

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CAMBRIDGE INDUSTRIES USA, INC.,

Petitioner, v.

APPLIED OPTOELECTRONICS, INC.,

Patent Owner.

Case IPR2025-00436
Patent No. 10,313,024

PATENT OWNER'S PRELIMINARY RESPONSE

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EXHIBITS

Exhibit No.	Description
2004	Declaration of Dr. Alan Willner

I. INTRODUCTION

Patent Owner Applied Optoelectronics, Inc. (“AOI”) submits this Preliminary Response to the Petition of Cambridge Industries USA, Inc. (“CIG USA” or “Petitioner”) challenging the patentability of Claims 1-17 (the “Challenged Claims”) of U.S. Patent No. 10,313,024 (the “’024 Patent”) (Ex. 1001). The Board should deny institution because CIG USA has not established a reasonable likelihood that it will prevail on any claim in any Ground raised in the Petition.

CIG USA presents two grounds of invalidity against the Challenged Claims.

In ground 1, CIG USA challenges all claims under an anticipation theory. Ground 1 is based on U.S. Patent No. 9,568,694 to Mizobuchi (“Mizobuchi”)

In ground 2, CIG USA challenges all claims under an anticipation theory. Ground 2 is based on U.S. Patent Application Publication No. 2014/0140665 to Akashi (“Akashi”).

As set forth below, CIG USA has not established that either of the prior art references disclose every feature of the Challenged Claims. Thus, CIG USA has not established a reasonable likelihood that it will prevail on any claim on either Ground raised in the Petition. In addition, as further set forth below, the Board

should exercise its discretion and deny institution.¹ Accordingly, AOI respectfully requests that the Board decline to institute *inter partes* review.

II. BACKGROUND

A. '024 Patent

The '024 Patent is directed to a transmitter optical subassembly (TOSA) including a hermetically-sealed housing with a feedthrough device for electrically isolating RF and power traces. The TOSA includes a substrate with driving circuitry. A first end of the substrate may electrically couple to transmit connecting circuitry, and a second end of the substrate may couple to the hermetically-sealed housing. The hermetically-sealed housing can include one or more laser packages in addition to monitor photodiodes (PDs) and temperature control devices. See

¹ On April 28, 2025, pursuant to the Director's Memorandum of March 26 2025, AOI filed a Request to Director for Discretionary Denial of Petition for *Inter Partes* Review of U.S. Patent 10,313,024 (Paper No. 8). AOI includes the same arguments from the Request in this brief in support of AOI's position that the Board should exercise its discretion for the same reasons and deny institution of *inter partes* review.

'024 Patent (Exhibit 1001), Abstract; *See also* Exhibit 2004 (Declaration of Dr. Alan E. Willner) at ¶¶ 47-48.

FIGS. 2A-2B (reproduced below) show an example TOSA module 200. The TOSA 200 includes a substrate 202 and a hermetically-sealed light engine 204 coupled to an end of the substrate 202. The substrate 202 includes a first end 206-1 that extends to a second end 206-2 along a longitudinal axis 216. '024 Patent at Col. 5:5-12.

The substrate 202 includes a transmit circuit interface region 208 proximate the first end 206-1, a light engine interface region 212 proximate the second end 206-2 of the substrate, and a light engine driving circuit 210 disposed therebetween. '024 Patent at Col. 5:19-23.

The hermetically-sealed light engine 204 includes a hermetically-sealed housing 224 or housing 224. '024 Patent at Col. 5:52-53.

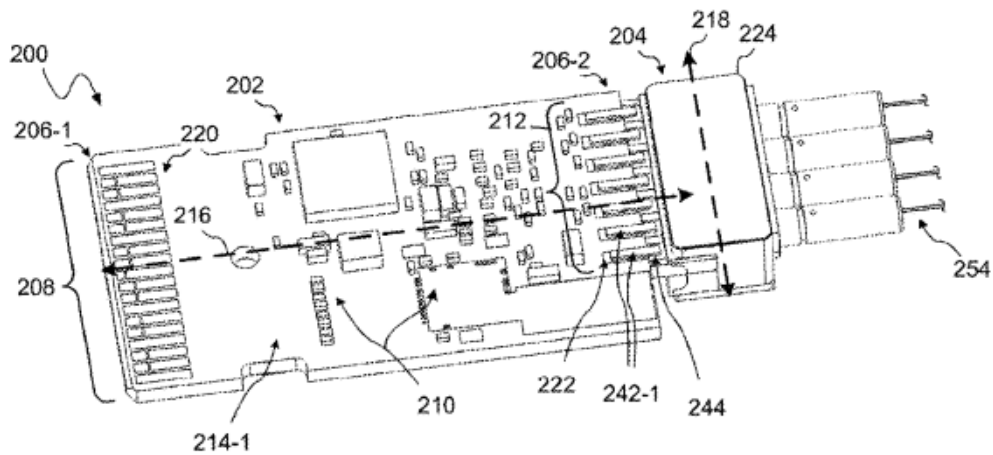


FIG. 2A

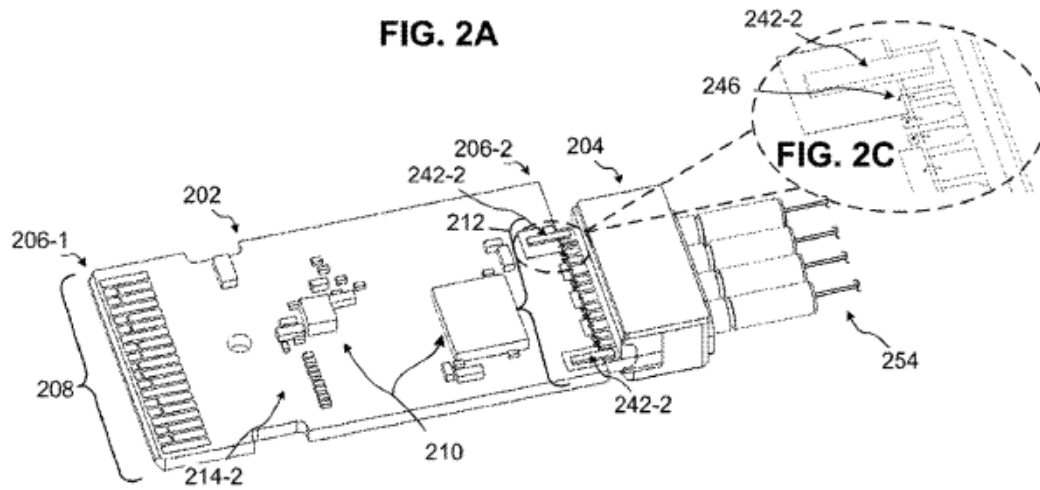


FIG. 2B

FIG. 3 (reproduced below) shows an example cross-sectional view of a housing 224 that includes a plurality of sidewalls that define a cavity 226. The cavity 226 may be at least partially formed by a feedthrough device 228. '024 Patent at Col. 7:44-50 to Col. 8: 1-3.

