

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LITE-ON TECHNOLOGY CORPORATION

Petitioner,

v.

SENSOR ELECTRONIC TECHNOLOGY, INC.,

Patent Owner.

Inter Partes Review No. 2022-00780

U.S. Patent No. 9,923,117

**PATENT OWNER'S RESPONSE
TO PETITION**

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<i>TQ Delta, LLC v. CISCO Systems, Inc.</i> , 942 F.3d 1352 (Fed. Cir. 2019)	20, 27

EXHIBIT LIST

Ex. No.	Description
Ex. 2001	Chambers Dictionary of Science and Tech., definition for “homogeneous”, 2007.
Ex. 2002	United States Patent No. 7,812,366.
Ex. 2003	E. Fred Schubert, “Light-Emitting Diodes”, pgs. 167-168, 2006.
Ex. 2004	United States Patent and Trademark Office, Director Memorandum, dated June 21, 2022.
Ex. 2005	<i>Sensor Electronic Tech., Inc. v. Lite-On Tech. Corp. et al.</i> , Case No. 6:21-cv-00322-ADA (W.D. Texas), Dkt. No. 1, Complaint with Jury Demand, dated April 2, 2021.
Ex. 2006	<i>Sensor Electronic Tech., Inc. v. Lite-On Tech. Corp. et al.</i> , Case No. 6:21-cv-00322-ADA (W.D. Texas), Dkt. No. 45, Amended Scheduling Order, dated June 22, 2022.
Ex. 2007	<i>Burley Licensing LLC v. Micro-Star International Co. Ltd.</i> , Case No. 6:21-cv-00862-ADA (W.D. Texas), Docket Report.
Ex. 2008	<i>Frac Shack Inc. v. Alaska Fuel Distributors Inc.</i> , Case No. 7:19-cv-00026-ADA-DTG (W.D. Texas), Docket Report.
Ex. 2009	<i>MicroPairing Technologies LLC v. General Motors LLC</i> , Case No. 6:21-cv-00761-ADA (W.D. Texas), Docket Report.
Ex. 2010	<i>ParkerVision, Inc. v. LG Electronics Inc.</i> , Case No. 6:21-cv-00520-ADA (W.D. Texas), Docket Report.
Ex. 2011	<i>TrackThings LLC v. Amazon.com, Inc. et al</i> , Case No. 6:21-cv-00720-ADA (W.D. Texas), Docket Report.
Ex. 2012	Docket Navigator, Motion Stay Success Rates Pending <i>Inter Partes</i> Review in W.D. Texas.
Ex. 2013	Ryan Davis, “Albright Says He’ll Very Rarely Put Cases On Hold For PTAB”, Law360, dated May 11, 2021.
Ex. 2014	<i>Sensor Electronic Tech., Inc. v. Lite-On Tech. Corp. et al.</i> , Case No. 6:21-cv-00322-ADA (W.D. Texas), Dkt. No. 36, Agreed Scheduling Order, dated February 24, 2022.
Ex. 2015	Docket Navigator, Time to Trial in W.D. Texas.
Ex. 2016	<i>Sensor Electronic Tech., Inc. v. Lite-On Tech. Corp. et al.</i> , Case No. 6:21-cv-00322-ADA (W.D. Texas), Defendants’ Preliminary Invalidity Contentions, dated March 24, 2022.

Ex. No.	Description
Ex. 2017	Declaration of Etai Lahav in Support of Patent Owner's Motion For <i>Pro Hac Vice</i> Admission
Ex. 2018	Declaration of Dr. Daniel Feezell in Support of Patent Owner's Contingent Motion to Amend
Ex. 2019	Deposition Transcript of Dr. James R. Shealy, taken on January 26, 2023.
Ex. 2020	U.S. Patent Application No. 14/984,156
Ex. 2021	Declaration of Dr. Daniel Feezell in Support of Patent Owner's Response to Petition

I. INTRODUCTION

Lite-On Technology Corporation's ("Lite-On "or "Petitioner") arguments should be rejected and the challenged claim of U.S. Patent No. 9,923,117 ("the '117 Patent") should be upheld. The '117 Patent, assigned to Sensor Electronic Technology, Inc ("SETi" or "Patent Owner") is directed to a novel arrangement for a semiconductor device not found in the prior art. Particularly, the claimed structure includes inhomogeneous regions having attributes that differ from the material forming the semiconductor layer. These regions are vertically offset from each other and are arranged in multiple levels of the semiconductor layer.

As discussed below and in the attached Declaration of Dr. Daniel Feezell (Ex. 2021), the four prior art references at issue fail to disclose the claimed arrangement. Lite-On fails to support its invalidity positions beyond conclusory statements and unexplained citations to the record. Lite-On purports to rely on an expert, but he offers conclusory "opinions" on the limitations in question without providing any analysis. The Petition should be rejected and the challenged claim should be found not unpatentable.

II. RELATED PROCEEDINGS UNDER 37 C.F.R § 42.8(B)(2)

The '117 Patent is currently the subject of a lawsuit in the United States District Court for the Western District of Texas: *Sensor Electronic Technology,*

Inc. v. Lite-On Technology Corporation, Lite-On Technology USA, Inc., Lite-On, Inc., and Lite-On Trading USA, Inc., No. 6:21-cv-00322-ADA (W.D. Tex.), filed on April 2, 2021 (the “Western District of Texas Case”).

III. THE ’117 PATENT

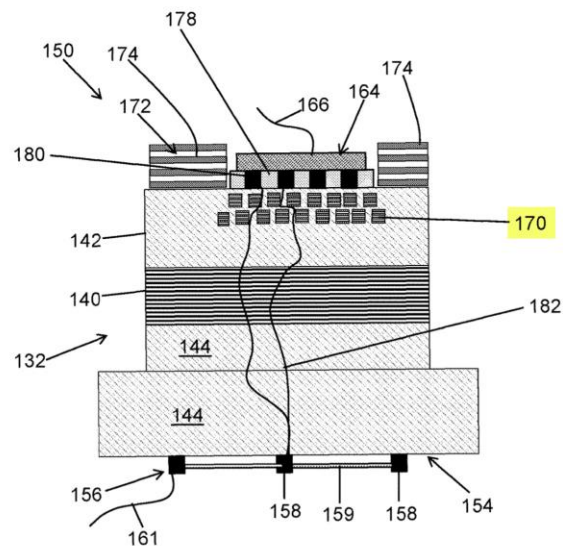
A. OVERVIEW

The ’117 Patent improves upon issues with deep-UV LEDs caused by “light trapping within the device, light absorption in the semiconductor layers, as well as light absorption in the contact regions.” Ex. 1001, 1:53-55. It does so by providing a semiconductor layer that includes a plurality of inhomogeneous regions. The inhomogeneous regions have “one or more attributes that differ from a material forming the semiconductor layer,” such as a region “configured based on radiation having a target wavelength,” a transparent region, a reflective region, and/or a region having “higher conductivity than a conductivity of the radiation-based regions.” *Id.*, 2:5-16.

The ’117 Patent discloses the arrangement of inhomogeneous regions within multiple levels of the semiconductor layer. For example, Figure 13A depicts reflective regions arranged within multiple levels of a semiconductor layer that are vertically offset from each other: “As shown in FIG. 13A, the reflective elements 170 in each level can be staggered with reflective elements in an adjacent level

such that there is an offset in position between elements in the different levels.” *Id.*, 16:3-6.

FIG. 13A



Id., Fig. 13A (annotated).

B. PROSECUTION HISTORY

During prosecution, the examiner rejected method claims 8-10 (which are not challenged by Lite-On here) over U.S. Patent Application Publication No. 2004/0031956 to Saxler (“Saxler,” Ex. 1007) in combination with another Saxler reference. Ex. 1018 at 163-64. To overcome that rejection, Patent Owner argued “FIG. 4 of Saxler . . . shows a first set of discontinuous regions 34 in a first layer 32 and another set of discontinuous regions 40 in a third layer 38, with a second layer 36 separating layers 32 and 38. Both the first layer 32 and the third layer 38 are separate and distinct semiconductor layers. Each of these layers in Saxler . . .

only have a single level of discontinuous regions and not multiple levels. In view of these distinctions, [the first Saxler reference] in view of Saxler . . . does not disclose or suggest a single semiconductor layer having a plurality of inhomogeneous regions arranged within multiple levels of the single semiconductor layer. *Id.* at 229. This is consistent with SETi's argument *infra* that Saxler does not disclose or render obvious limitation 1[d], even in view of Dr. Shealy's conclusory "expert testimony." *See infra* section IX.E.

