

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BOE TECHNOLOGY GROUP CO., LTD.,

Petitioner,

v.

OPTRONIC SCIENCES LLC,

Patent Owner.

Case IPR2025-00238

U.S. Patent No. 8,604,471

**DECLARATION OF ERIC BRETSCHNEIDER, PH.D. IN SUPPORT OF
PATENT OWNER'S PRELIMINARY RESPONSE**

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1. I, Eric Bretschneider, declare as follows:

I. INTRODUCTION

2. I have been retained by counsel for Patent Owner Optronic Sciences LLC in this proceeding. My credentials are described in my curriculum vitae, which is Exhibit 2013. I offer this report in response to the Petition for *Inter Partes* Review, Case No. 2025-00238 regarding U.S. Patent No. 8,604,471 (the "'471 Patent"), filed by Petitioner Boe Technology Group Co., Ltd.

3. I have been asked by Patent Owner's counsel to offer technical opinions relating to the '471 Patent, the alleged prior art, and the arguments and opinions presented by Petitioner and its expert, Dr. R. Jacob Baker.

4. I am being compensated at my standard consulting rate of \$500 an hour, plus out-of-pocket expenses. My compensation does not depend on the testimony that I express in this Declaration, or on the outcome of these cases.

5. I have conducted a preliminary review of the papers and exhibits filed in this proceeding as of the date my declaration is signed. I understand that Petition challenged the patentability of claims 1, 4, 6, 9, 12, 14, 17, and 18 of the '471 Patent. Specifically, the Petition sets forth the following challenges:

Ground	Claims	Basis	Prior Art
1	1, 4, 6, 9, 12, 14, 17, 18	§103	Hwang
2	Same	§103	Hwang and Godo
3	Same	§103	Hwang and Yamashita
4	Same	§103	Hwang, Godo and Yamashita

6. For purposes of my preliminary analysis, I opine on the theories presented in independent claims 1 and 9. I reserve the right to supplement my analysis to address the full breadth of the Petition and to provide greater depth to my analysis of independent claims 1 and 9 in the event the Board decides to institute trial in this proceeding.

7. After performing the analysis described herein and applying the standard outlined below, in my opinion, none of the authorized grounds provide a reasonable basis for concluding that independent claims 1 or 9 of the '471 Patent should be found invalid. Accordingly, it is my opinion that the Petition does not provide a reasonable likelihood that any of the challenged claims are invalid due at least to their dependence from claims 1 or 9 as well as the additional limitation recited. My opinions are based on the record evidence, my knowledge and experience in the field, and my opinion as to the level of ordinary skill in the art.

II. BACKGROUND AND QUALIFICATIONS

8. My complete qualifications and professional experience are described in my Curriculum Vitae, a copy of which is attached as Exhibit 2013.

9. I have over 30 years of experience with LEDs, displays, lighting fixtures, and lighting including a comprehensive background in a full range of LED technologies, including solid state lighting (SSL) fixture/lamp design, integration, and reliability, LED chip and package testing and reliability, fabrication, optical design, thermal management, and color conversion.

10. Throughout the course of my career, I have designed and transferred into manufacturing over 150 different LED-based lighting products, including LED lighting products designed to be installed in fixtures and in different lighting environments and applications. I have also designed and transferred into manufacturing dozens of different LED chips and packages for a variety of different applications with a particular focus on display applications and general lighting.

11. I am recognized as a leading expert in matters related to reliability for all types of LED technology and have consulted with numerous companies to help develop internal testing methods and reliability standards for evaluating their products.

12. I am currently the Chief Technology Officer at EB Designs & Technology. In that capacity, I am, among other things, responsible for the design of solid-state lighting technologies for clients ranging from startups to Fortune 100 companies.

13. I also served as a member of the University of Florida's Department of Chemical Engineering Advisory Board for 25 years, from 1998 until 2022. During my tenure on this Advisory Board, I served as Chair for a total of 8 years. I also served on the Dean's Advisory board for the College of Engineering at the University of Florida from 2007-2009 and 2017-2022. I have been a Conference Chair for LED Measurement and Standards. I am also a member of numerous professional societies, including the International Society for Optics and Photonics (SPIE), Optica, the Society for Information Display (SID), the Materials Research Society (MRS), and the Illuminating Engineering Society (IES).

14. Inside the IES, I am a founding member of the Science Advisory Panel, which has oversight over all testing and technical committees and work groups inside the IES. I am also a full member of the Test Procedures Committee which develops test, measurement and reliability standards for LEDs and lighting fixtures. Inside the Test Procedures Committee, I serve as chair of the projections and reliability subcommittee which develops reliability standards for LED based lighting products including utilizing all forms of lighting technologies. I recently led the work group that revised TM-21 which is the internationally accepted standard for predicting reliability of LED packages. I also developed a new mathematical model that, for the first time, allows prediction of the color shift of an LED package over

its time. This model is the basis for a new IES standard known as TM-35, which predicts the rate of color shift for LED products over time.

