UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SAMSUNG ELECTRONICS CO., LTD., SAMSUNG ELECTRONICS AMERICA, INC., SAMSUNG SEMICONDUCTOR, INC., and SAMSUNG AUSTIN SEMICONDUCTOR LLC,
Petitioners,

v.

W&WSENS DEVICES INC.,
Patent Owner.

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Case IPR2025-00993
U.S. Patent No. 12,087,871

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**PATENT OWNER'S REQUEST FOR DISCRETIONARY DENIAL**

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# PATENT OWNER'S EXHIBIT LIST

| Exhibit | Description |
|---|---|
| 2001 | Messages between W&Wsens and Samsung (April 25, 2019 through April 26, 2019) |
| 2002 | Messages between W&Wsens and Samsung (April 27-28, 2019, August 14, 2019, February 20, 2020) |
| 2003 | Messages between W&Wsens and Samsung (April 27, 2019, August 14-15, 2019, February 20, 2020) |
| 2004 | Messages between W&Wsens and Samsung (April 24-25, 2019, May 14, 2019, August 14, 2019, March 3, 2020) |
| 2005 | W&Wsens Devices Inc. presentation – Thin Silicon Photosensors for The Next Generation |
| 2006 | Excerpts from the file history of U.S. Patent No. 10,348,240 |
| 2007 | Excerpts from the file history of U.S Patent No. 10,587,095 |
| 2008 | Excerpts from Plaintiff W&Wsens Devices Inc.'s First Supplemental Objections and Responses to Defendants' First Set of Interrogatories (Nos. 1 and 3), *W&Wsens Devices, Inc. v. Samsung Elecs. Co.*, No. 24-cv-00854-JRG, E.D. Tex., served April 3, 2025 |
| 2009 | Excerpts from Plaintiff W&Wsens Devices Inc.'s Objections and Responses to Defendants' First Set of Interrogatories (Nos. 1- 3), *W&Wsens Devices, Inc. v. Samsung Elecs. Co.*, No. 24-cv-00854-JRG, E.D. Tex., served March 20, 2025 |
| 2010 | Photon-trapping microstructures enable high-speed high-efficiency silicon photodiodes, Nature Photonics 11, 301-308 (2017) |
| 2011 | U.S. Patent Application Publication No. 2011/0309331 ("Yu-331") |

| Exhibit | Description |
|---|---|
| 2012 | Second Amended Docket Control Order, *W&Wsens Devices, Inc. v. Samsung Elecs. Co.*, No. 24-cv-00854-JRG, Dkt. No. 54 (E.D. Tex. April 22, 2025) |
| 2013 | Order, *Resonant Sys., Inc. v. Sony Grp. Corp.*, No. 2:22-cv-00424-JRG, Dkt. No. 84 (E.D. Tex. July 9, 2024) |
| 2014 | Order, *Gen. Access Sols., Ltd. v. Cellco P'ship*, No. 2:22-cv-00394-JRG, Dkt. No. 225 (E.D. Tex. May 22, 2024) |
| 2015 | Order, *Cal. Inst. of Tech. v. Samsung Elecs. Co.*, No. 21-cv-00446-JRG, Dkt. No. 108 (E.D. Tex. Jan. 20, 2023) |
| 2016 | Excerpt from U.S. District Court – National Judicial Caseload Profile Federal for the Eastern District of Texas |
| 2017 | Excerpts from Defendants' Supplemental Invalidity Contentions cover pleading, *W&Wsens Devices, Inc. v. Samsung Elecs. Co.*, No. 24-cv-00854-JRG, E.D. Tex., served May 30, 2025 |
| 2018 | U.S. Patent No. 10,622,498 |
| 2019 | U.S. Patent No. 9,530,905 |
| 2020 | Intentionally omitted |
| 2021 | U.S. Patent Application Publication No. 2020/0006416 ("Baba") |

Patent Owner, W&Wsens Devices Inc. ("W&Wsens"), respectfully requests that the Director discretionarily deny this Petition challenging claims 1-4, 6-8, 10-16, 18 ("the Challenged Claims") of U.S. Patent No. 12,087,871 (Ex. 1001, "the '871 Patent"). This request for discretionary denial is authorized by the "Interim Processes for PTAB Workload Management" and "Interim Director Discretionary Process." W&Wsens will discuss, in full, the reasons why the '871 Patent is patentable on the merits in its Patent Owner Preliminary Response.

