

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HANWHA SOLUTIONS CORPORATION,
Petitioner

v.

MAXEON SOLAR PTE. LTD.,
Patent Owner

Case IPR2024-01203
U.S. Patent No. 8,222,516

**PATENT OWNER'S PRELIMINARY RESPONSE
UNDER 37 C.F.R. § 42.107(a)**

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PATENT OWNER'S EXHIBIT LIST

Exhibit No.	Description
2001	<i>Intentionally Left Blank</i>
2002	<i>Intentionally Left Blank</i>
2003	Gan, Jon-Yiew, Polysilicon emitters for silicon concentrator solar cells, Stanford University (July 1990) (“Gan Thesis”)
2004	<i>Intentionally Left Blank</i>
2005	<i>Intentionally Left Blank</i>
2006	Federal Court Management Statistics (September 30, 2024)
2007	<i>Intentionally Left Blank</i>
2008	<i>Intentionally Left Blank</i>
2009	Invalidity Contentions, <i>Maxeon Solar Pte. Ltd. v. Canadian Solar Inc.</i> , Case No. 2:24-cv-00210-JRG (E.D. Tex. Sept. 6, 2024)
2010	Feldman, et al., “A Passivated Rear Contact for High-Efficiency n-Type Silicon Solar Cells Enabling High VocS and FF > 82%” (28th European PV Solar Energy Conference & Exhibition, Paris, Sept. 30 – Oct. 4, 2013) (“Feldman”)
2011	Chieh-Wa Tsai, et. al, <i>Patent Analysis of High Efficiency Tunneling Oxide Passivated Contact Solar Cells</i> , 13 Energies 3060 (2020)
2012	<i>Intentionally Left Blank</i>
2013	<i>Intentionally Left Blank</i>
2014	<i>Intentionally Left Blank</i>
2015	<i>Intentionally Left Blank</i>
2016	<i>Intentionally Left Blank</i>

Exhibit No.	Description
2017	<i>Intentionally Left Blank</i>
2018	<i>Intentionally Left Blank</i>
2019	<i>Intentionally Left Blank</i>
2020	<i>Intentionally Left Blank</i>
2021	Docket Sheet, <i>Maxeon Solar Pte. Ltd. v. Canadian Solar, Inc.</i> , Case No. 2:24-cv-00210-JRG (E.D. Tex.)
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2024	Counterclaims, <i>Maxeon Solar Pte. Ltd. v. Hanwha Solutions Corp.</i> , Case No. 2:24-cv-00262-JRG (E.D. Tex. Nov. 15, 2024)

I. INTRODUCTION

The Board should deny Petitioner Hanwha Solutions Corp.’s (“Hanwha”) Petition for *inter partes* review, which challenges claims 1-12 (the “Challenged Claims”) of U.S. Patent No. 8,222,516 (“the ’516 patent”). Hanwha bears the burden to show that the Challenged Claims are unpatentable, and has not met that burden here. Hanwha’s Petition mischaracterizes teachings of the asserted art and fails to establish that a person of ordinary skill in the art (“POSITA”), having a proper understanding of the context and teachings of the prior art, would have arrived at the proposed combinations. The Petition attempts to buttress its flawed combinations with generic, conclusory statements that are not supported by evidence, which exposes Hanwha’s failure to carry its burden to show that any of the Challenged Claims are unpatentable.

First, Hanwha fails to establish a reasonable likelihood of showing that any of the asserted combinations would have rendered the Challenged Claims obvious. In each of its five grounds, Hanwha relies on references that plainly contradict Hanwha’s assertions. In addition, for the combinations based on Froitzheim/Gan and Li/Gan, Hanwha fails to provide adequate motivations to combine the asserted references or show that a skilled artisan would have had a reasonable expectation of success in making such combinations. And for the combinations based on Froitzheim/Borden-575, Hanwha provides vague combinations that fail to clearly

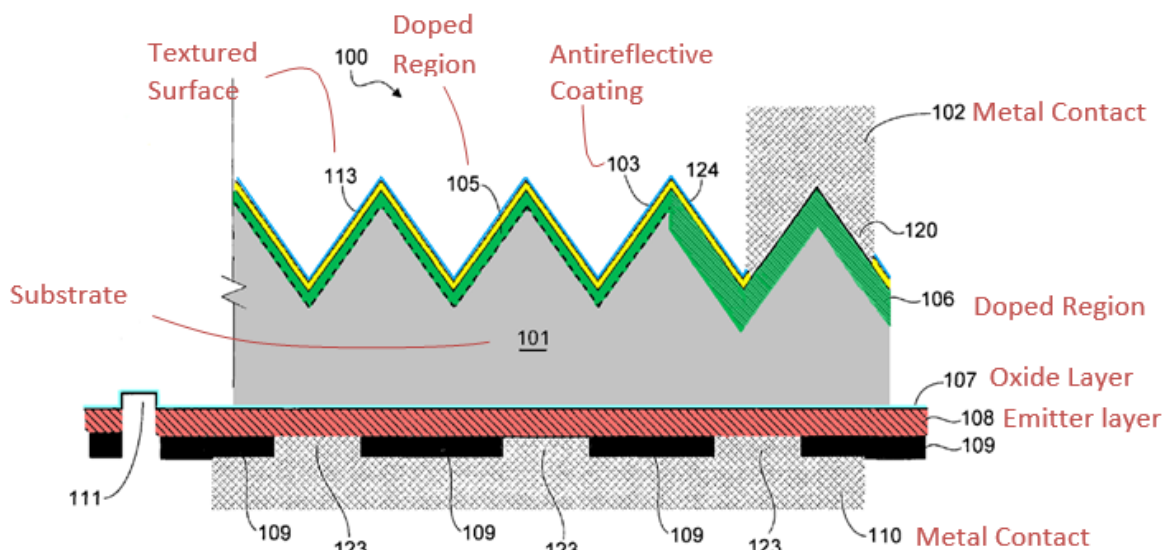
identify what is relied upon to allegedly render the claim unpatentable. The Petition falls well short of meeting Hanwha's burden of identifying with particularity how each of the Challenged Claims is allegedly unpatentable. Hanwha's burden cannot be met by simply submitting evidence and leaving it to the Board to determine a cogent theory of unpatentability.

Second, the *Fintiv* factors weigh in favor of exercising discretion to deny institution under 35 U.S.C. § 314(a). And as is evident from the flaws explained below, Hanwha's Petition does not present a compelling unpatentability challenge that would otherwise warrant institution. Accordingly, Maxeon respectfully requests that the Board deny institution of this IPR and preserve the judicial resources of the Board and the parties.

II. OVERVIEW OF THE '516 PATENT

A. The '516 Patent

The '516 patent discloses and claims a novel tunnel oxide passivated contact (i.e., "TOPCon") solar cell. As illustrated in one embodiment, the solar cell 100 has a front side facing the sun during normal operation to collect solar radiation and a backside opposite the front side:



EX1001, FIG. 1 (annotated).

EX1001, 2:22-27, FIG. 1. The solar cell additionally has a substrate 101 with a textured surface 113, *id.*, 2:28-31, 2:36-38, an antireflective layer 103 over the textured front surface of the substrate, *id.*, 2:50-52, and a metal contact 102 electrically connected to the front side of the substrate, *id.*, 2:24-26. The solar cell further has an emitter layer 108 over a back surface of the substrate, *id.*, 2:28-31, and a metal contact 110 electrically connected to the emitter layer, *id.*, 2:66-3:2. Critically, the solar cell has a “tunnel” oxide layer 107 between the substrate and emitter layer. *Id.*, 2:57-58. The ’516 patent discloses that the tunnel oxide layer “may comprise silicon dioxide thermally grown to a thickness of about 10 to 50 Angstroms on the backside surface of the substrate 101.” *Id.*, 2:64-66.