15. I joined the IES in 2006 and have been a member of the Test Procedures Committee since that time. As a result, I have been an active participant in the development of testing standards related and have helped to formalize the terminology for solid state lighting since the beginnings of the industry. Additionally, I serve on the IES Color Committee and the IES Photobiology Committee.

16. I previously served as Chief Technology Officer at QuarkStar, LLC., from 2016 until 2023. QuarkStar is primarily a technology development company that is focused on new approaches to improving performance and efficiency of products that rely on LED light sources. In this role, I helped negotiate the company's first technology license to a European manufacturer of lighting fixtures. This technology has since be incorporated into one of their premium product lines. I also lead the efforts to transition products into manufacturing to produce fixtures for the Museum of Fine Arts, Houston (MFAH). These fixtures provide over 60% of the artificial lighting in a \$500 million expansion.

17. Prior to my position at EB Designs & Technology, I served as the Director of Engineering at HeathCo, LLC. In that capacity, I was responsible for

advanced technology/product development related to solid-state lighting, sensors, notifications, and control products.

18. Prior to my position as Director of Engineering at HeathCo, I was at the Elec-Tech International Co., Ltd., where I held the positions of Chief Engineer, ETi Lighting Research Institute and VP of Research and Development, ETi Solid State Lighting. In my Elec-Tech capacities, my responsibilities included developing all technology and product roadmaps for markets in North America, China, Europe, and Japan. I designed and developed LEDs, LED packages and LED based lighting products for all of these markets.

19. Between 2008 and 2011, I was at Lighting Science Group Corporation (LSG), first as a product development manager, and my responsibilities included developing solid state lighting products, then as VP of Research, and my responsibilities included developing advanced LED models for product development and production control. In these roles, I was involved in the design and manufacture of numerous LED-based lighting fixtures and products. The products I helped launch included LSG's C2D (Curb to Door) products. These products were designed to be installed in outdoor locations including wall packs, parking lots, and streetlights. These fixtures, particularly the wall pack fixtures, were also suitable for installation in public transportation areas.

20. Between 2004 and 2008, I was at Toyoda Gosei North America, where I was a sales manager, and my responsibilities included managing and developing LED die and package sales accounts from the eastern region of North America. I was also tasked with providing technical support for the entire western hemisphere. The support I provided included design of LED packages and design of lighting fixtures and products that incorporated LED packages. Notable successes at Toyoda Gosei included expanding market niches and applications for LED based backlights for LCD displays. I provided significant technical and design support to large customers, including 3M, Global Lighting Technologies, Apple, Dell, and Hewlett Packard.

21. Between 2003 and 2004, I was at Beeman Lighting, where I was Director of Solid State Lighting Engineering, and my responsibilities included leading development of solid state lighting systems and materials.

22. Between 1998 and 2003, I was at Uniroyal Optoelectronics. Uniroyal Optoelectronics was a joint venture between Uniroyal Technology Corporation and Emcore Corporation which was initially focused on development and production of GaN-based and AlInGaP-based LED chips. Later, Uniroyal Optoelectronics expanded their scope to include LED packages. At Uniroyal Optoelectronics, I held a number of positions including Team Leader for the Epitaxial Growth and Materials Characterization areas, Sr. Epi Scientist, Director of Intellectual Property, University

Relations and Government Contracts. My responsibilities included MOCVD hardware modification, epitaxial process development as well as design, development and testing of new LED chip structures for both AlInGaP and GaN-based material systems. I was also responsible for providing technical support and assistance to customers on topics related to use of LED chips, design of LED packages and design of LED based lighting products and systems. This support included both optical and thermal design of LED packages and LED lighting products. My work at Uniroyal included providing technical support and package design for Kopin which resulted in the development of full color micro displays that were used as electronic viewfinders for Kodak digital cameras.

23. I have also authored and presented more than a total of 30 publications, presentations, and seminars, and I am a named inventor on over 65 issued patents and more than 25 pending patents.

24. I earned a bachelor's degree in Chemical Engineering from Tulane University in 1989.

25. I earned a Ph.D. in Chemical Engineering from the University of Florida in 1997, where my graduate work focused on development of optoelectronic devices, including novel silicon based visible LEDs and sulfide based TFELD structures and zinc selenide blue LEDs. As a graduate student, I was also an active participant in the Phosphor Technology Center of Excellence (PTCOE). The

PTCOE was a large research consortium that was focused on technology development of display technology for electroluminescent (both alternating current and direct current) displays, field emission displays, and plasma displays.

26. In 1989 I worked for Shell Oil Corporation in Norco, LA. I was tasked with modeling heat exchanger performance for the crude oil distillation column in order to identify cost saving opportunities. I developed an improved model for determining the operating efficiency of heat exchange units that incorporated determined the economic impact on different operating conditions. The model was designed to be compatible with all major operating units on site and resulted in costs savings of over \$20 million/year at the Norco Facility alone. My work was quickly adopted throughout the entire corporation and has resulted in sustained annual cost savings of approximately \$500 million/year.

