

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF TEXAS
WACO DIVISION**

SENSOR ELECTRONIC TECHNOLOGY, INC.
Plaintiff,

v.

LITE-ON TECHNOLOGY CORPORATION,
LITE-ON TECHNOLOGY USA, INC., LITE-ON,
INC., and LITE-ON TRADING USA, INC.,
Defendants.

LITE-ON TECHNOLOGY CORPORATION,
Counterclaim-Plaintiff, and
GENESIS PHOTONICS, INC.

Third-Party Plaintiff,

v.

SENSOR ELECTRONIC TECHNOLOGY, INC.,
Counterclaim-Defendant.

Civil Action No. 6:21-cv-322-ADA

DEMAND FOR JURY TRIAL

DEFENDANTS' PRELIMINARY INVALIDITY CONTENTIONS

Defendants Lite-On Technology Corporation, Lite-On Technology USA, Inc., Lite-On, Inc., and Lite-On Trading USA, Inc. (collectively "Lite-On" or "Defendants") hereby provide to Plaintiff Sensor Electronic Technology, Inc. ("SETi" or "Plaintiff") their Preliminary Invalidity Contentions for U.S. Patent Nos. 8,552,562 (the "562 Patent"); 9,042,420 (the "420 Patent"); 9,330,906 (the "906 Patent"); 9,923,117 (the "117 Patent"); 9,966,496 (the "496 Patent"); 10,147,848 (the "848 Patent"); 10,411,156 (the "156 Patent"); 10,460,952 (the "952 Patent"); and 10,854,785 (the "785 Patent") (collectively, the "Asserted Patents"). Lite-On's discovery and

investigation in connection with this lawsuit is continuing, and these disclosures are based on information obtained to date. Lite-On reserves the right to supplement these Preliminary Invalidity Contentions, particularly in light of the Court's *Markman* Order, additional information Lite-On obtains, or if Plaintiff asserts additional claims or otherwise modifies its allegations.

I. INTRODUCTION

Plaintiff asserts that Lite-On infringes the following claims of the Asserted Patents:

- '562 Patent: claims 1, 4, 7, 9, and 10
- '420 Patent: claims 1, 2, 4, 5, and 12-14
- '906 Patent: claims 1-4
- '117 Patent: claim 1
- '496 Patent: claims 1, 3, 4, 16, and 17
- '848 Patent: claims 1, 2, 4, 10-12, 15, and 16
- '156 Patent: claims 1 and 7
- '952 Patent: claims 1-5, 7, and 11-14
- '785 Patent: claims 1, 2, 4, 7, 10-12, 15, and 16

These claims will be referred to as the "Asserted Claims" in this document. On July 27, 2021, Plaintiff served its Preliminary Infringement Contentions for each of the Asserted Claims against Lite-On.

With respect to each Asserted Claim and based on its investigation to date, Lite-On: (a) identifies each currently known item of prior art that either anticipates or renders obvious each Asserted Claim; (b) specifies whether each such item of prior art (or a combination of several of the same) anticipates each Asserted Claim or renders it obvious; (c) submits a chart identifying where each element in each Asserted Claim is disclosed, described, or taught in the prior art;

(d) identifies the grounds for invalidating the Asserted Claims based on indefiniteness under pre-AIA 35 U.S.C. § 112(2) or AIA 35 U.S.C. § 112(b), or lack of enablement or inadequate written description under pre-AIA 35 U.S.C. § 112(1) or AIA 35 U.S.C. § 112(a); and (e) identifies the grounds for invalidating the Asserted Claims under 35 U.S.C. § 101. In addition, based on its investigation to date, and in connection with its Preliminary Invalidity Contentions, Lite-On has produced herewith documents in its possession, custody, or control related to the prior art cited in these Invalidity Contentions and accompanying claim charts. This production is being made available via an FTP site, access instructions for which will be provided. Lite-On reserves the right to supplement its production as the case proceeds and as such documentation is uncovered or made available, through discovery or otherwise obtained from Plaintiff or third parties, as the case proceeds.

Lite-On's Preliminary Invalidity Contentions are based at least in part on its present understanding of Plaintiff's contentions concerning the scope and interpretation of the Asserted Claims in its Preliminary Infringement Contentions and Lite-On's own understanding of the scope and potential interpretation of the Asserted Claims. Lite-On reserves the right to modify the interpretation of terms recited in the Asserted Claims as the case proceeds. Accordingly, Lite-On's Preliminary Invalidity Contentions, including the accompanying invalidity claim charts, may reflect alternative positions as to claim construction and scope, including constructions that Plaintiff appears to advocate. Nothing in these contentions, however, should be construed as an admission or suggestion that: (i) Lite-On agrees with Plaintiff's Preliminary Infringement Contentions, or any claim interpretations asserted therein, or (ii) any claim of the Asserted Patents, whether asserted or not in the litigation, is valid, enforceable, or infringed by any of Lite-On's accused products.

The accompanying invalidity claim charts list specific examples of prior art references, patents, knowledge, inventions, uses, sales, methods, and/or systems that included and/or disclosed, expressly and/or inherently, each limitation of the Asserted Claims, and/or examples of prior art references and systems in view of which a person of ordinary skill in the art (“POSITA”) would have considered each limitation, and the claimed combination of such limitations, anticipated or obvious. Wherever it may be asserted that an element is not present or inherent in any accompanying claim chart and/or disclosed by the cited prior art, Lite-On asserts that the element is also obvious in light of the knowledge of a POSITA, in light of the reference alone, and/or in combination with certain others of the references cited herein and the state of the art reflected by those references.

For each limitation recited in the Asserted Claims, Lite-On’s invalidity claim charts identify certain relevant portions and/or features of the identified prior art that disclose that limitation. The identified prior art, however, includes additional descriptions of, or alternative support for, these claim limitations, and Lite-On’s invalidity claim charts for each prior art reference are not intended to be exhaustive. Further, persons having ordinary skill in the art generally may view each prior art reference in the context of other publications, literature, products, and understanding. Accordingly, the cited portions of the prior art references identified in the accompanying charts are only exemplary. Lite-On will rely on the entirety of the prior art references listed herein, as well as the understanding of a POSITA when reading and analyzing the prior art included in Lite-On’s invalidity claim charts. Lite-On may rely on uncited portions or features of the identified prior art, other documents, and expert testimony, to, for example, provide context or to aid in understanding the identified prior art. Where Lite-On cites to a particular figure in a prior art reference, the citation should be understood to encompass the caption

and description of the figure and any text relating to or accompanying the figure. Similarly, where Lite-On cites to specific text referring to a figure, the citation should be understood to include the figure and caption as well.

Lite-On will also rely on the entirety of prior art references listed herein, including uncited portions of the prior art references, other references mentioned or cited in the prior art, as well as other publications not necessarily charted as prior art, testimony, and other documentation, to establish bases for and motivations to make combinations of certain cited references that render the Asserted Claims obvious. Specifically, Lite-On will rely on the identified prior art in its entirety; other prior art identified in future supplements pursuant to the Federal Rules; corroborating references, documentation, products, and testimony, including materials obtained through further investigation and third-party discovery of the prior art identified herein, that demonstrates the invalidating functionality identified in these Preliminary Invalidity Contentions; references that show the state of the art in the relevant time period (irrespective of whether such references themselves qualify as prior art to the Asserted Patents); and/or expert testimony to provide context to or aid in understanding the cited portions of the identified prior art.

The references discussed in the accompanying invalidity claim charts may disclose the elements of the Asserted Claims explicitly, implicitly, and/or inherently, and they may be relied upon to show the state of the art in the relevant time frame. The suggested obviousness combinations are provided in the alternative to Lite-On's contentions that the cited prior art anticipates the Asserted Claims and are not to be construed to suggest that any reference included in the combinations is not by itself anticipatory.

Lite-On reserves the right to amend its Preliminary Invalidity Contentions if additional information becomes available through discovery, if Plaintiff relies on arguments or produces

documents or testimony that changes Lite-On's understanding of the Asserted Claims or of Plaintiff's assertions, or if Plaintiff seeks to amend its Preliminary Infringement Contentions. Moreover, Lite-On reserves the right to revise its ultimate contentions concerning the invalidity of the Asserted Claims, which contentions may change depending on, for example, the Court's construction of the Asserted Claims, additional information obtained during the discovery period, and/or positions that Plaintiff, Lite-On, or any expert witness(es) may take concerning claim construction, infringement, and/or invalidity issues in this lawsuit or any other proceedings in which the Asserted Patents are or may become involved. Lite-On likewise reserves the right to modify, amend, or supplement these Preliminary Invalidity Contentions to show the invalidity of any additional claims that the Court may allow Plaintiff to assert.

Lite-On further intends to rely on inventor admissions concerning the scope of the Asserted Claims, the patentability of the Asserted Claims, and the prior art relevant to the Asserted Claims, found in, for example: the Asserted Patents, the patent prosecution histories for the Asserted Patents, and related patents and/or patent applications; any deposition testimony of any inventor of the Asserted Patents; any trial testimony of any inventor of the Asserted Patents; and any papers filed or any evidence produced or submitted by Plaintiff in connection with this litigation, or any litigation, proceeding or negotiation related to the Asserted Patents. Lite-On reserves the right to contend that the Asserted Claims are invalid in view of admitted prior art.

Prior art not included in these contentions, whether known or not known to Lite-On, may become relevant. In particular, Lite-On is currently unaware of the extent, if any, to which Plaintiff will contend that limitations of the Asserted Claims are not disclosed in the prior art identified by Lite-On. Lite-On reserves the right to identify additional references that would teach, anticipate and/or render obvious the allegedly missing limitation(s) of the identified art. Discovery is

ongoing, Lite-On has not yet completed its search for and analysis of relevant prior art. Lite-On reserves the right to revise, amend, and/or supplement the information provided herein, including identifying, charting, and relying on additional references, should Lite-On's further search and analysis yield additional information or references, consistent with the Scheduling Order in the above-captioned case and the Federal Rules of Civil Procedure.

Prior art patents or publications included in these Preliminary Invalidity Contentions may be related (e.g., as a divisional, continuation, continuation-in-part, parent, child, or other relation or claim of priority) to earlier or later patents or publications, may have counterparts filed in other jurisdictions, or may incorporate (or be incorporated by) other patents or publications by reference, or may describe actual prior art systems and/or apparatuses. The listed patents or publications are intended to be representative of such other patents, publications, systems, or apparatuses. References to later filed applications from a foreign filing or publication may also be made to assist with translation of the disclosure and should also be considered representative of the earlier disclosure. Similarly, where a publication date is referenced regarding a patent application reference, the application may have been filed earlier or claim priority to an earlier reference that may constitute prior art based on an earlier date. For example, earlier filing and priority dates should be understood to confer prior art status where applicable. Accordingly, Lite-On reserves the right to modify, amend and/or supplement these contentions with related patents or publications, as well as other prior art references.

Additionally, Lite-On reserves the right to present additional items of prior art under, for example, 35 U.S.C. §§ 102(a), (b), (e), (f), and/or (g), and/or § 103 located during third party or other discovery or further investigation, and to assert contentions of invalidity under, for example, 35 U.S.C. §§ 102(c) or (d). For example, subpoenas may be issued to third parties believed to

have knowledge, documentation, and/or corroborating evidence concerning some of the prior art listed below and/or additional prior art. These third parties may include, without limitation, the authors, inventors, or assignees of the references listed in these disclosures.

II. GENERAL STATE OF THE ART AT THE TIME OF THE ALLEGED INVENTIONS

The prior art identified herein, as well as “References Cited” on the face of the Asserted Patents that are not explicitly identified below, may provide background and context pertinent to the teachings and interpretation of the invalidating prior art referenced by the invalidity claim charts. These prior art references are only exemplary and are not in any way intended to limit the scope of what a POSITA would have understood at the time of the alleged invention. Lite-On reserves the right to rely upon additional prior art, information, and/or knowledge to demonstrate what a POSITA would have understood prior to the dates of alleged invention of the Asserted Claims. The accompanying prior art, art cited, and arguments made in the patent prosecution history, as well as the “References Cited” on the face of each Asserted Patent (which are incorporated herein by reference), are illustrative of the general state of the art to which each Asserted Patent pertains (i.e., what a POSITA would have understood) at a time prior to the dates of alleged invention of each of the Asserted Claims of each Asserted Patent.

III. THE '562 PATENT

A. Priority

Plaintiff has identified that the Asserted Claims of the '562 Patent are entitled to a priority date of June 1, 2009, which is the filing date of U.S. Provisional Application No. 61/217,531. Plaintiff has provided no evidence to support its contention that the Asserted Claims of the '562 Patent are entitled to claim priority back to this earlier filed application, and Lite-On asserts the Asserted Claims of the '562 Patent may not be entitled to the benefit of the provisional application.