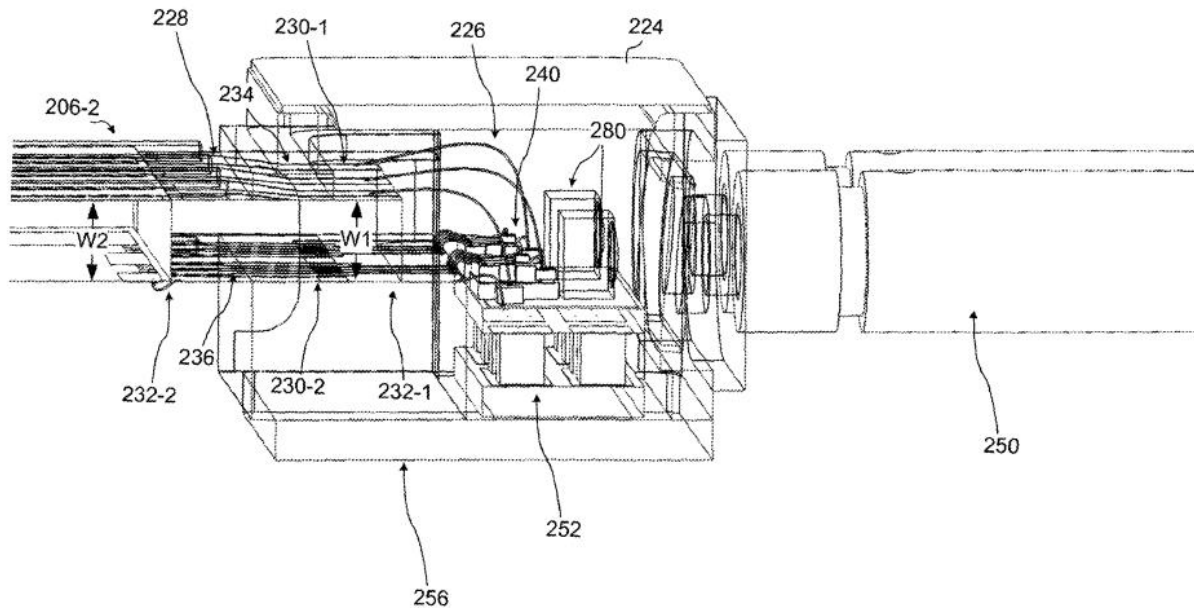


FIG. 3

B. Relevant File History

The application for the '024 Patent was filed on April 26, 2018 as application no. 15/963,246 with 17 claims, including two independent claims.

During prosecution, in a non-final Office Action mailed November 19, 2018, the PTO ("Office") rejected both independent claims and several dependent claims under 35 U.S.C. § 103 as obvious over U.S. Patent Application Publication No. 2005/0175350 to Hartzell in view of U.S. Patent Application Publication No. 2005/02259552 to Grebenkemper in further view of U.S. Patent Application Publication No. 2015/0162990 to Daiber. The Office rejected several dependent claims as obvious and further view of other references. The Office Action stated

that claims 2-4 and 11-13 contained allowable subject matter if rewritten in independent form to include all the limitations of the base claim and any intervening claims.

On February 19, 2019, AOI filed an amendment amending the two independent claims to add limitations from dependent claims and canceling the dependent claims, and adding a new independent claim and two new dependent claims. A Notice of Allowance was mailed on March 26, 2019, allowing all pending claims. The Notice of Allowance contained a notice of allowability, but did not set forth the reasons for allowance.

The '024 Patent issued on June 4, 2019, with 17 claims, including three independent claims.

C. The Litigation Between AOI and Petitioner

On February 20, 2024, AOI filed a lawsuit against Petitioner for patent infringement entitled *Applied Optoelectronics, Inc. v. Cambridge Industries, Inc.*, case no. 3:24-cv-01010-JD (N.D. CA) (the “Litigation”). The complaint alleges that Petitioner infringes eight of AOI’s patents, including the '024 Patent. AOI filed a First Amended Complaint on April 25, 2024.

On May 16, 2024, the parties exchanged initial disclosures. On June 6, 2024, AOI served its infringement contentions, stating that Petitioner infringes

claims 1-4, 7, 8, 10-12, and 14-17 of the '024 patent. On October 15, 2024, Petitioner served its amended invalidity contentions. Petitioner's contentions stated that claims 1-4, 7, 8, 10-12, and 14-17 are invalid under either § 102 or § 103 on four grounds, the following grounds of which are relevant here: (1) anticipated by or obvious over U.S. Patent No. 9,568,694 to Mizobuchi; and (2) anticipated by or obvious over U.S. Patent Application Publication No. 2014/0140665 to Akashi. *See* "Petitioner's Invalidity Contentions", Exhibit 2002.

On August 8, 2024, the District Court entered its scheduling order setting the following pre-trial dates: a claim construction hearing on April 10, 2025, fact discovery cut-off on September 29, 2025, expert discovery cut-off on December 29, 2025, dispositive motion cut-off on January 28, 2026, and pre-trial conference on May 21, 2026. The court set a jury trial for June 8, 2026. *See* Scheduling Order, Exhibit 1010.

On November 7, 2024, Petitioner filed its answer and counterclaims against AOI. In its counterclaims, Petitioner alleges that each of the eight patents-in-suit is invalid. On November 15, 2024, AOI filed its answer to the counterclaims.

Pursuant to the District Court's Scheduling Order, between October 2024 and March 2025, AOI and Petitioner exchanged proposed terms for claim construction, exchanged preliminary claim constructions and extrinsic evidence,

filed a Joint Claim Construction Statement and Prehearing Statement, exchanged damage contentions, and filed opening, responsive, and reply claim construction briefs.

On March 19, 2025, AOI and Petitioner jointly filed a Notice to Court of Filing of Petitions for *Inter Partes* Review, informing the District Court that Petitioner had filed petitions for IPR of five of the eight patents-in-suit. On April 4, 2025, the District Court issued an order staying the case pending further order, vacating the claim construction hearing set for April 10, 2025, and requiring the parties to file joint status reports on the status of the PTAB proceedings every 90 days beginning on July 7, 2025.

D. The Additional Litigation Involving the '024 Patent

In addition to the Litigation against Petitioner, AOI has filed another patent infringement suit against another defendant, Accelight Technologies, Inc. (“Accelight”), entitled *Applied Optoelectronics, Inc. v. Accelight Technologies, Inc.*, case no. 4:24-cv-09041-HSG (N.D. CA) (the “Additional Litigation”). The complaint, filed on December 13, 2024, alleges infringement of six AOI patents, including the '024 Patent. Four of the other patents-in-suit are also the subject of the Litigation and are the subject of separate petitions for IPR that Petitioner filed on January 17, 2025, the same day that Petitioner filed the Petition that is the

subject of this Preliminary Response. Thus, the Litigation with Petitioner and Additional Litigation share five patents-in-suit, all of which are the subject of separate petitions for IPR that Petitioner filed in January 2025.