27. Based on the above education and experience, I believe that I have a detailed understanding of the state of the art during the relevant period, as well as a sound basis for opining how persons of ordinary skill in the art at that time would understand the claim terms and technical issues in this case. I meet Petitioner's proposed definition, which is "a Bachelor's degree in electrical or computer engineering or a comparable field of study, plus approximately two to three years of professional experience with integrated circuit layout or other relevant industry

experience”, because I have a B.S. and a Ph.D. in Chemical Engineering as well as over 30 years of experience in LED design.

28. The opinions stated in this declaration are based on my own personal knowledge and professional judgment; if called as a witness during any proceeding in this matter I am prepared to testify competently about them.

29. In forming my opinions, I have considered the materials discussed and cited herein, including the asserted patents, the prosecution histories of the patents, and the prior art references discussed herein, and any other references referred to or cited in this declaration.

III. THE '471 PATENT

30. Patent 8,604,471 (the “'471 Patent”) relates to a semiconductor structure and OLED capable of effectively preventing a device characteristic variation that occurs when a device is irradiated by light. Ex. 1001 at 1:43–45. Specifically, the '471 Patent discloses using a light shielding layer to mitigate influence of light irradiation on a thin film transistor. *Id.* at 3:8–13 (“In order to mitigate influence on a thin film transistor caused by light irradiation, for example, a drain induced barrier lowering (DIBL) effect and a current leakage phenomenon, a light mask is used to define a light-shielding layer covering the device, so as to shield the light from directly irradiating the channel layer.”). The '471 Patent further recognizes that “if the light-shielding layer covers a drain electrode of the device, an

extra electric field is generated during operation of the device, which may cause shift and decrease of a threshold voltage of the device driven by a high source voltage, and may also cause the current leakage phenomenon.” *Id.* at 3:13–18. The '471 Patent teaches the importance of providing a light-shielding layer that is “adjusted to balance a light-shielding effect and device performance.” *Id.* at 3:19–21. A conductive light-shielding pattern layer 172 is disposed on the dielectric layer 160, is electrically floating (meaning it is not grounded or connected to the other electrodes), and is overlapped to a portion of the source electrode 140 and a portion of the channel layer 130 in a vertical projection. *Id.* at 3:53–58. The '471 Patent explains that, to balance the light-shielding effect with the device performance and the DIBL effect, the overlapping length d_1 of the preferred embodiment is at least $0.3 \leq d_1/L \leq 0.85$. *Id.* at 4:6–9.

31. The '471 Patent discloses a semiconductor structure as shown in the embodiments in Figs. 1A-4B. Using Petitioner’s annotations, exemplary Figure 4A includes a substrate (12), channel layer (430), gate insulating layer, gate electrode, source electrode (440), drain electrode (450), dielectric layer, and conductive light shielding pattern layer.

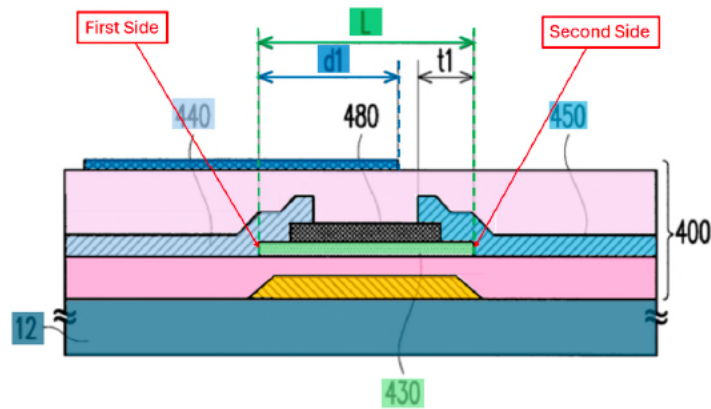


FIG. 4A

Petition at 3 (annotating Ex. 1001, Fig. 4A).

32. The '471 Patent further explains that its semiconductor structure may be implemented in an organic electroluminescent device.

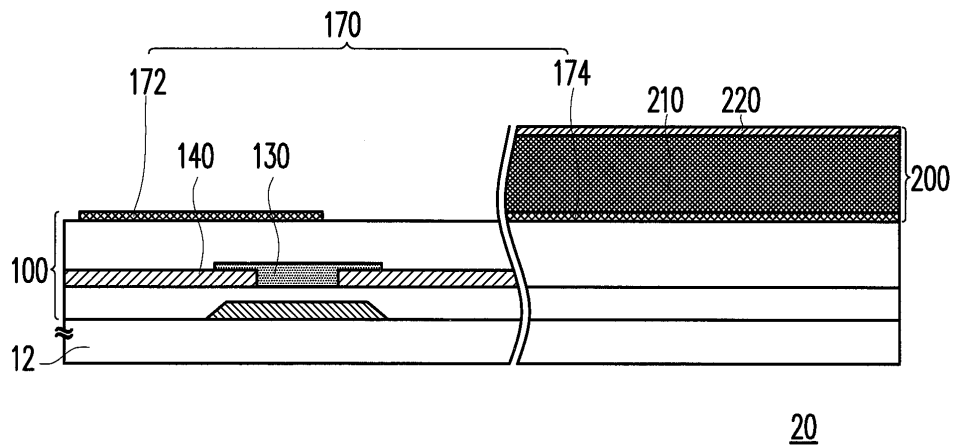


FIG. 2

Ex. 1001, Fig. 2 (showing OLED 200 including a lower electrode 174, organic light emitting material layer 210, and upper electrode 220).