Lite-On reserves the right to assert a later priority date based on any findings as to the priority date of the Asserted Claims of the '562 Patent by the Court, information learned through discovery, or otherwise.

B. Anticipation

Some or all of the Asserted Claims of the '562 Patent are invalid as anticipated under 35 U.S.C. § 102 at least in view of each of the prior art references identified in the claim charts included in **Exhibits 562**, which identify specific examples of where each limitation of the Asserted Claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary only and representative of the content and teaching of the prior art references and should be understood in the context of the reference as a whole and as they would be understood by a POSITA.

Lite-On identifies the following references as anticipating one or more of the Asserted Claims of '562 Patent under 35 U.S.C. § 102. The table below of anticipating references is exemplary, and it does not constitute an admission that any reference anticipates only the listed claims. Further, Lite-On contends that any prior art reference in the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following table.

Exhibit No.	Anticipating Prior Art	Claims
562-A1	U.S. Patent No. 8,242,539 (“ Ohmaki ”)	Claims 1, 4, 7, 9, 10
562-A2	U.S. Pat. App. Pub. No. 2008/0185606 (“ Sano ”)	Claims 1, 4, 7, 9, 10
562-A3	U.S. Pat. App. Pub. No. 2008/0135929 (“ Saito ”)	Claims 1, 4, 7, 9, 10
562-A4	WO 2007/015537 (“ Kamei ”)	Claims 1, 4, 7, 9, 10

To the extent any item of prior art cited above is deemed not to disclose, explicitly, implicitly, or inherently, any limitation of an Asserted Claim of the '562 Patent, Lite-On reserves the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent to the art, or obvious to a POSITA, even if Lite-On has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

C. Obviousness

To the extent any limitation is deemed not to be met by an item of prior art listed above and in **Exhibits 562**, then any purported differences are such that the claimed subject matter as a whole would have been obvious to a POSITA at the time of the alleged invention, in view of Applicant Admitted Prior Art ("AAPA"), the state of the art and knowledge of those skilled in the art. The item of prior art would, therefore, render the relevant claims invalid for obviousness under 35 U.S.C. § 103.

In addition, the references identified above render the Asserted Claims of the '562 Patent obvious when the references are read in combination with each other, and/or when read in view of AAPA, the state of the art and knowledge of those skilled in the art. Each and every reference identified is also relevant to the state of the art at the time of the alleged invention. Any of the references disclosed above may be combined with AAPA and/or one another to render obvious (and therefore invalid) each of the Asserted Claims. Lite-On may rely upon a subset of the above identified references or all of the references identified above, including all references in **Exhibits 562**, for purposes of obviousness depending on the Court's claim construction, positions taken by Plaintiff during this litigation, and further investigation and discovery.

To the extent the foregoing references are found not to anticipate the Asserted Claims, the foregoing references render the Asserted Claims obvious either alone or in combination with one or more of the other references identified herein. It would have been obvious to a POSITA at the time of the alleged invention of the Asserted Claims of the '562 Patent to combine the various references cited herein so as to disclose the Asserted Claims of the '562 Patent.

Prior art references rendering the Asserted Claims obvious, alone or in combination with other references, are outlined below and included in **Exhibits 562**, which include exemplary claim charts for the Asserted Claims of the '562 Patent showing specifically where in each reference or combinations of references each Asserted Claim is found, and an explanation of why the prior art renders the Asserted Claim obvious. Where applicable, the charts include the motivation to combine references.

Moreover, in addition to the information contained elsewhere in these contentions, Defendants have identified additional motivations and reasons to combine the various references cited herein. In particular, multiple teachings, suggestions, and/or reasons to modify any of the references and/or to combine any two or more of the references in **Exhibits 562** come from many sources, including the prior art (specific and as a whole), common knowledge, common sense, predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, obvious to try, the nature of the problem faced, and/or knowledge possessed by one of ordinary skill. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field or endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. The combination of prior art references identified in these contentions would have been obvious because the claimed

combinations represent the known potential options with a reasonable expectation of success. Additionally, a POSITA would have been motivated to create combinations identified in these contentions using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or teaching, suggestion, or motivation in the prior art generally. Also, market forces in the industry, and the desire to improve features and performance, would motivate the addition of features to systems as they become available, become less expensive, become more commonly used, provide better performance, reduce costs, or predictably achieve other clearly desirable results.

In addition, Lite-On contends that additional combinations of prior art references render the Asserted Claims of the '562 Patent obvious. Claim charts included in **Exhibits 562** identify specific examples of where each limitation of the Asserted Claims is found in the combination of the prior art references below.

Exhibit No.	Additional Obviousness Combinations	Claims
562-A1	Ohmaki in view of knowledge of POSITA, AAPA , and/or U.S. Patent No. 7,195,937 (“ Akita ”)	Claims 1, 4, 7, 9, 10
562-A3	Saito in view of knowledge of POSITA and/or AAPA	Claims 1, 4, 7, 9, 10
562-A4	Kamei in view of knowledge of POSITA and/or AAPA	Claims 1, 4, 7, 9, 10

In addition to the specific combinations of prior art and the specific combinations of groups of prior art disclosed above, Lite-On reserves the right to rely on any other combination of any prior art references disclosed herein. Lite-On further reserves the right to rely upon combinations disclosed within the prosecution history of the references cited herein. These obviousness combinations reflect Lite-On’s present understanding of the potential scope of the claims that

Plaintiff appears to be advocating and should not be seen as Lite-On's acquiescence to Plaintiff's interpretation of the patent claims.

Lite-On also reserves the right to amend or supplement these contentions regarding anticipation or obviousness of the Asserted Claims, in view of further information from Plaintiff, information discovered during discovery, or a claim construction ruling by the Court. Plaintiff has not identified what elements or combinations it alleges were not known to a POSITA at the time. Therefore, for any claim limitation that Plaintiff alleges is not disclosed in a particular prior art reference, Lite-On reserves the right to assert that any such limitation is either inherent in the disclosed reference or obvious to a POSITA at the time in light of the same, or that the limitation is disclosed in another of the references disclosed above and in combination would have rendered the Asserted Claims obvious.

D. Other Grounds for Invalidity

Lite-On identifies the following grounds for invalidity of the Asserted Claims of the '562 Patent based on 35 U.S.C. §§ 101 and/or 112. Lite-On reserves the right to supplement its Invalidity Contentions related to invalidity under § 101 and/or § 112 as the case proceeds, particularly in view of constructions to be proposed by Plaintiff during claim construction proceedings.

1. Invalidity Based On Enablement Or Written Description Under 35 U.S.C. § 112(a) And/or Invalidity Based On Indefiniteness Under 35 U.S.C. § 112(b)

Pre-AIA 35 U.S.C. § 112(1) recites the written description and enablement requirement. *See* 35 U.S.C. § 112(1) ("The specification shall contain a written description . . . of the manner and process of making and using [the invention] in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same."). To satisfy the written description requirement, the description must

“clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed.” *Ariad Pharmaceuticals, Inc. v. Eli Lilly and Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010). In other words, the test for sufficiency is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date. *Id.* The test requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art. Based on that inquiry, the specification must describe an invention understandable to that skilled artisan and show that the inventor actually invented the invention claimed. “Whether the written description requirement is satisfied is a fact-based inquiry that will depend on the nature of the claimed invention and the knowledge of one skilled in the art at the time an invention is made and a patent application is filed.” *Carnegie Mellon Univ. v. Hoffmann La Roche Inc.*, 541 F.3d 1115, 1122 (Fed. Cir. 2008). Actual “possession” or reduction to practice outside of the specification is not enough. Rather, as stated above, it is the specification itself that must demonstrate possession. And while the description requirement does not demand any particular form of disclosure, *Carnegie Mellon Univ.*, 541 F.3d at 1122, or that the specification recite the claimed invention *in haec verba*, a description that merely renders the invention obvious does not satisfy the requirement, *Lockwood v. Am. Airlines*, 107 F.3d 1565, 1571-72 (Fed. Cir. 1997).

The Supreme Court “require[s] that a patent’s claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (U.S. 2014) (emphasis added). While “absolute precision is unattainable” in patented claims, the definiteness requirement “mandates clarity.” *Id.*

Based on Lite-On's present understanding of Plaintiff's infringement contentions, Lite-On asserts that the Asserted Claims of the '562 Patent are invalid for reciting at least the following claim terms/phrases/limitations:

- "wherein the at least two contact corners have a lateral profiled shape along the substantially lateral direction and at least one edge having a perpendicular profiled shape along the substantially perpendicular direction" (claims 1, 4, 7, 9 and 10); and
- "wherein the lateral profiled shape of each of the at least two contact corners provides a gradual transition between a first edge and a second edge forming the corresponding contact corner and the perpendicular profiled shape provides a non-planar transition from the surface of the semiconductor structure to a top surface of the first contact" (claims 1, 4, 7, 9 and 10).

Based on Lite-On's present understanding of Plaintiff's Preliminary Infringement Contentions, at least one or more of these claim terms/phrases/limitations are indefinite because they are vague and ambiguous, and given Plaintiff's apparent constructions of the claims, a POSITA at the time of the invention would not understand the scope of the invention with reasonable certainty.

The parties have not yet exchanged terms for construction or proposed constructions. Lite-On reserves the right to argue that Plaintiff's proposed constructions of any of the above terms render the Asserted Claims of the '562 Patent invalid for indefiniteness.

IV. THE '420 PATENT

A. Priority

Plaintiff has identified that the Asserted Claims of the '420 Patent are entitled to a priority date of August 11, 2011, which is the filing date of U.S. Provisional Application No. 61/522,425. Plaintiff has provided no evidence to support its contention that the Asserted Claims of the '420 Patent are entitled to claim priority back to this earlier filed application, and Lite-On asserts the Asserted Claims of the '420 Patent may not be entitled to the benefit of the provisional application.

Lite-On reserves the right to assert a later priority date based on any findings as to the priority date of the Asserted Claims of the '420 Patent by the Court, information learned through discovery, or otherwise.

B. Anticipation

Some or all of the Asserted Claims of the '420 Patent are invalid as anticipated under 35 U.S.C. § 102 at least in view of each of the prior art references identified in the claim charts included in **Exhibits 420**, which identify specific examples of where each limitation of the Asserted Claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary only and representative of the content and teaching of the prior art references and should be understood in the context of the reference as a whole and as they would be understood by a POSITA.

Lite-On identifies the following references as anticipating one or more of the Asserted Claims of '420 Patent under 35 U.S.C. § 102. The table below of anticipating references is exemplary, and it does not constitute an admission that any reference anticipates only the listed claims. Further, Lite-On contends that any prior art reference in the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following table.

Exhibit No.	Anticipating Prior Art	Claims
420-A1	U.S. Patent No. 7,498,182 (“ Sampath '182 ”)	Claims 1, 2, 12, 13
420-A2	U.S. Patent No. 9,627,580 (“ Liao ”)	Claims 1, 2, 12, 13
420-A3	U.S. Patent No. 6,861,270 (“ Sakai ”)	Claims 1, 2, 12, 13
420-A4	U.S. Patent No. 7,812,366 (“ Sampath '366 ”)	Claims 1, 2, 12, 13

To the extent any item of prior art cited above is deemed not to disclose, explicitly, implicitly, or inherently, any limitation of an Asserted Claim of the '420 Patent, Lite-On reserves the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent to the art, or obvious to a POSITA, even if Lite-On has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

C. Obviousness

To the extent any limitation is deemed not to be met by an item of prior art listed above and in **Exhibits 420**, then any purported differences are such that the claimed subject matter as a whole would have been obvious to a POSITA at the time of the alleged invention, in view of Applicant Admitted Prior Art ("AAPA"), the state of the art and knowledge of those skilled in the art. The item of prior art would, therefore, render the relevant claims invalid for obviousness under 35 U.S.C. § 103.

In addition, the references identified above render the Asserted Claims of the '420 Patent obvious when the references are read in combination with each other, and/or when read in view of AAPA, the state of the art and knowledge of those skilled in the art. Each and every reference identified is also relevant to the state of the art at the time of the alleged invention. Any of the references disclosed above may be combined with AAPA and/or one another to render obvious (and therefore invalid) each of the Asserted Claims. Lite-On may rely upon a subset of the above identified references or all of the references identified above, including all references in **Exhibits 420**, for purposes of obviousness depending on the Court's claim construction, positions taken by Plaintiff during this litigation, and further investigation and discovery.

To the extent the foregoing references are found not to anticipate the Asserted Claims, the foregoing references render the Asserted Claims obvious either alone or in combination with one or more of the other references identified herein. It would have been obvious to a POSITA at the time of the alleged invention of the Asserted Claims of the '420 Patent to combine the various references cited herein so as to disclose the Asserted Claims of the '420 Patent.