C. CHALLENGED CLAIM

Claim 1 of the '117 Patent are challenged in the Petition and is shown below.

1[pre] A semiconductor heterostructure, comprising:

1[a] an active region;

1[b] a metallic contact;

1[c] a group III nitride semiconductor layer located between the active region and the metallic contact;

1[d] the semiconductor layer including a plurality of inhomogeneous regions arranged within multiple levels of the semiconductor layer along a height direction of the semiconductor layer;

1[e] wherein some of the inhomogeneous regions in a first level of the semiconductor layer are vertically offset from inhomogeneous regions in a second level of the semiconductor layer, and

1[f] wherein the plurality of inhomogeneous regions include one or more of a set of transparent regions, a set of reflective regions and/or a set of conductive regions;

1[g] each of the inhomogeneous regions having a set of attributes differing from a group III nitride material forming the semiconductor layer.

IV. CLAIM CONSTRUCTION

A. “inhomogeneous region”¹

The parties dispute whether the inhomogeneity of the regions derives from the mere introduction of a different material into the “group III nitride semiconductor layer” (Lite-On’s position) or whether the region is “inhomogeneous” because of its own properties (SETi’s position).

The term “inhomogeneous region” should be construed as “a region whose compositional makeup varies within the region.” Based on both the intrinsic and

¹ In its institution decision, the Panel “encourage[d] the parties to propose an express construction for the term ‘inhomogeneous regions,’ which appears to be a focus of the parties’ argument.” Paper 11 at 8.

extrinsic evidence, it is clear that the term does not merely refer to a different material introduced into the “group III nitride semiconductor layer.”

The claim language supports SETi’s proposed construction. Limitations 1.c. and 1.d together provide “a group III nitride semiconductor layer . . . including a plurality of inhomogeneous regions.” That is, the claim language requires that the inhomogeneous regions are **in** the semiconductor layer, and not that the semiconductor layer itself is inhomogeneous (even though it might also be). Ex. 2021 ¶ 32.

The specification also supports SETi’s proposed construction. The specification discloses that “[t]he inhomogeneous regions can include one or more of: a set of transparent regions, a set of reflective regions, and/or a set of conductive regions.” Ex. 1001, 5:43-46. The specification gives an example of such a conductive region as one that has “a higher concentration of carriers due to, for example, a locally reduced band gap of the semiconductor layer, a local high doping of the semiconductor layer, and/or the like,” i.e., its internal composition intrinsically varies due to it having increased doping in certain areas of the conductive region. *Id.*, 5:61-65.

Similarly, the specification gives an example of an inhomogeneous region that is reflective, reflective region 40A-40C. The specification states that these regions can “be formed of a composite mirror having alternating sublayers of low

index of refraction material 42 and relatively high index of refraction material 44.”

Id., 7:15-19. The specification further states that a reflective region 40 can be “epitaxially grown, and include a superlattice of group III nitride semiconductor sublayers 42, 44,” where the composition of these layers is “chosen such that a refractive index of one sublayer is different from a refractive index of another sublayer by at least two percent.” *Id.*, 7:21-28.

The specification also gives an example of an inhomogeneous region that is transparent, an $\text{Al}_x\text{In}_y\text{Ga}_{1-x-y}\text{N}/\text{Al}_{x'}\text{In}_{y'}\text{Ga}_{1-x'-y'}\text{N}$ superlattice, which has alternating layers comprised of materials with different compositional makeup. *Id.*, 9:8-10.

All of these examples from the specification concern inhomogeneous regions whose internal composition varies within the region. Ex. 2021 ¶¶ 33-38.

Extrinsic evidence also supports SETi’s proposed construction. The word “homogeneous” means “a system in which the chemical composition and physical state of any physically small portion are the same as those of any other portion.” Ex. 2001, Chambers Dict. of Sci. & Tech. (2007). Thus, the word “inhomogeneous” means such a system in which the chemical composition/physical state of some of the physically small portions are different from other portions. Ex. 2021 ¶ 39.

Dr. Shealy did not propose a construction for “inhomogeneous regions” in his declaration. Ex. 1002 ¶¶ 54-55; Ex. 2019, 41:9-14. Nor did he explain what

the plain and ordinary meaning of the term is. Ex. 1002 ¶ 55. Notably, his opinions concerning why certain disclosures in the prior art constituted “inhomogeneous regions” are entirely conclusory, with him merely identifying something and stating, without explanation, that it was an “inhomogeneous region.” *See, e.g. id.* ¶¶ 76, 92.

During deposition, it became clear that Dr. Shealy had in fact been applying an implied construction of the term, as he testified that “anything that is imbedded in the semiconductor that is not the same semiconductor of identical crystal orientation would be an **inhomogeneous layer**.” Ex. 2019, 63:10-14 (emphasis added). He also testified that a region would be inhomogeneous if it “had a different crystal orientation, it had a different composition, if it had a defect running through it,” “anything that’s different about it that changes its semiconductor properties would be considered inhomogeneous.” *Id.*, 63:14-17, 64:14-17.

This testimony makes explicit that Lite-On is interpreting “inhomogeneous” to apply to the semiconductor layer as a whole and not as a description of the characteristic of the inhomogeneous region itself, as SETi’s proposed construction properly does. And, Dr. Shealy’s implicit construction contradicts his statement in

his declaration that the term “inhomogeneous region” should be given its plain and ordinary meaning.² SETi’s proposed construction should be adopted.

V. A PERSON HAVING ORDINARY SKILL IN THE ART

For the purposes of this Response, SETi does not dispute the definition of a person of ordinary skill in the art (“POSA”) adopted in the institution decision, which is a person with “Bachelor’s degree in physics, electrical engineering, materials science, or a related field, and three to five years of experience in semiconductor devices, with specific experience in nitride based LEDs.” SETi contends that Lite-On has failed to meet its burden under any definition of a POSA.

VI. OHMAE DOES NOT RENDER OBVIOUS CLAIM 1 OF THE ’117 PATENT (GROUND 1)

Claim 1 is not rendered obvious by U.S. Patent Application Publication No. 2007/0085093 to Ohmae *et al.* (“Ohmae,” Ex. 1004).

A. Overview of Ohmae

Ohmae discloses a light-emitting diode with a substrate having protruded portions. Ex. 1004 ¶ 21. In Figure 35, the protruded portions are grown on top of a conductive substrate and then a p-type nitride-based III-V Group compound

² 37 CFR § 42.104(b)(3) requires the Petitioner in the Petition to “identify . . . [h]ow the challenged claim is to be construed.” *Id.* As stated above, Lite-On failed to do that here, instead relying on an implicit claim construction that it did not disclose. Thus, Lite-On should be held to the content of its Petition.

semiconductor layer is grown on top of the protruded portions. *Id.* ¶ 231. In a different embodiment, Ohmae discloses growing multiple n-type nitride-based III-V Group compound semiconductor layers on top of each other in succession. *Id.* ¶¶ 247, 248; Ex. 2021 ¶¶ 47-48.