33. The '471 Patent discloses that “the conductive light-shielding pattern layer 172 and the lower electrode 174 can be obtained by patterning a same material layer.” *Id.* at 4:48–50. The '471 Patent explains that its structure enables embodiments where the OLED emits light upwards and embodiments where the OLED emits light downwards. *See id.* 4:58–5:9.

IV. SUMMARY OF THE ALLEGED PRIOR ART

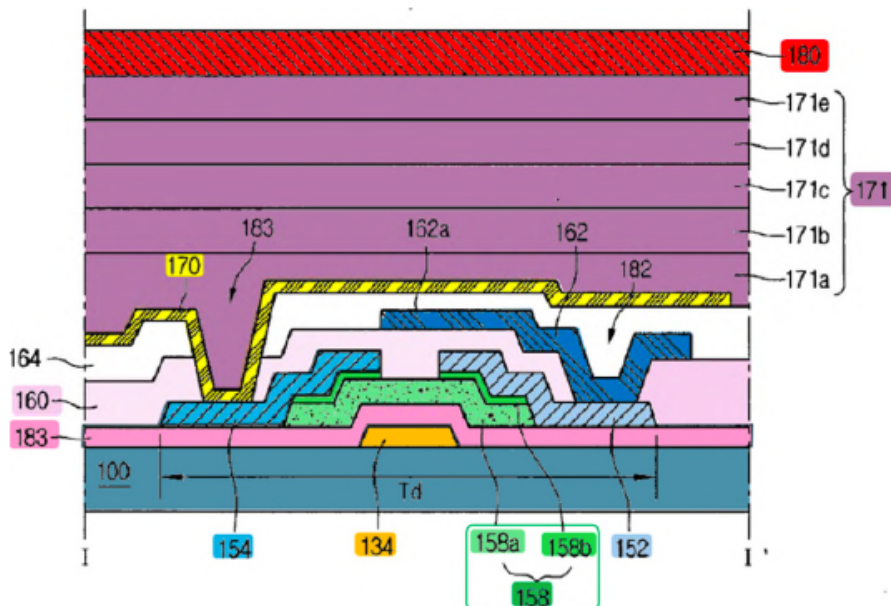
A. Overview of Hwang

34. Hwang describes a top emission OLED and describes the problem with applying the technology to bottom emission OLEDs. *See* Ex. 1004, [0012]–[0013] (“The above-described [related art] OLED is a bottom emission OLED. The bottom emission OLED has stability by a sealing process and high degree of freedom in processing, but has a limited aperture ratio and thus is difficult to apply to a high resolution product. On the other hand, in a top emission OLED, a thin film transistor is easily designed and the aperture ratio can be improved, so that the top emission OLED is advantageous with respect to product life.”); *see also id.* [0038], [0053], [0103]. Specifically, Hwang seeks to “prevent an output current saturation characteristic from being deteriorated and improve reliability and life of a driving device by a ground potential on the driving device in an OLED,” noting that this also “improves image quality by preventing brightness reduction and non-uniformity

caused by a reducing current due to deterioration of an organic light emitting layer.”

Id. at [0141], [0142].

35. Hwang teaches an OLED having a **second semiconductor layer 158** disposed on the **gate insulating layer¹** and located above the **gate electrode 134**, **source electrode 152**, **drain electrode 154**, **passivation layer 160**, **ground line 162**, **auxiliary electrode 162a**, **lower electrode 170** (bright yellow), **organic light emitting layer 171**, and **upper electrode 180**.



Petition at 38 (annotating Ex. 1004, Fig. 3).

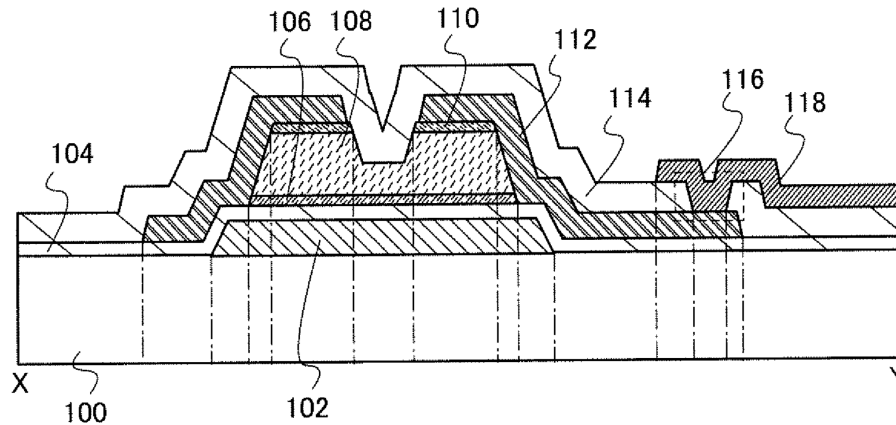
36. Hwang teaches using “a metal layer including at least one of Al, an aluminum alloy, W, Cu, Mo, Ti, Ca, Mg, and LiF/Al . . . to form the first electrode

¹ Fig. 3 of Hwang refers to the gate insulating layer as 183, and Hwang also labels its “second contact hole” as 183. The labeling of the gate insulating layer appears to be a mistake as the specification refers to gate insulating layer 138.

