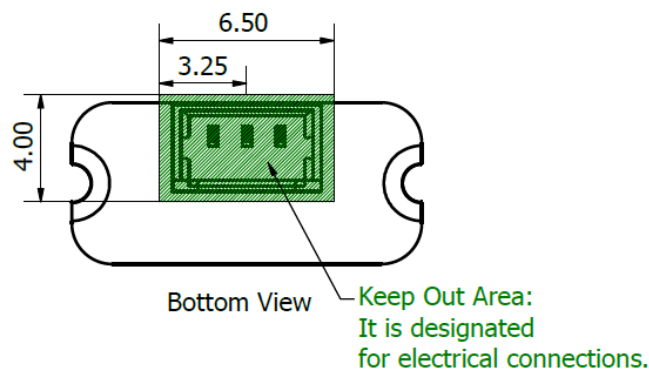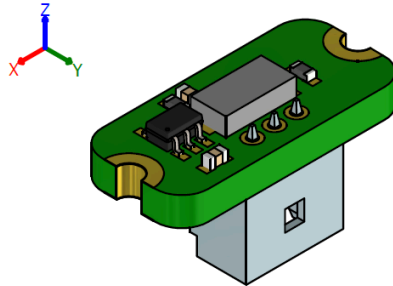Figure 2-2. MOLEX 0530470360 Connector PIN Definition

Figure 2-3. Keep Out Area of CSS-10 for Electrical Connection (Unit: mm)

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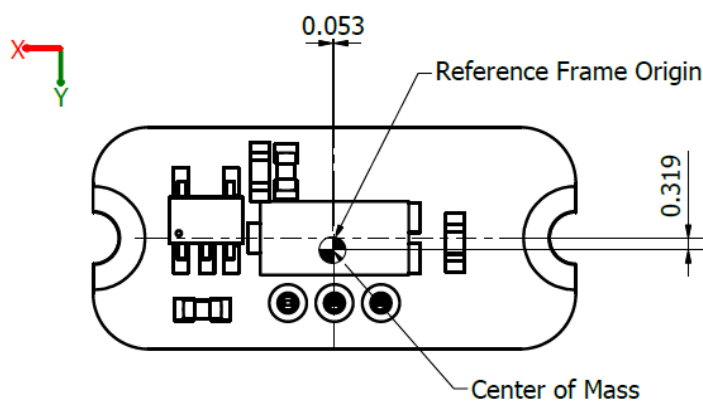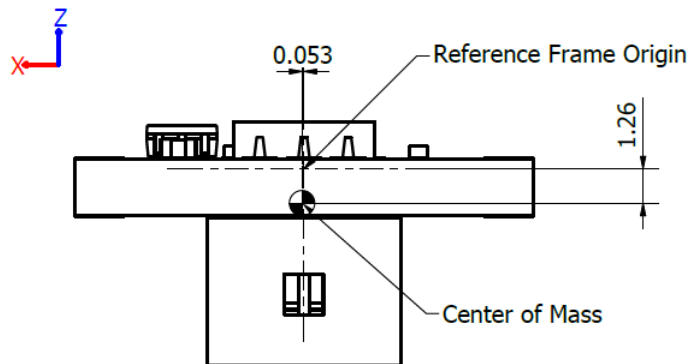
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2.3 Mass and COM

CSS-10

Note:
- Total Mass: 0.5 grams as typical
- Reference Center of Mass:
  - X: 0.053 mm
  - Y: 0.319 mm
  - Z: -1.261 mm
- Refernce Mass Moments of Inertia with respect to Center of Mass (g mm^2)
  - I_{xx} = 0.749
  - I_{yx} = 0.006 I_{yy} = 2.030
  - I_{zx} = -0.016 I_{zy} = 0.117 I_{zz} = 2.212

0.053 — Reference Frame Origin

1.26

Center of Mass

0.053 — Reference Frame Origin

0.319

Center of Mass

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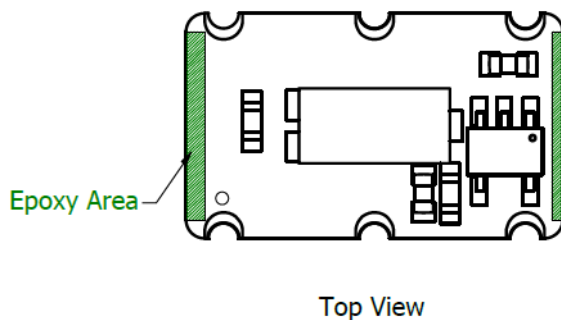
4