## I. INTRODUCTION

W&Wsens invented microstructured holes in thin silicon photodetectors, an important improvement in image sensors that dramatically improved their sensitivity in low-light situations. After conceiving of these microstructures in April 2013, W&Wsens invested in research and development, simulations, and proof-of-concept test wafer fabrication to validate and refine its microstructure inventions. W&Wsens shared its discoveries with the world in a seminal 2017 article in Nature Photonics that is now widely cited. W&Wsens repeatedly disclosed its patents to Petitioners ("Samsung"), explaining the importance of its patented microstructure technology that Samsung is now using. W&Wsens provided detailed presentations to several of Samsung's officers and offered to partner with or license the patents to Samsung.

Despite these repeated disclosures, Samsung decided to infringe W&Wsens' patents without taking a license. More than six years later and long after W&Wsens

commenced an infringement action against Samsung, it has now decided to pursue *inter partes* review of W&Wsens' '871 Patent. The Director should exercise her discretion to deny this Petition for multiple reasons:

**(1)** the parties' settled expectations support denial because Samsung has long been on notice of W&Wsens' patents, W&Wsens' invested substantial resources in developing and validating the inventions of the '871 Patent, and three other W&Wsens' patents also challenged by Samsung have been in force for nearly six years and more;

**(2)** the advanced state of the corresponding litigation between W&Wsens and Samsung in the Eastern District of Texas (the "District Court Action") warrants denial under *Apple Inc. v. Fintiv, Inc.*, because the District Court promises to be the faster and more efficient forum to address the same validity issues raised here, with a trial date set for five months before the final written decision ("FWD") is due in this proceeding;

**(3)** Samsung relies extensively on its expert to fill in limitations missing from the asserted references, demonstrating the weakness of its grounds; and

**(4)** Samsung relies on the same or substantially the same art previously considered by the Office warrants discretionary denial under 35 U.S.C. § 325(d).

## II. ARGUMENT: THE PETITION SHOULD BE DENIED

### A. Strong Settled Expectations Favor Discretionary Denial

The parties' strong settled expectations favor discretionary denial because (1) Samsung filed IPRs challenging the validity of other, related W&Wsens patents that issued long ago and is also challenging their validity in the District Court Action, (2) Samsung has long had notice of the '871 Patent, and (3) W&Wsens invested substantial resources in the inventions of the '871 Patent.

*First,* the strong settled expectations with respect to W&Wsens' related patents support denial here. Samsung filed petitions for IPR of other W&Wsens patents, including IPR2025-00997, challenging U.S. Patent No. 9,525,084, which issued close to nine years ago (on December 20, 2016), IPR2025-00995, challenging U.S. Patent No. 10,468,543, which issued almost six years ago (on November 5, 2019), and IPR2025-00996, challenging U.S. Patent No. 10,446,700, which issued almost six years ago (on October 15, 2019). Given the strong settled expectations for those long-standing patents, institution should be denied on those petitions, which supports denial of this Petition as well. *Samsung Elecs. Co. v. iCashe, Inc.*, No. IPR2025-00639, Paper 11 at 2-3 (P.T.A.B. Aug. 14, 2024) (declining to institute IPRs against patents that issued approximately two years ago in view of denial of IPRs against related patents that issued eight to twelve years ago).

*Second*, Samsung's awareness of other patents in the '871 Patent's family further creates settled expectations. *See Google LLC v. Soundclear Techs, LLC*, No. IPR2025-00344, Paper 15 at 2-3 (P.T.A.B. Aug. 4, 2025) (a petitioner's prolonged knowledge of the challenged patents creates strong settled expectations); *Murata Mfg. Co. v. Ga. Tech Rsc. Corp.*, No. IPR2025-00383, Paper 14 at 2 (P.T.A.B. July 29, 2025) (finding strong settled expectations because petitioner was aware of patent owner's technology space "for a significant amount of time before filing its Petition challenging Patent Owner's patent").