170 [bright yellow].” Ex. 1004, [0089]. Hwang discloses using a ground line to block the electric field generated by the lower electrode 170 (bright yellow). *Id.* at [0073] (“a field effect in the channel of the second semiconductor layer 158 due to the first electrode 170 can be blocked by the ground line 162 and the auxiliary electrode 162 a connected to the second source electrode 152.”), [0050] (“the auxiliary electrode 162 a is formed under the first electrode 170 to not only block an influence of the first electrode 170 on the channel of the second semiconductor layer 158, but also cover only the second semiconductor layer 158 and does not overlap the second drain electrode 154. The auxiliary electrode 162a may be longer or shorter than the channel upon need. Accordingly, a short circuit between the auxiliary electrode 162a and the second drain electrode 154 can be prevented.”).

B. Overview of Godo

37. Godo is directed generally to a thin film transistor for a display device, particularly liquid crystal display devices. *See* Ex. 1005, [0001], [0002], [0033], [0161]–[0164].



Ex. 1005, Fig. 1A (showing a thin film transistor including, inter alia, a gate electrode layer 102 and first semiconductor layer 106).

C. Overview of Yamashita

38. Yamashita relates to electroluminescent displays. Ex. 1006, Abstract. “Each pixel circuit has a thin-film transistor in which a portion of a pattern of a metal wiring material above the channel layer of the thin-film transistor is so laid out as to shield the channel region of the thin-film transistor.” *Id.*

V. THE LEVEL OF ORDINARY SKILL IN THE ART

39. I have been informed that my analysis of the Challenged Claims should be viewed from the perspective of a person of ordinary skill in the art (POSITA) as the earliest claimed priority date, which I have been informed is May 24, 2011.

40. I understand that a POSITA is a hypothetical person presumed to have known the relevant art at the time of the invention. I have been informed that in determining the level of ordinary skill in the art the following factors may be

considered none of which is predominant: (1) type of problems encountered in the art; (2) prior art solutions to those problems; (3) rapidity with which innovations are made; (4) sophistication of the technology; and (5) educational level of active workers in the field.

41. I understand that Dr. Baker has opined that a POSITA “would have had a Bachelor’s degree in electrical or computer engineering or a comparable field of study, plus approximately two to three years of professional experience with integrated circuit layout or other relevant industry experience. Additional graduate education could substitute for professional experience, and significant experience in the field could substitute for formal education.” Ex. 1002, ¶46.

42. For purposes of my preliminary opinion, I will use Dr. Baker’s proposed definition of a POSITA but reserve the right to supplement my opinion if trial is instituted.

VI. APPLICABLE LEGAL STANDARDS

43. I am not a lawyer and offer no legal opinions. My analysis and opinions are based on my expertise in this technical field and on the instruction that counsel has given me for the legal standards outlined in the rest of this section. These principles are summarized below.

A. Burden of Proof

44. I understand that the petitioner must prove invalidity of a patent claim by a preponderance of the evidence, that is, the evidence must be sufficient to show that a fact or legal conclusion is more likely than not.

B. Date of Invention

45. I have been asked to use the date of the filing of the earliest application to which priority is claimed (i.e., December 1, 2004) as the date of invention for purposes of my analysis.

C. Anticipation

46. I understand that a claim may be anticipated if a prior art disclosure teaches each and every element required by the claim, either expressly or inherently. The identical invention must be shown in as complete detail as is contained in the claim. When a claim covers several structures or compositions, either generically or as alternatives, the claim is deemed anticipated if any of the structures or compositions within the scope of the claim is known in the prior art.

47. I understand that, once the claims of a patent have been properly construed, the next step in determining anticipation of a patent claim requires a comparison of the properly construed claim language to the prior art on a limitation-by-limitation basis.

D. Obviousness

48. I understand that even if a patent claim is not anticipated, it may still be invalid if the differences between the claimed subject matter and the prior art are

such that the subject matter as a whole would have been obvious at the time the invention was made to a person of ordinary skill in the pertinent art.

49. I also understand that a patent may be rendered obvious based on an alleged prior art reference or a combination of such references plus what a person of ordinary skill in the art would understand based on his or her knowledge and the references. It is also my understanding that in assessing the obviousness of claimed subject matter one should evaluate obviousness over the prior art from the perspective of one of ordinary skill in the art at the time the invention was made (and not from the perspective of either a layman or a genius in that art).