3. CSS-10S

3.1 Mechanical Interface

Featuring semi-circles with a diameter of 0.8mm for installation, CSS-10S is more compact without the MOLEX connector compared with CSS-10.
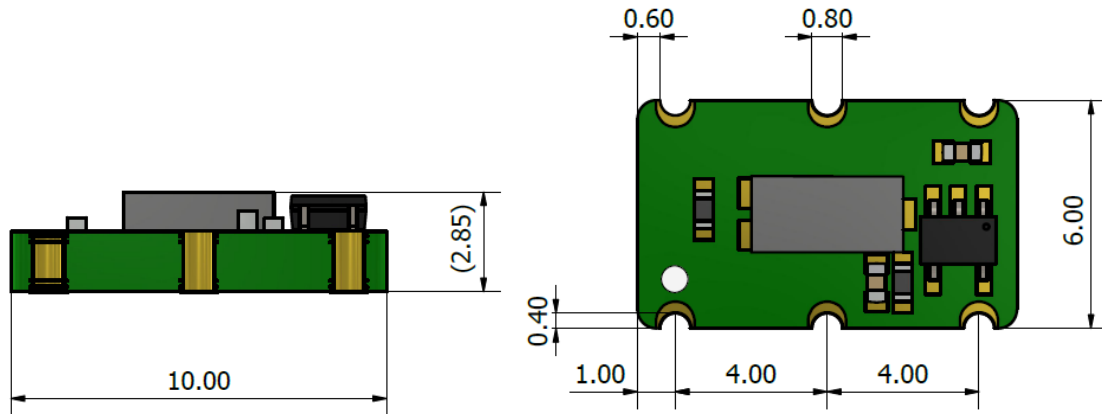
Dimensions without tolerance annotations all follow the "General Tolerance Table" in Ch.4.

Figure 3-1. Board Outline of CSS-10S (Unit: mm)

3.1.1 Epoxy Recommendation

Epoxy Recommendation Area:

● To enhance robustness, apply the space-grade epoxy to the top surface, focusing on the suggested areas (the green areas as shown).
● Please be careful that the epoxy does not contact the solder joints (the golden metal areas) and the electrical components.

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3.2 Electrical Interface

Designed for Surface Mount Technology (SMT) installation, CSS-10S necessitates the user to define and provide a specific footprint layout for precise installation, shown in Fig. 3-2.
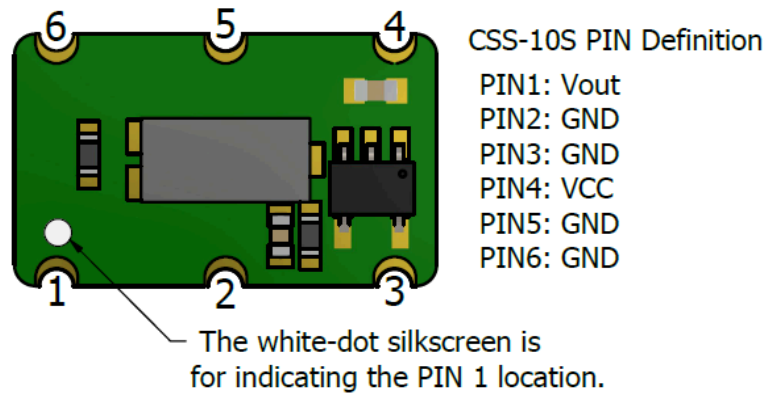

Figure 3-2. Assembly Guide of CSS-10S (Unit: mm)

One example of land pattern for CSS-10S installation is provided as Fig 3-3.
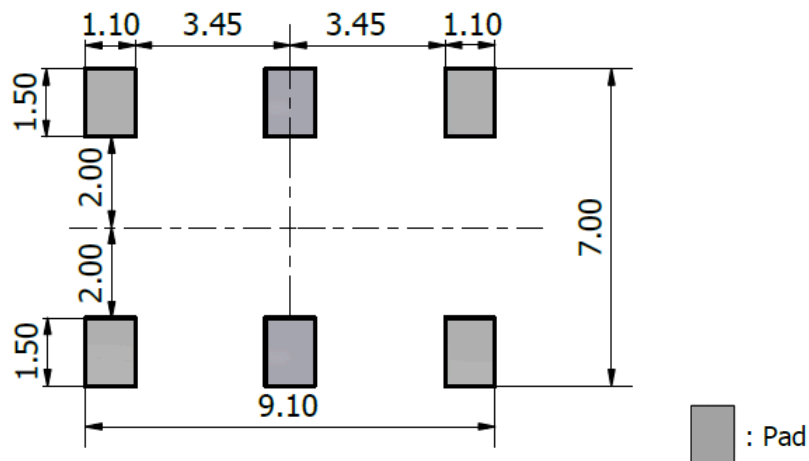