W&Wsens first communicated with four executives at Samsung about its patents on April 24, 2019, and continued to do so for over a year. Ex. 2004; *see generally* Exs. 2001-2004. On February 20, 2020, W&Wsens emailed those executives a comprehensive presentation entitled "Thin Silicon Photosensors For the Next Generation." Exs. 2002-2004, and Ex. 2005. This presentation included a wealth of information about W&Wsens' patent portfolio, including the marketing outlook for W&Wsens' patents and scientific reports on W&Wsens' technology. Ex. 2005 at 4-5, 6, 8, 11. W&Wsens then offered Samsung the possibility of partnering, licensing, or investing in W&Wsens on multiple occasions, including March 24, 2020. Ex. 2004 at 14-16. W&Wsens' offer and comprehensive presentation put Samsung on notice of the '871 Patent's ancestral applications.

Samsung was also put on notice of W&Wsens' patents and applications related to the '871 Patent by no later than November 16, 2018, more than seven years before Samsung filed this Petition, when those applications were cited as prior art to pending applications filed by Samsung. *See Dabico Airport Sols Inc. v. AXA Power ApS*, No. IPR2025-00408, Paper 21 at 3 (P.T.A.B. June 18, 2025) (noting that actual notice of a particular challenged patent is unnecessary to create settled expectations because published applications are searchable). Once Samsung was put on notice of W&Wsens' technology and portfolio of patents covering its microstructured-holes-in-silicon inventions, it had every reason to avail itself of "the Office's automated search systems as well as publicly available resources on the Internet" to understand the scope of W&Wsens' IP rights. *Id.*

The USPTO identified one of the applications in the '871 Patent's priority chain as prior art to one of Samsung's pending applications in a Notice of References Cited on November 16, 2018. Ex. 2006 (File History of '240 patent) at 9 (citing U.S. Pat. App. Pub. No. 2016/0254407), Ex. 2018 ('498 patent, App. No. 14/947,718). On July 11, 2019, the USPTO identified another application in the '871 Patent's priority chain as prior art to one of Samsung's pending applications in an Office Action. Ex. 2007 at 9-10, 12 (citing U.S. Pat. App. Pub. No. 2016/0307939), Ex. 2019 ('905 patent, App. No. 14/943,898). Both patent applications cited by the UPSTO to Samsung share common subject matter with the

'871 Patent. Therefore, from its patent prosecution activities, Samsung has had at least constructive notice of patents related to the '871 Patent for at least seven years, which further supports strong settled expectations. *See iRhythm Techs., Inc. v. Welch Allyn, Inc.,* No. IPR2025-00363, Paper 10 at 3 (P.T.A.B. June 6, 2025) (finding that settled expectations favored denial of institution because the petitioner was aware of the patent owner's patents during prosecution of its own patents).

*Third*, W&Wsens' "investment, time, and resources dedicated to research, development, [and] trials" that went into developing the claimed invention further gives rise to settled expectations that weigh in favor of discretionary denial. *Amgen Inc., v. Bristol-Myers Squibb Co.*, No. IPR2025-00601, Paper 9 at 2 (P.T.A.B. July 24, 2025) (explaining that the level of investment in the claimed invention can create settled expectations for patents in force for even less than six years).

In April 2013, inventors Shih-Yuan Wang and Shih-Ping Wang were working on solutions to improve the absorption efficiency of thin silicon photodetectors, such as for use in CMOS sensor and optical interconnect applications. Ex. 2008 (4/3/25 Resp. to Interrogatories) at 14-15. After conceiving of the solution of using microstructures in thin silicon photodetectors, they worked diligently with their patent counsel to prepare a patent application. They filed provisional application U.S. 61/826,446 shortly thereafter on May 22, 2013. *Id.*

W&Wsens invested in bringing in additional team members to participate in developing their technology. In June 2014, they engaged Dr. M. Saif Islam, a professor at the University of California, Davis, to fabricate proof of concept photodetectors to test their inventions and collaborate on design improvements. *Id.* at 15. Dr. Islam conducted a series of proof-of-concept fabrication runs, verifying the efficacy of the use of microstructures and fabricating and testing the resulting photodetectors. *Id.* In addition, W&Wsens engaged Katya Ponizovskaya Devine, who conducted computer simulations confirming the efficacy of the inventors' inventions. Ex. 2009 (3/20/25 Resp. to Interrogatories) at 14. The group published *Photon-trapping microstructures enable high-speed high-efficiency silicon photodiodes* in Nature Photonics 11, 301-308 (2017). Ex. 2010.

Thus, strong settled expectations favor discretionary denial. *iRhythm Techs., Inc.*, Paper 10 at 3 (denying institution in view of the settled expectations of the parties).