B. Lite-On fails to provide any justification for its single-reference obviousness ground based on multiple embodiments

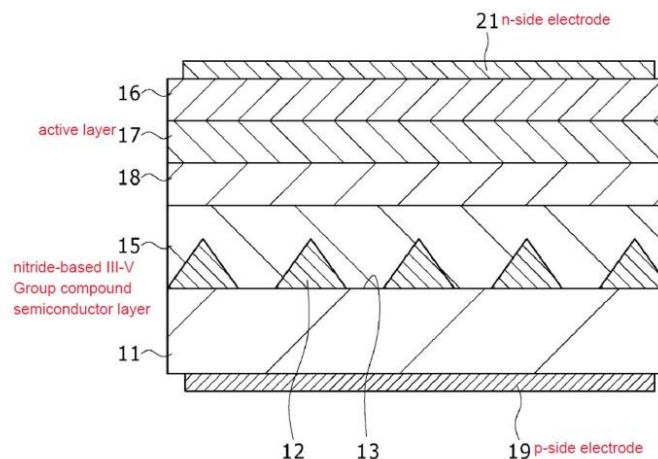
Lite-On's Ground 1 is purportedly a single-reference obviousness ground based on Ohmae. Lite-On states that "a POSITA would have understood that Ohmae renders obvious each of the limitations recited in Claim 1 of the '117 Patent." Pet. at 25. However, Lite-On relies improperly on mixing and matching embodiments. *See Net MoneyIN, Inc. v. VeriSign Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008). In particular, Lite-On relies exclusively on the Figure 35 embodiment for claim limitations 1[a], 1[b], and 1[c]. Pet. at 27-29. In contrast, Lite-On relies on the Figure 39 embodiment for limitations 1[d] and 1[e]. Critically, Lite-On offers no justification for its combination of Ohmae's different embodiments.

In the Institution Decision, the Panel stated that it "appears that Petitioner cites to Figure 35 to demonstrate the overall structure of the Ohmae device . . . and Figure 39 to depict certain layers of Figure 35, i.e. layers 12 and 15, when those layers are grown by 'repeating the step plural times.'" Paper 11 at 19.

But that is not what Ohmae discloses.

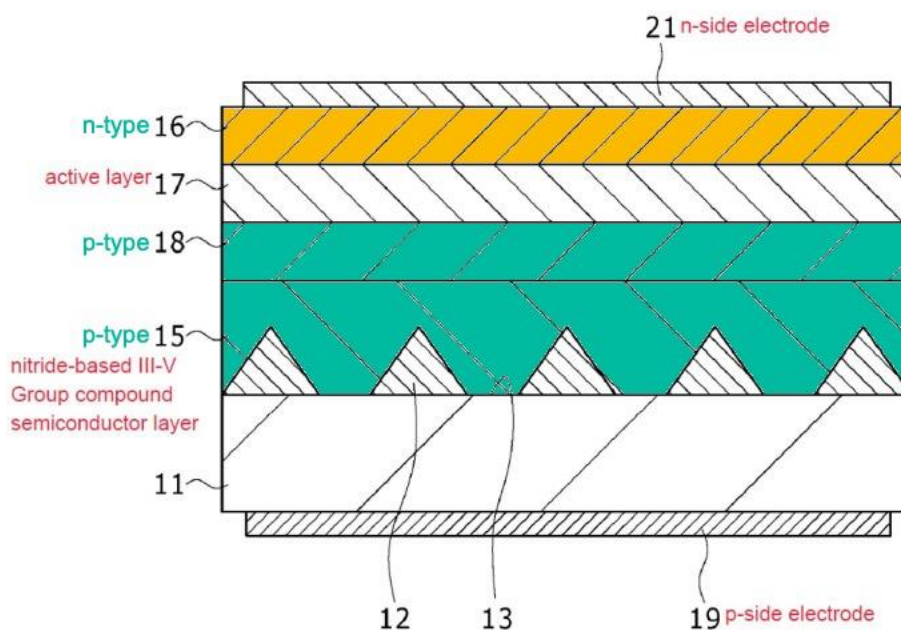
Ohmae discloses multiple different embodiments. Ohmae discusses a first embodiment, *see, e.g.*, Ex. 1004 ¶ 157, and then goes on to discuss, in successive fashion, to discuss 31 additional embodiments, *id.* ¶ 344. Figure 35 depicts the twelfth embodiment and Figure 39 depicts the sixteenth embodiment. *Id.*, ¶¶ 231, 247. The Figure 39 embodiment is a variation of the first embodiment, shown in Figure 3, and has no relation to the embodiment in Figure 35. *Id.* ¶ 248 (“The sixteenth embodiment other than [the specific features recited with respect to this embodiment] above is similar to the first embodiment.”). Critically, Figures 35 and 39 show fundamentally different embodiments, rather than alternate variations of the same embodiment, as Lite-On contends and which the Panel found in its Institution Decision. Ex. 2021 ¶ 53.

The Figure 35 embodiment is a vertical semiconductor structure, with a p-side electrode on the bottom, as depicted in Lite-On’s annotated figure, reproduced below:



Pet. at 11 (Annotated Figure 35, Ex. 1004).

Ohmae discloses that layer 15 in the Figure 35 embodiment “is of a **p-type**, on which a p-type nitride-based III-V Group compound layer 18, an active layer 17 and an n-type nitride-based III-V Group compound layer 16 are successively grown,” with an n-side electrode on top. Ex. 1004 ¶ 231 (emphasis added). Thus, as further annotated below in green, the structure in Figure 35 is grown with the p-side layers deposited first, and then the n-type layer deposited on top of the active layer. Ex. 2021 ¶ 54.



Ex. 1004, Fig. 35 (annotated).

Unlike the embodiment depicted in Figure 35, the embodiment in Figure 39 differs in two critical ways.

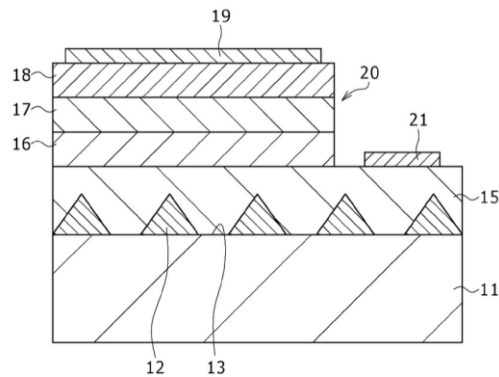
First, the Figure 39 embodiment is grown with the n-type layer deposited first, not the p-type layer. Although Figure 39 uses the numeral 15 to label the three layers in the Figure, these three layers are not p-type layers. Ex. 2021 ¶ 55.

Ohmae discloses that, in the Figure 39 embodiment, on top of the uppermost layer 15, the following layers are successively grown: an [sic] nitride-based III-V Group compound layer 16, an active layer 17 and a **p-type** nitride-based III-V Group compound layer 18. Ex. 1004 ¶ 247 (emphasis added). A POSA would understand that in the LED depicted in Figure 39, in addition to the explicitly-referenced p-type layer 18, there would need to be one or more n-type layers, to allow the LED to operate. Ex. 2021 ¶ 56. Dr. Shealy agrees, as he admitted at his deposition that layer 16 is an n-type layer. Ex. 2019, 50:13-15.

As explained below, Ohmae discloses, and Dr. Shealy admitted, that the three layer 15s in Figure 39 are also n-type layers.

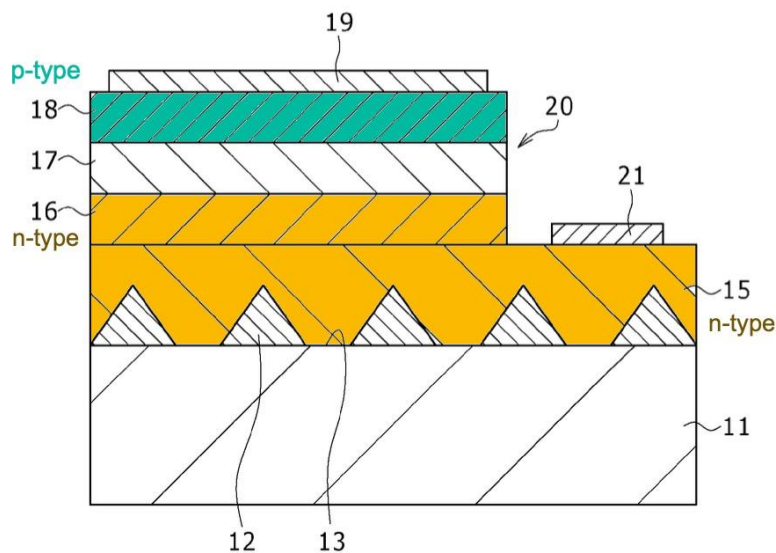
Figure 39 is a modification of the first embodiment, Ex. 1004, ¶ 248, and in the first embodiment, the following semiconductor structure is depicted in Figure 3:

FIG. 3



Ohmae discloses that layer 15 is “of an n-type,” layer 16 is n-type, and layer 18 is p-type. Ex. 1004 ¶ 157; Ex. 2019, 56:5-57:7; Ex. 2021 ¶ 57. Thus, in the first embodiment, the n-type layers are deposited first, as shown in the annotated version of Figure 3 below:

FIG. 3



Ex. 1004, Figure 3 (annotated).