Figure 3-3. Example Land Pattern for CSS-10S (Unit: mm)

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The reflow solder suggestion is in Fig 3-4.

REFLOW SOLDER PROFILE
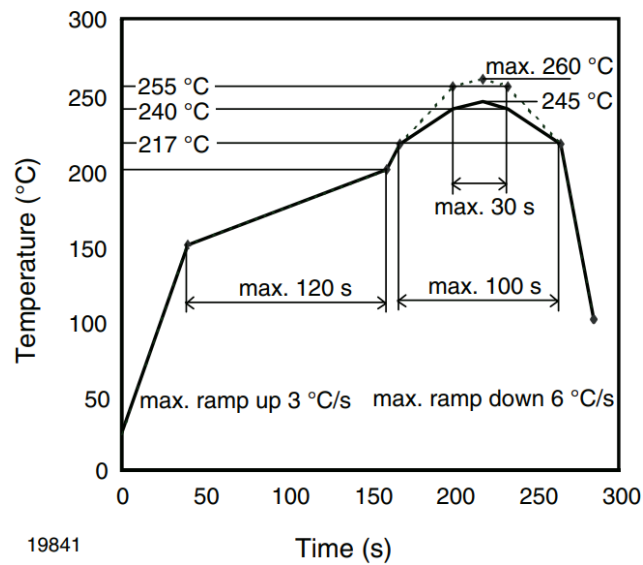
Figure 3-4. Reflow Solder Suggestion for CSS-10S

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3.3 Mass and COM

CSS-10S

Note:
- Total Mass: 0.4 grams as typical
- Reference Center of Mass:
  - X: 0.087 mm
  - Y: -0.018 mm
  - Z: -0.666 mm
- Refernce Mass Moments of Inertia with respect to Center of Mass (g mm^2)
  - Ixx = 0.318
  - Iyx = 0.005   Iyy = 0.865
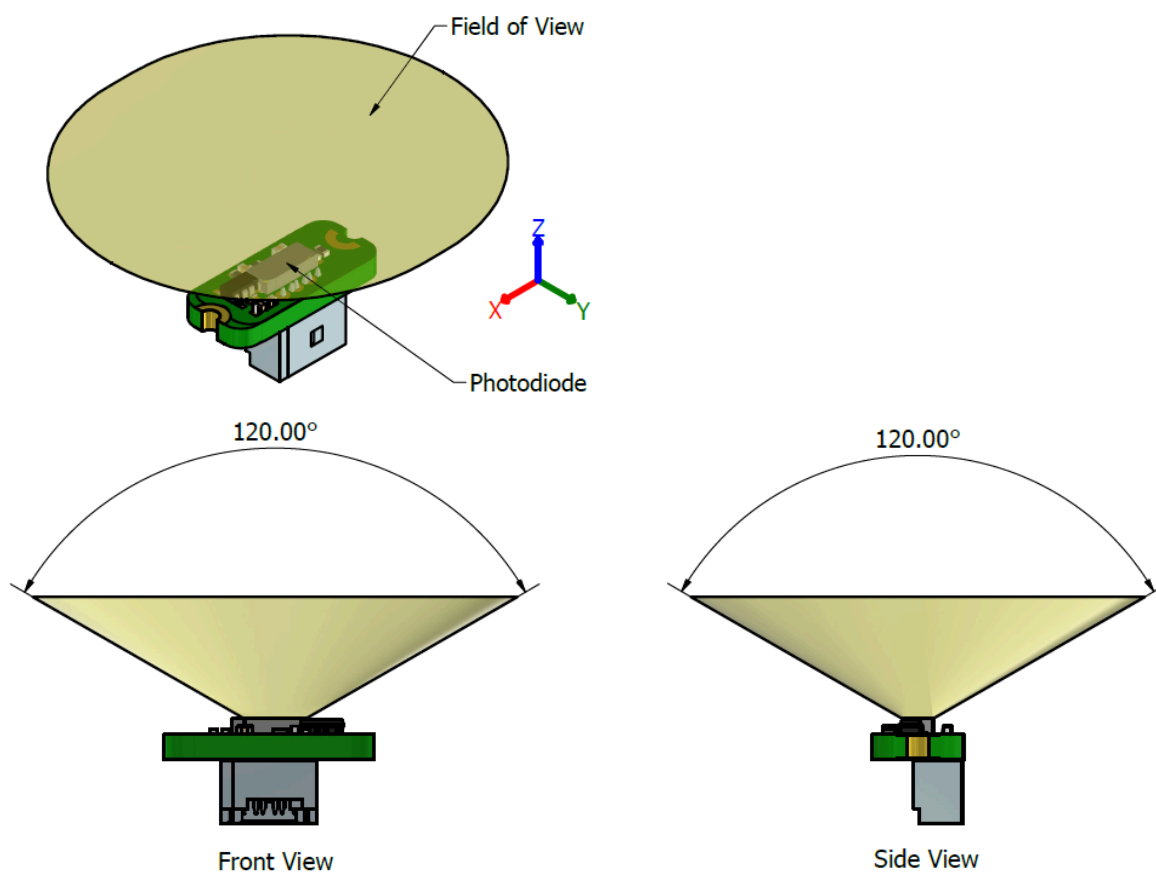 - Izx = -0.010   Izy = 0.002   Izz = 1.104