### B. The Director Should Deny Institution Under *Fintiv*

The Director should also deny institution under 35 U.S.C. § 314(a) because the *Fintiv* Factors overwhelmingly support denial. Trial in the District Court Action is scheduled to commence on August 3, 2026, five months before a final written decision would be expected in this case (January 11, 2027). Ex. 2012 (Docket Control Order) at 1; *Samsung Elecs. Co., v. Headwater Rsch. LLC*, No. IPR2025-

00481, Paper 9 (P.T.A.B Aug. 4, 2025) (denying institution where time-to-trial statistics suggest that trial will begin four months before the projected FWD deadline). There is also little to no likelihood that Judge Gilstrap will stay the District Court Action.

1. *Fintiv* Factor 1 Favors Denial Because a Stay Is Unlikely

*Fintiv* Factor 1 favors discretionary denial in this case because Judge Gilstrap is highly unlikely to stay the District Court Action. Factor 1 favors discretionary denial where "there is insufficient evidence that the district court is likely to stay its proceeding even if the Board were to institute trial." *Arm Ltd. v. Daedalus Prime LLC*, No. IPR2025-00207, Paper 10 at 2 (P.T.A.B. May 16, 2025) (denying institution in part due to the absence of evidence of a likelihood of a stay, vacated on other grounds).

Samsung has not asked Judge Gilstrap to stay the District Court Action. Any such request would be unlikely to succeed because it is the practice of the Eastern District of Texas to deny pre-institution motions to stay as premature. *See* 2013, *Resonant Sys., Inc. v. Sony Grp. Corp.*, No. 2:22-cv-00424-JRG, Dkt. No. 84 at 3 (E.D. Tex. July 9, 2024) ("[T]his Court routinely denies pre-institution motions to stay as premature."). To the extent Samsung files a motion to stay ***after*** the January 11, 2026, institution decision deadline in this case, such a motion would be unlikely to succeed given the advanced stage of the case.

*First*, Samsung delayed filing this Petition for more than eight months after W&Wsens commenced the District Court Action. Judge Gilstrap routinely denies motions to stay filed by petitioners like Samsung who are dilatory in filing IPRs. *See, e.g.,* Ex. 2014, *Gen. Access Sols, Ltd. v. Cellco P'ship*, No. 2:22-cv-00394-JRG, Dkt. No. 225 at 4 (E.D. Tex. May 22, 2024) (defendants' late filing of IPRs "seven and eight months after Plaintiff filed suit" weighs against a stay).

*Second*, Judge Gilstrap denies motions to stay where the "parties [have] engaged in extensive discovery" before the briefing on the motion to stay is complete. *See* Ex. 2015, *Cal. Inst. of Tech. v. Samsung Elecs. Co.*, No. 21-cv-00446-JRG, Dkt. No. 108 at 5 (E.D. Tex. Jan. 20, 2023); Ex. 2014, *Gen. Access Sols.* at 4 (finding that the state of the case disfavors a stay when "the parties have already completed fact discovery and will have served opening expert reports by the time the Motion to Stay is fully briefed").

By the time an institution decision is expected, the parties to the District Court Action will have already engaged in extensive discovery, including exchanging infringement, invalidity, and subject-matter eligibility contentions, proposed claim terms for construction and preliminary claim constructions, will have filed a joint claim construction statement, narrowed the election of asserted claims and prior art, substantially completed document production and privilege logs, and started claim construction briefing. *See* Ex. 2012 (Docket Control Order) at 5-6. Moreover, the

briefing schedule on any motion to stay filed after the institution deadline, would likely extend close to or beyond the scheduled end of fact discovery on March 16, 2026. *Id* at 4. Accordingly, Factor 1 favors of denying institution because it is unlikely that the District Court Action will be stayed.

2. *Fintiv* Factor 2 Favors Denial Due to the Trial's Proximity to the Final Written Decision Deadline

*Fintiv* Factor 2 strongly favors discretionary denial because trial in the District Court Action is scheduled to commence on August 3, 2026, five months before the January 11, 2027, deadline to issue a FWD in this case. Ex. 2012 at 1. As a result, engaging in an IPR in parallel to the District Court Action would raise a risk "of inconsistent outcomes and duplication of efforts resulting from . . . proceedings operating in parallel." *Amgen Inc.*, Paper at 2. The Board and Director have repeatedly found that discretionary denial is appropriate when the FWD is expected one or more months after the projected trial date. *See, e.g., Amazon.com, Inc. v. KAIFI LLC*, No. IPR 2025-00624, Paper 16 at 2 (P.T.A.B. July 29, 2025) (a one-month gap between the trial date and FWD deadline favors denial).