On March 28, 2025, AOI and defendant Accelight jointly filed a Notice to Court of Filing of Petitions for *Inter Partes* Review, informing the District Court that Petitioner had filed petitions for IPR of five of the six patents-in-suit. In the Joint Case Management Statement, defendant Accelight stated that one of the issues in the case was whether the asserted claims of the patents-in-suit were invalid. At the case management conference held on April 22, 2025, the court indicated that the case would move forward, and stated that it would set claim construction deadlines.

On April 23, 2025, the court entered a Scheduling Order which set the following dates: invalidity contentions and documents on May 30, 2025; exchange of proposed terms for claim construction on June 13, 2025; exchange of preliminary constructions and extrinsic evidence on July 7, 2025; damages contentions on July 22, 2025; a Joint Claim Construction Statement and Prehearing Statement to be filed on July 30, 2025; claim construction discovery cut-off on August 29, 2025; opening, responsive, and reply claim construction briefs to be filed on September 16, 2025, September 30, 2025, and October 7, 2025,

respectively; a technical tutorial on October 17, 2025; and a claim construction hearing on October 31, 2025. *See* Exhibit 2003.

E. The Petition for *Inter Partes* Review

On January 17, 2025, 11 months after AOI filed its complaint in the Litigation and seven months after AOI served its infringement contentions in the Litigation, Petitioner filed its Petition for IPR of the '024 Patent, PTAB Case IPR2025-00436. On the same date, Petitioner also filed petitions for IPR of four of the other AOI patents in the Litigation: U.S. Patent Nos. 9,523,826; 10,379,301; 10,788,690; and 10,042,116.

In the Petition for IPR of the '024 patent, Petitioner challenges claims 1-17. CIG USA presents two grounds of invalidity against the Challenged Claims: (1) anticipation based on U.S. Patent No. 9,568,694 to Mizobuchi; and (2) anticipation based on U.S. Patent Application Publication No. 2014/0140665 to Akashi.

The Petition relies on the 68-page declaration of Petitioner's expert, Dr. Andrew G. Kirk. *See* Exhibit 1003. Petitioner's other four petitions for IPR of the other four patents also rely on a declaration of Dr. Kirk.

On February 28, 2025, the PTAB issued its Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response (Paper 3).

On April 28, 2025, AOI timely filed a Request to the Director for

Discretionary Denial of each of Petitioner's five Petitions for IPR.

Pursuant to the PTAB's "Consolidated Trial Practice Guide – November 2019," the PTAB will determine whether to institute an IPR within three months of the date the Patent Owner's Preliminary Response was filed or was due, by about August 28, 2025. Pursuant to 35 U.S.C. § 316(a)(11), the PTAB will set the trial date for the IPR within one year of the notice of institution, no later than about August 28, 2026.

F. Alleged Prior Art References

1. Mizobuchi (Exhibit 1006, U.S. Patent No. 9,568,694)

Mizobuchi is directed to an optical module that includes a first circuit board, an optical sub-assembly, a first flexible printed circuit, and a second flexible printed circuit. First electrical connection terminals and a first electrical connector are provided on the first circuit board. The optical sub-assembly includes a second circuit board that includes second electrical connection terminals and a second electrical connector. The first flexible printed circuit is connected to the first electrical connection terminals and the second electrical connection terminals. The second flexible printed circuit is connected to the first and second electrical connectors. A high-speed electrical signal is transmitted between both the circuit boards through the first flexible printed circuit, and a power source signal and a

low-speed electrical signal are transmitted between both the circuit boards through the second flexible printed circuit. Exhibit 1006, Abstract; Exhibit 2004 at ¶ 65.

Figures 1A and 1B of Mizobuchi show an optical module 100 that includes a transmitter and receiver integrated optical subassembly 1. Exhibit 1006 at Col. 3: Col. 4:22-26; Exhibit 2004 at ¶ 66.

FIG. 1A

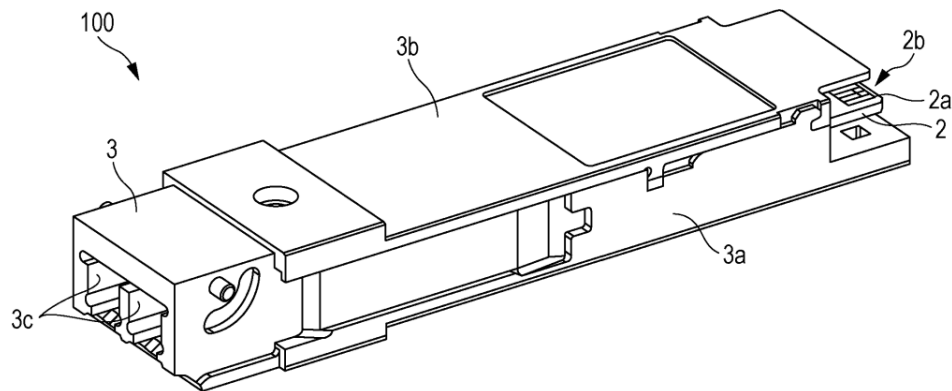


FIG. 1B

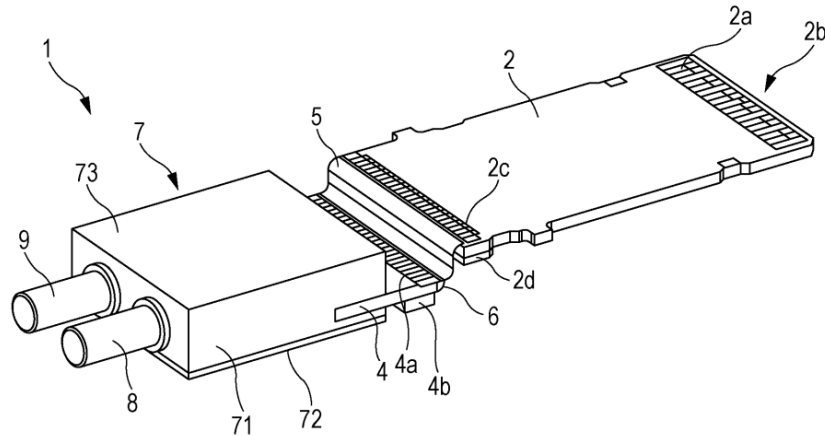


Figure 2 of Mizobuchi shows optical module 100 with first circuit board 2 and second circuit board 4 connected through two flexible printed circuits 5 and 6. Exhibit 1006 at Col. 3: Col. 4:22-26; Exhibit 2004 at ¶ 67.