50. I understand that a patent claim composed of several elements is not proved obvious merely by demonstrating that each of its elements was known in the prior art. There must be a reason for combining the elements in the manner claimed. That is, there must be a showing that a person of ordinary skill in the art at the time of the invention would have thought of either combining two or more references or modifying a reference to achieve the claimed invention.

51. I understand that an obviousness determination includes the consideration of the following factors: (1) the scope and content of the prior art, (2) the differences between the prior art and the claims at issue, (3) the level of ordinary skill in the art, and (4) any secondary indicia of non-obviousness (*e.g.*, “secondary considerations” such as commercial success in the marketplace of the claimed

invention), to the extent that they exist. I understand that the following are examples of approaches and rationales that may be considered:

52. Combining prior art elements according to known methods to yield predictable results;

53. Simple substitution of one known element for another to obtain predictable results;

54. Use of a known technique to improve similar devices (methods, or products) in the same way;

55. Applying a known technique to a known device (method or product) ready for improvement to yield predictable results;

56. Applying a technique or approach that would have been obvious to try (choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success);

57. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to a person having ordinary skill in the art; and

58. Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

59. I understand that the burden is on the petitioner to explain how an invention is obvious if one of ordinary skill in the art, facing a wide range of needs created by developments in the field, would have seen an obvious benefit to the solutions tried by the applicant. I further understand when there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, it may be obvious to a person of ordinary skill to try the known options. If a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique would have been obvious.

60. I understand that the burden is on the petitioner to explain how specific references could be combined, which combinations of elements in specific references would yield a predictable result, and how any specific combination would operate or read on the claims. I further understand that the petitioner cannot rely on conclusory statements but must instead provide a reasoned explanation supported by evidence. I also understand that obviousness does not exist where the prior art discourages or teaches away from the claimed invention. I also understand that even if a reference does not teach away, its statements regarding preferences are relevant to a finding whether a person skilled in the art would be motivated to combine that reference with another reference.

61. I also understand that one of ordinary skill in the art must have a reasonable expectation of success in combining or modifying prior art references.

62. I also understand that all elements of a claim must be considered in an obviousness analysis.

63. I understand that it is impermissible to use hindsight to arrive at the claimed invention. My understanding is that the inventor's own path never leads to a conclusion of obviousness. I also understand that, when assessing whether there was a motivation to combine references to teach a claim element, defining the problem in terms of its solution reveals improper hindsight.

E. Claim Construction

64. I understand that claims are construed from the perspective of a person of ordinary skill as of the effective filing date of the patent application. A "person of ordinary skill in the art" is a hypothetical person who is presumed to have known the relevant art at the time of the invention.

65. I understand that persons of ordinary skill in the art are deemed to read the claims in the context of the entire patent, including the specification and prosecution history.

66. I understand that the claims define the invention and the terms used in the claims are generally given their plain and ordinary meanings they would have to a person of ordinary skill in the art at the time of the effective filing date of the

application. The context of a claim can be particularly helpful, and other claims may inform the meaning of a term in a particular claim.

67. I understand that claim terms are normally used consistently throughout a patent. Thus, the meaning of a term may help inform the meaning of the same term in other claims. Differences between claims may also help define the terms, although this may not be the case where the specification or prosecution history indicate that such differences do not impact the scope of the claims.

68. I understand that a patentee can act as its own lexicographer by defining a term, in the patent specification, to have a specific meaning. It is my understanding that statements made to the patent office by the patentee or its legal representative during prosecution can serve to illuminate, or possibly narrow the proper scope of claim terms, and that such statements must be considered when construing the claim terms. This is sometimes referred to as a disclaimer. I have taken into account these principles in my analysis.

69. I understand that reference materials that were publicly available at the time that the patent application was filed, such as dictionaries, treatises or other technical references, may provide context and background for deciphering how one of ordinary skill in the art would have considered the terms used in the claims.

70. However, I understand that such references, as well as testimony (including this report) are generally known as “extrinsic evidence,” and are accorded

less weight than evidence found within the patent and prosecution history. In addition, I understand that extrinsic evidence that is inconsistent with the claims, specification, or prosecution history should not be considered in the claim construction process.

F. Section 112(f) Means Plus Function

71. I understand that under pre-America Invents Act (AIA) 35 U.S.C. § 112(6) and post-AIA § 112(f) “An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.”

72. I understand that when claim terms use the words “means . . . for” and recites a function, and the term does not recite any structure for performing that function, the term should be construed pursuant to Section 112(f) looking for a corresponding structure, material, or act described in the specification and equivalents.

G. Section 112 Definiteness

73. I understand that, under 35 U.S.C. § 112 ¶ 2, “[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.”

74. I understand that that claims must be definite. This means that the claims must particularly point out and distinctly claim the subject matter that the applicant regards as her invention. I understand that indefiniteness is evaluated from the perspective of a person of ordinary skill in the art at the time of a patent's filing. I understand that a patent claim is indefinite if the claim, when read in light of the specification and the prosecution history, fails to inform, with reasonable certainty, a person of ordinary skill in the art of the scope of the invention. Absolute or mathematical precision in claim language is not required and even if more than one interpretation is presented for a claim term, the term may still be definite if an informed and confident choice is available among the contending alternative definitions.