The median time-to-trial in the Eastern District of Texas is 21.9 months (i.e., approximately August 20, 2026), which "lends credibility to" the scheduled August 3, 2026, trial date. Ex. 2016; *see also Samsung Elecs. Co. v. Secure Wi-Fi LLC*, No. IPR2024-01367, Paper 10 at 12-13 (P.T.A.B. Mar. 24, 2025) (finding that Factor 2 weighed heavily in favor of denial and recognizing Judge Gilstrap's time-

to-trial statistics as lending credibility to scheduled trial date, which was set to occur five months before FWD deadline); *see also* March 24, 2025, USPTO's recission of Interim Procedure for Discretionary Denials at 3 ("[T]he Board may consider any evidence . . . that bears on the proximity of the district court's trial date . . . including median time-to-trial statistics"). Therefore, *Fintiv* Factor 2 strongly favors discretionary denial of institution.

3. *Fintiv* Factor 3: the Parties' Investment in the Case Favors Denial

*Fintiv* Factor 3 favors discretionary denial because the parties will already have invested significant resources in the District Court Action by the time the Board's institution decision is due. As discussed above, by that time the parties will have prepared infringement, invalidity, and subject-matter eligibility contentions, a disclosure of proposed claim terms for construction, preliminary claim constructions, a joint claim construction statement, narrowed elections of asserted claims and prior art, document productions, privilege logs, and claim construction briefing. *See* Ex. 2012 (Docket Control Order) at 5-6. This level of investment in the parallel District Court Action, combined with Samsung's unexplained delay in filing the Petition, tips Factor 3 in favor of denial. *Fintiv*, Paper 11 at 11-12 (petitioner's unexplained delay in filing petition supports denial)).

4. *Fintiv* Factor 4 Favors Denial Because Samsung's Stipulation is Not a True Alternative to the District Court Action

Fintiv Factor 4 favors denial because Samsung's Petition raises "the same or substantially the same claims, grounds, arguments, and evidence" as are at issue in the parallel District Court Action. *Fintiv*, Paper 11 at 12-13. Here, Samsung disputes the validity of all of the claims asserted in District Court. *See* Ex. 2017 at 1-2. Moreover, there is substantial overlap between the reference and arguments Samsung elected to assert in both forums. *Fintiv*, Paper 11 at 12-13. Samsung's invalidity contentions assert *Kuboi* (Ex. 1004), *Shinohara* (Ex. 1005), and *Yu* (Ex. 1050), the same references at issue in its Petition. In particular, five of Samsung's nine invalidity grounds for the '871 Patent in the District Court Action include at least one of the above as a reference. Ex. 2017 at 53-54.

Samsung's *Sotera* stipulation does not represent a true alternative to the validity portion of the District Court Action. *See* Paper 9; *Cisco Sys. Inc. v. WSOU Investments LLC*, IPR2025-00188, Paper 14 at 3 (P.T.A.B. Aug. 22, 2025) (denying review in part because petitioner's stipulation did not ensure the proceeding would be a true alternative to the district court proceeding). In its stipulation, Samsung expressly reserved the right to assert in the District Court Action any combination of prior art based on printed publications that could have been raised in the petition, so long as the combination also includes evidence (such as a prior art product) that could not have been raised in the Petition. Paper 9. Accordingly, Samsung's

grounds A4, A8 and A9, which rely on alleged prior art products, are unaffected by Samsung's stipulation other than that it cannot rely on at least *Kuboi*, *Shinohara*, *and Yu*, which Samsung cited in this Petition. Ex. 2017 at 53-54. Thus, Samsung's stipulation will not meaningfully narrow the validity issues in the District Court Action.