Prior art references rendering the Asserted Claims obvious, alone or in combination with other references, are outlined below and included in **Exhibits 420**, which include exemplary claim charts for the Asserted Claims of the '420 Patent showing specifically where in each reference or combinations of references each Asserted Claim is found, and an explanation of why the prior art renders the Asserted Claim obvious. Where applicable, the charts include the motivation to combine references.

Moreover, in addition to the information contained elsewhere in these contentions, Defendants have identified additional motivations and reasons to combine the various references cited herein. In particular, multiple teachings, suggestions, and/or reasons to modify any of the references and/or to combine any two or more of the references in **Exhibits 420** come from many sources, including the prior art (specific and as a whole), common knowledge, common sense, predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, obvious to try, the nature of the problem faced, and/or knowledge possessed by one of ordinary skill. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field or endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. The combination of prior art references identified in these contentions would have been obvious because the claimed

combinations represent the known potential options with a reasonable expectation of success. Additionally, a POSITA would have been motivated to create combinations identified in these contentions using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or teaching, suggestion, or motivation in the prior art generally. Also, market forces in the industry, and the desire to improve features and performance, would motivate the addition of features to systems as they become available, become less expensive, become more commonly used, provide better performance, reduce costs, or predictably achieve other clearly desirable results.

In addition, Lite-On contends that additional combinations of prior art references render the Asserted Claims of the '420 Patent obvious. Claim charts included in **Exhibits 420** identify specific examples of where each limitation of the Asserted Claims is found in the combination of the prior art references below.

Exhibit No.	Additional Obviousness Combinations	Claims
420-A1	Sampath '182 in view of AAPA of the '420 Patent, "Localization potentials in AlGa _N epitaxial films studied by scanning near-field optical spectroscopy" (" AAPA Pinos "), "Electrical and structural properties of AlGa _N : a comparison with CVD diamond" (" Stutzmann "), U.S. Patent No. 8,575,592 (" Bergmann "), and/or U.S. Pat. App. Pub. No. 2008/0054247 (" Eichler ")	Claims 1, 2, 4, 5, and 12-14
420-A2	Liao in view of AAPA Pinos , Stutzmann , U.S. Patent No. 5,739,554 (" Edmond "), Bergmann and/or Eichler	Claims 1, 2, 4, 5, and 12-14
420-A3	Sakai in view of AAPA Pinos , Stutzmann , U.S. Pat. App. Pub. 2009/0309126 (" Okuno "), Bergmann and/or Eichler	Claims 1, 2, 4, 5, and 12-14
420-A4	Sampath '366 in view of AAPA Pinos , Stutzmann , Bergmann and/or Eichler	Claims 1, 2, 4, 5, and 12-14

In addition to the specific combinations of prior art and the specific combinations of groups of prior art disclosed above, Lite-On reserves the right to rely on any other combination of any prior art references disclosed herein. Lite-On further reserves the right to rely upon combinations disclosed within the prosecution history of the references cited herein. These obviousness combinations reflect Lite-On's present understanding of the potential scope of the claims that Plaintiff appears to be advocating and should not be seen as Lite-On's acquiescence to Plaintiff's interpretation of the patent claims.

Lite-On also reserves the right to amend or supplement these contentions regarding anticipation or obviousness of the Asserted Claims, in view of further information from Plaintiff, information discovered during discovery, or a claim construction ruling by the Court. Plaintiff has not identified what elements or combinations it alleges were not known to a POSITA at the time. Therefore, for any claim limitation that Plaintiff alleges is not disclosed in a particular prior art reference, Lite-On reserves the right to assert that any such limitation is either inherent in the disclosed reference or obvious to a POSITA at the time in light of the same, or that the limitation is disclosed in another of the references disclosed above and in combination would have rendered the Asserted Claims obvious.

D. Other Grounds for Invalidity

Lite-On identifies the following grounds for invalidity of the Asserted Claims of the '420 Patent based on 35 U.S.C. §§ 101 and/or 112. Lite-On reserves the right to supplement its Invalidity Contentions related to invalidity under § 101 and/or § 112 as the case proceeds, particularly in view of constructions to be proposed by Plaintiff during claim construction proceedings.

1. Invalidity Based On Indefiniteness Under 35 U.S.C. § 112(b)

Based on Lite-On's present understanding of Plaintiff's infringement contentions, Lite-On asserts that the Asserted Claims of the '420 Patent are invalid for reciting at least the following claim terms/phrases/limitations:

- "a set of transparent regions having a first characteristic band gap" (claims 1, 2, 4, 5, 12-14);
- "a set of higher conductive regions having a second characteristic band gap at least five percent smaller than the first characteristic band gap" (claims 1, 2, 4, 5, 12-14);
- "wherein lateral inhomogeneities in at least one of: the composition or a doping of the at least one barrier forms the set of transparent regions and the set of higher conductive regions" (claims 1, 2, 4, 5, 12-14);
- "the SPSL semiconductor layer comprises a periodic structure including a plurality of periods, wherein at least one of: a composition or a width of each period varies along the height of the SPSL semiconductor layer" (claim 2);
- "wherein at least one barrier in the SPSL semiconductor layer has a graded composition" (claim 4);
- "wherein the inhomogeneous layer includes a plurality of transparent regions and a plurality of higher conductive regions" (claim 13); and
- "a semiconductor layer having a graded composition directly adjacent to the SPSL semiconductor layer" (claim 13).

Based on Lite-On's present understanding of Plaintiff's Preliminary Infringement Contentions, at least one or more of these claim terms/phrases/limitations are indefinite because they are vague and ambiguous, and given Plaintiff's apparent constructions of the claims, a POSITA at the time of the invention would not understand the scope of the invention with reasonable certainty.

The parties have not yet exchanged terms for construction or proposed constructions. Lite-On reserves the right to argue that Plaintiff's proposed constructions of any of the above terms render the Asserted Claims of the '420 Patent invalid for indefiniteness.

2. Invalidity Under 35 U.S.C. § 101

In addition to the preceding invalidity contentions, Lite-On further contends that each of the Asserted Claims of the '420 Patent is drawn to subject matter that is not patentable under 35 U.S.C. § 101. For example, if the Asserted Claims are construed or interpreted to cover naturally occurring (or inherent) variations in the make-up or naturally occurring (or inherent) fluctuations in the composition or band gap of alloys (e.g., AlGa_N), the Asserted Claims are invalid for claiming unpatentable subject matter.

Compound semiconductor materials have been synthesized using a variety of methods as early as the 1960's. It was known since the 1970s that ternary and quaternary III-V compound semiconductor materials have lateral inhomogeneities caused by lateral changes in the material composition itself. The random distribution of the alloy's components gives rise to an electron scattering mechanism caused by the local (and lateral) changes in the semiconductor bandgap.

In 1976, Harrison and Hauser produced a model which described the mean time between electron collisions caused by the random changes in the bandgap. *See, e.g.*, ("Alloy scattering in ternary III-V compounds") at 5347. It is well known that this collision time is proportional to the electron mobility which relates the low field conductivity to the concentration of electrons. The random distribution of the alloy's components is native to the epitaxial processes used to form the semiconductor materials. Indeed, this is described in the '420 Patent as follows: "With proper growth conditions, it also was found that the aluminum did not incorporate uniformly throughout the AlGa_N layer (i.e., the material has areas of high and low concentrations of aluminum spread throughout). These compositional fluctuations, together with doping fluctuations, also known as localized inhomogeneities, result in carrier localization and lead to the creation of conduction layers for carriers." '420 Patent, 2:6-13; *see also*, 2:14-3:22. It is clear to one skilled in the art that growth of compound semiconductor alloys will result in compositional fluctuations and

inhomogeneous regions within the semiconductor layer. Accordingly, the natural phenomenon of “inhomogeneous regions” in semiconductor layers have been known to a POSITA dating back to the 1960-1970 timeframe.

For GaN based semiconductor materials having at least three chemical elements (*e.g.*, InGaN or AlGaN), the distribution of metal atoms (*e.g.*, In, Al, Ga) within the crystal structure of the material during growth of the semiconductor layer can vary, including randomly, leading to compositional fluctuations, which are sometimes referred to as inhomogeneities, across the lateral dimension (the direction parallel to the surface of the substrate). *See, e.g.*, “Phase separation and ordering in InGaN alloys grown by molecular beam epitaxy,” 1391. For example, inherently in a single layer of AlGaN, there may be more Ga atoms than Al atoms at one location and more Al atoms than Ga atoms at another location within the semiconductor layer due to random ordering. *See, e.g.*, “Photoconductive detectors based on partially ordered AlGaN alloys grown by molecular beam epitaxy,” 2203. This lateral inhomogeneity or composition fluctuation of AlGaN semiconductor layer is an inherent property of AlGaN. Similarly, InGaN will have inherent compositional fluctuations where there are regions having more In atoms than Ga atoms. *See, e.g.*, “Phase separation and ordering in InGaN alloys grown by molecular beam epitaxy,” 1391. This inherent, compositional fluctuation of the GaN based semiconductor alloys can lead to inhomogeneous regions in the semiconductor layer, and this natural phenomenon was well known before the invention of the ’420 Patent.

Lite-On’s investigation of grounds of invalidity based upon lack of patentable subject matter is ongoing, and Lite-On reserve the right to supplement these Preliminary Invalidity Contentions.

V. THE '906 PATENT

A. Priority

Plaintiff has identified that the Asserted Claims of the '906 Patent are entitled to a priority date of May 1, 2013, which is the filing date of U.S. Provisional Application No. 61/817,970. Plaintiff has provided no evidence to support its contention that the Asserted Claims of the '906 Patent are entitled to claim priority back to this filed application, and Lite-On asserts the Asserted Claims of the '906 Patent may not be entitled to the benefit of the provisional application. Lite-On reserves the right to assert a later priority date based on any findings as to the priority date of the Asserted Claims of the '906 Patent by the Court, information learned through discovery, or otherwise.

B. Anticipation

The Asserted Claims of the '906 Patent are invalid as anticipated under 35 U.S.C. § 102 at least in view of each of the prior art references identified in the claim charts included in **Exhibits 906**, which identify specific examples of where each limitation of the Asserted Claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary only and representative of the content and teaching of the prior art references and should be understood in the context of the reference as a whole and as they would be understood by a POSITA.

Lite-On identifies the following references as anticipating the Asserted Claims of '906 Patent under 35 U.S.C. § 102. The table below of anticipating references is exemplary, and it does not constitute an admission that any reference anticipates only the listed claims. Further, Lite-On contends that any prior art reference in the attached charts that is charted for each limitation of any

given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following table.

Exhibit No.	Anticipating Prior Art	Claims
906-A1	U.S. Patent No. 9,412,586 (“ Amano ”)	Claims 1-4
906-A2	U.S. Patent No. 9,171,717 B2 (“ Ju ”)	Claims 1-4
906-A3	U.S. Patent Pub. No. 2012/0007039 (“ Ueta ”)	Claims 1-4
906-A4	U.S. Patent App. Pub. No. 2007/0085093 (“ Ohmae ”)	Claims 1-4
906-A5	U.S. Patent Pub. No. 2012/0187,444 (“ Oh ”)	Claims 1-4
906-A6	U.S. Patent Pub. No. 2009/0272993 (“ Cheong ”)	Claims 1-4

To the extent any item of prior art cited above is deemed not to disclose, explicitly, implicitly, or inherently, any limitation of an Asserted Claim of the ’906 Patent, Lite-On reserves the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent to the art, or obvious to a POSITA, even if Lite-On has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

C. Obviousness

To the extent any limitation is deemed not to be met by an item of prior art listed above and in **Exhibits 906**, then any purported differences are such that the claimed subject matter as a whole would have been obvious to a POSITA at the time of the alleged invention, in view of Applicant Admitted Prior Art (“AAPA”), the state of the art and knowledge of those skilled in the art. The item of prior art would, therefore, render the relevant claims invalid for obviousness under 35 U.S.C. § 103.

In addition, the references identified above render the Asserted Claims of the '906 Patent obvious when the references are read in combination with each other, and/or when read in view of AAPA, the state of the art and knowledge of those skilled in the art. Each and every reference identified is also relevant to the state of the art at the time of the alleged invention. Any of the references disclosed above may be combined with AAPA and/or one another to render obvious (and therefore invalid) each of the Asserted Claims. Lite-On may rely upon a subset of the above identified references or all of the references identified above, including all references in **Exhibits 906**, for purposes of obviousness depending on the Court's claim construction, positions taken by Plaintiff during this litigation, and further investigation and discovery.