The term “TOPCon” appears to have been coined by researchers at the Fraunhofer Institute for Solar Energy Systems (ISE) in 2013. *See* EX2010.

SunPower Corporation (the predecessor to Maxeon) (“SunPower”), however, had designed and patented the ’516 patent, which is a front contact solar cell with an oxide layer, years before the “TOPCon” moniker was ever used. In 2020, a group of researchers conducted a patent landscape report related to TOPCon technology and found that “SunPower is the earliest patent assignee among the top six companies” who own the most TOPCon patents, and that SunPower’s “early patents might be the parent applications of the initial structure of the TOPCon solar cell.” EX2011, 10; *see also id.*, FIG. 8 (reproduced below).

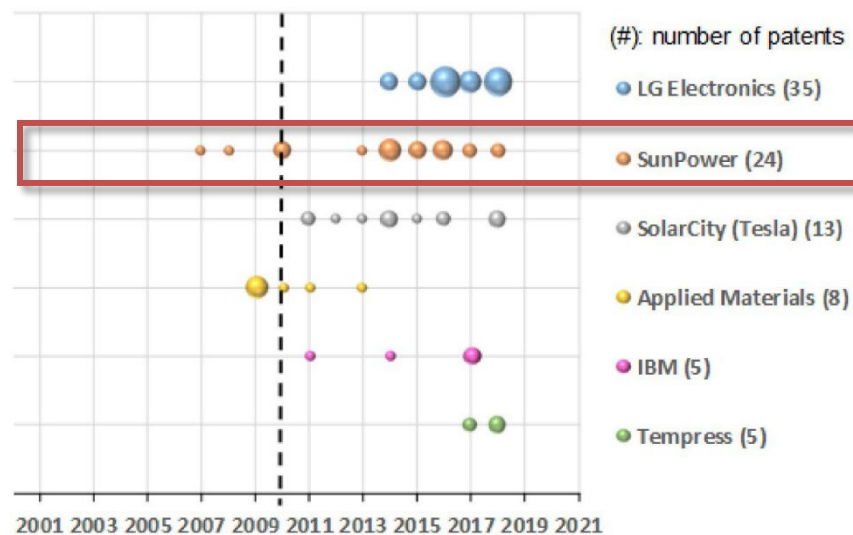


Figure 8. Timeline of technology development of major patent assignees.

EX2011, FIG. 8 (annotated).

B. The ’516 Patent Prosecution History

The ’516 patent was filed as U.S. Patent App. No. 12/070,742 (“the ’742 application”) on February 20, 2008. EX1002, 34. The ’742 application was filed with original claims 1-20, of which claims 1, 9, and 17 were independent. EX1002,

16-19. Prior to examination, the Examiner issued a restriction requirement between the claims “drawn to a solar cell” and those “drawn to a method of making a solar cell.” *Id.*, 61. SunPower elected the solar cell claims for prosecution in the ’742 application and canceled method claims 9-16.¹ *Id.*

Remaining original claims 1-8 and 17-20 were thoroughly examined during prosecution of the ’742 application. In a first Office Action issued on December 24, 2009, the Examiner rejected independent claims 1 and 17 on two separate grounds of obviousness (Meier in view of Jordan and Sah in view of Jordan). *Id.*, 76-83. The Examiner also rejected all of the dependent claims, citing five pieces of art against only twelve claims (Meier, Jordan, Sah, Sheats, and Hall). *Id.* The Examiner maintained each of these rejections in a subsequent Final Office Action issued on May 26, 2010. *Id.*, 118-28.

The ’516 patent ultimately issued after the independent claims were amended and the Examiner determined that “[t]he prior art of record lacks an oxide layer formed between an emitter and an oppositely doped substrate and a metal contact making an electrical connection to the substrate on the front light incident

¹ The method claims were filed in U.S. Patent App. No. 13/495,577, which ultimately issued as U.S. Patent No. 8,878,053 (“the ’053 patent”). The ’053 patent is subject to co-pending IPR2024-01199.

side of the solar cell.” EX1002, 135-36 (Amendment to the Claims), 152 (Notice of Allowance).

III. PERSON OF ORDINARY SKILL IN THE ART

Hanwha’s declarant, Dr. Zachary Holman, asserts that a POSITA “would have had (1) an advanced degree in applied physics, chemistry, electrical engineering, materials science, mechanical engineering, or a related discipline and (2) at least one year of experience designing, developing, or researching the design and/or manufacture of solar cells or related technologies” or, alternatively, “(1) a bachelor’s degree in one of the aforementioned disciplines and (2) at least two years of experience designing, developing, or researching the design and/or manufacture of solar cells or related technologies.” EX1003, ¶39. For the purposes of this Preliminary Response, Maxeon applies Hanwha’s level of ordinary skill.

IV. THE PETITION FAILS TO ESTABLISH A REASONABLE LIKELIHOOD OF PREVAILING ON ANY CHALLENGED CLAIM.

In an IPR, “the burden of proving a proposition of unpatentability” is borne by (and remains at all times with) the petitioner. 35 U.S.C. §§ 314(a), 316(e); *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1375 (Fed. Cir. 2016). To satisfy its burden, a petitioner must “articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness”—“mere conclusory statements” will not suffice. *Magnum Oil*, 829 F.3d at 1380. Indeed, “[i]t is of the utmost importance that petitioners in the IPR proceedings adhere to the

requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge to each claim.’” *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (quoting 35 U.S.C. § 312(a)(3)).

“An obviousness determination requires finding that [a POSITA] would have been motivated to combine or modify the teachings in the prior art and would have had a reasonable expectation of success in doing so.” *Regents of the Univ. of Cal. v. Broad Inst., Inc.*, 903 F.3d 1286, 1291 (Fed. Cir. 2018); *Intelligent Bio-Sys.*, 821 F.3d at 1367-68; *see also, e.g., NJOY, LLC v. JUUL Labs, Inc.*, IPR2024-00536, Paper 17 (P.T.A.B. Aug. 12, 2024) (denying institution where petitioner did not show a reasonable expectation of success in combining the asserted references); *Honeywell Int’l Inc. v. DSM IP Assets, B.V.*, IPR2024-00493, Paper 7 (P.T.A.B. Aug. 21, 2024) (same).

In requesting *inter partes* review, “the petitioner is master of its complaint.” *SAS Inst. Inc. v. Iancu*, 138 S.Ct. 1348, 1355 (2018). For this reason, the petition must include “a detailed explanation of the significance of the evidence including material facts” and “[h]ow the construed claim is unpatentable.” 37 C.F.R. §§ 42.22(a)(2), 42.104(b)(4). Given the “expedited nature of IPR proceedings,” it is incumbent on a Petitioner to fully present its obviousness theory in its petition. *See Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1330 (Fed. Cir. 2019).

“[I]f the fact trier of the issue is left uncertain, the party with the burden loses.”

Dynamic Drinkware, LLC v. Nat’l Graphics, Inc., 800 F.3d 1375, 1378-79 (Fed. Cir. 2015) (quoting *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1327 (Fed. Cir. 2008)).

Hanwha’s Petition asserts five grounds of unpatentability against the Challenged Claims. Pet., 6-7. As explained below, Hanwha has not satisfied its burden with respect to *any* of its obviousness grounds. Therefore, the Board should deny institution of this Petition.