Indeed, Samsung's stipulation permits it to assert grounds primarily based on ***any*** patents and printed publications other than those cited in the Petition in combination with conventional prior art photodetectors, like the Canon CMOS sensor products, Intel CMOS products or Samsung products. Samsung has raised at least 244 patents and published publications, 138 non-patent publications, and 11 products in its invalidity contentions (Ex. 2017 at 12-30, 30-46, 47-48), and it only promises not to rely on the selected few publications cited in the Petition. *See* Paper 9. And because Samsung will have another opportunity to amend its invalidity contentions following the District Court's claim construction order, Samsung can attempt to keep those references in play in the District Court Action. If Samsung intended to avoid this result, it could have provided a more fulsome stipulation, rather than hedging its bets. Samsung elected not to do so.

Accordingly, Samsung's stipulation seeks to exploit the loophole recognized by the Federal Circuit, without meaningfully narrowing its invalidity grounds in the District Court Action. *See Ingenico Inc. v. IOENGINE, LLC*, 136 F.4th 1354, 1367

(Fed. Cir. 2025) (recognizing that IPR estoppel does not preclude a petitioner from relying on a prior art system in combination with patents and printed publications). Therefore, Factor 4 weighs in favor of denial.

5. *Fintiv* Factor 5 Favors Denial Because the Parties Are the Same

*Fintiv* Factor 5 weighs in favor of exercising discretionary denial because petitioners in this proceeding (Samsung Electronics Co., Ltd., and Samsung Electronics America, Inc.) are also defendants in the District Court Action. *Fintiv*, Paper 11 at 13-14 (when the parties to the parallel district court action are identical, that weighs in favor of discretionary denial).

6. *Fintiv* Factor 6 Favors Denial on the Merits of the Unpatentability Case

*Fintiv* Factor 6 weighs in favor of denying institution because the merits of Samsung's proposed grounds are weak. As discussed directly below, *Kuboi* and *Yu* facially fail to disclose multiple limitations of the Challenged Claims. Tacitly acknowledging the shortcomings in *Kuboi* and *Yu's* disclosures, Samsung relies extensively on the conclusory testimony of its expert, Dr. Lebby, to try to fill in these gaps. *See* § II.C, *infra*. The facial weakness of Samsung's case is another factor in favor of discretionary denial. *Fintiv*, Paper 11 at 15 ("[I]f the merits of the grounds raised in the petition are a closer call, then that fact has favored denying institution when other factors favoring denial are present.").

### C. Petitioners' Extensive Use of Expert Testimony to Fill in a Missing Limitation Warrants Discretionary Denial

Samsung's Petition depends on expert testimony to fill in missing claim limitations, which is another reason to deny institution. In particular, the Petition relies on 32 pages of expert testimony to fill in claim limitation [1g], which is missing from the asserted references, Kuboi and Yu. This limitation requires: "the presence of said one or more holes increases by a factor of at least 1.1 the absorption of the light by at least some of the photodetectors relative to otherwise like photodetectors lacking said holes." Pet. at 35-47 (Ground 1, citing Lebby Decl., ¶¶ 149-175); *id*. at 91-96 (Ground 3, citing Lebby Decl., ¶¶ 267-277). Samsung does not argue that Kuboi or Yu inherently or expressly discloses that the presence of its alleged "holes" increases light absorption by a factor of at least 1.1, as the Challenged Claims require. Pet. at 35-36, 91-92. Instead, Samsung relies on its expert declaration in which the expert tries to calculate a hypothetical amount of light absorption for Kuboi's or Yu's pixels based on a series of assumptions stemming from their pixel dimensions. Lebby Decl., ¶¶ 154-157, 269-272. These calculations are extrinsic to the references and not evidence of how a person of ordinary skill in the art would understand their disclosures.

Samsung's Petition thus depends on expert testimony, rather than any specific teaching in a patent or printed publication. This type of gap filling warrants discretionary denial, as it indicates substantive weakness in the grounds and that

resolution of the Petition will require weighing battling expert opinions which may be more appropriately handled through the receipt of fulsome live testimony in the District Court Action. *See USPTO Memorandum on Interim Processes* (Mar. 26, 2025) at 2 (discretionary denial may be warranted based on the "extent of the petition's reliance on expert testimony").

### D. Discretionary Denial is Warranted Under 35 U.S.C. § 325(d)

The Director should exercise her discretion to deny institution under § 325(d) because Petitioners' challenge relies on references that are cumulative of art already considered by the Examiner during examination.