To the extent the foregoing references are found not to anticipate the Asserted Claims, the foregoing references render the Asserted Claims obvious either alone or in combination with one or more of the other references identified herein. It would have been obvious to a POSITA at the time of the alleged invention of the Asserted Claims of the '906 Patent to combine the various references cited herein so as to disclose the Asserted Claims of the '906 Patent.

Moreover, in addition to the information contained elsewhere in these contentions, Defendants have identified additional motivations and reasons to combine the various references cited herein. In particular, multiple teachings, suggestions, and/or reasons to modify any of the references and/or to combine any two or more of the references in **Exhibits 906** come from many sources, including the prior art (specific and as a whole), common knowledge, common sense, predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, obvious to try, the nature of the problem faced, and/or knowledge possessed by one of ordinary skill. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because

known work in one field or endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. The combination of prior art references identified in these contentions would have been obvious because the claimed combinations represent the known potential options with a reasonable expectation of success. Additionally, a POSITA would have been motivated to create combinations identified in these contentions using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or teaching, suggestion, or motivation in the prior art generally. Also, market forces in the industry, and the desire to improve features and performance, would motivate the addition of features to systems as they become available, become less expensive, become more commonly used, provide better performance, reduce costs, or predictably achieve other clearly desirable results.

In addition, Lite-On reserves the right to rely on any other combination of any prior art references disclosed herein. Lite-On further reserves the right to rely upon combinations disclosed within the prosecution history of the references cited herein. These obviousness combinations reflect Lite-On's present understanding of the potential scope of the claims that Plaintiff appears to be advocating and should not be seen as Lite-On's acquiescence to Plaintiff's interpretation of the patent claims.

Lite-On also reserves the right to amend or supplement these contentions regarding anticipation or obviousness of the Asserted Claims, in view of further information from Plaintiff, information discovered during discovery, or a claim construction ruling by the Court. Plaintiff has not identified what elements or combinations it alleges were not known to a POSITA at the time. Therefore, for any claim limitation that Plaintiff alleges is not disclosed in a particular prior art

reference, Lite-On reserves the right to assert that any such limitation is either inherent in the disclosed reference or obvious to a POSITA at the time in light of the same, or that the limitation is disclosed in another of the references disclosed above and in combination would have rendered the Asserted Claims obvious.

D. Other Grounds for Invalidity

Lite-On identifies the following grounds for invalidity of the Asserted Claims of the '906 Patent based on 35 U.S.C. §§ 101 and/or 112. Lite-On reserves the right to supplement its Invalidity Contentions related to invalidity under § 101 and/or § 112 as the case proceeds, particularly in view of constructions to be proposed by Plaintiff during claim construction proceedings.

1. Invalidity Based On Indefiniteness Under 35 U.S.C. § 112(b)

Based on Lite-On's present understanding of Plaintiff's infringement contentions, Lite-On asserts that that the Asserted Claims of the '906 Patent are invalid for reciting at least the following claim terms/phrases/limitations:

- “wherein the nucleation layer has a thickness of at least one nanometer and contains no large scale cavities” (claims 1-4); and
- “a semiconductor layer immediately adjacent to the cavity containing layer, wherein the semiconductor layer contains no large scale cavities” (claim 4).

Based on Lite-On's present understanding of Plaintiff's Preliminary Infringement Contentions, at least one or more of these claim terms/phrases/limitations are indefinite because they are vague and ambiguous, and given Plaintiff's apparent constructions of the claims, a POSITA at the time of the invention would not understand the scope of the invention with reasonable certainty.

The parties have not yet exchanged terms for construction or proposed constructions. Lite-On reserves the right to argue that Plaintiff's proposed constructions of any of the above terms render the Asserted Claims of the '906 Patent invalid for indefiniteness.

VI. THE '117 PATENT

A. Priority

Plaintiff has identified that the Asserted Claim of the '117 Patent is entitled to a priority date of February 25, 2013, which is the filing date of U.S. Provisional Application No. 61/768,581. Plaintiff has provided no evidence to support its contention that the Asserted Claim of the '117 Patent is entitled to claim priority back to this earlier filed application, and Lite-On asserts the Asserted Claim of the '117 Patent may not be entitled to the benefit of the provisional application. Lite-On reserves the right to assert a later priority date based on any findings as to the priority date of the Asserted Claim of the '117 Patent by the Court, information learned through discovery, or otherwise.

B. Anticipation

The Asserted Claim of the '117 Patent is invalid as anticipated under 35 U.S.C. § 102 at least in view of each of the prior art references identified in the claim charts included in **Exhibits 117**, which identify specific examples of where each limitation of the Asserted Claim is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary only and representative of the content and teaching of the prior art references and should be understood in the context of the reference as a whole and as they would be understood by a POSITA.

Lite-On identifies the following references as anticipating the Asserted Claim of '117 Patent under 35 U.S.C. § 102. The table below of anticipating references is exemplary, and it does

not constitute an admission that any reference anticipates only the listed claim. Further, Lite-On contends that any prior art reference in the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following table.

Exhibit No.	Anticipating Prior Art	Claim
117-A1	Japan Pat. Pub. No. JP2000022283 (“ Ban ”)	Claim 1
117-A2	Ohmae	Claim 1
117-A3	U.S. Pat. App. Pub. No. 2004/0031956 (“ Saxler ”)	Claim 1
117-A4	PCT International Pub. No. WO 2013/023197 (“ Shur ”)	Claim 1
117-A5	U.S. Patent No. 7,265,374 (“ Stephen ”)	Claim 1
117-A6	U.S. Patent No. 6,734,033 (“ Emerson ”)	Claim 1

To the extent any item of prior art cited above is deemed not to disclose, explicitly, implicitly, or inherently, any limitation of the Asserted Claim of the ’117 Patent, Lite-On reserves the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent to the art, or obvious to a POSITA, even if Lite-On has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

C. Obviousness

To the extent any limitation is deemed not to be met by an item of prior art listed above and in **Exhibits 117**, then any purported differences are such that the claimed subject matter as a whole would have been obvious to a POSITA at the time of the alleged invention, in view of Applicant Admitted Prior Art (“AAPA”), the state of the art and knowledge of those skilled in the

art. The item of prior art would, therefore, render the relevant claims invalid for obviousness under 35 U.S.C. § 103.

In addition, the references identified above render the Asserted Claim of the '117 Patent obvious when the references are read in combination with each other, and/or when read in view of AAPA, the state of the art and knowledge of those skilled in the art. Each and every reference identified is also relevant to the state of the art at the time of the alleged invention. Any of the references disclosed above may be combined with AAPA and/or one another to render obvious (and therefore invalid) the Asserted Claim. Lite-On may rely upon a subset of the above identified references or all of the references identified above, including all references in **Exhibits 117**, for purposes of obviousness depending on the Court's claim construction, positions taken by Plaintiff during this litigation, and further investigation and discovery.

To the extent the foregoing references are found not to anticipate the Asserted Claim, the foregoing references render the Asserted Claim obvious either alone or in combination with one or more of the other references identified herein. It would have been obvious to a POSITA at the time of the alleged invention of the Asserted Claim of the '117 Patent to combine the various references cited herein so as to disclose the Asserted Claim of the '117 Patent.

Prior art references rendering the Asserted Claim obvious, alone or in combination with other references, are outlined below and included in **Exhibits 117**, which include exemplary claim charts for the Asserted Claim of the '117 Patent showing specifically where in each reference or combinations of references Asserted Claim is found, and an explanation of why the prior art renders the Asserted Claim obvious. Where applicable, the charts include the motivation to combine references.

Moreover, in addition to the information contained elsewhere in these contentions, Defendants have identified additional motivations and reasons to combine the various references cited herein. In particular, multiple teachings, suggestions, and/or reasons to modify any of the references and/or to combine any two or more of the references in **Exhibits 117** come from many sources, including the prior art (specific and as a whole), common knowledge, common sense, predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, obvious to try, the nature of the problem faced, and/or knowledge possessed by one of ordinary skill. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field or endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. The combination of prior art references identified in these contentions would have been obvious because the claimed combinations represent the known potential options with a reasonable expectation of success. Additionally, a POSITA would have been motivated to create combinations identified in these contentions using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or teaching, suggestion, or motivation in the prior art generally. Also, market forces in the industry, and the desire to improve features and performance, would motivate the addition of features to systems as they become available, become less expensive, become more commonly used, provide better performance, reduce costs, or predictably achieve other clearly desirable results.

In addition, Lite-On contends that additional combinations of prior art references render the Asserted Claim of the '117 Patent obvious. Claim charts included in **Exhibits 117** identify

specific examples of where each limitation of the Asserted Claim is found in the combination of the prior art references below.

Exhibit No.	Additional Obviousness Combinations	Claim
117-A1	Ban in view of U.S. Patent No. 8,114,691 (“ Lee ’691 ”)	Claim 1
117-A3	Saxler in view of Stutzmann	Claim 1
117-A5	Stephen in view of Lee ’691	Claim 1
117-A6	Emerson in view of U.S. Patent No. 6,294,440 (“ Tsuda ”) and/or Lee ’691	Claim 1

In addition to the specific combinations of prior art and the specific combinations of groups of prior art disclosed above, Lite-On reserves the right to rely on any other combination of any prior art references disclosed herein. Lite-On further reserves the right to rely upon combinations disclosed within the prosecution history of the references cited herein. These obviousness combinations reflect Lite-On’s present understanding of the potential scope of the claims that Plaintiff appears to be advocating and should not be seen as Lite-On’s acquiescence to Plaintiff’s interpretation of the patent claims.

Lite-On also reserves the right to amend or supplement these contentions regarding anticipation or obviousness of the Asserted Claim, in view of further information from Plaintiff, information discovered during discovery, or a claim construction ruling by the Court. Plaintiff has not identified what elements or combinations it alleges were not known to a POSITA at the time. Therefore, for any claim limitation that Plaintiff alleges is not disclosed in a particular prior art reference, Lite-On reserves the right to assert that any such limitation is either inherent in the disclosed reference or obvious to a POSITA at the time in light of the same, or that the limitation is disclosed in another of the references disclosed above and in combination would have rendered the Asserted Claim obvious.

D. Other Grounds for Invalidity

Lite-On identifies the following grounds for invalidity of the Asserted Claim of the '117 Patent based on 35 U.S.C. §§ 101 and/or 112. Lite-On reserves the right to supplement its Invalidity Contentions related to invalidity under § 101 and/or § 112 as the case proceeds, particularly in view of constructions to be proposed by Plaintiff during claim construction proceedings.

1. Invalidity Based On Indefiniteness Under 35 U.S.C. § 112(b)

Based on Lite-On's present understanding of Plaintiff's infringement contentions, Lite-On asserts that the Asserted Claim of the '117 Patent is invalid for reciting at least the following claim terms/phrases/limitations:

- "a plurality of inhomogeneous regions" (claim 1);
- "a set of conductive regions" (claim 1); and
- "each of the inhomogeneous regions having a set of attributes differing from a group III nitride material forming the semiconductor layer" (claim 1).

Based on Lite-On's present understanding of Plaintiff's Preliminary Infringement Contentions, at least one or more of these claim terms/phrases/limitations are indefinite because they are vague and ambiguous, and given Plaintiff's apparent constructions of the claim, a POSITA at the time of the invention would not understand the scope of the invention with reasonable certainty.

The parties have not yet exchanged terms for construction or proposed constructions. Lite-On reserves the right to argue that Plaintiff's proposed constructions of any of the above terms render the Asserted Claim of the '117 Patent invalid for indefiniteness.

2. Invalidity Under 35 U.S.C. § 101

In addition to the preceding invalidity contentions, Lite-On further contends that the Asserted Claim of the '117 Patent is drawn to subject matter that is not patentable under 35 U.S.C. § 101. For example, if the Asserted Claims are construed or interpreted to cover naturally occurring (or inherent) variations in the make-up or naturally occurring (or inherent) fluctuations in the composition or band gap of alloys (e.g., AlGa_N), the Asserted Claims are invalid for claiming unpatentable subject matter.

Compound semiconductor materials have been synthesized using a variety of methods as early as the 1960's. It was known since the 1970s that ternary and quaternary III-V compound semiconductor materials have lateral inhomogeneities caused by lateral changes in the material composition itself. The random distribution of the alloy's components gives rise to an electron scattering mechanism caused by the local (and lateral) changes in the semiconductor bandgap.