VII. CLAIM CONSTRUCTION

75. I understand that in *Inter Partes* review, claims “shall be construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 2282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F. R. § 42.100(b). This is also referred to as the *Phillips* standard as explained in the case *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005). I have applied this standard in rendering my opinions herein.

A. “a conductive light-shielding pattern layer”

76. In my opinion, and based on my preliminary analysis, this term should be construed according to its plain and ordinary meaning, which is a conductive pattern layer that blocks directly irradiating light. This is consistent with the plain and ordinary meaning as well as the specification of the '471 Patent, which states:

In order to mitigate influence on a thin film transistor caused by light irradiation, for example, a drain induced barrier lowering (DIBL) effect and a current leakage phenomenon, a light mask is used to define a light-shielding layer covering the device, so as to shield the light from directly irradiating the channel layer.

Ex. 1001 at 3:8–13.

77. I understand that the Petition has offered two constructions. In my opinion, neither construction is consistent with the specification or the plain and ordinary meaning of the terms.

78. I understand that the Petition provides a primary construction that the term *conductive light-shielding pattern layer* “is not limited to any particular degree of conduction or light-shielding.” Petition at 6. In my opinion, this construction is contrary to a POSITA’s understanding of the plain meaning of the terms. By arguing that “no particular degree of conduction or light shielding is required,” the proposed definition would encompass *all materials*, because every material has some degree of light shielding or conductivity. Yet a POSITA would not have understood an insulator to be “conductive” or a transparent material to be “light-shielding.” Rather,

a POSITA would have immediately known what sort of materials are conductive and light-shielding in the art, even if a precise level of conductivity or light-shielding was not specified. For example, while a POSITA would not consider glass to be light-shielding (a POSITA would consider it transparent) or conductive (a POSITA would consider it an insulator), glass would be meet this proposed construction of a conductive light-shielding pattern layer. Accordingly, it is my opinion that the Petition's primary construction should be rejected.

79. I further understand that the Petition provides a proposed alternate construction that the term *conductive light-shielding pattern layer* is “a layer that the designer subjectively intends to serve the purpose of being electrically conductive and shielding the channel layer from some light.” Petition at 9. A POSITA would not have considered conductivity or light-shielding to be issues of the subjective intent of the designer. Accordingly, it is my opinion that the Petition's alternate construction should be rejected.

VIII. Ground 1: Hwang Fails to Render the Independent Claims Obvious

A. Hwang Does Not Have a “conductive light-shielding pattern layer” (Independent Claims 1 and 9)

80. In my opinion, Hwang's ground line 162 / auxiliary electrode 162a would not have rendered the claimed “conductive light-shielding pattern layer” obvious to a POSITA. In fact, Hwang's very structure ensures that a POSITA would not have thought it obvious to include a “light-shielding pattern layer.”

understanding is supported by the disclosure of Hwang itself, which (1) explicitly states that ground line 162 / auxiliary electrode 162a is for blocking *electrical interference* from electrode 170 and (2) does not mention blocking light *anywhere*. See Ex. 1004, [0050]. Further, and as discussed below, the structure identified by Petitioner as the channel layer (second semiconductor layer 158) is also protected from light by passivation layer 160 and/or second passivation layer 164—but the Petition provides no reasoning for excluding such layers (other than that they do not meet the claimed elements).

83. Thus, the very structure of Hwang does not have or need a light-shield, and a POSITA would not have thought it obvious to include a conductive light-shield pattern layer because ground line 162 does not block light—the configuration of lower electrode 170 (yellow) prevents light from reaching ground line 162. In my opinion, the Petition is based on hindsight and a desire to invalidate the claims, not what would have been obvious to a POSITA at the time of the '471 Patent.

IX. Ground 2: Hwang and Godo Fail to Render the Independent Claims Obvious

84. I have reviewed Godo and, in my opinion, nothing in Godo fixes Hwang's shortcomings with respect to the claimed ““conductive light-shielding pattern layer.”

85. Further, the Petition states that “[t]he combination of Hwang and Godo modifies Hwang's general teachings for a broad genus of TFTs with Godo's

disclosure of more particular species of TFTs.” Petition at 44. However, in my opinion, the Petition does not articulate any reason a POSITA would arrive at Godo from Hwang and then apply the “particular species” of Godo to the broader genus of Hwang. It is my opinion that the Petition’s proposed combination of Hwang and Godo is based on hindsight.

X. Ground 3: Hwang and Yamashita Fail to Render the Independent Claims Obvious

86. The Petition states that Hwang and Yamashita render obvious a “conductive light-shielding pattern layer.” I disagree.