FIG. 2

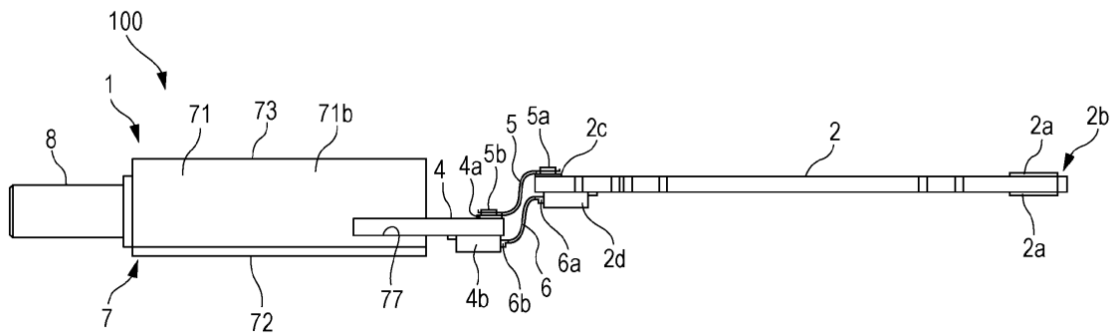
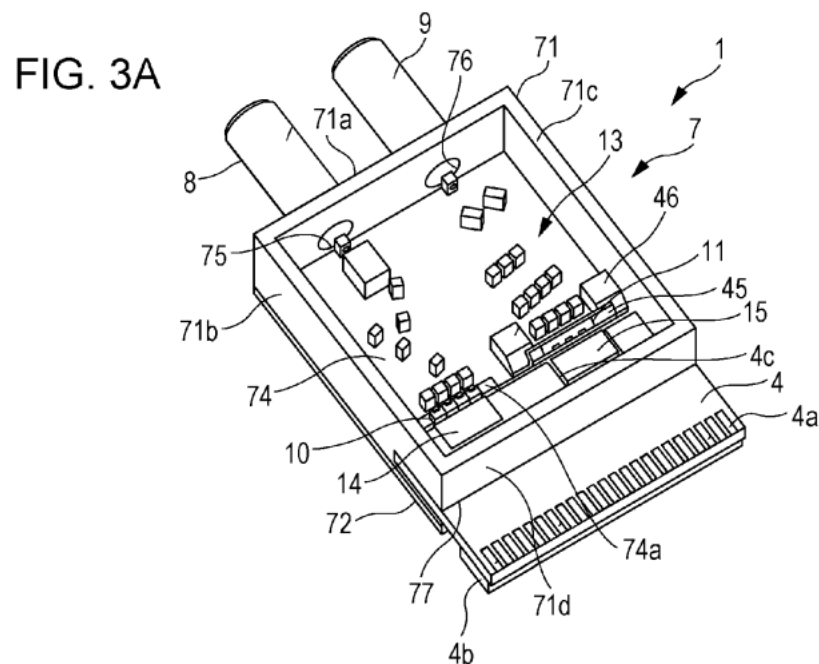


Figure 3A of Mizobuchi shows the transmitter and receiver integrated optical sub-assembly 1. That includes housing 7, a transmitter-side optical

receptacle 8, a receiver-side optical receptacle 9, the second circuit board 4, a plurality of laser diodes 10, a plurality of photo diodes 11, a transmitter-side optical system 12, a receiver-side optical system 13, a driver integrated circuit 14, and a transimpedance amplifier 15. Exhibit 1006 at Col. 5:37-53; Exhibit 2004 at ¶ 68.

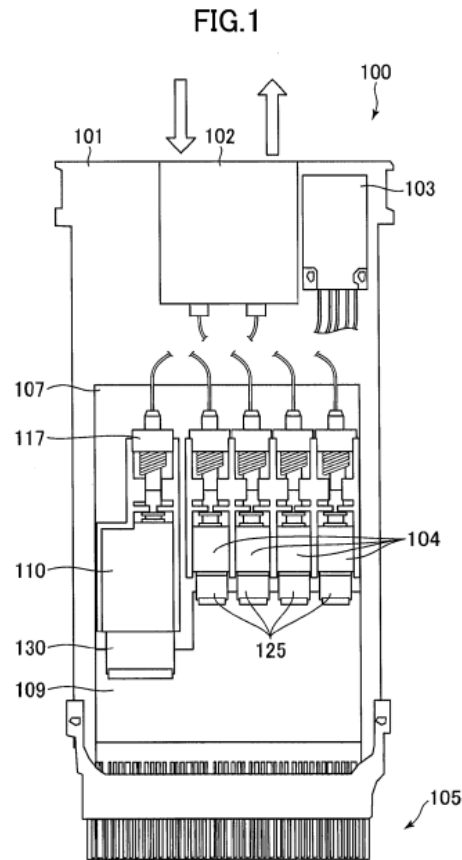


2. Akashi (Exhibit 1007, U.S. Patent Application Publication No. 2014/0140665)

Akashi is directed to an optical module. The optical module includes an optical connector to which a communication cable transferring optical signal is

connected, and a terminal portion on which a plurality of terminal pads for transmitting and receiving an electric signal for communication using the optical signal are arranged; a lead array including a lead fixing portion that retains a plurality of metal leads arranged in parallel on and protruding from the lead fixing portion and electrically connected to the plurality of terminal pads of the terminal portion; and a flexible printed circuit including a plurality of holes through which the plurality of metal leads penetrate, and wires electrically connected to the metal leads. Exhibit 1007, Abstract; Exhibit 2004 at ¶ 78.

Figure 1 of Akashi shows an optical transceiver 100 that includes a first substrate 107, an optical filter 103, an optical connector 102 for external connection, and a second substrate 109. The first substrate 107 is a circuit board with four transmitter optical sub-assemblies (TOSA) 104 and one receiver optical sub-assembly (ROSA) 110. Exhibit 1007 at ¶ 26; Exhibit 2004 at ¶ 79.



III. DEFINITION OF A PERSON OF ORDINARY SKILL IN THE ART

For the purposes of this Preliminary Response only, AOI applies CIG USA's proposed level of skill in the art: A person of ordinary skill in the art ("POSITA") knowledgeable of the technical field of the '024 Patent would have had at least (1) an undergraduate degree in electrical engineering, computer engineering, networking, or a comparable field of study and (2) at least two years of experience with optical data communications and networks or a comparable field of work. Ex. 1003, ¶ 22. Individuals having different educational backgrounds and supplemental

experience might still be of ordinary skill in the art if such experience compensates for any deficiencies in education relative to the criteria stated above. *Id.* In some cases, additional education might be an acceptable substitute for some experience, or vice versa. *Id.*; *see also* Exhibit 2004 at ¶ 29.

AOI reserves the right to further address CIG USA's formulation of a POSITA if trial is instituted.

IV. CLAIM CONSTRUCTION

CIG USA identifies a dispute over the terms “feedthrough device,” “interconnect device,” and “opposing arrangement” based on claim construction positions taken by the parties in the Litigation. Petition at p. 8-11.

CIG USA argues that “feedthrough device” should be construed to mean “the feedthrough device (also referred to in the claims as an ‘interconnect device’) is formed by ‘patterns/traces that propagate signals from external circuitry to components within the hermetic sealed package.’” *Id.*, Exhibit 2004 at ¶ 61. AOI asserted in district court that the term should be given its plain and ordinary meaning. *Id.*

CIG USA argues that “interconnect device” refers to a feedthrough device. *Id.*, Exhibit 2004 at ¶ 62. AOI asserted in district court that the term should be

given its plain and ordinary meaning. *Id.*

CIG USA argues that “opposing arrangement” should be construed to mean “first and second surfaces disposed opposite each other.” *Id.*, Exhibit 2004 at ¶ 63. AOI asserted in district court that the term should be given its plain and ordinary meaning. *Id.*

But the Board need not construe these terms because claim construction is not necessary to resolve the controversy presented by CIG USA’s petition. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms ... in controversy, and only to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)). CIG USA has not a reasonable likelihood of prevailing on any Challenged Claim. *See* Exhibit 2004 at ¶ 64.