In 1976, Harrison and Hauser produced a model which described the mean time between electron collisions caused by the random changes in the bandgap. *See, e.g.*, ("Alloy scattering in ternary III-V compounds") at 5347. It is well known that this collision time is proportional to the electron mobility which relates the low field conductivity to the concentration of electrons. The random distribution of the alloy's components is native to the epitaxial processes used to form the semiconductor materials. Indeed, this is described in the '117 Patent as follows: "Ternary and quaternary nitride semiconductor epitaxial layers inherently grow inhomogeneously due to contrasting optimum growth conditions needed for respective binary layers." '117 Patent, 18:15-18. This is also described in the '420 Patent as follows: "With proper growth conditions, it also was found that the aluminum did not incorporate uniformly throughout the AlGa_N layer (i.e., the material has areas of high and low concentrations of aluminum spread throughout). These compositional fluctuations, together with doping fluctuations, also known as localized

inhomogeneities, result in carrier localization and lead to the creation of conduction layers for carriers.” ’420 Patent, 2:6-13; see also, 2:14-3:22. It is clear to one skilled in the art that growth of compound semiconductor alloys will result in compositional fluctuations and inhomogeneous regions within the semiconductor layer. Accordingly, the natural phenomenon of “inhomogeneous regions” in semiconductor layers have been known to a POSITA dating back to the 1960-1970 timeframe.

For GaN based semiconductor materials having at least three chemical elements (*e.g.*, InGaN or AlGaN), the distribution of metal atoms (*e.g.*, In, Al, Ga) within the crystal structure of the material during growth of the semiconductor layer can vary, including randomly, leading to compositional fluctuations, which are sometimes referred to as inhomogeneities, across the lateral dimension (the direction parallel to the surface of the substrate). *See, e.g.*, “Phase separation and ordering in InGaN alloys grown by molecular beam epitaxy,” 1391. For example, inherently in a single layer of AlGaN, there may be more Ga atoms than Al atoms at one location and more Al atoms than Ga atoms at another location within the semiconductor layer due to random ordering. *See, e.g.*, “Photoconductive detectors based on partially ordered AlGaN alloys grown by molecular beam epitaxy,” 2203. This lateral inhomogeneity or composition fluctuation of AlGaN semiconductor layer is an inherent property of AlGaN. Similarly, InGaN will have inherent compositional fluctuations where there are regions having more In atoms than Ga atoms. *See, e.g.*, “Phase separation and ordering in InGaN alloys grown by molecular beam epitaxy,” 1391. This inherent, compositional fluctuation of the GaN based semiconductor alloys can lead to inhomogeneous regions in the semiconductor layer, and this natural phenomenon was well known before the invention of the ’117 Patent.

Lite-On's investigation of grounds of invalidity based upon lack of patentable subject matter is ongoing, and Lite-On reserve the right to supplement these Preliminary Invalidity Contentions.

VII. THE '496 PATENT

A. Priority

Plaintiff has identified that the Asserted Claims of the '496 Patent are entitled to a priority date of January 9, 2013, which is the filing date of U.S. Provisional Application No. 61/750,432. Plaintiff has provided no evidence to support its contention that the Asserted Claims of the '496 Patent are entitled to claim priority back to this earlier filed application, and Lite-On asserts the Asserted Claims of the '496 Patent may not be entitled to the benefit of the provisional application. Lite-On reserves the right to assert a later priority date based on any findings as to the priority date of the Asserted Claims of the '496 Patent by the Court, information learned through discovery, or otherwise.

B. Anticipation

The Asserted Claims of the '496 Patent are invalid as anticipated under 35 U.S.C. § 102 at least in view of each of the prior art references identified in the claim charts included in **Exhibits 496**, which identify specific examples of where each limitation of the Asserted Claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary only and representative of the content and teaching of the prior art references and should be understood in the context of the reference as a whole and as they would be understood by a POSITA.

Lite-On identifies the following references as anticipating the Asserted Claims of '496 Patent under 35 U.S.C. § 102. The table below of anticipating references is exemplary, and it does

not constitute an admission that any reference anticipates only the listed claims. Further, Lite-On contends that any prior art reference in the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following table.

Exhibit No.	Anticipating Prior Art	Claims
496-A1	U.S. Patent No. 7,888,670 (“ Han ”)	Claims 1, 3, 4, 16, 17
496-A2	U.S. Patent No. 8,227,791 (“ Yan ”)	Claims 1, 3, 4, 16, 17
496-A3	U.S. Patent No. 7,537,950 (“ Gaska ”)	Claims 1, 3, 4, 16, 17
496-A4	Liao	Claims 1, 3, 4, 16, 17

To the extent any item of prior art cited above is deemed not to disclose, explicitly, implicitly, or inherently, any limitation of an Asserted Claim of the ’496 Patent, Lite-On reserves the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent to the art, or obvious to a POSITA, even if Lite-On has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

C. Obviousness

To the extent any limitation is deemed not to be met by an item of prior art listed above and in **Exhibits 496**, then any purported differences are such that the claimed subject matter as a whole would have been obvious to a POSITA at the time of the alleged invention, in view of Applicant Admitted Prior Art (“AAPA”), the state of the art and knowledge of those skilled in the art. The item of prior art would, therefore, render the relevant claims invalid for obviousness under 35 U.S.C. § 103.

In addition, the references identified above render the Asserted Claims of the '496 Patent obvious when the references are read in combination with each other, and/or when read in view of AAPA, the state of the art and knowledge of those skilled in the art. Each and every reference identified is also relevant to the state of the art at the time of the alleged invention. Any of the references disclosed above may be combined with AAPA and/or one another to render obvious (and therefore invalid) each of the Asserted Claims. Lite-On may rely upon a subset of the above identified references or all of the references identified above, including all references in **Exhibits 496**, for purposes of obviousness depending on the Court's claim construction, positions taken by Plaintiff during this litigation, and further investigation and discovery.

To the extent the foregoing references are found not to anticipate the Asserted Claims, the foregoing references render the Asserted Claims obvious either alone or in combination with one or more of the other references identified herein. It would have been obvious to a POSITA at the time of the alleged invention of the Asserted Claims of the '496 Patent to combine the various references cited herein so as to disclose the Asserted Claims of the '496 Patent.

Prior art references rendering the Asserted Claims obvious, alone or in combination with other references, are outlined below and included in **Exhibits 496**, which include exemplary claim charts for the Asserted Claims of the '496 Patent showing specifically where in each reference or combinations of references each Asserted Claim is found, and an explanation of why the prior art renders the Asserted Claim obvious. Where applicable, the charts include the motivation to combine references.

Moreover, in addition to the information contained elsewhere in these contentions, Defendants have identified additional motivations and reasons to combine the various references cited herein. In particular, multiple teachings, suggestions, and/or reasons to modify any of the

references and/or to combine any two or more of the references in **Exhibits 496** come from many sources, including the prior art (specific and as a whole), common knowledge, common sense, predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, obvious to try, the nature of the problem faced, and/or knowledge possessed by one of ordinary skill. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field or endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. The combination of prior art references identified in these contentions would have been obvious because the claimed combinations represent the known potential options with a reasonable expectation of success. Additionally, a POSITA would have been motivated to create combinations identified in these contentions using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or teaching, suggestion, or motivation in the prior art generally. Also, market forces in the industry, and the desire to improve features and performance, would motivate the addition of features to systems as they become available, become less expensive, become more commonly used, provide better performance, reduce costs, or predictably achieve other clearly desirable results.

In addition, Lite-On contends that additional combinations of prior art references render the Asserted Claims of the '496 Patent obvious. Claim charts included in **Exhibits 496** identify specific examples of where each limitation of the Asserted Claims is found in the combination of the prior art references below.

Exhibit No.	Additional Obviousness Combinations	Claims
496-A1	Han in view of “Lighting-Emitting Diodes” (“ Schubert ”)	Claims 1, 3, 4, 16, 17
496-A2	Yan in view of Schubert	Claims 1, 3, 4, 16, 17
496-A3	Gaska in view of Yan and/or Schubert	Claims 1, 3, 4, 16, 17
496-A4	Liao in view of Schubert	Claims 1, 3, 4, 16, 17

In addition to the specific combinations of prior art and the specific combinations of groups of prior art disclosed above, Lite-On reserves the right to rely on any other combination of any prior art references disclosed herein. Lite-On further reserves the right to rely upon combinations disclosed within the prosecution history of the references cited herein. These obviousness combinations reflect Lite-On’s present understanding of the potential scope of the claims that Plaintiff appears to be advocating and should not be seen as Lite-On’s acquiescence to Plaintiff’s interpretation of the patent claims.

Lite-On also reserves the right to amend or supplement these contentions regarding anticipation or obviousness of the Asserted Claims, in view of further information from Plaintiff, information discovered during discovery, or a claim construction ruling by the Court. Plaintiff has not identified what elements or combinations it alleges were not known to a POSITA at the time. Therefore, for any claim limitation that Plaintiff alleges is not disclosed in a particular prior art reference, Lite-On reserves the right to assert that any such limitation is either inherent in the disclosed reference or obvious to a POSITA at the time in light of the same, or that the limitation is disclosed in another of the references disclosed above and in combination would have rendered the Asserted Claims obvious.

D. Other Grounds for Invalidity

Lite-On identifies the following grounds for invalidity of the Asserted Claims of the '496 Patent based on 35 U.S.C. §§ 101 and/or 112. Lite-On reserves the right to supplement its Invalidity Contentions related to invalidity under § 101 and/or § 112 as the case proceeds, particularly in view of constructions to be proposed by Plaintiff during claim construction proceedings.

1. Invalidity Based On Indefiniteness Under 35 U.S.C. § 112(b)

Based on Lite-On's present understanding of Plaintiff's infringement contentions, Lite-On asserts that the Asserted Claims of the '496 Patent are invalid for reciting at least the following claim terms/phrases/limitations:

- “an embedded partially relaxed sublayer” (claims 1, 3, 4, 16, 17);
- “a dislocation blocking structure” (claims 1, 3, 4, 16, 17); and
- “a graded composition that changes from a first side of the dislocation blocking structure to a second side thereof” (claims 1, 3, 4, 16, 17).

Based on Lite-On's present understanding of Plaintiff's Preliminary Infringement Contentions, at least one or more of these claim terms/phrases/limitations are indefinite because they are vague and ambiguous, and given Plaintiff's apparent constructions of the claims, a POSITA at the time of the invention would not understand the scope of the invention with reasonable certainty.

The parties have not yet exchanged terms for construction or proposed constructions. Lite-On reserves the right to argue that Plaintiff's proposed constructions of any of the above terms render the Asserted Claims of the '496 Patent invalid for indefiniteness.

2. Invalidity Under 35 U.S.C. § 101

In addition to the preceding invalidity contentions, Lite-On further contends that each of the Asserted Claims of the '496 Patent is drawn to subject matter that is not patentable under 35 U.S.C. § 101. For example, if the Asserted Claims are construed or interpreted to cover naturally occurring (or inherent) variations in the make-up or naturally occurring (or inherent) fluctuations in the composition or band gap of alloys (e.g., AlGa_N), the Asserted Claims are invalid for claiming unpatentable subject matter.

Compound semiconductor materials have been synthesized using a variety of methods as early as the 1960's. It was known since the 1970s that ternary and quaternary III-V compound semiconductor materials have lateral inhomogeneities caused by lateral changes in the material composition itself. The random distribution of the alloy's components gives rise to an electron scattering mechanism caused by the local (and lateral) changes in the semiconductor bandgap.

In 1976, Harrison and Hauser produced a model which described the mean time between electron collisions caused by the random changes in the bandgap. *See, e.g.*, ("Alloy scattering in ternary III-V compounds") at 5347. It is well known that this collision time is proportional to the electron mobility which relates the low field conductivity to the concentration of electrons. The random distribution of the alloy's components is native to the epitaxial processes used to form the semiconductor materials. This is also described in the '420 Patent as follows: "With proper growth conditions, it also was found that the aluminum did not incorporate uniformly throughout the AlGa_N layer (i.e., the material has areas of high and low concentrations of aluminum spread throughout). These compositional fluctuations, together with doping fluctuations, also known as localized inhomogeneities, result in carrier localization and lead to the creation of conduction layers for carriers." '420 Patent, 2:6-13; see also, 2:14-3:22. It is clear to one skilled in the art that growth of compound semiconductor alloys will result in compositional fluctuations and

inhomogeneous regions within the semiconductor layer. Accordingly, the natural phenomenon of “inhomogeneous regions” in semiconductor layers have been known to a POSITA dating back to the 1960-1970 timeframe.