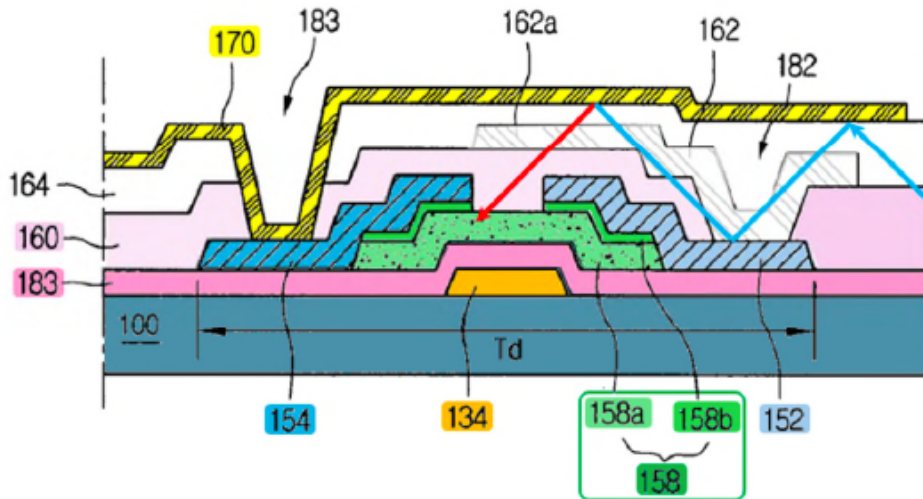
87. I note that the Petition relies on a construction of the limitation “conductive light-shielding pattern layer” that is “a layer that the designer subjectively intends to serve the purpose of being electrically conductive and shielding the channel layer from some light.” *See* Petition at 9, 56–57. As I discussed above, such a construction is inconsistent with the plain and ordinary meaning of the claims. In my opinion, the Petition’s alternate construction should be adopted, and they have not met their burden with respect to this ground.

88. The Petition argues that Yamashita adds “mental recognition” that Hwang’s layer 162/162a is a “conductive light-shielding layer” and that no modifications to Hwang’s structure are necessary. Petition at 57. As I described above in Ground 1, Hwang teaches a top emitting LED and its very structure poses different design considerations and needs to that of the ’471 Patent (e.g., the lower

electrode 170 blocks light but creates an electrical interference). *See* Ex. 1004, [0050] (“However, the auxiliary electrode 162a is formed under the first electrode 170 [yellow] to . . . block an influence of the first electrode 170 [bright yellow] on the channel of the second semiconductor layer 158”). Thus, the very structure of Hwang, without any modification, does not disclose or render obvious a conductive light-shielding pattern layer. In my opinion, the Petition improperly relies on hindsight and does not show a reasonable likelihood of success on the merits.

89. I further note that nothing in Yamashita would impact the designer of Hwang’s “subjective intent” for auxiliary electrode 162a, which is to prevent electrical interference from the electrode. *See* Ex. 1004, [0050] (“However, the auxiliary electrode 162a is formed under the first electrode 170 [yellow] to . . . block an influence of the first electrode 170 [bright yellow] on the channel of the second semiconductor layer 158”). Nothing in Hwang suggests any need for a conductive light-shielding pattern layer, as lower electrode 170 already blocks light from entering the channel layer.

90. Further, the figure depicted in the Petition shows a ray of light emanating from passivation layer 160, which is contrary to what a POSITA would have understood:



Petition at 61. This depiction shows a light ray originating from passivation layer 160 and then passing through passivation layer 160 and second passivation layer 164 to argue that light would impact second semiconductor layer 158 without ground line 162 and auxiliary electrode 162a. A POSITA would have known that a passivation layer protects and insulates and that it does not emit light. Further, in top emitting LEDs (like the one taught by Hwang), it would not have been obvious to consider, let alone use, the type of transparent passivation layers that is assumed in the Petition's hypothetical.

91. Further, there is no reason in the Petition that the proposed combination meets any construction of "conductive light-shielding pattern layer." Under their primary and alternate constructions, the passivation layer 160 and/or second passivation layer 164 would meet the claimed limitation because they inherently block at least some light and have some level of conductivity. This further supports

my opinion that the only way one could arrive at the theory presented in the Petition is through hindsight. Further, under the plain and ordinary meaning of the term, as I explain above, Petitioner's argument about "incident light" fails because Petitioner is not pointing direct irradiating light.

92. Accordingly, in my opinion, the Petition has not shown a reasonable likelihood of success on this or any other ground.

XI. Ground 4: Hwang, Godo, and Yamashita Fail to Render the Independent Claims Obvious

93. In my opinion, for purposes of the issues addressed at this stage, Ground 4 incorporates the arguments of Grounds 1-3. I incorporate Grounds 1 through 3 above.

94. In sum, it is my opinion that trial should not be instituted, as the Petition has not set forth a reasonable likelihood that it will prevail on any of the challenged claims.

95. I reserve the right to supplement my opinion with additional details and arguments if trial is instituted.

XII. CONCLUSION

96. In signing this Declaration, I understand that the Declaration will be filed as evidence in contested cases before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I acknowledge that I may be subject to cross-examination in this case and that cross examination will take place within the

United States. If cross examination is required of me, I will appear for cross examination within the United States during the time allotted for cross examination.

97. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the '471 Patent.

Executed on July 16, 2025 at Parker, Colorado.



Eric Bretschneider, Ph.D.