In particular, independent claim 9² recites a solar cell including “an emitter layer formed over a back surface of the substrate” and “an oxide layer formed between the back surface of the substrate and the emitter layer.” Independent claim 1 similarly recites a solar cell including “a P-type polysilicon emitter formed over the N-type silicon substrate” and “an oxide layer formed between the P-type polysilicon emitter and the N-type silicon substrate.” None of Hanwha’s asserted grounds establishes that it would have been obvious to arrive at the claimed configuration of an emitter layer and an oxide layer, as recited by claims 1 and 9.

For each ground, Hanwha concedes that the primary reference (Froitzheim

² Petitioner begins its analysis with independent claim 9, referring back to this discussion for independent claim 1. *See, e.g.*, Pet. 38-46 (claim 9), 52-54 (claim 1).

or Li) does not disclose the recited configuration of an emitter layer and an oxide layer. Pet., 27-28, 40-43, 64-66, 67-70 (Froitzheim), 79-80, 83-85 (Li). And as explained in detail below, a POSITA would not have been motivated to incorporate the structure of an emitter layer and oxide layer into these references in the manner described and claimed by the '516 patent. Hanwha's attempts to combine Gan and Borden-575 as secondary references confirm this.

A. Grounds I and II: Hanwha fails to show that a POSITA would have been motivated to combine Froitzheim and Gan in the manner alleged, or that a POSITA would have had a reasonable expectation of success in doing so.

Hanwha fails to meet its burden to show that a POSITA would have been motivated to combine Gan with Froitzheim to arrive at the claimed invention.³ In particular, Hanwha fails to meet its evidentiary burden because it (1) fails to establish why a POSITA would have applied art relating to a concentrator solar cell (i.e., Gan) to Froitzheim's conventional solar cell, and (2) fails to establish that a POSITA would have had a reasonable expectation that Gan's polysilicon emitter and oxide layers could be successfully incorporated into Froitzheim's conventional solar cell in the manner proposed. These flaws are fatal to Grounds I and II.

³ Ground II, challenging dependent claim 5, further relies on Sheats. Pet., 60-63. Hanwha's reliance on Sheats does not remedy the deficiencies of the Froitzheim-Gan combination. *See id.*

1. Hanwha fails to establish why a POSITA would have modified Froitzheim’s conventional solar cell in view of Gan’s different type of solar cell.

Hanwha fails to establish why a POSITA would have been motivated to modify Froitzheim’s conventional solar cell in view of teachings relevant to Gan’s concentrator solar cell, the structure of which is “distinctive from the ‘conventional’ cell.” EX2003,⁴ 1.⁵ In this regard, Hanwha mischaracterizes the teachings of Gan as “broadly suggest[ing] that its polysilicon emitter and oxide layer structure are generally ‘useful for silicon solar cells.’” Pet., 31 n.9 (quoting EX1005, 249). However, Gan is clear that the teachings of its study are limited to concentrator solar cells, and, as explained below, Hanwha’s own declarant recognizes the substantial structural differences between concentrator solar cells and conventional solar cells. Moreover, additional context from the authors of Gan confirms that, contrary to Hanwha’s assertion, a POSITA would *not* have understood that Gan’s teachings were “*generally* ‘useful for silicon solar cells,’”

⁴ Citations to EX2003 are to the native page numbers of the document.

⁵ A concentrator solar cell “uses lenses, mirrors, and other components to focus (i.e., concentrate) sunlight on a cell.” EX1003, ¶131. This provides a solar cell designed to operate over a wide range of *elevated sunlight concentrations*, such as “from 6 to 200 suns for AM1.5 sunlight.” EX2003, 5.

Pet., 31 n.9⁶, but rather are limited to Gan’s specific context of concentrator solar cells. Accordingly, Hanwha’s combinations for Grounds I and II are undergirded by a false premise and, therefore, fail.

Gan does not support Hanwha’s sweeping assertion that its teachings are “*generally* ‘useful for silicon solar cells,’” Pet., 31 n.9. Although briefly acknowledging (in a footnote) that “Gan references ‘concentrator’ solar cells,” Hanwha contends that “Gan broadly suggests that its polysilicon emitter and oxide layer structure are generally ‘useful for silicon solar cells,’ and a POSITA would have understood that the benefits Gan teaches are equally applicable to non-concentrator solar cells.” Pet., 31 n.9. Hanwha bases this contention on a single sentence from Gan. Pet., 31 (“Based on this data, Gan concludes that a polysilicon emitter and oxide layer structure is ‘quite useful for silicon solar cells.’”) (quoting EX1005, 249). In the sentence that Hanwha relies on, Gan describes that “[t]he data shown in Fig. 6 [of Gan] are quite useful for silicon solar cells.” EX1005, 249. Hanwha attempts to characterize this statement as showing that a POSITA would understand that Gan’s study is applicable to *all* silicon solar cells, but Gan does not support this broad conclusion. In fact, this is the only instance in Gan using this more general language.

⁶ *Emphasis* added throughout unless otherwise indicated.

Indeed, the structure of Gan’s “concentrator” solar cells differs significantly from “conventional” solar cells (i.e., Froitzheim). Hanwha’s own declarant, Dr. Holman, acknowledges structural differences between these two types of solar cells. EX1003, ¶131 (Dr. Holman implicitly conceding, yet trying to gloss over, the difference, testifying that “*although* Gan references a concentrator solar cell—a category of solar cells that uses lenses, mirrors, and other components to focus (i.e., concentrate) sunlight on a cell ... —a person of ordinary skill in the art would have understood that Gan’s teachings are equally applicable to non-concentrator solar cells.”). But instead of explaining *why* the structure of a concentrator solar cell is in any way applicable to Froitzheim’s conventional solar cell structure, Hanwha’s declarant merely concludes, relying only on the same single sentence of Gan, that “a person of ordinary skill in the art would have understood that Gan’s teachings are equally applicable to non-concentrator solar cells.” *Id.*; *see also id.* (“Gan explains that its disclosed polysilicon emitter and oxide layer structure is ‘useful for silicon solar cells’ generally and does not state that its teachings are limited to concentrator solar cells.”). Dr. Holman cites no other evidence to support his contention that a POSITA would have understood teachings specific to concentrator solar cells would have been generally applicable to conventional solar cells. Hanwha’s and Dr. Holman’s unsupported conclusions ignore what a

POSITA would have understood about the differences between conventional and concentrator solar cells.

Indeed, reading Gan as a whole, it is evident that the considerations discussed therein are applicable specifically to concentrator solar cells, and *not* to solar cells more generally. For example, Gan begins by recognizing that “[f]or silicon solar cells *operated under high concentrated sunlight*, the emitter recombination is one of the main recombination [sic] that limit the solar cell performance.” EX1005, 245. Gan continues, “[t]his is because the diffused-emitter, which is formed with dopant diffusion into the base (substrate), has high J_0 ($=4.5 \times 10^{-13} \text{ A/cm}^2$).” *Id.* According to Gan, “the cell performance can be improved if the diffused-emitter is replaced with the polysilicon emitter” having a lower J_0 . *Id.* After describing its findings, Gan concludes that “[f]rom the cell modeling, polysilicon emitters with these qualities can be quite useful for *silicon concentrator solar cells*.” EX1005, 249.