V. CIG USA HAS NOT ESTABLISHED A REASONABLE LIKELIHOOD OF PREVAILING FOR ANY CHALLENGED CLAIM

CIG USA bears the burden on institution of “demonstrating a reasonable likelihood that it will prevail in showing the unpatentability of at least one claim.” *SMIC, Ams. v. Innovative Foundry Techs., LLC*, IPR2020-00837, Paper 13, 13–14 (PTAB Oct. 9, 2020) (citing 35 U.S.C. §§ 314(a) and 312(a)(3)). In making this showing, CIG USA’s Petition must identify “the evidence that supports the grounds

for the challenge to each claim.”” *Id.* CIG USA has not met that burden here.

CIG USA alleges that each of the 17 claims are invalid as anticipated under 35 U.S.C. § 102. Anticipation requires “that a single prior art reference discloses each and every element of a claimed invention.” *Silicon Graphics, Inc. v. ATI Techs., Inc.*, 607 F.3d 784, 796 (Fed. Cir. 2010). A reference must not only explicitly or inherently disclose every claimed element, but those elements must also be arranged within that reference as they are in the claim. *See Net MoneyIN, Inc. v. Verisign, Inc.*, 545 F.3d 1359, 1369–71 (Fed. Cir. 2008). Disclosures from multiple, distinct embodiments of a prior art reference cannot be combined to anticipate the challenged claim. *See id.*, 1371. And “differences between the prior art reference and a claimed invention, however slight, invoke the question of obviousness, not anticipation.” *Id.*

Here, CIG USA has not shown a reasonable likelihood of success for any challenged claim under either ground of unpatentability. The Board should thus deny institution.

**VI. GROUND 1: CIG USA HAS NOT SHOWN A REASONABLE
LIKELIHOOD THAT MIZOBUCHI ANTICIPATES OR RENDERS
OBVIOUS CLAIMS 1-17**

Petitioner fails to show that Mizobuchi discloses all the limitations of any claim of the '024 Patent.

For example, Petitioner fails to show that Mizobuchi discloses “a light engine driving circuit disposed on the substrate” as required by claims 1-17. *See* Exhibit 2004 at ¶ 70.

Specifically, Petitioner fails to show that Mizobuchi discloses “a light engine driving circuit disposed on the substrate” as required by independent claim 1. Claims 2-11 depend from claim 1 and thus also contain this limitation. Similarly, independent claim 12 also requires this limitation. Claims 13-14 depend from claim 12 and thus also contain this limitation. Further, independent claim 15 requires this limitation. Claims 16-17 depend from claim 15 and thus contain this limitation. Therefore, all of the claims 1-17 include the requirement for “a light engine driving circuit disposed on the substrate.” '024 Patent. Exhibit 2004 at ¶ 71.

A. Mizobuchi does not disclose the “a light engine driving circuit disposed on the substrate” as required by claims 1-17 of the '024 Patent.

Petitioner fails to show that Mizobuchi (Exhibit 1006) discloses “a light

engine driving circuit disposed on the substrate” as required by independent claim

1. Claims 2-11 depend from claim 1 and thus also contain this limitation.

Similarly, independent claim 12 also requires this limitation. Claims 13-14 depend from claim 12 and thus also contain this limitation. Further, independent claim 15 requires this limitation. Claims 16-17 depend from claim 15 and thus contain this limitation. Therefore, all of the claims 1-17 include the requirement for “a light engine driving circuit disposed on the substrate.” ’024 Patent; Exhibit 2004 at ¶ 71.

Petitioner and its expert argue Mizobuchi discloses “a light engine driving circuit disposed on the substrate.” Specifically, Petitioner and its expert argue that a first circuit board in Mizobuchi defines the claimed substrate, and they identify the first circuit board in annotations to Mizobuchi’s FIG. 2. *See* Petition pp. 18-19.

Petitioner and its expert further state that “[t]he substrate defined by the first circuit board carries a light engine driving circuit,” and allegedly identify the light engine driving circuit in annotations to Mizobuchi’s FIG. 2b *See Id.* In addition, Petitioner and its expert argue that “Mizobuchi discloses a light engine driving circuit disposed on the substrate that includes a clock data recovery (“CDR”) circuit and a power supply circuit.” *See* Petition pp. 18-19.

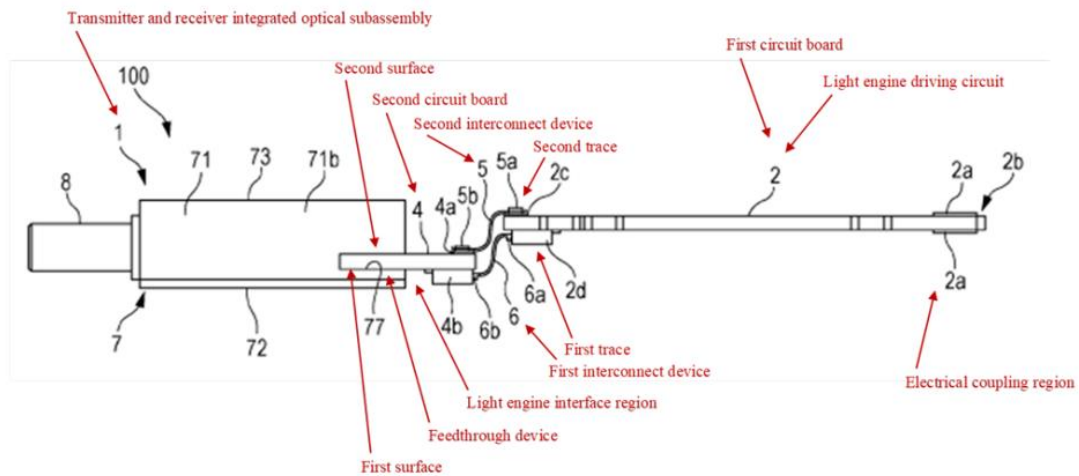


FIG. 2 (Mizobuchi)

However, Petitioner has not shown that Mizobuchi teaches “a light engine driving circuit disposed on the substrate.” See Exhibit 2004 at ¶ 75.