#### 1. Kuboi is Less Relevant to Patentability Than any Reference Cited During Prosecution or in this Petition

Denial of the Petition under § 325(d) is appropriate because Kuboi is less relevant to patentability than any of the references cited during prosecution or in the Petition. Kuboi discloses an array of photodetectors, including the typical P-I-N semiconductor layers, but that is where the similarities between Kuboi and the '871 Patent (and Yu and Shinohara) end. Rather than use pillars with holes to increase the absorption of photons in these semiconductor layers, Kuboi actively ***blocks*** the semiconductor regions from receiving photons, ensuring that they are only incident on columns of *organic* material. Kuboi at [0059] ("A light shielding film 19 is formed on a surface of the $p^+$-type semiconductor region 18 on the rear surface side of the semiconductor layer 12 so that light h$\nu$ does not enter the semiconductor layer

12."). This is the opposite of what the '871 Patent claims. '871 Patent at Claim 1 (reciting an array of pillars comprising semiconductor material that have light-receiving surfaces). Kuboi is, therefore, not relevant to patentability and is, at most, cumulative to art considered during prosecution. *See Regeneron Pharms., Inc., v. Kymab Ltd.*, No. IPR2019-01579, Paper 9 at 10 (P.T.A.B. Mar. 20, 2020) (finding *Advanced Bionics* prong 1 satisfied when the new reference was found "not relevant, or, at most, cumulative of the prior-art reference . . . considered by the Examiner").

2. Yu Was Already of Record Because it Was Incorporated by Reference Into Yu-331

Yu was previously presented to the office because it was incorporated by reference into U.S. Patent Publication No. 2011/0309331 to Yu ("Yu-331", Ex. 2011). Ex. 2011 at [0001] ("This application is related to U.S. patent application Ser. Nos. . . . 12/974,499, . . . , the disclosures of which are hereby incorporated by reference in their entirety); Ex. 1050 at 1 (showing Application No. 12/974,499). The '871 Patent issued over Yu-331, which was disclosed to the Office in a March 13, 2024, IDS. Ex. 1003 at 135, 143 (IDS). The Examiner marked Yu-331 as "considered" and incorporated its publication number in the prior art search. *See* Ex. 1003 at 100 (Yu-331 considered), 96 (search history entry L105). Accordingly, Yu was previously presented to the Office.

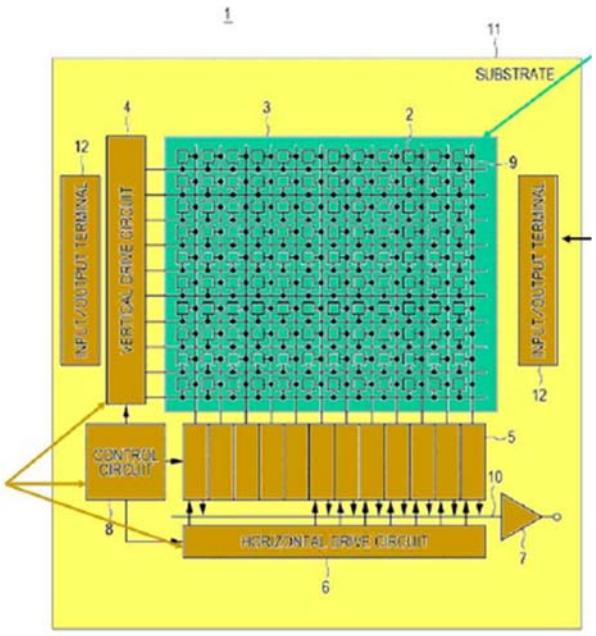
3. Shinohara is Substantially Similar to Baba

Shinohara (Ex. 1005) is cumulative to Baba, which was previously considered during the '871 Patent's examination. Baba was disclosed to the Office in a March 13, 2024, IDS. Ex. 1003 at 136 (IDS, Entry 14); Ex. 2021 (Baba, U.S. Patent Application Publication No. 2020/0006416). The Examiner also incorporated Baba's publication number in its prior art search history. *See* Ex. 1003 at 101 (marking Baba considered), 97 (search history entry L106 ("20200006416")).