Gan purposefully and repeatedly constrains the teaching of replacing a diffused-emitter with a polysilicon emitter to the case of *concentrator* solar cells—specifically because the lower J_0 would impact emitter recombination, which is a dominant factor for concentrator solar cells. EX1005, 245, 249. Thus, a POSITA would have considered Gan’s single statement that a particular data set “are quite useful for silicon solar cells” in the specific context of concentrator solar cells.

EX1005, 249. Accordingly, Hanwha’s reliance on this statement ignores Gan’s fundamental premise, highlighting the Petition’s purely hindsight combination of references.

Furthermore, Gan’s doctoral thesis (“Gan Thesis,” EX2003⁷) confirms that the authors of Gan were focused on improvements specific to concentrator solar cells (that is, without regard to conventional solar cells). Gan Thesis begins by noting several differences between the concentrator solar cells being studied therein and conventional solar cells. EX2003, 1. With respect to concentrator solar cells, Gan Thesis observes that “[w]hen the cell is under illumination, increased recombination in the emitter takes place,” “characterized by the emitter saturation current density, J_0 ,” resulting in a significant “cell efficiency loss due to the emitter recombination.” *Id.*, 3. Gan Thesis concludes that “the only way to resolve the emitter recombination completely [in concentrator solar cells] is to use a substitute material, which has very low J_0 when it contacts to the silicon, to replace the

⁷ Gan Thesis includes a more in-depth discussion of the experiment described in the cited Gan reference, and provides significantly more details about its theory, experiment, and conclusions. In particular, it should be appreciated that the data and measurements discussed by Gan are presented in more detail in Chapter 5 of Gan Thesis. *See, e.g.*, EX2003, 70-106.

diffused emitters.” *Id.*, 6. Gan Thesis thus confirms that Gan’s suggested replacement of a diffused emitter with a polysilicon emitter layer and an oxide layer is confined to the problem of addressing emitter recombination in concentrator solar cells, which are distinct in both structure and challenges from “conventional” solar cells. EX2003, 1, 10 (explaining that “the approach of this work” is to “mak[e] polysilicon emitters of both types useful for concentrator solar cells” by “obtaining small broken areal fraction of the interfacial oxide”); EX1003, ¶131. Thus, Hanwha’s reliance on Gan is facially flawed.

In summary, Hanwha relies on one sentence from Gan to mischaracterize the teachings of the entire reference as being “equally applicable to non-concentrator solar cells.” Pet., 31 n.9. Relying solely on this mischaracterization, Hanwha concludes that a POSITA “would have been motivated to modify Froitzheim’s solar cell to incorporate a polysilicon emitter and oxide layer structure to obtain a more efficient solar cell.” *Id.*, 32. However, as explained above, Gan’s concentrator solar cells have a structure that is substantially different from Froitzheim’s conventional solar cell, EX1003, ¶131, and Gan’s disclosure is particularly limited to the field of concentrator solar cells. EX1005, 245, 249. Gan Thesis supports this understanding by explaining that “replac[ing] the diffused emitters” with a polysilicon emitter layer resolves a problem that is unique to concentrator solar cells (i.e., a high J_0 due to increased emitter recombination that

occurs due to the higher levels of illumination in the concentrator solar cell).

EX2003, 1, 5-6.

Neither Hanwha nor Dr. Holman addresses this conventional solar cell versus concentrator solar cell issue, providing only conclusory assertions that fit their incorrect narrative. Petitioner's alleged motivation for the combination is that "Gan specifically teaches that replacing a diffused emitter (as taught by Froitzheim) with a polysilicon emitter and oxide layer structure would improve the efficiency of a solar cell." Pet., 32. However, neither Hanwha nor Dr. Holman explains why a POSITA would have understood Gan's teaching to increase efficiency by replacing a diffused emitter with a polysilicon emitter and oxide layer *in a concentrator solar cell* would necessarily apply to *all* (i.e., conventional) solar cells. And, absent such a teaching, Hanwha provides no reason to modify Froitzheim's *conventional solar cell* to include a polysilicon emitter layer and an oxide layer. Petitioner's conclusory assertions and Dr. Holman's similarly conclusory testimony are insufficient to meet Hanwha's burden to show that a POSITA would have been motivated to combine Froitzheim with Gan to arrive at the claimed invention. *Magnum Oil*, 829 F.3d at 1380; *Intelligent Bio-Sys.*, 821 F.3d at 1369.

2. Hanwha fails to establish a reasonable expectation of success in modifying Froitzheim in view of Gan.

Even if a POSITA were motivated to modify Froitzheim in view of Gan (they would not be), Hanwha fails to establish that a POSITA would have had a reasonable expectation that such a modification would be successful. It is Hanwha's burden to do so. And their failure is fatal to Grounds I and II.

Hanwha contends that a POSITA would have “understood that modifying Froitzheim to include Gan's polysilicon emitter and oxide layer was simply substituting one known element (polysilicon emitter and oxide layer structure) for another (diffused-emitter).” Pet., 36. Hanwha then asserts that

a POSITA would have understood that instead of diffusing boron into the substrate's back side as taught by Froitzheim, a POSITA would instead follow the manufacturing technique taught by Gan. That is, a POSITA would have grown an interfacial oxide layer on the substrate's back side, created a polysilicon layer over the oxide layer on the substrate's back side, and then doped the polysilicon layer instead of the substrate to form the polysilicon emitter. Ex.1005-Gan, 246. These well-known and routine steps were well within a POSITA's skillset.

Pet., 37. Hanwha concludes that a POSITA “would have expected that Gan's teachings of adopting a *known, successful technique* for transistors to solar cells *would likewise succeed* when applied to Froitzheim's backside solar cell configuration.” *Id.*, 37-38.

However, Hanwha's assertions that "the manufacturing technique taught by Gan" were "well-known and routine" and "a known, successful technique" run counter to the nature of Gan's study and are expressly contradicted by the authors of Gan. In fact, Gan teaches that, rather than being "well-known and routine," the formation of Gan's oxide layer is *unpredictable*. In Gan, the chemical or thermal oxide layer "is not thermally stable" and "tends to break up during high temperature anneals," which affects "the specific contact resistivity" ρ_c and "the emitter saturation current density" J_0 . EX1005, 245. Between the extremes of a robust thermal oxide layer and one that has lost all integrity due to annealing effects, "various combinations of ρ_c and J_0 can be obtained," caused by "the *random distribution* of the oxide breakup." *Id.*, 245, 247; *see also id.*, FIG. 2. That is, Gan recognizes that the breakup of the oxide layer is inherently "random," leading to large measurement error and thus poor predictability.

This is confirmed in Gan Thesis, where the authors of Gan explain that the discussion of the oxide layer is highly experimental and prone to unpredictability. In particular, Gan Thesis explains that "[a]lthough a thermally grown interfacial oxide seems essential for a polysilicon emitter to have both low J_0 and ρ_c , the breakup process is still *difficult to control*. On several occasions, we have encountered *reproducibility problems*." EX2003, 107. Gan Thesis also notes that "the ρ_c is *quite different* between two separate experiments with *identical*

processing conditions.” Id. The study described in Gan Thesis (and Gan) is motivated by the understanding that “it is clear that the interfacial oxide did not break as we expected.” *Id.*, 110. And, yet, Gan Thesis is ultimately forced to conclude only that “a *consistent result* of ρ_c is *difficult to reproduce* for the polysilicon emitter with a thermally grown interfacial oxide,” such as the ones described in Gan. *Id.*, 116.