Mizobuchi discloses that the first circuit board 2 includes a clock data recovery (CDR) circuit [and] a power supply circuit. See Exhibit 2006, Col. 3, l. 57-59. However, the clock data recovery circuit and power supply circuit are not the claimed “light engine driving circuit.” Instead, the light engine driving circuit in Mizobuchi is not on the substrate defined by the first circuit board as Petitioner argues. Instead, the light engine driving circuit in Mizobuchi is the driver integrated circuit (IC) 14, which is inside the housing 7 of the transmitter and receiver integrated optical sub-assembly 1 as shown above in Petitioner’s annotated version of Mizobuchi’s FIG. 2 and shown below in Petitioner’s

annotated version of Mizobuchi's FIG. 3A See Exhibit 2006 at Col. 5:43-53 and FIGS. 2 and 3a; Exhibit 2004 at ¶ 76. As shown in the specification and figures, the transmitter and receiver integrated optical sub-assembly is not part of the claimed substrate identified by the Petitioner. See *Id.*

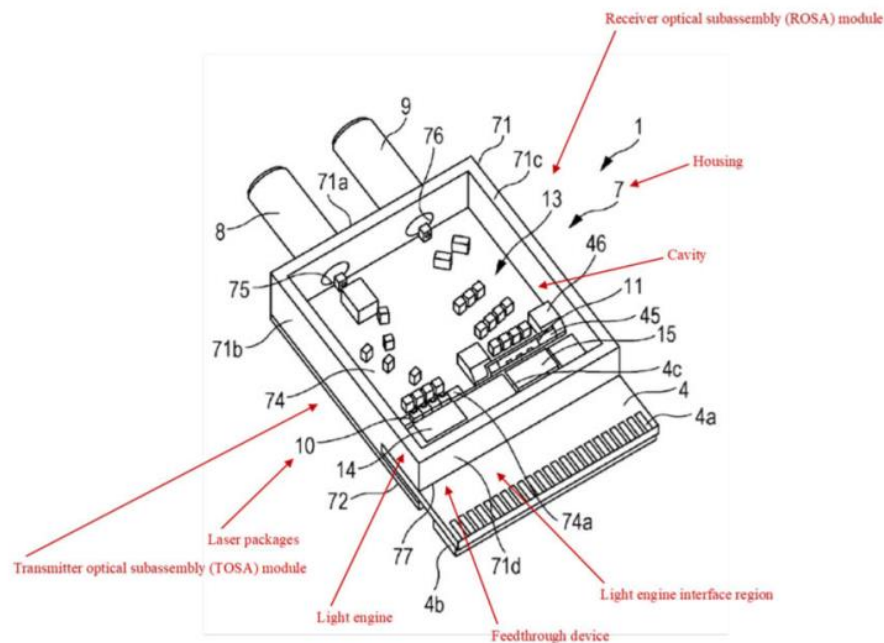


FIG. 3A (Mizobuchi)

Thus, Petitioner fails to show that Mizobuchi discloses a “a light engine driving circuit disposed on the substrate” as required by claims 1-17 of the '024 Patent.

Therefore, Petitioner fails to show to a reasonable likelihood that Soldano anticipates any challenged claim in Ground 1.

**VII. GROUND 2: CIG USA HAS NOT SHOWN A REASONABLE
LIKELIHOOD THAT AKASHI ANTICIPATES OR RENDERS
OBVIOUS CLAIMS 1-17.**

Petitioner fails to show that Akashi discloses all the limitations of any claim of the '024 Patent.

For example, Petitioner has not shown that Akashi discloses “a light engine driving circuit disposed on the substrate” as required by claims 1-17. *See* Exhibit 2004 at ¶ 81.

Specifically, Petitioner fails to show that Akashi discloses “a light engine driving circuit disposed on the substrate” as required by independent claim 1. Claims 2-11 depend from claim 1 and thus also contain this limitation. Similarly, independent claim 12 also requires this limitation. Claims 13-14 depend from claim 12 and thus also contain this limitation. Further, independent claim 15 requires this limitation. Claims 16-17 depend from claim 15 and thus contain this limitation. Therefore, all of the claims 1-17 include the requirement for “a light engine driving circuit disposed on the substrate.” '024 Patent (Exhibit 1001). *Id.* at ¶ 81.

In addition, Petitioner fails to show that Akashi discloses “a light engine interface region for electrically coupling with the hermetically-sealed light engine” as required by claims 1-17. *See* Exhibit 2004 at ¶ 82.

Specifically, Petitioner has not shown that Akashi discloses “a light engine interface region for electrically coupling with the hermetically-sealed light engine” as required by independent claim 1. Claims 2-11 depend from claim 1 and thus also contain this limitation. Similarly, independent claim 12 also requires this limitation. Claims 13-14 depend from claim 12 and thus also contain this limitation. Further, independent claim 15 requires this limitation. Claims 16-17 depend from claim 15 and thus contain this limitation. Therefore, all of the claims 1-17 include the requirement for “a light engine interface region for electrically coupling with the hermetically-sealed light engine.” ’024 Patent. *Id.* at ¶ 83.

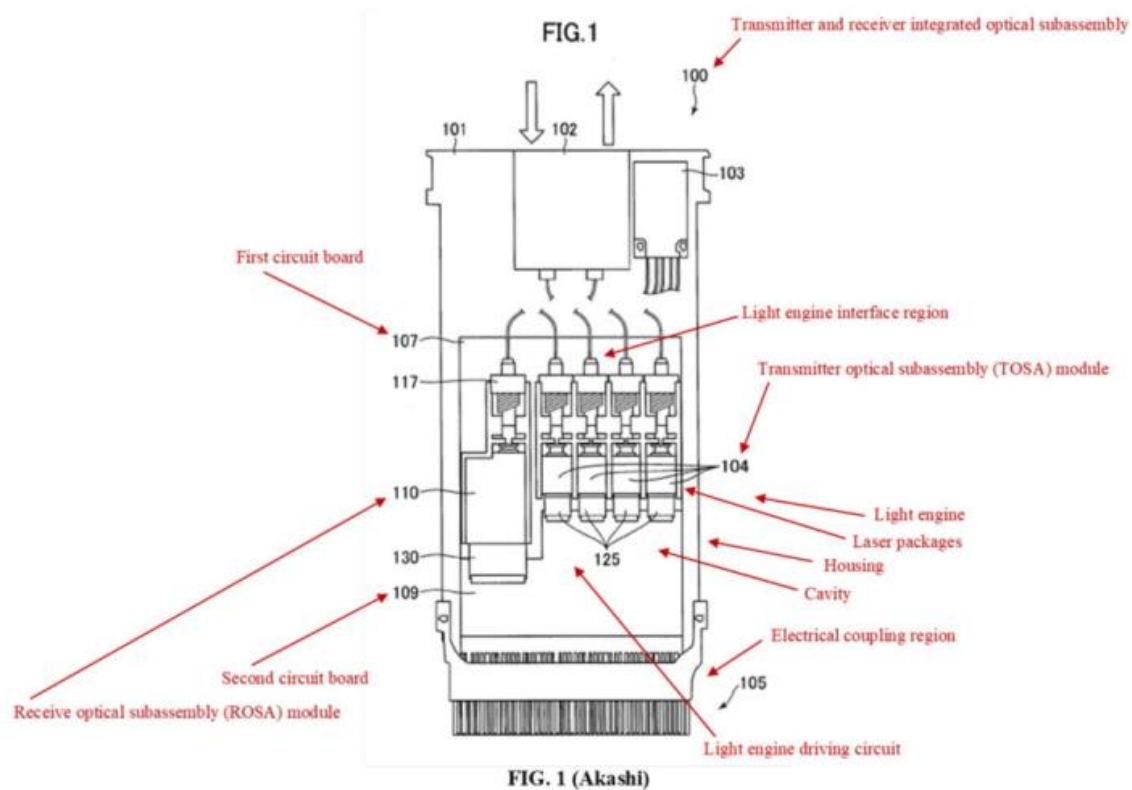
A. Petitioner fails to show that Akashi discloses the “a light engine driving circuit disposed on the substrate” as required by claims 1-17 of the ’024 Patent.