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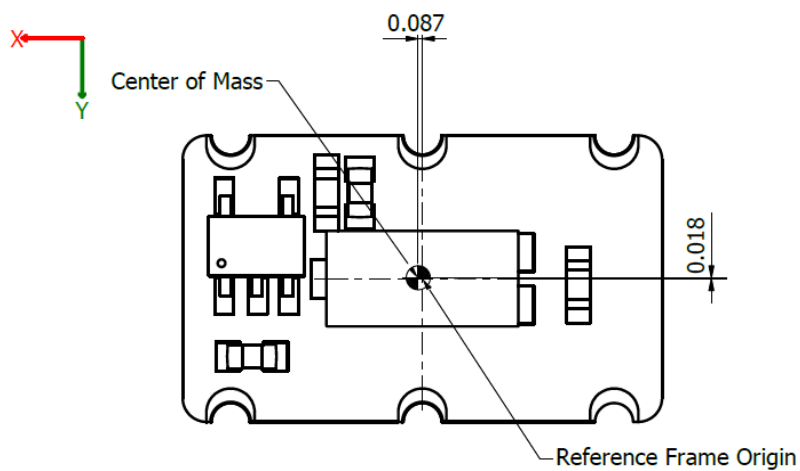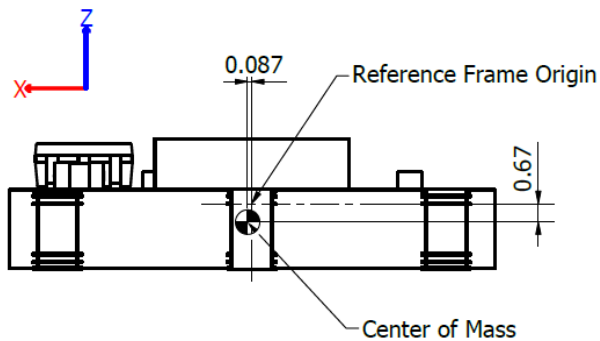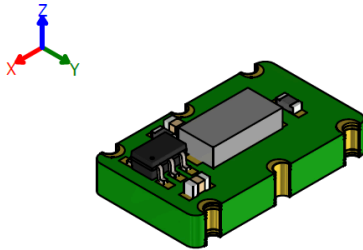
4. GENERAL TOLERANCE TABLE

Dimneison	Tolerance
>0.1mm~0.5mm	±0.05mm
>0.55mm~6.00mm	±0.10mm
>6.05mm~30.00mm	±0.20mm
>30.05mm~100.00mm	±0.30mm

5. FIELD of VIEW

Field of View (FOV) of CSS-10 Illustration

Field of View

Photodiode

120.00°

Front View

120.00°

Side View

REVISION HISTORY

Date	Editor	Version	Contents
2024.02.15	S. Lee, C. Hu, Z. Liu, A. Wang, A. Chen, A. Huang	1.0.0a	Initial release

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