Contrary to Hanwha’s assertions, Gan and Gan Thesis both expressly describe that the sought-after performance of the polysilicon layer and oxide layer structure is “random,” “difficult to control,” and “difficult to reproduce.” EX1005, 247; EX2003, 96, 107, 116. Gan Thesis shows that even the positive results reported in Gan were prone to “reproducibility problems” and highly dependent on the thickness of the oxide layer, which is difficult to control. EX2003, 107.

Hanwha ignores these predictability and reproducibility issues, which contradict Hanwha’s conclusory assertion that a POSITA would have a reasonable expectation of success. Accordingly, Hanwha fails to show that a POSITA would have had an expectation that the polysilicon emitter layer and oxide layer structure of Gan could be successfully manufactured to obtain the benefits allegedly suggested in Gan’s highly experimental results. And Gan Thesis confirms that the manufacturing process was, in fact, unreliable and unpredictable and would not necessarily result in the allegedly beneficial structures suggested by Gan.

In view of the above, Hanwha fails to carry its burden to show that a POSITA would have had a reasonable expectation of success in incorporating the oxide layer from Gan into Froitzheim. *Magnum Oil*, 829 F.3d at 1380; *Intelligent Bio-Sys.*, 821 F.3d at 1369.

* * *

For these reasons, Hanwha fails to meet its burden of showing a reasonable likelihood of prevailing for independent claims 1 and 9 for Grounds I and II. Claims 2-8 and 10-12 depend from claims 1 and 9 respectively and, thus, Hanwha also fails to meet its burden for those claims.

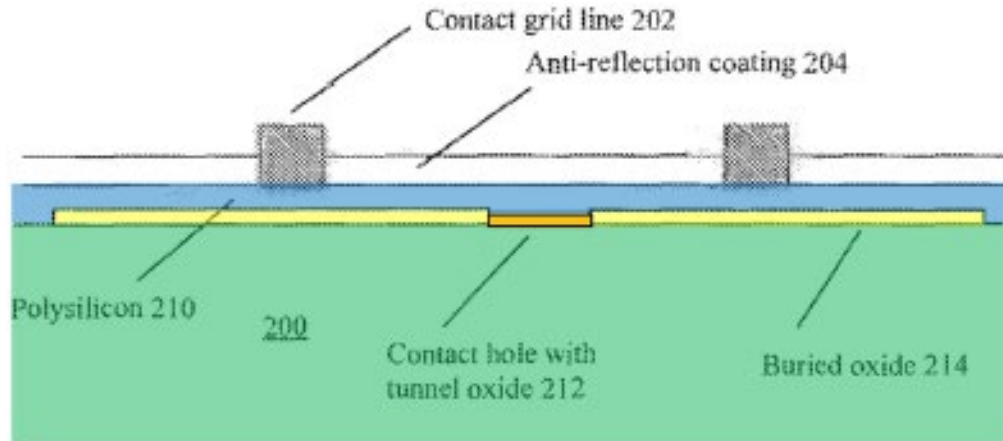
B. Grounds III and IV: Hanwha fails to show that a POSITA would have been motivated to combine Froitzheim and Borden-575 in the manner alleged.

As with Grounds I and II, Hanwha also fails to meet its burden for Grounds III and IV to show that a POSITA would have been motivated to combine Borden-575 with Froitzheim to arrive at the claimed invention.⁸ In particular, Hanwha fails to sufficiently explain how a POSITA would have modified Froitzheim's solar cell in view of Borden-575.

⁸ Ground IV, challenging dependent claim 5, further relies on Sheats. Pet., 77-78. Hanwha's reliance on Sheats does not remedy the deficiencies of the Froitzheim-Borden-575 combination identified herein. *See id.*

Hanwha fails to meet its burden of “identify[ing] with particularity” how the challenged claims are unpatentable over Froitzheim in view of Borden-575. *Henny Penny*, 938 F.3d at 1330. Instead, as shown below, Hanwha’s explanation is rife with ambiguity as to the actual combination being proposed and the factors that might motivate that combination. Hanwha explains *why* it would have been obvious to use Borden-575’s *tunnel oxide* layer in Froitzheim, before shifting theories and explaining *how* using Borden-575’s *buried oxide* layer in Froitzheim would have arrived at the claimed configuration of an oxide layer. Hanwha thus fails to satisfy its burden. *Dynamic Drinkware*, 800 F.3d at 1378-79.

More specifically, Hanwha contends that it would have been obvious to a POSITA to use “Borden-575’s polysilicon emitter and oxide layer” to improve “Froitzheim’s rear contact cell” to increase the efficiency of the resulting device. Pet., 64-65. But Borden-575 teaches *two different types of oxides* with two very different functions: a strongly insulating buried oxide layer (yellow) and a somewhat conductive tunnel oxide layer (orange), neither of which extends across the entire surface of the substrate. Pet., 25. And Hanwha is inconsistent in articulating *which* of Borden-575’s oxide layers would be used in its proposed combination.



EX1006, FIG. 2 (annotated by Petitioner), Pet., 25.

With respect to the *buried oxide layer 214*, Borden-575 describes an oxide layer having a “thickness of 100 to 150Å,” and “[a] thickness >20Å is desirable, as *thinner layers may support leakage through tunnel currents.*” EX1006, ¶25. In addition, Borden-575 describes that this buried oxide layer “provides an excellent passivation layer over most of the surface” and “*isolates the contacts from the substrate*, achieving the advantage of a selective emitter structure without requiring deep diffusions.” *Id.*, ¶16.

In contrast, with respect to the *tunnel oxide layer*, Borden-575 describes “a thin tunnel oxide” that is “included between the substrate 200 and the polysilicon 210 in the contact holes 212. This oxide – *typically 8 to 15Å thick* – provides passivation between the substrate and the polysilicon, *while allowing for tunnel current flow.*” *Id.*, ¶22.

Thus, Borden-575 describes a tunnel oxide layer and a buried oxide layer having substantially different thicknesses and different electrical functions within

the resulting device. However, the Petition ignores these stark structural and functional differences between Borden-575's buried oxide layer and the tunnel oxide layer. Instead, Hanwha's obviousness contentions intermingle discussion of the two oxide layers, including alleged benefits coming from the different layers, in an attempt to motivate the proposed combination.

For example, the Petition asserts that “the combination of Froitzheim and Borden-575 amounts to use of a known technique and feature (Borden-575's polysilicon emitter and oxide layer between the PN junction) to improve” Froitzheim's device. Pet., 64. But, as noted, the Petition does not describe *which* of Borden-575's oxide layers is being referenced here. Because Petitioner's proposed combination shows a single oxide layer incorporated into Froitzheim, Pet. 65, it appears that Petitioner is being intentionally vague here.