Petitioner fails to show that Akashi discloses “a light engine driving circuit disposed on the substrate” as required by independent claim 1. Claims 2-11 depend from claim 1 and thus also contain this limitation. Similarly, independent claim 12 also requires this limitation. Claims 13-14 depend from claim 12 and thus also contain this limitation. Further, independent claim 15 requires this limitation. Claims 16-17 depend from claim 15 and thus contain this limitation. Therefore, all of the claims 1-17 include the requirement for “a light engine driving circuit

disposed on the substrate.” See ’024 Patent. *Id.* at ¶¶ 83-84.

Petitioner and its expert argue Akashi discloses “a light engine driving circuit disposed on the substrate.” Specifically, Petitioner and its expert identify first circuit board 107 as the claimed substrate. See Petition at p. 30 and Petitioner’s annotated version of Akashi’s FIG. 1 at pp. 29, 33. Petitioner and its expert then point to an empty portion of first circuit board 107 argue that “[a] POSITA would have understood that Akashi discloses a light engine driving circuit on the substrate 107.” See Exhibit 2004 at ¶ 85.

Petitioner fails to show that Akashi, however, does not disclose “a light engine driving circuit disposed on the substrate” and pointing to an empty portion of a circuit board does not satisfy the claim limitation. See Exhibit 2004 at ¶ 86.



B. Petitioner fails to show that Akashi discloses “a light engine interface region for electrically coupling with the hermetically-sealed light engine” as required by claims 1-17 of the ’024 Patent.

Petitioner fails to show that Akashi discloses “a light engine interface region for electrically coupling with the hermetically-sealed light engine” as required by independent claim 1. Claims 2-11 depend from claim 1 and thus also contain this limitation. Similarly, independent claim 12 also requires this limitation. Claims 13-14 depend from claim 12 and thus also contain this limitation. Further, independent claim 15 requires this limitation. Claims 16-17 depend from claim 15 and thus

contain this limitation. Therefore, all of the claims 1-17 include the requirement for “a light engine interface region for electrically coupling with the hermetically-sealed light engine.” *See* ’024 Patent. *Id.* at ¶ 83.

Petitioner and its expert argue that the first circuit board 107 includes “a light engine interface region (adjacent to optical connector 117)”. *See* Petition at p. 30 and Petitioner’s annotated version of Akashi’s FIG. 1 at pp. 29, 33.

However, the region pointed to by Petitioner is the region containing optical fibers. *See* Exhibit 2004 at ¶ 89. The signals in that region are optical signals, not electrical signals. *See* Exhibit 2004 at *Id.* Claims 1-17 require that the light engine interface region is for electrically coupling, not optically coupling. *See* Exhibit 2004 at *Id.*

Therefore, Petitioner has not shown that Akashi discloses “a light engine interface region for electrically coupling with the hermetically-sealed light engine” as required by claims 1-17.

CIG USA fails to show a reasonable likelihood that Akashi anticipates any Challenged Claim in Ground 2.

VIII. THE BOARD SHOULD EXERCISE ITS DISCRETION TO DENY INSTITUTION.

The Board should exercise its discretion and deny institution of IPR on the

'024 Patent. The following factors support a discretionary denial:

- There is significant overlap between the issues in the Petition and in the Litigation. Many of the same claims are challenged, and some of the grounds, the key art, and the arguments are substantially the same in the Petition as in the Litigation. All of the art relied upon in the Petition is also relied upon by Petitioner in the Litigation.
- There has been significant investment in the Litigation in that substantive issues have already been addressed by the parties.
- There are settled expectations in the enforcement of the '024 Patent in that the patent has been in force for almost six years.
- Petitioner's arguments on unpatentability are weak.
- The Petition relies heavily on the declaration of an expert.
- Petitioner and the defendant are the same party.
- The '024 Patent is one of the patents-in-suit in the Additional Litigation between AOI and defendant Accelight, and claim construction and the validity of the '024 Patent may well be adjudicated before the PTAB's decision in an IPR would be due.
- There are no relevant changes in the law that affect patentability.

- Four of the other five patents asserted by AOI in the Litigation are each the subject of an IPR filed by Petitioner on the same date as this Petition.

Each of these factors is discussed separately below in sections A through I.

A. The Issues in the Petition Have Significant Overlap with the Issues in the Litigation.

The Board may consider whether there is significant overlap between the issues raised in the Petition and in the Litigation. See *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11, p. 6 (March 20, 2020) (precedential). “[I]f the petition includes the same or substantially the same claims, grounds, arguments, and evidence as presented in the parallel proceeding, this fact has favored denial.”

Here, there is significant overlap in the issues raised in the Petition and in the Litigation.

First, many of the same claims are challenged in the Petition (claims 1-17) as are challenged in the Litigation (claims 1-4, 7, 8, 10-12, and 14-17).

Second, all of the art relied upon in the Petition (Wu and Mizue) is relied upon in the Litigation. The art at issue in the Petition is a subset of the art at issue in the Litigation.

Third, the two grounds for invalidity in the Petition are the same or substantially the same as two of the several grounds asserted in the Litigation. In the Petition, Petitioner argues that claims 1-17 are anticipated by Mizobuchi; in the Litigation, Petitioner argues that claims 1-4, 7, 8, 10-12, and 14-17 are anticipated by or obvious over Mizobuchi. In the Petition, Petitioner argues that claims 1-17 are anticipated by Akashi; in the Litigation, Petitioner argues that claims 1-4, 7, 8, 10-12, and 14-17 are anticipated by or obvious over obvious over Akashi.

Fourth, the arguments in the Petition are substantially the same as the arguments in the Litigation. Petitioner's arguments as to where the claim limitations are found in the prior art, on a limitation-by-limitation basis, are essentially the same in both proceedings. This is demonstrated by a comparison of the Declaration of Andrew G. Kirk in Support of Petition (pp. 32-50 as to Mizobuchi and pp. 50-67 as to Akashi) filed in the PTAB with Petitioner's Amended Invalidity Contentions and claim charts filed in the Litigation (Exhibit 2002, Ex. A-2 as to Mizobuchi and Ex. A-3 as to Akashi).

Thus, there is significant overlap in the challenged claims, the grounds, the art, and the arguments. Moreover, the Litigation involves one other reference and one additional ground not asserted in the Petition. And the Litigation also involves seven other patents. Thus, the issues in the Petition are essentially a subset of the

issues in the Litigation; meaning that the Litigation will need to go forward regardless of whether IPR is instituted. The fact that the Litigation involves an additional challenge to the '024 Patent weighs in favor of a denial. See, *Next Caller Inc. v. Trustid, Inc.*, IPR 2019-00963, Paper 8, p. 12 (October 28, 2019) (informative).