For GaN based semiconductor materials having at least three chemical elements (*e.g.*, InGaN or AlGaN), the distribution of metal atoms (*e.g.*, In, Al, Ga) within the crystal structure of the material during growth of the semiconductor layer can vary, including randomly, leading to compositional fluctuations, which are sometimes referred to as inhomogeneities, across the lateral dimension (the direction parallel to the surface of the substrate). *See, e.g.*, “Phase separation and ordering in InGaN alloys grown by molecular beam epitaxy,” 1391. For example, inherently in a single layer of AlGaN, there may be more Ga atoms than Al atoms at one location and more Al atoms than Ga atoms at another location within the semiconductor layer due to random ordering. *See, e.g.*, “Photoconductive detectors based on partially ordered AlGaN alloys grown by molecular beam epitaxy,” 2203. This lateral inhomogeneity or composition fluctuation of AlGaN semiconductor layer is an inherent property of AlGaN. Similarly, InGaN will have inherent compositional fluctuations where there are regions having more In atoms than Ga atoms. *See, e.g.*, “Phase separation and ordering in InGaN alloys grown by molecular beam epitaxy,” 1391. This inherent, compositional fluctuation of the GaN based semiconductor alloys can lead to inhomogeneous regions in the semiconductor layer, and this natural phenomenon was well known before the invention of the '496 Patent.

Lite-On's investigation of grounds of invalidity based upon lack of patentable subject matter is ongoing, and Lite-On reserve the right to supplement these Preliminary Invalidity Contentions.

VIII. THE '848 PATENT

A. Priority

Plaintiff has identified that the Asserted Claims of the '848 Patent are entitled to a priority date of October 1, 2015, which is the filing date of U.S. Provisional Application No. 62/236,045. Plaintiff has provided no evidence to support its contention that the Asserted Claims of the '848 Patent are entitled to claim priority back to this earlier filed application, and Lite-On asserts the Asserted Claims of the '848 Patent may not be entitled to the benefit of the provisional application. Lite-On reserves the right to assert a later priority date based on any findings as to the priority date of the Asserted Claims of the '848 Patent by the Court, information learned through discovery, or otherwise.

B. Anticipation

Some or all of the Asserted Claims of the '848 Patent are invalid as anticipated under 35 U.S.C. § 102 at least in view of each of the prior art references identified in the claim charts included in **Exhibits 848**, which identify specific examples of where each limitation of the Asserted Claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary only and representative of the content and teaching of the prior art references and should be understood in the context of the reference as a whole and as they would be understood by a POSITA.

Lite-On identifies the following references as anticipating one or more of the Asserted Claims of '848 Patent under 35 U.S.C. § 102. The table below of anticipating references is exemplary, and it does not constitute an admission that any reference anticipates only the listed claims. Further, Lite-On contends that any prior art reference in the attached charts that is charted

for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following table.

Exhibit No.	Anticipating Prior Art	Claims
848-A1	U.S. Patent No. 8,963,177 (“ Katsuno ’177 ”)	Claims 1, 2, 4, 10-12, 16
848-A2	U.S. Patent No. 6,998,281 (“ Taskar ”)	Claims 1, 2, 4, 10-12, 15
848-A3	U.S. Pat. App. Pub. No. 2009/0057707 (“ Katsuno ’707 ”)	Claims 1, 2, 4, 12, 16
848-A4	Sano	Claims 1, 2, 4, 12, 16
848-A5	Japanese Pat. App. Pub. No. JP 2015103768 (“ Obata ”)	Claims 1, 2, 4, 12
848-A6	U.S. Patent No. 8,822,976 (“ Inazu ”)	Claims 1, 2, 4, 12, 16
848-A7	U.S. Pat. Pub. No. 2013/0214317 (“ Kim ”)	Claims 1, 2, 4, 12

To the extent any item of prior art cited above is deemed not to disclose, explicitly, implicitly, or inherently, any limitation of an Asserted Claim of the ’848 Patent, Lite-On reserves the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent to the art, or obvious to a POSITA, even if Lite-On has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

C. Obviousness

To the extent any limitation is deemed not to be met by an item of prior art listed above and in **Exhibits 848**, then any purported differences are such that the claimed subject matter as a whole would have been obvious to a POSITA at the time of the alleged invention, in view of Applicant Admitted Prior Art (“AAPA”), the state of the art and knowledge of those skilled in the art. The item of prior art would, therefore, render the relevant claims invalid for obviousness under 35 U.S.C. § 103.

In addition, the references identified above render the Asserted Claims of the '848 Patent obvious when the references are read in combination with each other, and/or when read in view of AAPA, the state of the art and knowledge of those skilled in the art. Each and every reference identified is also relevant to the state of the art at the time of the alleged invention. Any of the references disclosed above may be combined with AAPA and/or one another to render obvious (and therefore invalid) each of the Asserted Claims. Lite-On may rely upon a subset of the above identified references or all of the references identified above, including all references in **Exhibits 848**, for purposes of obviousness depending on the Court's claim construction, positions taken by Plaintiff during this litigation, and further investigation and discovery.

To the extent the foregoing references are found not to anticipate the Asserted Claims, the foregoing references render the Asserted Claims obvious either alone or in combination with one or more of the other references identified herein. It would have been obvious to a POSITA at the time of the alleged invention of the Asserted Claims of the '848 Patent to combine the various references cited herein so as to disclose the Asserted Claims of the '848 Patent.

Prior art references rendering the Asserted Claims obvious, alone or in combination with other references, are outlined below and included in **Exhibits 848**, which include exemplary claim charts for the Asserted Claims of the '848 Patent showing specifically where in each reference or combinations of references each Asserted Claim is found, and an explanation of why the prior art renders the Asserted Claim obvious. Where applicable, the charts include the motivation to combine references.

Moreover, in addition to the information contained elsewhere in these contentions, Defendants have identified additional motivations and reasons to combine the various references cited herein. In particular, multiple teachings, suggestions, and/or reasons to modify any of the

references and/or to combine any two or more of the references in **Exhibits 848** come from many sources, including the prior art (specific and as a whole), common knowledge, common sense, predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, obvious to try, the nature of the problem faced, and/or knowledge possessed by one of ordinary skill. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field or endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. The combination of prior art references identified in these contentions would have been obvious because the claimed combinations represent the known potential options with a reasonable expectation of success. Additionally, a POSITA would have been motivated to create combinations identified in these contentions using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or teaching, suggestion, or motivation in the prior art generally. Also, market forces in the industry, and the desire to improve features and performance, would motivate the addition of features to systems as they become available, become less expensive, become more commonly used, provide better performance, reduce costs, or predictably achieve other clearly desirable results.

In addition, Lite-On contends that additional combinations of prior art references render the Asserted Claims of the '848 Patent obvious. Claim charts included in **Exhibits 848** identify specific examples of where each limitation of the Asserted Claims is found in the combination of the prior art references below.

Exhibit No.	Additional Obviousness Combinations	Claims
848-A1	Katsuno '177 in view of U.S. Patent No. 7,495,259 (“ Sakamoto ”)	Claims 1, 2, 4, 10-12, 15, 16
848-A2	Taskar in view of Sano , U.S. Pat. App. Pub. No. 2006/0255358 (“ Shum ”), U.S. Patent No. 8,476,648 (“ Lee '648 ”), and/or Sakamoto	Claims 1, 2, 4, 10-12, 15, 16
848-A3	Katsuno '707 in view of Lee '648 and/or Sakamoto	Claims 1, 2, 4, 10-12, 15, 16
848-A4	Sano in view of Lee '648 and/or Sakamoto	Claims 1, 2, 4, 10-12, 15, 16
848-A5	Obata in view of Sano , Lee '648 and/or Sakamoto	Claims 1, 2, 4, 10-12, 15, 16
848-A6	Inazu in view of Lee '648 and/or Sakamoto	Claims 1, 2, 4, 10-12, 15, 16
848-A7	Kim in view of Katsuno '177 and/or Sakamoto	Claims 1, 2, 4, 10-12, 15, 16

In addition to the specific combinations of prior art and the specific combinations of groups of prior art disclosed above, Lite-On reserves the right to rely on any other combination of any prior art references disclosed herein. Lite-On further reserves the right to rely upon combinations disclosed within the prosecution history of the references cited herein. These obviousness combinations reflect Lite-On’s present understanding of the potential scope of the claims that Plaintiff appears to be advocating and should not be seen as Lite-On’s acquiescence to Plaintiff’s interpretation of the patent claims.

Lite-On also reserves the right to amend or supplement these contentions regarding anticipation or obviousness of the Asserted Claims, in view of further information from Plaintiff, information discovered during discovery, or a claim construction ruling by the Court. Plaintiff has not identified what elements or combinations it alleges were not known to a POSITA at the time.

Therefore, for any claim limitation that Plaintiff alleges is not disclosed in a particular prior art reference, Lite-On reserves the right to assert that any such limitation is either inherent in the disclosed reference or obvious to a POSITA at the time in light of the same, or that the limitation is disclosed in another of the references disclosed above and in combination would have rendered the Asserted Claims obvious.

D. Other Grounds for Invalidity

Lite-On identifies the following grounds for invalidity of the Asserted Claims of the '848 Patent based on 35 U.S.C. §§ 101 and/or 112. Lite-On reserves the right to supplement its Invalidity Contentions related to invalidity under § 101 and/or § 112 as the case proceeds, particularly in view of constructions to be proposed by Plaintiff during claim construction proceedings.

1. Invalidity Based On Indefiniteness Under 35 U.S.C. § 112(b)

Based on Lite-On's present understanding of Plaintiff's infringement contentions, Lite-On asserts that that the Asserted Claims of the '848 Patent are invalid for reciting at least the following claim terms/phrases/limitations:

- “a second n-type metallic contact layer located over a second portion of the n-type contact region” (claims 1, 2, 4, 10-12, 15, 16);
- “wherein the second n-type metallic contact layer is formed of a reflective metallic material distinct from a metallic material used to form the first n-type metallic contact layer” (claims 1, 2, 4, 10-12, 15, 16); and
- “wherein the first n-type metallic contact layer extends between the plurality of interconnected fingers” (claim 16).

Based on Lite-On's present understanding of Plaintiff's Preliminary Infringement Contentions, at least one or more of these claim terms/phrases/limitations are indefinite because they are vague and ambiguous, and given Plaintiff's apparent constructions of the claims, a

POSITA at the time of the invention would not understand the scope of the invention with reasonable certainty.

The parties have not yet exchanged terms for construction or proposed constructions. Lite-On reserves the right to argue that Plaintiff's proposed constructions of any of the above terms render the Asserted Claims of the '848 Patent invalid for indefiniteness.

IX. THE '156 PATENT

A. Priority

Plaintiff has identified that the Asserted Claims of the '156 Patent are entitled to a priority date of August 11, 2011, which is the filing date of U.S. Provisional Application No. 61/522,425. Plaintiff has provided no evidence to support its contention that the Asserted Claims of the '156 Patent are entitled to claim priority back to this earlier filed application, and Lite-On asserts the Asserted Claims of the '156 Patent may not be entitled to the benefit of the provisional application. Lite-On reserves the right to assert a later priority date based on any findings as to the priority date of the Asserted Claims of the '156 Patent by the Court, information learned through discovery, or otherwise.

B. Anticipation

Some or all of the Asserted Claims of the '156 Patent are invalid as anticipated under 35 U.S.C. § 102 at least in view of each of the prior art references identified in the claim charts included in **Exhibits 156**, which identify specific examples of where each limitation of the Asserted Claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary only and representative of the content and teaching of the prior art references and should be understood in the context of the reference as a whole and as they would be understood by a POSITA.

Lite-On identifies the following references as anticipating one or more of the Asserted Claims of '156 Patent under 35 U.S.C. § 102. The table below of anticipating references is exemplary, and it does not constitute an admission that any reference anticipates only the listed claims. Further, Lite-On contends that any prior art reference in the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following table.

Exhibit No.	Anticipating Prior Art	Claims
156-A1	Sampath '182	Claims 1, 7
156-A2	"Stimulated emission from optically pumped GaN quantum dots" ("Tanaka")	Claim 1
156-A3	Sakai	Claim 1
156-A4	Saxler	Claims 1, 7
156-A5	Sampath '366	Claims 1, 7
156-A6	Liao	Claims 1, 7

To the extent any item of prior art cited above is deemed not to disclose, explicitly, implicitly, or inherently, any limitation of an Asserted Claim of the '156 Patent, Lite-On reserves the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent to the art, or obvious to a POSITA, even if Lite-On has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

C. Obviousness

To the extent any limitation is deemed not to be met by an item of prior art listed above and in **Exhibits 156**, then any purported differences are such that the claimed subject matter as a whole would have been obvious to a POSITA at the time of the alleged invention, in view of

Applicant Admitted Prior Art (“AAPA”), the state of the art and knowledge of those skilled in the art. The item of prior art would, therefore, render the relevant claims invalid for obviousness under 35 U.S.C. § 103.