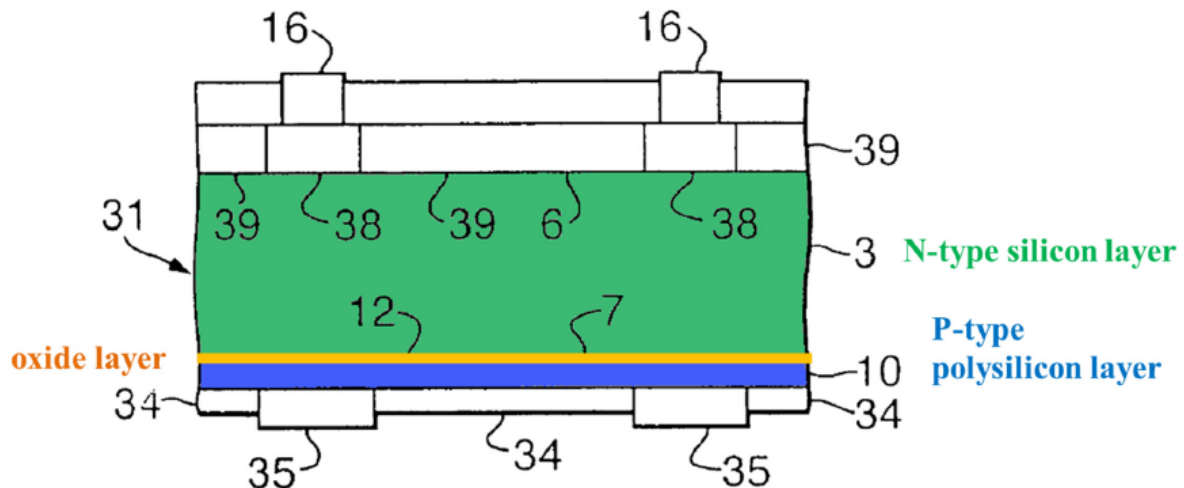
Then, relying on Borden-575's *tunnel oxide* layer, Hanwha contends that it would have been obvious to “implement[] Borden-575's polysilicon emitter and tunnel oxide layer to the backside configuration taught by Froitzheim,” because “Borden-575 explains that adding an oxide layer” ““provides passivation between the substrate and the polysilicon, while allowing for tunnel current flow.”” Pet., 65-66 (where this description all relates to the tunnel oxide layer). The Petition then refers back to the discussion of Gan's tunnel oxide layer (not included in the combination) as additional support. *Id.* In fact, all of the purported benefits of the

combination relate only to Borden-575's tunnel oxide layer. *Id.*, 65-67. Thus, at best, the Petition alleges a motivation to modify Froitzheim only in view of Borden-575's tunnel oxide layer. But Borden-575's tunnel oxide layer is expressly only included in contact holes 212. EX1006, ¶22. Allowing tunnel current at other locations is undesired. EX1006, ¶25.

However, in explaining how the proposed combination of Froitzheim and Borden-575 would meet the features of claim 9, the Petition identifies Borden-575's *buried oxide* layer 214 as being "disposed between the polysilicon emitter and substrate." Pet., 69. Thus, Hanwha moves from explaining *why* it would have been obvious to use Borden-575's *tunnel oxide* layer to explaining *how* using Borden-575's *buried oxide* layer would have arrived at the claimed configuration of an oxide layer. The Petition further obfuscates this point by asserting "Borden-575 also teaches creating contact holes 212 in the **buried oxide**, and a **tunnel oxide 212** layer between the **polysilicon emitter** and the **substrate** in the contact holes." Pet., 69 (emphasis original). Petitioner mixes and matches its discussion of the Borden-575's buried oxide and tunnel oxide, leaving it unclear which of these layers, or both, Petitioner relies on in mapping Borden-575's teachings to the claimed oxide layer.

And as to motivation, the Petition merely refers back to the earlier discussion of the benefits of Borden-575's *tunnel oxide* layer to motivate a

combination of Froitzheim and Borden-575 purportedly having the below structure. *Id.*, 70. As noted, the only benefits and motivations identified by Hanwha relate exclusively to Borden-575's *tunnel oxide* layer. The Petition fails to provide any motivation whatsoever for applying Borden-575's *buried oxide* layer, alone or in combination with Borden-575's tunnel oxide layer, to Froitzheim in the manner suggested by Hanwha.



EX1004, FIG. 3 (annotated by Petitioner), Pet., 70.

The Petition's annotated figures do not clarify *which* of Borden-575's oxide layers Petitioner proposes to implement in Froitzheim. *Neither* of Borden-575's oxide layers is provided across the *entire* surface of the substrate, contrary to what is depicted in Hanwha's annotations (reproduced above), and yet with no explanation, Petitioner simply adds a complete "oxide layer" to the annotated figure showing its proposed modifications to Froitzheim. *Compare* EX1006, FIG. 2 (showing buried oxide 214 formed within polysilicon layer 210 and tunnel oxide

212 formed below polysilicon layer 210 only in contact holes), *with* Petitioner’s annotations to FIG. 3 of Froitzheim, Pet. 70 (shown above).

In addition, Froitzheim does not include *any* structure at the “oxide layer” (orange line) in Petitioner’s annotated figure, so that such structure must be provided entirely by the teachings of Borden-575. *See* EX1004, FIG. 3. However, the extension of either of Borden-575’s oxide layers into a continuous layer as shown above would be inconsistent with the teachings of Borden-575. This is because Borden-575’s tunnel oxide layer is expressly provided *only* within contact holes 212, EX1006, ¶22, and thus would not be provided in a continuous layer, as suggested by Hanwha, if it were to be combined with Froitzheim. Similarly, because Borden-575’s buried oxide layer blocks all electrical current, including even “leakage through tunnel currents,” providing this buried oxide layer as the continuous layer suggested by Hanwha would render Froitzheim’s device inoperable. *See, e.g.,* EX1006, ¶¶16 (“Holes in the [buried] oxide provide contact areas”), 19 (“Contact holes 212 are provided in the insulating layer [(i.e., the buried oxide layer 214)] to allow for photocurrent flow.”), 21 (“Photocurrent flows through contact holes 212 patterned in the [buried] oxide layer 214.”), 25 (regarding the buried oxide layer, “thinner layers may support leakage through tunnel currents”).

In view of the above, the Petition is ambiguous to the point of being meaningless in describing how a POSITA would have modified Froitzheim in view of Borden-575 to arrive at the recited configuration of an oxide layer. Although the Petition alleges a motivation for implementing Borden-575's *tunnel oxide* layer into Froitzheim, the Petition does not explain how this modification (which, on its face, would result in a tunnel oxide layer only directly above rear contacts 35) would satisfy the claimed configuration. And the Petition fails to provide any explanation why a POSITA would modify Froitzheim to include Borden-575's *buried oxide* layer, either alone or in combination with the tunnel oxide layer. For these reasons, the Petition fails to "identify with particularity the evidence that supports the grounds for the challenge to each claim," *Henny Penny*, 938 F.3d at 1330, and instead leaves ambiguity as to how the combination of Froitzheim and Borden-575 would render the claimed configuration unpatentable. Therefore, Hanwha fails to satisfy its burden under 37 C.F.R. §§ 42.22(a)(2) and 42.104(b)(4) with respect to the proposed combination of Froitzheim and Borden-575. *Henny Penny*, 938 F.3d at 1330; *see also SAS*, 138 S.Ct. at 1348; *Dynamic Drinkware*, 800 F.3d at 1378-79.

For these reasons, Hanwha fails to meet its burden of showing a reasonable likelihood of prevailing for independent claims 1 and 9 for Grounds III and IV.

Claims 2-8 and 10-12 depend from claims 1 and 9 respectively, and, thus, Hanwha also fails to meet its burden for those claims.

C. Ground V: Hanwha fails to show that a POSITA would have been motivated to combine Li and Gan, or that a POSITA would have had a reasonable expectation of success in doing so.

In view of the above, it is no surprise that Hanwha also fails to meet its burden to show that a POSITA would have been motivated to combine Li and Gan to arrive at the claimed invention. In particular, Hanwha fails to meet its evidentiary burden because (1) it merely references back to its earlier, flawed discussion of the Froitzheim-Gan combination, and thus similarly fails to provide a motivation to combine Gan with Li or provide a reasonable expectation of success for the combination, and (2) it also fails to establish that a POSITA would have been motivated to or had a reasonable expectation of success in modifying Li to implement Gan's polysilicon emitter and oxide layers.