Samsung cites Shinohara as a secondary reference for allegedly disclosing "a base dielectric region" (limitation [1e]) and a "pixel region" (claim 2). Pet. at 64-65, 68. Petitioners cited to Shinohara's discussion about "multilayer wiring layer 33" and "interlayer insulating film 31" and Fig. 1, respectively. Pet. at 65 (citing Shinohara, [0082]); *id*. at 68 (citing Ex. 1005, Fig. 1). As shown below, Baba includes a substantially identical discussion and figure:

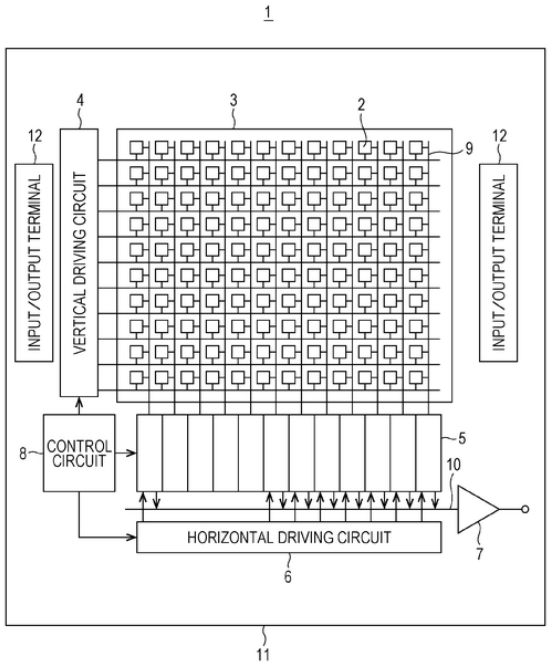
| **Shinohara (Ex. 1005)** | **Baba (Ex. 2021)** |
|---|---|
| [0082]: "Next, as shown in FIG. 4F, the multilayer wiring layer 33 in which a plurality of layers of the wires 32 is disposed with at least **one interlayer insulating film 31** provided therebetween **is formed on the surface of the semiconductor substrate 22**." (emphasis added). | [0111]: "Next, a first **interlayer insulating film 39** is **formed on a surface of the first semiconductor substrate 31**, and then a connection hole is formed through the interlayer insulating film 39 and a connection conductor 44 to be connected to a predetermined transistor is formed." (emphasis added). |

FIG. 1




Pet. at 68 (citing Ex. 1005, Fig. 1)

FIG. 2




Ex. 2021, Fig. 2.

Therefore, the portions of Shinohara relied upon by Petitioners are substantially the same as those already considered by the Office in Baba.

4. Petitioners Have Not and Cannot Make a Showing of Material Error

The second prong of *Advanced Bionics* is satisfied because Petitioners do not show that the Examiner erred in a manner material to patentability. *Ecto World LLC v. RAI Strategic Holdings, Inc.*, No. IPR2024-01280, Paper 13 at 5 (P.T.A.B. May 19, 2025) ("[A] petitioner must provide an analysis even when the asserted prior art is on an IDS but the Examiner did not apply the reference."). Petitioners do not discuss the '871 Patent's prosecution history, do not acknowledge that Yu was

previously presented to the Office via Yu-331, and do not allege any material error during the '871 Patent's examination. Pet. at 5-7. Because the Petition presents only the same or substantially the same prior art and arguments previously presented during prosecution, and because Petitioners have failed to show any error by the USPTO, the Director should exercise her discretion and deny institution under 35 U.S.C. § 325(d). *See Advanced Bionics, LLC v. Med-El Elektromedizinsche Geräte GmbH*, No. IPR2019-01469, Paper 6 at 8-10 (P.T.A.B. Feb. 13, 2020).

## III. CONCLUSION

For all of these reasons, W&Wsens accordingly requests that the Director deny institution of *inter partes* review of the Challenged Claims of the '871 Patent.

Respectfully submitted,

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**CERTIFICATE OF SERVICE**

The undersigned certifies, in accordance with 37 C.F.R. § 42.6(e), and pursuant to agreement by the parties that filing with the Board through the Patent Trial and Appeal Case Tracking System (P-TACTS) constitutes electronic service, that service was made on Petitioners as detailed below.

| | |
|---|---|
| *Date of service* | September 11, 2025 |
| *Manner of service* | Electronic Filing with the Board (joshua.goldberg@finnegan.com; benjamin.saidman@finnegan.com; abhay.watwe@finnegan.com; biju.chandran@finnegan.com; kai.rajan@finnegan.com) |
| *Documents served* | PATENT OWNER'S REQUEST FOR DISCRETIONARY DENIAL |
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