Because Ohmae discloses that the sixteenth embodiment, other than the specific differences mentioned, is the same as the first embodiment, the three layer 15s in Figure 39 are also n-type layers. Ex. 1004 ¶¶ 157, 247, 248; Ex. 2021 ¶ 58.

Dr. Shealy agrees: “[The three layer 15s are] all labeled the same, so they’re all going to be n-type.” Ex. 2019, 58:18-25.

Thus, contrary to Lite-On’s argument and contrary to the institution decision, the embodiments in Figures 35 and 39 are distinct and cannot be combined in the conclusory fashion advocated by Lite-On.

This is because p-type layers and n-type layers are fundamentally different structures, as Dr. Feezell explains. The p-type layer(s) provide the holes and n-type layer(s) provide the electrons that recombine in the active layer. Ex. 2021 ¶ 61. Merely substituting the n-type layers 15 from Figure 39’s embodiment in place of the p-type layer 15 in Figure 35’s embodiment results in an undesirable device that would have two opposing p-n junctions, leading to a device with at least one reverse-biased p-n junction and rectifying current-voltage characteristics. Ex. 2021 ¶ 61. Lite-On and Dr. Shealy provide no reason or motivation to modify Figure 35’s embodiment in this manner, other than pure hindsight, and neither Lite-On nor Dr. Shealy acknowledge the fundamental differences between these two embodiments. Pet. at 32 (“As shown and described with respect to Figure 39 of Ohmae, the nitride-based III-V Group compound semiconductor layer 15 in Figure

35 of Ohmae includes multiple levels (i.e., multiple sub-layers 15), and the protruded portions 12 are arranged within the multiple levels of the nitride-based III-V Group compound semiconductor layer 15 along the vertical direction.”); Ex. 1002 ¶ 78.

The Figure 35 and Figure 39 embodiments also differ in the placement of the p-type and n-type electrodes. In the Figure 35 embodiment, the p-type electrode is on the bottom of the LED structure and the n-type electrode is on the top, whereas in the Figure 39 embodiment, both the p-type and the n-type electrodes are on the top of the LED. Ex. 1004, Figs. 3, 35, 39; Ex. 2021 ¶ 62. Dr. Shealy acknowledges that both electrodes being on the top of the LED is the configuration that the “vast majority of gallium nitride LEDs” take. Ex. 2019, 36:25-37:7. Thus, for this additional reason, a POSA would not be motivated to modify the Figure 35 embodiment, whose LED has its contacts on the top and bottom, based on the Figure 39 embodiment, whose LED has its contacts only on the top. Finally, the conductive substrate 11 in Figure 35 is a p-type substrate, and thus substituting the p-type layer with the three n-type layers would also require replacing that p-type substrate with an n-type substrate. Ex. 2021 ¶ 63.

If a petitioner seeks to rely on a “combined embodiment” based on “multiple, distinct teachings that the artisan might somehow combine to achieve the claimed invention,” it must reconcile the “question of obviousness” as a

threshold matter. *Net MoneyIN*, 545 F.3d at 1371. This is true irrespective of whether it is “combining disclosures from multiple references, [or] combining multiple embodiments from a single reference, or selecting from large lists of elements in a single reference.” *In re Stepan Co.*, 868 F.3d 1342, 1345-46 n.1 (Fed. Cir. 2017). “[T]here must be a motivation to make the combination and a reasonable expectation that such a combination would be successful, otherwise a skilled artisan would not arrive at the claimed combination.” *Id.*; *see also Abiomed, Inc. v. Maquet Cardiovascular, LLC*, IPR2017-01204, Paper 9, at 8-12 (P.T.A.B. Oct. 23, 2017).

Lite-On never argues that its mix-and-match embodiment of “multiple, distinct teachings” is obvious. *Net MoneyIN*, 545 F.3d at 1371. Instead, Lite-On merely states that “Ohmae discloses this limitation” for every claim limitation, and then summarily concludes at the end of the Ground 1 section that “Ohmae . . . renders obvious Claim 1 of the ’117 Patent.” Pet. at 36. Lite-On’s failure to explain why a person of ordinary skill in the art would combine the Figure 35 and 39 embodiments, which, as discussed above, are fundamentally different, is fatal to this Ground. *Apple Inc. v. MPH Techs. Oy*, 28 F.4th 254, 262–63 (Fed. Cir. 2022) (finding that the Board’s rejection of Petitioner’s expert’s conclusory testimony on obviousness that was “improperly guided by hindsight” was based on substantial evidence and that it “amounted to an argument about ‘what *could* be combined’

and a conclusory statement that the combination would have been obvious”); *Supercell Oy v. Gree, Inc.*, IPR2020-00513, Paper 11 at 16 (P.T.A.B. Jun. 24, 2020) (“Generic conclusions that the references could have been combined is insufficient.”). For this reason alone, Lite-On has failed to demonstrate that claim 1 is unpatentable with respect to Ground 1.

C. Ohmae does not disclose or render obvious limitation 1[d] of Claim 1, “the semiconductor layer including a plurality of inhomogeneous regions arranged within multiple levels of the semiconductor layer along a height direction of the semiconductor layer”

Lite-On has failed to demonstrate that Ohmae discloses or renders obvious i) a “plurality of inhomogeneous regions” that are ii) “arranged within multiple levels of the semiconductor layer.”

1. Lite-On fails to demonstrate that Ohmae’s protruded portions are “inhomogeneous regions”

Ohmae discloses, according to a first embodiment, a method for manufacturing a light-emitting diode that includes “a providing step.” Ex. 1004 ¶ 21. The “providing step provides a substrate having a plurality of protruded portions on one main surface thereof.” *Id.* Ohmae discloses, in reference to its Figure 39 embodiment, that “the step of forming protruded portions 12 and growing the nitride-based III-V Group compound semiconductor layer 15 like the

first embodiment starts from forming protruded portions 12 on the substrate 11, followed by repeating the step plural times.” *Id.* ¶ 247.

Lite-On argues that Ohmae’s protruded portions 12 may be made of “various types” of materials such as dielectric materials or conductors and that “protruded portions made of dielectric materials or conductors would constitute inhomogeneous regions within the semiconductor layer composed of nitride-based III-V Group compound semiconductor.” Pet. 30-32; Ex. 1002 ¶¶ 75-76. Thus, according to Lite-On and Dr. Shealy, because the protruded portions are not made of the nitride-based III-V Group compound semiconductor material that Figure 35’s layer 15 is made of, they are “inhomogeneous regions.” *Id.*; *see also* Ex. 2019, 63:14-17, 64:14-17.

But as discussed above, limitation 1[d] provides for a semiconductor layer that includes a plurality of inhomogeneous regions arranged within the layer; the claim limitation is not directed to an inhomogeneous semiconductor layer. *See supra* Section IV.A. Therefore, Lite-On has failed to demonstrate that Ohmae discloses or renders obvious limitation 1[d] for this reason alone. Ex. 2021 ¶ 67.

Additionally, Lite-On has failed to demonstrate that the protruded portions it identifies are “inhomogeneous regions” under SETi’s proposed construction. Although Lite-On broadly argues that the “protruded portions made of dielectric materials or conductors would constitute inhomogeneous regions,” it fails to

explain how these materials are “regions whose compositional makeup varies within the region,” and indeed, Lite-On believes that such a showing is not necessary because it has a fundamentally different interpretation of what constitutes an inhomogeneous region. Pet. at 34-35; Ex. 1002 ¶ 76, 81; Ex. 2021 ¶ 68.