1. Hanwha fails to meet its burden for the proposed combination of Li and Gan for at least the same reasons as for the proposed combination of Froitzheim and Gan.

Apparently recognizing the weaknesses in the proposed modification of Froitzheim to include a polysilicon emitter and oxide layer in the combinations with each of Gan and Borden-575, the Petition includes a third combination—this time combining Gan with a different conventional solar cell structure in Li. Pet., 78.

In arguing that a POSITA would have been motivated to combine Li with Gan, Hanwha primarily refers back to and reiterates the flawed motivations to modify Froitzheim in view of Gan discussed above. *Id.*, 78-81. However, Li, like Froitzheim, is directed to a *conventional* solar cell, whereas Gan's teachings are directed to remedying problems in solar *concentrator* cells, as discussed in § IV.A *supra*. Thus, Hanwha's proposed combination of Li and Gan fails for at least the same reasons discussed above regarding the combination of Froitzheim and Gan.

More specifically, as discussed above, Gan limits its teachings to addressing problems specific to solar concentrator cells. Yet again, Hanwha does not address this distinction between conventional solar cells (i.e., Li) and solar concentrator cells (i.e., Gan). Because Hanwha has not shown that the same problems and considerations relevant to solar concentrator cells would also necessarily be relevant to conventional solar cells that operate at lower illumination levels, Petitioner likewise has not sufficiently alleged that a POSITA would have been motivated to apply Gan's polysilicon emitter and oxide layer structure to Li's conventional solar cell structure. *See* § IV.A.1 *supra*.

In addition, a POSITA would have understood from Gan and Gan Thesis that the condition of the oxide layer is critical to the performance of the resulting device and that it is very difficult to reproduce performance even between devices undergoing the same treatments. *See* § IV.A.2 *supra*. Thus, Hanwha has not shown

that a POSITA would have had a reasonable expectation that Gan's polysilicon emitter layer and oxide layer structure could or would be applied to Li's conventional solar cell structure to achieve predictable results.

Accordingly, Petitioner has not met its burden for Ground V for at least the same reasons discussed above for Grounds I and II.

2. Hanwha fails to explain why a POSITA would replace Li's silicon thin film emitter layer with Gan's polysilicon emitter, or would have had a reasonable expectation that such a replacement would be successful.

The combination of Li and Gan also fails for additional reasons beyond those discussed for Froitzheim and Gan. Unlike Froitzheim, which includes a diffused-emitter layer, Li teaches a silicon thin film emitter layer. Hanwha fails to articulate why it would have been obvious to a POSITA to replace Li's silicon thin film emitter layer with Gan's polysilicon emitter layer and an oxide layer.

Hanwha alleges that "Gan specifically teaches adding a polysilicon emitter and oxide layer structure to improve the efficiency of a solar cell." Pet., 80. However, this again mischaracterizes Gan, which actually only more narrowly describes the benefits of *replacing a diffused-emitter* with a polysilicon emitter layer and an oxide layer in solar concentrator cells. *See* § IV.A.1 *supra*; *see also* Pet., 30 ("Gan teaches that a solar cell's 'performance can be improved if a **diffused-emitter ... is replaced with a polysilicon emitter**'") (emphasis original, internal annotations omitted). And, Hanwha notes, "Li teaches a deposited emitter

instead of a diffused emitter.” Pet., 78. The purported benefits of Gan are limited, by Hanwha’s own admission, to the replacement of a diffused-emitter with a polysilicon emitter. Hanwha provides no other alleged motivation for replacing Li’s deposited silicon thin film emitter with Gan’s deposited polysilicon emitter layer, let alone with Gan’s polysilicon emitter layer and an oxide layer.

Moreover, Li discourages such a modification. In particular, Li teaches that an undoped amorphous silicon thin film emitter layer is able to avoid problems that occur upon boron doping (such as the doping in Gan’s polysilicon emitter layer) while also passivating the back surface (an effect of Gan’s oxide layer). EX1008, 4 (noting that the disclosed structure “not only effectively avoids influence of boron-oxygen defects in P-type cells, but also effectively passivates the back surface.”); Pet., 66 (“Borden-575 explains that adding an oxide layer ... ‘provides passivation between the substrate and the polysilicon’”). In other words, Li teaches a single layer of amorphous silicon that achieves the passivation of an oxide layer *without* creating the problems of a doped polycrystalline emitter layer (as in Gan). As with other inconvenient facts discussed above, Hanwha does not address these teachings of Li, and thus Hanwha fails to establish why a POSITA would have been motivated to modify Li in view of Gan as proposed.

The Petition provides a similarly conclusory assertion of a POSITA’s reasonable expectation of success in implementing the proposed combination.

Specifically, the Petition naïvely asserts that, because “Li and Gan each teach solar cells with deposited emitters,” a POSITA “would have thus realized that Li and Gan’s emitters were readily interchangeable and additional equipment would not be required.” Pet., 80-81; EX1003, ¶276 (same). However, as discussed above, Li and Gan have very different structures, and the Petition fails to provide any evidence that a POSITA would have had a reasonable expectation that Li’s thin film silicon emitter layer and Gan’s polysilicon emitter and oxide layer structure are “readily interchangeable.” Pet., 81; EX1003, ¶276 (merely classifying Li and Gan as teaching “deposited emitters over a silicon substrate.”). Thus, Hanwha fails to establish why a POSITA, upon reviewing Li and Gan, would have had a reasonable expectation of successfully modifying Li and Gan as proposed to achieve predictable results.

* * *

For these reasons, Hanwha fails to meet its burden of showing a reasonable likelihood of prevailing for independent claims 1 and 9 for Ground V. Claims 2 and 8 depend from claim 1, and claims 10 and 11 depend from claim 9. Thus, Hanwha also fails to meet its burden for those claims.

V. THE BOARD SHOULD EXERCISE ITS DISCRETION TO DENY INSTITUTION UNDER § 314(A) AND *FINTIV*.

Under 35 U.S.C. § 314(a), the Director has discretion to deny institution. In determining whether to exercise that discretion on behalf of the Director, the

PTAB considers the status of parallel litigation. *NHK Spring Co. v. Intri-Plex Techs., Inc.*, IPR2018-00752, Paper 8 (PTAB Sept. 12, 2018). The '516 patent is involved in three concurrent, on-going parallel district court actions in the United States District Court for the Eastern District of Texas:

- *Maxeon Solar Pte. Ltd. v. Canadian Solar, Inc.*, No. 2:24-CV-00210-JRG (E.D. Tex. Mar. 25, 2024);
- *Maxeon Solar Pte. Ltd. v. Hanwha Solutions Corp. et al.*, No. 2:24-CV-00262 (E.D. Tex. Apr. 19, 2024);
- *Maxeon Solar Pte. Ltd. v. REC Solar Holdings AS*, No. 2:24-CV-00260 (E.D. Tex. Apr. 19, 2024).

The Board considers six non-exclusive factors in making its determination. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 6 (PTAB Mar. 20, 2020) (precedential). Balancing these six factors (the “*Fintiv* Factors”) demonstrates that efficiency and integrity of the America Invents Act are best served by denying institution of this Petition, as each factor is either neutral or weighs in favor of denial. Petitioner, however, gives the *Fintiv* analysis short shrift, addressing the six factors cursorily, if at all. Pet., 97. And despite acknowledging the earlier ongoing lawsuit against Canadian Solar, *id.*, 93, Petitioner ignores the impact of that

proceeding on the *Fintiv* analysis completely. *See id.*, 97.⁹ As explained herein, evaluating the *Fintiv* factors as a whole, the Board should deny institution.