In addition, the references identified above render the Asserted Claims of the ’156 Patent obvious when the references are read in combination with each other, and/or when read in view of AAPA, the state of the art and knowledge of those skilled in the art. Each and every reference identified is also relevant to the state of the art at the time of the alleged invention. Any of the references disclosed above may be combined with AAPA and/or one another to render obvious (and therefore invalid) each of the Asserted Claims. Lite-On may rely upon a subset of the above identified references or all of the references identified above, including all references in **Exhibits 156**, for purposes of obviousness depending on the Court’s claim construction, positions taken by Plaintiff during this litigation, and further investigation and discovery.

To the extent the foregoing references are found not to anticipate the Asserted Claims, the foregoing references render the Asserted Claims obvious either alone or in combination with one or more of the other references identified herein. It would have been obvious to a POSITA at the time of the alleged invention of the Asserted Claims of the ’156 Patent to combine the various references cited herein so as to disclose the Asserted Claims of the ’156 Patent.

Prior art references rendering the Asserted Claims obvious, alone or in combination with other references, are outlined below and included in **Exhibits 156**, which include exemplary claim charts for the Asserted Claims of the ’156 Patent showing specifically where in each reference or combinations of references each Asserted Claim is found, and an explanation of why the prior art renders the Asserted Claim obvious. Where applicable, the charts include the motivation to combine references.

Moreover, in addition to the information contained elsewhere in these contentions, Defendants have identified additional motivations and reasons to combine the various references cited herein. In particular, multiple teachings, suggestions, and/or reasons to modify any of the references and/or to combine any two or more of the references in **Exhibits 156** come from many sources, including the prior art (specific and as a whole), common knowledge, common sense, predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, obvious to try, the nature of the problem faced, and/or knowledge possessed by one of ordinary skill. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field or endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. The combination of prior art references identified in these contentions would have been obvious because the claimed combinations represent the known potential options with a reasonable expectation of success. Additionally, a POSITA would have been motivated to create combinations identified in these contentions using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or teaching, suggestion, or motivation in the prior art generally. Also, market forces in the industry, and the desire to improve features and performance, would motivate the addition of features to systems as they become available, become less expensive, become more commonly used, provide better performance, reduce costs, or predictably achieve other clearly desirable results.

In addition, Lite-On contends that additional combinations of prior art references render the Asserted Claims of the '156 Patent obvious. Claim charts included in **Exhibits 156** identify

specific examples of where each limitation of the Asserted Claims is found in the combination of the prior art references below.

Exhibit No.	Additional Obviousness Combinations	Claims
156-A1	Sampath '182 in view of Stutzmann and/or Liao	Claims 1, 7
156-A2	Tanaka in view of Stutzmann , U.S. Patent No. 6,734,033 (" Emerson ") and/or Katsuno '707	Claims 1, 7
156-A3	Sakai in view of Stutzmann , Liao and/or Edmond	Claims 1, 7
156-A4	Saxler in view of Stutzmann	Claims 1, 7
156-A5	Sampath '366 in view of Stutzmann and/or Liao	Claims 1, 7
156-A6	Liao in view of Stutzmann and/or Edmond	Claims 1, 7

In addition to the specific combinations of prior art and the specific combinations of groups of prior art disclosed above, Lite-On reserves the right to rely on any other combination of any prior art references disclosed herein. Lite-On further reserves the right to rely upon combinations disclosed within the prosecution history of the references cited herein. These obviousness combinations reflect Lite-On's present understanding of the potential scope of the claims that Plaintiff appears to be advocating and should not be seen as Lite-On's acquiescence to Plaintiff's interpretation of the patent claims.

Lite-On also reserves the right to amend or supplement these contentions regarding anticipation or obviousness of the Asserted Claims, in view of further information from Plaintiff, information discovered during discovery, or a claim construction ruling by the Court. Plaintiff has not identified what elements or combinations it alleges were not known to a POSITA at the time. Therefore, for any claim limitation that Plaintiff alleges is not disclosed in a particular prior art reference, Lite-On reserves the right to assert that any such limitation is either inherent in the disclosed reference or obvious to a POSITA at the time in light of the same, or that the limitation

is disclosed in another of the references disclosed above and in combination would have rendered the Asserted Claims obvious.

D. Other Grounds for Invalidity

Lite-On identifies the following grounds for invalidity of the Asserted Claims of the '156 Patent based on 35 U.S.C. §§ 101 and/or 112. Lite-On reserves the right to supplement its Invalidity Contentions related to invalidity under § 101 and/or § 112 as the case proceeds, particularly in view of constructions to be proposed by Plaintiff during claim construction proceedings.

1. Invalidity Based On Indefiniteness Under 35 U.S.C. § 112(b)

Based on Lite-On's present understanding of Plaintiff's infringement contentions, Lite-On asserts that that the Asserted Claims of the '156 Patent are invalid for reciting at least the following claim terms/phrases/limitations:

- “a set of transparent regions having a first characteristic band gap” (claims 1, 7);
- “a set of higher conductive regions having a second characteristic band gap at least five percent smaller than the first characteristic band gap” (claims 1, 7); and
- “the set of conductive regions” (claims 1, 7).

Based on Lite-On's present understanding of Plaintiff's Preliminary Infringement Contentions, at least one or more of these claim terms/phrases/limitations are indefinite because they are vague and ambiguous, and given Plaintiff's apparent constructions of the claims, a POSITA at the time of the invention would not understand the scope of the invention with reasonable certainty.

The parties have not yet exchanged terms for construction or proposed constructions. Lite-On reserves the right to argue that Plaintiff's proposed constructions of any of the above terms render the Asserted Claims of the '156 Patent invalid for indefiniteness.

2. Invalidity Under 35 U.S.C. § 101

In addition to the preceding invalidity contentions, Lite-On further contends that each of the Asserted Claims of the '156 Patent is drawn to subject matter that is not patentable under 35 U.S.C. § 101. For example, if the Asserted Claims are construed or interpreted to cover naturally occurring (or inherent) variations in the make-up or naturally occurring (or inherent) fluctuations in the composition or band gap of alloys (e.g., AlGa_N), the Asserted Claims are invalid for claiming unpatentable subject matter.

Compound semiconductor materials have been synthesized using a variety of methods as early as the 1960's. It was known since the 1970s that ternary and quaternary III-V compound semiconductor materials have lateral inhomogeneities caused by lateral changes in the material composition itself. The random distribution of the alloy's components gives rise to an electron scattering mechanism caused by the local (and lateral) changes in the semiconductor bandgap.

In 1976, Harrison and Hauser produced a model which described the mean time between electron collisions caused by the random changes in the bandgap. *See, e.g.*, ("Alloy scattering in ternary III-V compounds") at 5347. It is well known that this collision time is proportional to the electron mobility which relates the low field conductivity to the concentration of electrons. The random distribution of the alloy's components is native to the epitaxial processes used to form the semiconductor materials. Indeed, this is described in the '156 Patent as follows: "With proper growth conditions, it also was found that the aluminum did not incorporate uniformly throughout the AlGa_N layer (i.e., the material has areas of high and low concentrations of aluminum spread throughout). These compositional fluctuations, together with doping fluctuations, also known as localized inhomogeneities, result in carrier localization and lead to the creation of conduction layers for carriers." '156 Patent, 2:11-18; *see also*, 2:19-3:29. It is clear to one skilled in the art that growth of compound semiconductor alloys will result in compositional fluctuations and

inhomogeneous regions within the semiconductor layer. Accordingly, the natural phenomenon of “inhomogeneous regions” in semiconductor layers have been known to a POSITA dating back to the 1960-1970 timeframe.

For GaN based semiconductor materials having at least three chemical elements (*e.g.*, InGaN or AlGaN), the distribution of metal atoms (*e.g.*, In, Al, Ga) within the crystal structure of the material during growth of the semiconductor layer can vary, including randomly, leading to compositional fluctuations, which are sometimes referred to as inhomogeneities, across the lateral dimension (the direction parallel to the surface of the substrate). *See, e.g.*, “Phase separation and ordering in InGaN alloys grown by molecular beam epitaxy,” 1391. For example, inherently in a single layer of AlGaN, there may be more Ga atoms than Al atoms at one location and more Al atoms than Ga atoms at another location within the semiconductor layer due to random ordering. *See, e.g.*, “Photoconductive detectors based on partially ordered AlGaN alloys grown by molecular beam epitaxy,” 2203. This lateral inhomogeneity or composition fluctuation of AlGaN semiconductor layer is an inherent property of AlGaN. Similarly, InGaN will have inherent compositional fluctuations where there are regions having more In atoms than Ga atoms. *See, e.g.*, “Phase separation and ordering in InGaN alloys grown by molecular beam epitaxy,” 1391. This inherent, compositional fluctuation of the GaN based semiconductor alloys can lead to inhomogeneous regions in the semiconductor layer, and this natural phenomenon was well known before the invention of the ’156 Patent.

Lite-On’s investigation of grounds of invalidity based upon lack of patentable subject matter is ongoing, and Lite-On reserve the right to supplement these Preliminary Invalidity Contentions.

X. THE '952 PATENT

A. Priority

Plaintiff has identified that the Asserted Claims of the '952 Patent are entitled to a priority date of May 1, 2013, which is the filing date of U.S. Provisional Application No. 61/817,970. Plaintiff has provided no evidence to support its contention that the Asserted Claims of the '952 Patent are entitled to claim priority back to this earlier filed application, and Lite-On asserts the Asserted Claims of the '952 Patent may not be entitled to the benefit of the provisional application. Lite-On reserves the right to assert a later priority date based on any findings as to the priority date of the Asserted Claims of the '952 Patent by the Court, information learned through discovery, or otherwise.

B. Anticipation

Some or all of the Asserted Claims of the '952 Patent are invalid as anticipated under 35 U.S.C. § 102 at least in view of each of the prior art references identified in the claim charts included in **Exhibits 952**, which identify specific examples of where each limitation of the Asserted Claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary only and representative of the content and teaching of the prior art references and should be understood in the context of the reference as a whole and as they would be understood by a POSITA.

Lite-On identifies the following references as anticipating one or more of the Asserted Claims of '952 Patent under 35 U.S.C. § 102. The table below of anticipating references is exemplary, and it does not constitute an admission that any reference anticipates only the listed claims. Further, Lite-On contends that any prior art reference in the attached charts that is charted

for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following table.

Exhibit No.	Anticipating Prior Art	Claims
952-A1	Ueta	Claims 1-5, 7, 11-14
952-A2	Ju	Claims 1-5, 7, 11-14
952-A3	Ohmae	Claims 1-5, 7, 11-14
952-A4	Oh	Claims 1-5, 11-14
952-A5	Cheong	Claims 1-5, 11-14

To the extent any item of prior art cited above is deemed not to disclose, explicitly, implicitly, or inherently, any limitation of an Asserted Claim of the '952 Patent, Lite-On reserves the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent to the art, or obvious to a POSITA, even if Lite-On has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

C. Obviousness

To the extent any limitation is deemed not to be met by an item of prior art listed above and in **Exhibits 952**, then any purported differences are such that the claimed subject matter as a whole would have been obvious to a POSITA at the time of the alleged invention, in view of Applicant Admitted Prior Art ("AAPA"), the state of the art and knowledge of those skilled in the art. The item of prior art would, therefore, render the relevant claims invalid for obviousness under 35 U.S.C. § 103.

In addition, the references identified above render the Asserted Claims of the '952 Patent obvious when the references are read in combination with each other, and/or when read in view of

AAPA, the state of the art and knowledge of those skilled in the art. Each and every reference identified is also relevant to the state of the art at the time of the alleged invention. Any of the references disclosed above may be combined with AAPA and/or one another to render obvious (and therefore invalid) each of the Asserted Claims. Lite-On may rely upon a subset of the above identified references or all of the references identified above, including all references in **Exhibits 952**, for purposes of obviousness depending on the Court's claim construction, positions taken by Plaintiff during this litigation, and further investigation and discovery.

To the extent the foregoing references are found not to anticipate the Asserted Claims, the foregoing references render the Asserted Claims obvious either alone or in combination with one or more of the other references identified herein. It would have been obvious to a POSITA at the time of the alleged invention of the Asserted Claims of the '952 Patent to combine the various references cited herein so as to disclose the Asserted Claims of the '952 Patent.

Prior art references rendering the Asserted Claims obvious, alone or in combination with other references, are outlined below and included in **Exhibits 952**, which include exemplary claim charts for the Asserted Claims of the '952 Patent showing specifically where in each reference or combinations of references each Asserted Claim is found, and an explanation of why the prior art renders the Asserted Claim obvious. Where applicable, the charts include the motivation to combine references.