Dr. Shealy opines that “the nitride-based semiconductor material grown on top of the protruded portions are also inhomogeneous regions.” Ex. 1002 ¶ 76. Once again, Dr. Shealy does not explain why this particular material within the semiconductor layer 15 additionally constitutes an “inhomogeneous region,” either under Lite-On’s flawed interpretation of the term or under SETi’s proposed construction. Indeed, his entire opinion is cabined to one sentence. *Id.*

This conclusory testimony, which fails to offer any factual support or explanation as to how Ohmae’s “protruded portions” or the unidentified semiconductor material grown above the protruded portions are the claimed “inhomogeneous regions” should thus be given little to no weight. *See Apple*, 28 F.4th at 262–63 (the Board may reject expert testimony “based on a lack of factual support”); *TQ Delta, LLC v. CISCO Systems, Inc.*, 942 F.3d 1352, 1357 (Fed. Cir. 2019) (overturning Board decision that relied on “conclusory testimony” for unpatentability); *American Multi-Cinema, Inc. v. Fall Line Patents, LLC*, IPR2019-00610, Paper 42 at 16 (P.T.A.B. May 17, 2022) (rejecting testimony

where the expert “cites nothing to support” the testimony and finding that “[c]onclusory testimony by an expert is not persuasive”).

For these reasons, Ohmae does not disclose or render obvious limitation 1[d] of claim 1.

2. Lite-On’s argument with respect to limitation 1[d] improperly mixes embodiments and fails to explain why combining them would be obvious

As discussed above, Lite-On relies on the Figure 35 embodiment as its base embodiment for the other claim limitations. Pet. at 27-29. However, Figure 35 depicts a single row of protruded portions in one semiconductor layer 15. Ex. 1004 ¶ 231; Figure 35. Thus, Lite-On must rely on combining Figure 35 with the Figure 39 embodiment, which depicts protruded portions in three separate layer 15s. Ex. 1004 ¶ 247; Figure 39. But as also discussed above, Figure 35 and Figure 39 depict fundamentally different semiconductor structures, which Lite-On and Dr. Shealy fail to acknowledge, and Lite-On provides no rationale for combining these embodiments in the manner it proposes, other than hindsight using the claim language as a guide. *See supra* Section VI.B.

For this reason, Ohmae does not disclose or render obvious limitation 1[d] of claim 1.

- D. Ohmae does not disclose or render obvious limitation 1[e] of Claim 1, “wherein some of the inhomogeneous regions in a first level of the semiconductor layer are vertically offset from**

inhomogeneous regions in a second level of the semiconductor layer”

As discussed above, Lite-On’s Figure 35/39 combination should be rejected. *See supra* Section VI.B. Without that combination, Lite-On cannot demonstrate that its alleged inhomogeneous regions—the protruded portions 12—are vertically offset from one other in different levels, because Figure 35 only discloses protruded portions 12 in one layer. *See* Ex. 1004 ¶ 231; Fig. 35.

Lite-On additionally alleges that “the nitride-based semiconductor material grown on top of the protruded portions are also inhomogeneous regions.” Pet. at 30 (citing Ex. 1002 ¶ 76). However, Lite-On fails to argue that limitation 1[e] is disclosed or rendered obvious in reference to these alleged inhomogeneous regions. Instead, Lite-On’s argument and Dr. Shealy’s opinions with respect to limitation 1[e] rely only on the protruded portions being allegedly vertically offset. Pet. at 33-34; Ex. 1002 ¶¶ 79-80.

For this reason, Lite-On has failed to demonstrate that limitation 1[e] is disclosed or rendered obvious by Ohmae.

VII. BAN DOES NOT RENDER OBVIOUS CLAIM 1 OF THE ’117 PATENT (GROUND 2)

Claim 1 is not rendered obvious by Japan Patent No. 2000-22283 to Ban *et al.* (“Ban,” Ex. 1005).

A. Overview of Ban

Ban discloses a semiconductor laser device. Ex. 1005 ¶ 42. Ban's third embodiment discloses an n-type GaN layer with a SiO₂ mask layer 34 embedded in that layer. *Id.* ¶¶ 42, 43; Ex. 2021 ¶ 72.

B. Ban does not disclose or render obvious limitation 1[d] of Claim 1, “the semiconductor layer including a plurality of inhomogeneous regions arranged within multiple levels of the semiconductor layer along a height direction of the semiconductor layer”

Ban does not disclose or render obvious limitation 1[d] of Claim 1 because it does not disclose or render obvious a “plurality of inhomogeneous regions.” Instead, Ban discloses a SiO₂ mask layer 34. Neither Lite-On nor its expert demonstrate that the SiO₂ mask layer 34 is the claimed plurality of inhomogeneous regions and instead implicitly allege that the limitation is met by incorrectly interpreting this limitation as “an inhomogeneous semiconductor layer.”

Ban discloses a SiO₂ mask layer 34 “embedded in a stripe shape in the group III-V compound semiconductor layer on the substrate.” Ex. 1005 ¶ 43. Ban further discloses that “a SiO₂ mask layer 34 (having a thickness of 100 nm) is formed by plasma CVD or the like and a striped opening with a pitch of 4μm and a width of 1.5μm is formed in the [1-100] direction of the GaN by the photolithography and dry etching processes.” *Id.* ¶ 45.

Neither Lite-On nor Dr. Shealy point to any disclosure or suggestion in Ban that the SiO₂ mask layer 34 in Ban is “a plurality of inhomogeneous regions.”

Instead, Dr. Shealy summarily concludes that “[i]n my opinion, the SiO₂ mask layer constitutes an inhomogeneous region,” without any explanation. Ex. 1002 ¶ 92. At his deposition, Dr. Shealy testified that his opinion is based on the implicit claim construction he failed to disclose in his declaration: that because the SiO₂ mask layer 34 has a different composition and different crystalline structure than the GaN layer 33, it is inhomogeneous. Ex. 2019, 64:18-65:4.

But this interpretation of the claim limitation by Lite-On and Dr. Shealy was revealed as an absurdity when Dr. Shealy testified that the SiO₂ mask layer 34 is in fact *homogeneous*:

Q. So the mask layer is just made of SiO₂, correct?

A. Yes.

Q. So the SiO₂ is homogeneous, right?

A. The SiO₂ within itself would be considered a homogeneous material; in other words, there’s not any composition or any other attributes that would vary, you know, within that stripe.

Ex. 2019, 72:18-73:3.

Thus, by Dr. Shealy’s own admission, the SiO₂ mask layer 34 cannot constitute “a plurality of inhomogeneous regions” because the mask layer is a homogeneous material. Similarly, the mask layer does not constitute a “plurality of inhomogeneous regions” under SETi’s proposed construction of the term,

because its composition does not vary within the layer. Ex. 2021 ¶¶ 73-75; Ex. 2019, 72:18-73:3.

For this reason, Ban does not disclose or render obvious limitation 1[d] of claim 1.

VIII. SHUR DOES NOT RENDER OBVIOUS CLAIM 1 OF THE '117 PATENT (GROUND 3)

Claim 1 is not rendered obvious by W.O. Publication No. 2013/023197 to Shur *et al.* (“Shur,” Ex. 1006).