B. The Parties Have Invested in the Litigation by Addressing Substantive Issues.

Pursuant to the District Court's Scheduling Order, between October 2024 and March 2025, AOI and Petitioner exchanged proposed terms for claim construction, exchanged preliminary claim constructions and extrinsic evidence, filed a joint claim construction statement and pre-hearing statement, exchanged damage contentions, and filed opening, responsive, and reply claim construction briefs.

Thus, the parties have spent significant time and effort in conducting discovery, in the claim construction process, and in briefing claim construction.

This factor weighs in favor of denial of institution.

C. There Are Settled Expectations in the '024 Patent.

The '024 Patent was issued on June 4, 2019. The patent has been in force for almost six years. Thus, there are settled expectations of the parties that the

'024 Patent is valid and enforceable.

This factor weighs in favor of denial of institution.

D. Petitioner's Arguments on Unpatentability are Weak.

The Board may consider the strength of the petitioner's unpatentability challenge in determining whether to discretionarily deny institution of IPR. *Apple Inc. v. Fintiv, Inc.*, *supra*, pp. 14-15. If the merits are a "close call," that fact weighs in favor of denying institution if other factors favoring denial are present. *Id.* at p. 15.

Here, Petitioner is unlikely to succeed on the merits because Petitioner fails to show that the cited references disclose all the limitations of the '024 Patent.

E. The Petition Relies Almost Exclusively on the Declaration of an Expert.

An over-reliance on expert testimony may weigh in favor of discretionary denial of an IPR. *See Next Caller Inc.*, *supra*, p. 14 (informative); *see also* Director's Memorandum "Interim Processes for PTAB Workload Management" dated March 26, 2025 (the "Memorandum"), Exhibit 2001, at p. 2.

The Petition is based almost exclusively on the Declaration of Andrew Kirk, Petitioner's expert (Exhibit 1003 to the Petition). As can be seen from the Petition, every limitation of every challenged claim cites to Exhibit 1003 (see Petition, pp.

17-28 for Mizobuchi and pp. 29-41 for Akashi), and the Declaration of Dr. Kirk discusses every limitation of every claim (see Kirk Declaration, Ex. 1003, pp. 32-50 for Mizobuchi and pp. 50-67 for Akashi).

Accordingly, this factor weighs in favor of denial.

F. Petitioner and the Defendant Are the Same Party.

Here, the fact that Petitioner and the defendant in the Litigation are the same party weighs in favor of denial of institution. *See Apple Inc. v. Fintiv, Inc., supra*, pp. 13-14.

G. The Validity of the '024 Patent May Be Adjudicated by a District Court Before the PTAB's Decision is Due if IPR is Instituted.

The Board may consider whether another forum has already adjudicated the validity of the challenged claims in determining whether to discretionarily deny institution of IPR. Memorandum, Exhibit 2001, at p. 2.

Here, the '024 Patent is one of the patents-in-suit in the Additional Litigation between AOI and defendant Accelight, filed on December 13, 2024. As noted above, five of the six patents-in-suit in the Additional Litigation are also in suit in the Litigation with Petitioner and are the subject of petitions for IPR filed by Petitioner.

In the Additional Litigation, the District Court has ordered the case to move

forward, despite the parties' notifying the court that five of the six patents-in-suit are the subject of petitions for IPR filed by Petitioner. On April 23, 2025, the court entered a Scheduling Order which set all of the dates pertaining to claim construction between June 2025 and October 2025 (exchange of proposed terms, exchange of preliminary constructions and extrinsic evidence, damages contentions, a Joint Claim Construction Statement and Prehearing Statement, claim construction discovery cut-off, opening, responsive, and reply claim construction briefs, and a technical tutorial), and set a claim construction hearing on October 31, 2025. *See* Exhibit 2003.

Defendant Accelight has stated that the validity of the asserted claims of the patents-in-suit is in issue and that it will be taking discovery on invalidity. The court has set invalidity contentions and documents due on May 30, 2025. *Id.*

Thus, the validity of the '024 Patent may well be adjudicated in the Additional Litigation before the PTAB's decision in an IPR, which would be due on or about August 28, 2026 if IPR is instituted. Accordingly, this factor weighs in favor of denial.

H. There Are No Relevant Changes in the Law that Affect Patentability.

There have been no changes in the law or judicial precedent regarding

patentability since the '024 Patent issued. Accordingly, this factor weighs in favor of denial of institution. *See* Memorandum, Exhibit 2001, p. 2.

I. Petitioner Filed Petitions for IPR for Four of the Other Patents Asserted by AOI in the Litigation on the Same Date as this Petition.

The Board may consider all relevant circumstances in determining whether to discretionarily deny institution of IPR. *See* Memorandum, Exhibit 2001, p. 3; *Apple Inc. v. Fintiv, Inc., supra*, p. 14.

The Litigation involves eight AOI patents, five of which are the subject of petitions for IPR filed by Petitioner, including the '024 Patent. These facts indicate that Litigation will need to go forward regardless of the petitions for IPR.

Therefore, it would be more efficient for the validity of the '024 Patent to be resolved in the Litigation, and the PTAB could conserve its resources by denying institution. *See, Next Caller Inc., supra*, p. 14, fn. 13, with similar facts (informative). Therefore, this factor weighs in favor of denial.

IX. RESERVATION OF RIGHTS

Should the Board decide to institute an *inter partes* review, Applied Optoelectronics, Inc. reserves all rights to make additional arguments in, and present claim constructions and evidence with, its Patent Owner Response. Applied Optoelectronic's silence on any particular claim or limitation at this time

is not a concession that the Petition's discussion of that claim or limitation is properly based. Applied Optoelectronics, Inc. also reserves the right to dispute the level of ordinary skill in the art if the Board decides to institute *inter partes* review. Accordingly, Applied Optoelectronics, Inc. reserves the right to submit additional or alternative arguments of patentability, and nothing in this Preliminary Response acts or should be construed to act as an admission, acquiescence, or estoppel on the merits of the Petition.

X. CONCLUSION

For the reasons set forth above, Applied Optoelectronics, Inc., respectfully requests that the Board deny institution of the Petition for all Challenged Claims of the '024 Patent.

Dated: May 28, 2025

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CERTIFICATE OF WORD COUNT

Under the provisions of 37 C.F.R. § 42.24(d), the undersigned hereby certifies that the Microsoft Office word count including all footnotes for the foregoing Patent Owner's Preliminary Response, excluding the table of contents, table of authorities, certificate of word count, appendix and certificate of service, totals 6,212 words, which is less than the 14,000 words allowed under 37 C.F.R. § 42.24(b)(1).

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CERTIFICATE OF SERVICE

The undersigned hereby certifies service on the Petitioner, pursuant to 37 C.F.R. § 42.6(e) and by agreement of counsel, by electronic (e-mail) delivery of a true copy of the foregoing **PATENT OWNER'S PRELIMINARY RESPONSE**, which was served on May 28, 2025 to the following Counsel for Petitioner via e-mail:

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