Moreover, in addition to the information contained elsewhere in these contentions, Defendants have identified additional motivations and reasons to combine the various references cited herein. In particular, multiple teachings, suggestions, and/or reasons to modify any of the references and/or to combine any two or more of the references in **Exhibits 952** come from many sources, including the prior art (specific and as a whole), common knowledge, common sense,

predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, obvious to try, the nature of the problem faced, and/or knowledge possessed by one of ordinary skill. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field or endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. The combination of prior art references identified in these contentions would have been obvious because the claimed combinations represent the known potential options with a reasonable expectation of success. Additionally, a POSITA would have been motivated to create combinations identified in these contentions using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or teaching, suggestion, or motivation in the prior art generally. Also, market forces in the industry, and the desire to improve features and performance, would motivate the addition of features to systems as they become available, become less expensive, become more commonly used, provide better performance, reduce costs, or predictably achieve other clearly desirable results.

In addition, Lite-On contends that additional combinations of prior art references render the Asserted Claims of the '952 Patent obvious. Claim charts included in **Exhibits 952** identify specific examples of where each limitation of the Asserted Claims is found in the combination of the prior art references below.

Exhibit No.	Additional Obviousness Combinations	Claims
952-A4	Oh in view of Ueta and/or Japan Patent Publication No. JP2004335635A (" Chin ")	Claims 1-5, 7, 11-14
952-A5	Cheong in view of Chin	Claims 1-5, 7, 11-14

In addition to the specific combinations of prior art and the specific combinations of groups of prior art disclosed above, Lite-On reserves the right to rely on any other combination of any prior art references disclosed herein. Lite-On further reserves the right to rely upon combinations disclosed within the prosecution history of the references cited herein. These obviousness combinations reflect Lite-On's present understanding of the potential scope of the claims that Plaintiff appears to be advocating and should not be seen as Lite-On's acquiescence to Plaintiff's interpretation of the patent claims.

Lite-On also reserves the right to amend or supplement these contentions regarding anticipation or obviousness of the Asserted Claims, in view of further information from Plaintiff, information discovered during discovery, or a claim construction ruling by the Court. Plaintiff has not identified what elements or combinations it alleges were not known to a POSITA at the time. Therefore, for any claim limitation that Plaintiff alleges is not disclosed in a particular prior art reference, Lite-On reserves the right to assert that any such limitation is either inherent in the disclosed reference or obvious to a POSITA at the time in light of the same, or that the limitation is disclosed in another of the references disclosed above and in combination would have rendered the Asserted Claims obvious.

D. Other Grounds for Invalidity

Lite-On identifies the following grounds for invalidity of the Asserted Claims of the '952 Patent based on 35 U.S.C. §§ 101 and/or 112. Lite-On reserves the right to supplement its Invalidity Contentions related to invalidity under § 101 and/or § 112 as the case proceeds, particularly in view of constructions to be proposed by Plaintiff during claim construction proceedings.

1. Invalidity Based On Indefiniteness Under 35 U.S.C. § 112(b)

Based on Lite-On's present understanding of Plaintiff's infringement contentions, Lite-On asserts that the Asserted Claims of the '952 Patent are invalid for reciting at least the following claim terms/phrases/limitations:

- "wherein the semiconductor layer contains no large scale cavities" (claims 1-5, 7, and 11-14); and
- "wherein a surface of the substrate adjacent to the nucleation layer is inclined at an angle" (claim 7).

Based on Lite-On's present understanding of Plaintiff's Preliminary Infringement Contentions, at least one or more of these claim terms/phrases/limitations are indefinite because they are vague and ambiguous, and given Plaintiff's apparent constructions of the claims, a POSITA at the time of the invention would not understand the scope of the invention with reasonable certainty.

The parties have not yet exchanged terms for construction or proposed constructions. Lite-On reserves the right to argue that Plaintiff's proposed constructions of any of the above terms render the Asserted Claims of the '952 Patent invalid for indefiniteness.

XI. THE '785 PATENT

A. Priority

Plaintiff has identified that the Asserted Claims of the '785 Patent are entitled to a priority date of October 1, 2015, which is the filing date of U.S. Provisional Application No. 62/236,045. Plaintiff has provided no evidence to support its contention that the Asserted Claims of the '785 Patent are entitled to claim priority back to this earlier filed application, and Lite-On asserts the Asserted Claims of the '785 Patent may not be entitled to the benefit of the provisional application. Lite-On reserves the right to assert a later priority date based on any findings as to the priority date

of the Asserted Claims of the '785 Patent by the Court, information learned through discovery, or otherwise.

B. Anticipation

Some or all of the Asserted Claims of the '785 Patent are invalid as anticipated under 35 U.S.C. § 102 at least in view of each of the prior art references identified in the claim charts included in **Exhibits 785**, which identify specific examples of where each limitation of the Asserted Claims is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary only and representative of the content and teaching of the prior art references and should be understood in the context of the reference as a whole and as they would be understood by a POSITA.

Lite-On identifies the following references as anticipating one or more of the Asserted Claims of '785 Patent under 35 U.S.C. § 102. The table below of anticipating references is exemplary, and it does not constitute an admission that any reference anticipates only the listed claims. Further, Lite-On contends that any prior art reference in the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following table.

Exhibit No.	Anticipating Prior Art	Claims
785-A1	Inazu	Claims 1, 2, 4, 7, 12, 16
785-A2	Taskar	Claims 1, 2, 4, 10-12, 15, 16
785-A3	Katsuno '177	Claims 1, 2, 4, 10-12, 16
785-A4	Katsuno '707	Claims 1, 2, 4, 12, 16
785-A5	Sano	Claims 1, 2, 4, 12, 16
785-A6	Obata	Claims 1, 2, 4, 12

To the extent any item of prior art cited above is deemed not to disclose, explicitly, implicitly, or inherently, any limitation of an Asserted Claim of the '785 Patent, Lite-On reserves the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent to the art, or obvious to a POSITA, even if Lite-On has not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

C. Obviousness

To the extent any limitation is deemed not to be met by an item of prior art listed above and in **Exhibits 785**, then any purported differences are such that the claimed subject matter as a whole would have been obvious to a POSITA at the time of the alleged invention, in view of the Applicant Admitted Prior Art ("AAPA"), state of the art and knowledge of those skilled in the art. The item of prior art would, therefore, render the relevant claims invalid for obviousness under 35 U.S.C. § 103.

In addition, the references identified above render the Asserted Claims of the '785 Patent obvious when the references are read in combination with each other, and/or when read in view of AAPA, the state of the art and knowledge of those skilled in the art. Each and every reference identified is also relevant to the state of the art at the time of the alleged invention. Any of the references disclosed above may be combined with AAPA and/or one another to render obvious (and therefore invalid) each of the Asserted Claims. Lite-On may rely upon a subset of the above identified references or all of the references identified above, including all references in **Exhibits 785**, for purposes of obviousness depending on the Court's claim construction, positions taken by Plaintiff during this litigation, and further investigation and discovery.

To the extent the foregoing references are found not to anticipate the Asserted Claims, the foregoing references render the Asserted Claims obvious either alone or in combination with one or more of the other references identified herein. It would have been obvious to a POSITA at the time of the alleged invention of the Asserted Claims of the '785 Patent to combine the various references cited herein so as to disclose the Asserted Claims of the '785 Patent.

Prior art references rendering the Asserted Claims obvious, alone or in combination with other references, are outlined below and included in **Exhibits 785**, which include exemplary claim charts for the Asserted Claims of the '785 Patent showing specifically where in each reference or combinations of references each Asserted Claim is found, and an explanation of why the prior art renders the Asserted Claim obvious. Where applicable, the charts include the motivation to combine references.

Moreover, in addition to the information contained elsewhere in these contentions, Defendants have identified additional motivations and reasons to combine the various references cited herein. In particular, multiple teachings, suggestions, and/or reasons to modify any of the references and/or to combine any two or more of the references in **Exhibits 785** come from many sources, including the prior art (specific and as a whole), common knowledge, common sense, predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, obvious to try, the nature of the problem faced, and/or knowledge possessed by one of ordinary skill. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field or endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. The combination of prior art references identified in these contentions would have been obvious because the claimed

combinations represent the known potential options with a reasonable expectation of success. Additionally, a POSITA would have been motivated to create combinations identified in these contentions using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or teaching, suggestion, or motivation in the prior art generally. Also, market forces in the industry, and the desire to improve features and performance, would motivate the addition of features to systems as they become available, become less expensive, become more commonly used, provide better performance, reduce costs, or predictably achieve other clearly desirable results.

In addition, Lite-On contends that additional combinations of prior art references render the Asserted Claims of the '785 Patent obvious. Claim charts included in **Exhibits 785** identify specific examples of where each limitation of the Asserted Claims is found in the combination of the prior art references below.

Exhibit No.	Additional Obviousness Combinations	Claims
785-A1	Inazu in view of U.S. Pat. Pub. No. 2013/0277697 (“ Lai ”), U.S. Patent Publication No. US 2010/0295080 (“ Lim ”), Lee '648 and/or Sakamoto	Claims 1, 2, 4, 7, 10-12, 15, 16
785-A2	Taskar in view of Lai, Lim, Sano, Shum, Lee '648 and/or Sakamoto	Claims 1, 2, 4, 7, 10-12, 15, 16
785-A3	Katsuno '177 in view of Lai, Lim , and/or Sakamoto	Claims 1, 2, 4, 7, 10-12, 15, 16
785-A4	Katsuno '707 in view of Lai, Lim, Lee '648 and/or Sakamoto	Claims 1, 2, 4, 7, 10-12, 15, 16
785-A5	Sano in view of Lai, Lim, Lee '648 and/or Sakamoto	Claims 1, 2, 4, 7, 10-12, 15, 16
785-A6	Obata in view of Lai, Lim, Sano, Lee '648 and/or Sakamoto	Claims 1, 2, 4, 7, 10-12, 15, 16

In addition to the specific combinations of prior art and the specific combinations of groups of prior art disclosed above, Lite-On reserves the right to rely on any other combination of any prior art references disclosed herein. Lite-On further reserves the right to rely upon combinations disclosed within the prosecution history of the references cited herein. These obviousness combinations reflect Lite-On's present understanding of the potential scope of the claims that Plaintiff appears to be advocating and should not be seen as Lite-On's acquiescence to Plaintiff's interpretation of the patent claims.

Lite-On also reserves the right to amend or supplement these contentions regarding anticipation or obviousness of the Asserted Claims, in view of further information from Plaintiff, information discovered during discovery, or a claim construction ruling by the Court. Plaintiff has not identified what elements or combinations it alleges were not known to a POSITA at the time. Therefore, for any claim limitation that Plaintiff alleges is not disclosed in a particular prior art reference, Lite-On reserves the right to assert that any such limitation is either inherent in the disclosed reference or obvious to a POSITA at the time in light of the same, or that the limitation is disclosed in another of the references disclosed above and in combination would have rendered the Asserted Claims obvious.

D. Other Grounds for Invalidity

Lite-On identifies the following grounds for invalidity of the Asserted Claims of the '785 Patent based on 35 U.S.C. §§ 101 and/or 112. Lite-On reserves the right to supplement its Invalidity Contentions related to invalidity under § 101 and/or § 112 as the case proceeds, particularly in view of constructions to be proposed by Plaintiff during claim construction proceedings.

1. Invalidity Based On Indefiniteness Under 35 U.S.C. § 112(b)

Based on Lite-On's present understanding of Plaintiff's infringement contentions, Lite-On asserts that the Asserted Claims of the '785 Patent are invalid for reciting at least the following claim terms/phrases/limitations:

- "a second metallic contact layer located over a second portion of the n-type contact region" (claims 1, 2, 4, 7, 10-12, 15, and 16);
- "wherein the first metal is distinct from the second metal" (claims 1, 2, 4, 7, 10-12, 15, and 16);
- "wherein the n-type semiconductor layer includes at least one-scattering element" (claims 1, 2, 4, 7, 10-12, 15, and 16); and
- "wherein the first n-type metallic contact layer extends between the plurality of interconnected fingers" (claim 16).

Based on Lite-On's present understanding of Plaintiff's Preliminary Infringement Contentions, at least one or more of these claim terms/phrases/limitations are indefinite because they are vague and ambiguous, and given Plaintiff's apparent constructions of the claims, a POSITA at the time of the invention would not understand the scope of the invention with reasonable certainty.

The parties have not yet exchanged terms for construction or proposed constructions. Lite-On reserves the right to argue that Plaintiff's proposed constructions of any of the above terms render the Asserted Claims of the '785 Patent invalid for indefiniteness.

XII. DOCUMENT PRODUCTION

Lite-On has produced copies of the invalidating references (*e.g.*, publications and patents) concurrent with service of these Preliminary Invalidity Contentions. Lite-On reserves the right to identify and produce additional documents pursuant to the Patent Local Rules and the orders of the Court.

Dated: March 24, 2022

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that all counsel of record are being served with a copy of the foregoing via electronic mail on March 24, 2022.

/s/ Christopher Kao
Christopher Kao