A. Overview of Shur

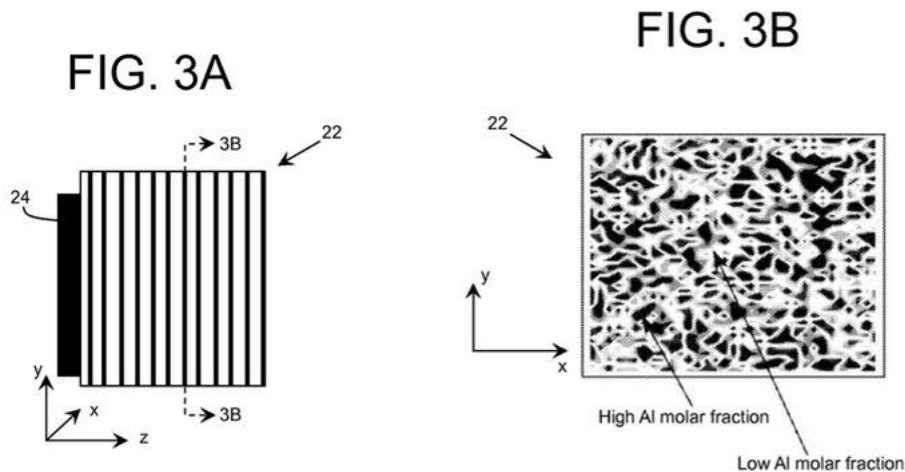
Shur discloses “use of composite inhomogeneities [to] obtain[] a more optimal semiconductor material for light emitting/transmission applications.” Ex. 1006 ¶ 11. It discloses a semiconductor structure with a p-type cladding layer having multiple sub-layers. *Id.* ¶ 45. Figure 5 depicts conductive channels that are disposed in these sub-layers. *Id.* ¶ 54.

B. Lite-On has not established that Shur discloses or renders obvious limitation 1[e] of Claim 1, “wherein some of the inhomogeneous regions in a first level of the semiconductor layer are vertically offset from inhomogeneous regions in a second level of the semiconductor layer”

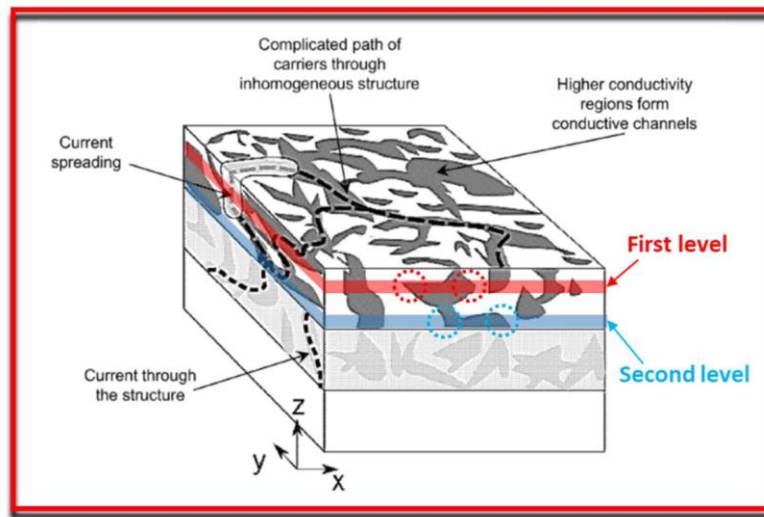
Lite-On has failed to establish that Shur discloses or renders obvious limitation 1[e] of Claim 1.

Shur discloses in Figure 3A a p-type cladding layer made up of “a $\text{Al}_x\text{Ga}_{1-x}\text{N}/\text{Al}_y\text{Ga}_{1-y}\text{N}$ superlattice.” Ex. 1006, ¶ 45. Shur further discloses that Figure 3A

“illustrates variation in aluminum composition within the layer 22 along the height of the layer (e.g., indicated by direction z) in a direction normal to a surface of the layer 22 adjacent to the p-type metal 24.” *Id.* Shur then discloses that Figure 3B illustrates “variation in the aluminum composition of the p-type cladding layer 22 in the **lateral directions** (e.g., indicated by directions x and y) of the layer 22.” *Id.*, ¶ 46 (emphasis added). Shur states that “areas with a high aluminum composition are indicated by the dark regions, while areas with a low aluminum composition are indicated by the lighter/bright regions.” *Id.*, ¶ 45.



Shur’s Figure 5 depicts “a schematic representation of an illustrative carrier path in a complicated energy landscape caused by the inhomogeneities according to an embodiment.” *Id.* ¶ 54. Lite-On annotated Figure 5 below by adding arbitrary “First level” and “Second level” delineations, shown in red and blue below.



Lite-On argues that its annotated Figure 5 shows “red-circled inhomogeneous regions in a first level of the semiconductor layer that are vertically offset from blue-circled inhomogeneous regions in a second level of the semiconductor layer.” Pet. at 54-55. Dr. Shealy repeats verbatim the Petition’s assertion. Ex. 1002 ¶ 117. He then states, without explanation, “[i]n my opinion, each of the red circle or blue circle constitutes an inhomogeneous region within the semiconductor layer; thus, Shur discloses this limitation.” *Id.*³

Lite-On’s conclusory argument is fatally flawed.

First, the “regions” identified by Dr. Shealy are not separate regions. As Dr. Feezell explains, the dark areas in Figure 5 are areas of relatively low aluminum

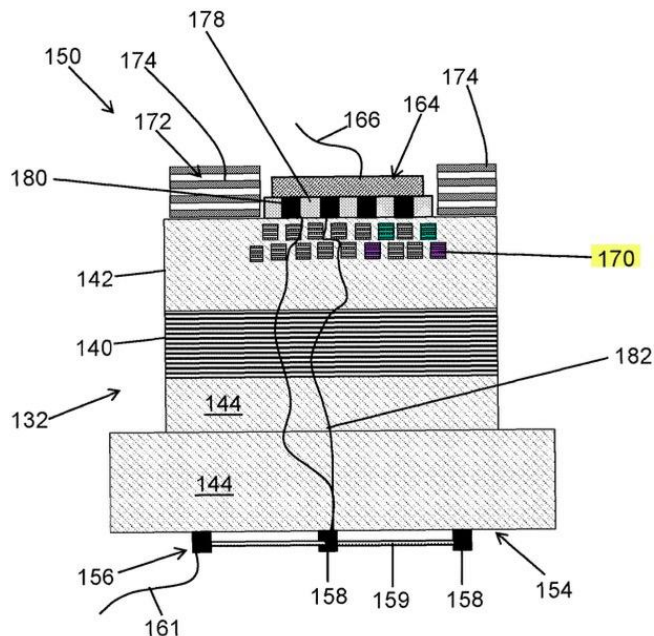
³ Similar to his opinions discussed *supra*, Dr. Shealy’s conclusory opinion, which lacks any factual support, should be disregarded. See *Apple*, 28 F.4th at 262–63; *TQ Delta*, 942 F.3d at 1357.

composition and thus they form conductive channels. Ex. 2021 ¶ 81. These dark areas, as depicted in Figure 5, are separated by gaps, as can plainly be seen in the figure. *Id.* Instead of identifying different regions in his analysis, Dr. Shealy identified four “regions” identified that have no gap in between them and are in fact one single region. Ex. 2021 ¶ 82. Critically, Dr. Shealy admitted at his deposition that the dark region where he and Lite-On’s attorneys applied red and blue circles was “one continuous region.” Ex. 2019, 76:4-10.

But limitation 1[e] requires separate “inhomogeneous regions in a first level of the semiconductor layer” and “inhomogeneous regions in a second level of the semiconductor layer.” Because Lite-On only identified a single region (which Dr. Shealy has improperly and arbitrarily cut up into four alleged “regions”), it cannot show that Shur discloses or renders obvious separate “inhomogeneous regions in a first level of the semiconductor layer” and “inhomogeneous regions in a second level of the semiconductor layer.” Ex. 2021 ¶ 83.

Additionally, the single continuous region cannot be “vertically offset” as required by the claim limitation because a single region cannot be offset from itself. In contrast, the ’117 Patent discloses staggered inhomogeneous regions 170 “such that there is an offset in position between elements in the different levels.” Ex. 1001, 16:3-6. This is depicted in Figure 13A, reproduced below, with annotations added:

FIG. 13A



Unlike the inhomogeneous regions 170 in Figure 13A, the identified single continuous region in Shur, Figure 5 is not offset in position from itself. Ex. 2021 ¶¶ 84-85.

For these reasons, Lite-On has failed to demonstrate that Shur discloses or renders obvious limitation 1[e] of claim 1.

IX. SAXLER DOES NOT RENDER OBVIOUS CLAIM 1 OF THE '117 PATENT (GROUND 4)

Claim 1 is not rendered obvious by U.S. Patent Application Publication No. 2004/0031956 to Saxler (Ex. 1007).

A. Overview of Saxler

Saxler discloses “a Group III nitride based semiconductor structure.” Ex. 1007 ¶ 16. Saxler discloses semiconductor layers composed of a wide bandgap material and additionally discloses incorporating a different bandgap semiconductor material inside the layers. *Id.* ¶ 25.

B. Lite-On fails to provide any justification for its single-reference obviousness ground based on multiple embodiments

Lite-On’s Ground 4 is purportedly a single-reference obviousness ground based on Saxler. Lite-On states that “[a] POSITA would have understood that Saxler renders obvious each limitation recited in Claim 1 [of the ’117 Patent]”. Pet. at 57. However, Lite-On relies exclusively on the Figure 4 embodiment as disclosing claim limitations 1[a], 1[b], and 1[c]. Pet. at 58-60. For limitations 1[d], 1[e], 1[f], and 1[g] however, Lite-On instead relies on the Figures 1, 3, and 4 embodiments, but offers no justification for its combination of Saxler’s different embodiments. *Id.* at 61-73.

Instead, Dr. Shealy states that “a POSITA would understand that Saxler’s teaching” in the Figure 1 embodiment can be applied to the Figure 4 embodiment. Ex. 1002 ¶ 134. He bases his opinion on Saxler’s statement that “embodiments of the present invention are not limited to such a structure” and “may be suitable for use in light emitting devices and/or lasers such as those described in” more than a dozen other patents. Ex. 1007, ¶ 30. (“Saxler expressly discloses that

embodiments of its invention (e.g., its teaching of the regions 22 embedded in the layer 20) can be applied to other light emitting diode structures and incorporated by reference several disclosures.”). Ex. 1002 ¶ 134.

But there is no “teaching” in Saxler that the regions 22 in Figure 1 can be combined or applied to the structure depicted in Figure 4. Nor is there any motivation identified by Lite-On for doing so. Rather, the paragraph of Saxler that Dr. Shealy relies on concerns applying the Saxler embodiments to light emitting devices and/or lasers in **other** prior art patents. Ex. 1007 ¶ 30; Ex. 2021 ¶ 90.

Similarly, Lite-On and Dr. Shealy rely on the Figure 3 embodiment to disclose limitation 1[e] but offer no explanation for combining the Figure 3 and Figure 4 embodiments. Pet. at 65-66; Ex. 1002 ¶ 135. Indeed, for this limitation, Lite-On and Dr. Shealy do not even mention the Figure 4 embodiment. *Id.*; Ex. 2021 ¶ 91. Finally, a POSA would not be motivated to modify Figure 4 in view of the Figure 3 embodiment because it adds significant complexity to the growth process. Ex. 2021 ¶ 91.

For these reasons and those discussed *supra* with respect to Ohmae (*see supra* Section VI.B), Lite-On has failed to demonstrate that claim 1 is unpatentable with respect to Ground 4.

C. Lite-On has not established that Saxler discloses or renders obvious limitation 1[a], “an active region”

Lite-On relies on optional layer 36 in Saxler's Figure 4 embodiment, which "may be provided between the first layer 32 and a third layer 38 and may have a lower bandgap than that of the first layer 32 and the third layer 38 to provide a well region for the device." Ex. 1007 ¶ 26.

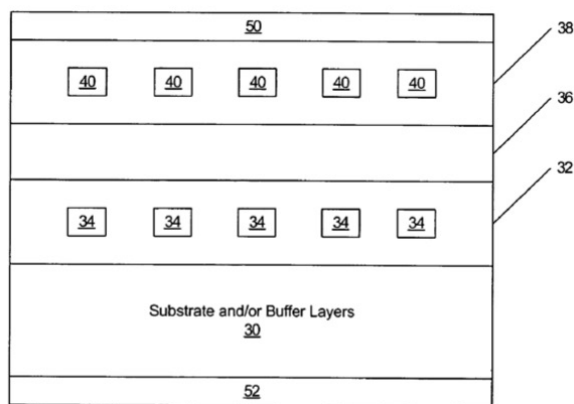


Figure 4

Saxler also discloses that "the first layer 32, second layer 36 and/or third layer 38 may be multiple layers, for example, in a multi-quantum well embodiment of the present invention." *Id.*, ¶ 28.

The active region refers to a layer where holes and electrons are injected and electron-hole recombination occurs to emit light. Ex. 2021 ¶ 95. As the '117 Patent discloses and as Dr. Shealy similarly acknowledges in his declaration, "[d]uring operation of the LED, a voltage bias applied across doped layers leads to injection of electrons and holes into an active layer where electron-hole recombination leads to light generation." Ex. 1001, 1:39-42; Ex. 1002 ¶¶ 37, 44.

But Lite-On points to no disclosure in Saxler regarding any recombination of electrons and holes in or any light emission by second layer 36; indeed, layer 36 is described by Saxler as being “optional,” further cutting against this layer being the claimed “active region.” Saxler only explains that the optional second layer 36 is a layer with a low bandgap. Because a modern LED must have an active region in order for it to be considered an LED, the fact that Saxler discloses that layer 36 is “optional” tells a POSA reading the reference that layer 36 cannot be the active region. Ex. 2021 ¶ 95.⁴

For this reason, Lite-On has failed to demonstrate that Saxler discloses or renders obvious limitation 1a of claim 1.

D. Lite-On has not established that Saxler discloses or renders obvious limitation 1[b], “a metallic contact”

Saxler does not disclose or render obvious limitation 1[b] of Claim 1 because it does not disclose a metallic contact. Saxler merely discloses, in Figure 4, that “[c]ontacts 50 and 52 may also be provided.” Ex. 1007 ¶ 26. Lite-On argues that contact 50 is made of metal, but there is no support in Saxler for that assertion, nor does Lite-On point to any. Instead, Lite-On turns to Dr. Shealy to

⁴ In his discussion of limitation 1[c], Dr. Shealy fails to take a position with respect to identifying which layer in Figure 4 is the claimed “active region.” Ex. 1002 ¶ 125. Instead, he vacillates between three different layers. *Id.* However, when forced to pick a layer for a subsequent claim limitation, he chooses layer 36, *Id.* ¶ 129, which is an untenable, for the reasons discussed above.

offer attorney argument masked as an expert opinion: “A POSITA would understand that contact 50 (and alternatively, contact 52) is a metallic contact of the semiconductor device; specifically, a POSITA would understand that contact 50 is an ohmic contact made of metal.” Pet. at 59 (citing Ex. 1002 ¶ 126). Dr. Shealy offers no explanation or basis for why a POSITA would understand that contact 50 is “an ohmic contact made of metal”; he merely says so.

Lite-On appears to be making an implied inherency argument. But a POSA would understand that the contact in Saxler could, for example, be made of Indium Tin Oxide (ITO), a common p-type contact material. Ex. 2003 at 167-68; Ex. 2021 ¶¶ 98-99. ITO is *not* metallic. Ex. 2003 at 168; Ex. 2021 ¶ 99. Thus, the mere presence of a contact in Saxler does not *necessarily* disclose a metal contact.

To the extent Lite-On relies on an obviousness rationale for this element, it has utterly failed to disclose it. There is no motivation to combine supplied nor any discussion of reasonable expectation of success. Thus, the Petition fails on this element.

Lite-On next tries to rely on a patent incorporated by reference into Saxler, but this too fails. Pet. at 59-60 (“Saxler incorporates by reference U.S. Patent No. 6,201,262, which discloses forming an ohmic contact to a conductive substrate.”). In incorporating by reference the ’262 Patent, Saxler states that “embodiments of the present invention may be suitable for use in light emitting devices and/or lasers

such as those described in U.S. Pat. No. 6,201,262.” Ex. 1007 ¶ 30. There is no incorporation by reference of the ’262 Patent as it relates specifically to an ohmic contact, and indeed, the word “ohmic” does not even appear in the ’262 Patent’s specification, only in the claim limitation that Lite-On and Dr. Shealy randomly seize upon. Furthermore, Saxler incorporates by reference **over a dozen** prior art patents, including the ’262 Patent, and does so by stating that the purported inventions in Saxler “may be suitable for use in light emitting devices and/or lasers such as those described” in those patents, not that the disclosures of those references can be used in aspects of Saxler’s disclosures. *See Apple Inc. v. Int’l Trade Com’n*, 725 F.3d 1356, 1362–63 (Fed. Cir. 2013) (reversing finding of anticipation because prior art reference “failed to identify with detailed particularity what specific material it incorporates and clearly indicate where that material is found in the various documents”). That is not what Lite-On and Dr. Shealy have done here in cherry-picking two lines from a prior art patent generally incorporated by reference with a dozen others.

For this reason, Lite-On has failed to demonstrate that Saxler discloses or renders obvious limitation 1[b] of claim 1.

E. Saxler does not disclose or render obvious limitation 1[d], “the semiconductor layer including a plurality of inhomogeneous regions arranged within multiple levels of the semiconductor layer along a height direction of the semiconductor layer”

Saxler does not disclose or render obvious limitation 1[d] for two reasons.

First Saxler does not disclose “a plurality of inhomogeneous regions.”

Instead, in Figure 1, Saxler discloses regions that have a different bandgap than the material comprising a semiconductor layer, but neither Lite-On nor its expert demonstrate that these regions are the claimed inhomogeneous regions, except by saying, without support, that they are. Second, Saxler does not disclose regions arranged within multiple levels of the semiconductor layer along a height direction. Instead, Figure 3 merely depicts a semiconductor layer 20 with regions 22 but Saxler does not disclose the orientation of the figure.

Saxler discloses, in the Figure 1 embodiment, “a first layer 20 of wide bandgap semiconductor material having a first bandgap has included therein regions 22 of wide bandgap semiconductor material having a second bandgap.”

Ex. 1007 ¶ 18. Figure 1 depicts a “top view of a layer of wide bandgap semiconductor material” and Figure 2 depicts a cross section of the layer of Figure 1. Figure 2 additionally depicts regions 22 arranged in a single level of layer 20.

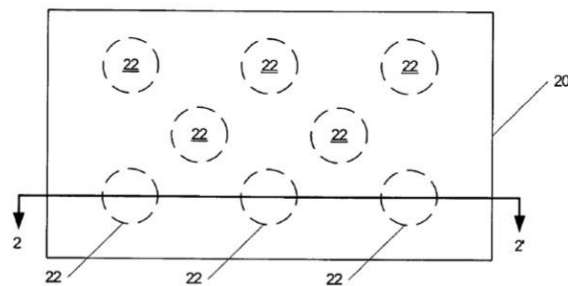


Figure 1

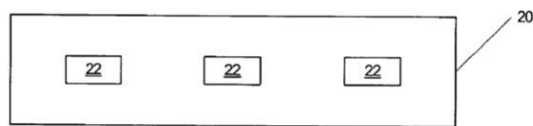


Figure 2

Dr. Shealy offers yet another conclusory opinion that “the regions 22 constitute inhomogeneous regions because these regions can include wider bandgap material, transparent regions, and contribute to higher electrical conductivity of the semiconductor layer 20 in which the regions 22 are embedded.” Ex. 1002 ¶ 131. But there is no disclosure or teaching in Saxler that the regions 22 are transparent and neither Lite-On nor Dr. Shealy point to such a disclosure. Ex. 2021 ¶ 102. Instead, Lite-On and Dr. Shealy rely on the teachings of the ’117 Patent with respect to the properties of the claimed plurality of inhomogeneous regions. Pet. at 62-63 (citing Ex. 1002 ¶ 131). This is improper and cannot fill the hole in Lite-On’s deficient prior art. *See In re Ochiai*, 71 F.3d 1565, 1570 (Fed. Cir. 1995) (holding that it is legal error to “use[] [the] specification as though it

were prior art in order to make the claim ... appear to be obvious”). And, once again, Dr. Shealy’s opinion is based on his implicit and erroneous claim interpretation that the term requires an “inhomogeneous semiconductor layer,” and not that the regions 22 are themselves “inhomogeneous regions.”

Lite-On and Dr. Shealy also fail to demonstrate that these regions are regions whose compositional makeup varies within the regions, as required by SETi’s proposed construction. Ex. 2021 ¶ 104.

Lite-On and Dr. Shealy then rely on Figure 3 as disclosing the arrangement of regions in multiple levels, Pet. at 63-64, Ex. 1002 ¶ 132, but there is no disclosure in Saxler regarding the composition of the regions 22 in the Figure 3 embodiment, such that Lite-On can demonstrate that these regions constitute “inhomogeneous regions.” Ex. 1007 ¶ 21. At best, Lite-On relies on the generic disclosure that the regions “can include a wider bandgap material”. Pet. at 61 (citing Ex. 1002 ¶ 131).

With respect to the allegations that Saxler meets limitation 1[d]’s requirement of “inhomogeneous regions” in multiple levels, neither Lite-On nor Dr. Shealy cite to or rely on the specification’s description of Figure 3, and instead create their own summation of what Figure 3 shows:

“Annotated FIG. 3 of Saxler . . . shows the semiconductor layer 20 including a plurality of inhomogeneous regions (the regions 22; shown in yellow)

arranged within multiple levels of the semiconductor layer (layer 20) along a height direction (vertical direction) of the semiconductor layer.”

Ex. 1002 ¶ 132; Ex. 2021 ¶ 106.

And, Lite-On cannot rely on Figure 4 on its own as disclosing this limitation, as the regions 40 and 34 are in **separate** semiconductor layers, and are not arranged within one semiconductor layer as required by the claim. As discussed *supra*, Lite-On’s only recourse is to mix-and-match the Figures 1, 3, and 4 embodiments, which is improper.

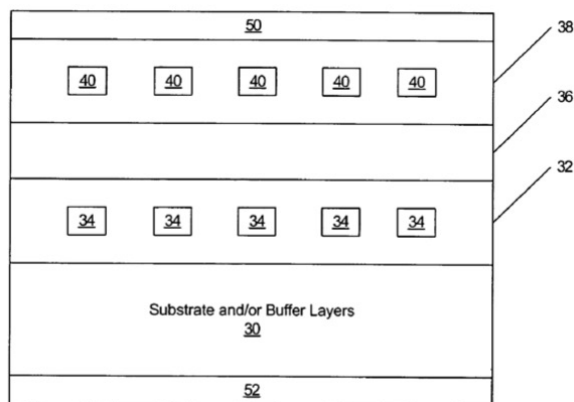


Figure 4

Ex. 1007, Fig. 4; Ex. 2021 ¶¶ 107-08.

For these reasons, Saxler does not disclose or render obvious limitation 1[d] of claim 1.

F. Saxler does not disclose or render obvious limitation 1[e], “wherein some of the inhomogeneous regions in a first level of the

semiconductor layer are vertically offset from inhomogeneous regions in a second level of the semiconductor layer”

Saxler does not disclose or render obvious limitation 1[e] of Claim 1.⁵ As discussed above, a POSA would not be motivated to modify the Figure 4 embodiment, which does not depict the alleged inhomogeneous regions in two separate levels as vertically offset from each other, in view of the Figure 3 embodiment. Ex. 2021 ¶ 110.

For this reason, Saxler does not disclose or render obvious limitation 1[e] of claim 1.

X. CONCLUSION

For the foregoing reasons, SETi respectfully requests that the Panel find the challenged claim not unpatentable.

⁵ As discussed *supra*, in any event, Saxler does not disclose or render obvious limitation 1[d].

Dated: February 9, 2023

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CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24, the undersigned attorney for the Patent Owner declares that this Response to Petition (Sections I through X) has a total of 7,793 words, according to the word count tool in Microsoft Word™.

Date: February 9, 2023

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the foregoing PATENT OWNER'S RESPONSE TO PETITION has been served in its entirety this 9th day of February 2023, on Lite-On's lead and backup counsel by the following email addresses:

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