A. *Fintiv* Factor 1 is neutral: No stay has been requested or granted in the district court proceedings.

Fintiv Factor 1 examines whether the district court in the parallel litigation has granted a stay or if there is evidence suggesting that a stay might be granted if a proceeding is instituted. *Fintiv*, IPR2020-00019, Paper 11 at 6. Neither party in the *Hanwha* proceeding has filed a motion to stay with the district court. *See* EX2022. Similarly, no stay has been requested in the *Canadian Solar* or *REC Solar* proceedings. *See* EX2021; EX2023. And the Board should “decline to infer, based on actions taken in different cases with different facts, how the District Court would rule should a stay be requested by the parties in the parallel case here.” *Fintiv*, IPR2020-00019, Paper 15 at 12 (informative).

Consequently, this factor remains neutral.

⁹ Petitioner should not be given the opportunity to submit additional briefing on this issue. Petitioner chose to use its allotted word count to address other issues. *See* Pet., 104 (certifying the Petition “contains 13,964 words”). Given the near lack of discussion regarding *Fintiv* in the Petition, to allow Petitioner additional briefing after the Preliminary Response would reward Petitioner’s gamesmanship.

B. *Fintiv* Factor 2 favors denial: The '516 patent will be adjudicated in district court before a final written decision in this IPR.

This factor assesses the proximity of the district court's trial date to the Board's projected statutory deadline for a final written decision. *Fintiv*, IPR2020-00019, Paper 11 at 6. The projected statutory deadline for the Board's final written decision is February 28, 2026.

In the *Hanwha* proceeding, trial is set for May 4, 2026.¹⁰ EX2022 (*see* Dkt. 33). However, trial in the *Canadian Solar* proceeding is scheduled for January 26, 2026, more than a month prior to the Board's projected statutory deadline here. EX2021 (*see* Dkt. 33). This trial date is consistent also with the median time to trial in the Eastern District of Texas, which currently is 21.9 months. EX2006, 35. The *Canadian Solar* proceeding was filed on March 25, 2024, thus the scheduled trial date more than twenty-two months from filing. EX2021.

Accordingly, the schedule in the *Canadian Solar* proceeding weighs in favor of denial. *See TCO AS v. NCS Multistage Inc.*, PGR2020-00077, Paper 16 at 11-12 (P.T.A.B. Feb. 18, 2021) (determining that a co-pending litigation that will resolve the patentability of the patent at issue weighs in favor of denying institution).

Thus, this factor favors denying institution.

¹⁰ No trial date has been set in the *REC Solar* proceeding.

C. *Fintiv* Factor 3 favors denial, or is at least neutral: The parties have and will continue to expend significant effort in the district court litigation.

Factor 3 considers “the amount and type of work already completed in the parallel litigation by the court and the parties at the time of the institution decision.” *Fintiv*, Paper 11 at 9. Here, the Board also looks to the timing of the petition. *Id.*, 11.

The *Hanwha* proceeding is in its early stages but the parties have already been substantially engaged prior to Hanwha’s answer/response deadline, as Hanwha sought early dismissal of one of the named defendants, Hanwha Energy Corporation. Substantial negotiations took place on this topic, including at least two meetings between counsel. Hanwha Energy Corporation and Hanwha Solutions Corporation filed Answers and Counterclaims on November 15, 2024. EX2022, 0002 (Dkts. 23, 24). Hanwha also filed a motion to transfer venue that included four declarations from different Hanwha entities and introduced 31 exhibits. *See id.* (Dkt. 25). In response, Maxeon requested and the Court granted expedited limited discovery into the venue related issues raised by Hanwha’s motion, including depositions of the four declarants identified in Hanwha’s motion and interrogatories. *See id.* (Dkt. 34). Moreover, on November 21, 2024, Maxeon served Infringement Contentions and related disclosures. Maxeon’s responses to Hanwha’s Counterclaims are due on December 6, 2024.

Further, in the *Canadian Solar* proceeding, the parties have already exchanged infringement and invalidity contentions, served and responded to written discovery requests, and served substantial document productions. And the parties continue to invest time and resources in all three co-pending district court proceedings, as none of the proceedings are stayed.

Thus, this factor weighs in favor of denying institution, or is at least neutral. *TCO*, PGR2020-00077, Paper 16 at 11-13 (determining that Patent Owner’s investment in co-pending litigation over the same patent amounts to investment in the parallel proceeding); *Sand Revolution II, LLC v. Continental Intermodal Group — Trucking LLC*, IPR2019-01393, Paper 24 at 10-11 (P.T.A.B. June 16, 2020) (informative) (determining *Fintiv* factor 3 “weighs only marginally, if at all, in favor of exercising discretion to deny institution,” where there was some but not substantial investment in the merits of the invalidity positions in the district court proceeding).

D. *Fintiv* Factor 4 favors denial: Hanwha does not provide a stipulation.

“*Fintiv* factor four looks at the overlap between the issues raised in the IPR petition and in the parallel proceeding in order to evaluate ‘concerns of inefficiency and the possibility of conflicting decisions.’” Guidance Memo, 7; *Fintiv*, IPR2020-00019, Paper 11 at 12.

While Hanwha has not yet submitted its invalidity contentions, all but one

secondary reference (U.S. Patent Appl. Pub. No. 2006/0157103 to Sheats; EX1012) have been identified by Hanwha in its counterclaim for invalidity against the '516 patent in the district court case. *See* EX2024, 29-31 (Counterclaims, ¶21). Moreover, there is significant overlap with the asserted grounds here and those presented in the *Canadian Solar* district court proceeding and the co-pending IPR filed by Canadian Solar. *Compare* Pet., 5-7, with EX2009 (Canadian Solar's Invalidity Contentions, which include Froitzheim, Gan, Borden-575, and Li), and IPR2024-01039, Paper 2 (Pet.) at 3; *see also Fintiv*, IPR2020-00019, Paper 11 at 12 (overlap of issues favors denial); Guidance Memo, 7 ("If the petition includes the same or substantially the same claims, grounds, arguments, and evidence as presented in the parallel proceeding, this fact has favored denial.").

Moreover, Hanwha could have, but did not, provide any stipulation here, *Sotera* or otherwise. *See* Guidance Memo, 3, 7-8 (discussing the impact of stipulations on the *Fintiv* analysis).

Thus, factor 4 favors denial.

E. *Fintiv* Factor 5 favors denial: Hanwha and the defendant in the parallel proceeding are the same party.

Hanwha is the defendant in one of the parallel district court action, which is all that is required to show *Fintiv* factor 5 weighs in favor of denial. *Fintiv*, IPR2020-00019, Paper 11 at 13-14; *Id.*, Paper 15 at 15; *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 19 (P.T.A.B. Dec. 1, 2020); *Sand*

Revolution II, IPR2019-01393, Paper 24 at 12-13.

F. *Fintiv* Factor 6: No other circumstances, including the merits, warrant institution.

Fintiv factor 6 considers any other circumstances that impact the Board's exercise of discretion, including the merits of the petition. *Fintiv*, IPR2020-00019, Paper 11 at 14. The Guidance Memo clarifies that with regard to the merits:

Where the information presented at the institution stage is merely sufficient to meet the statutory institution threshold, the PTAB has the authority, where warranted, to exercise discretion to deny institution in view of the other *Fintiv* factors. In contrast, where the PTAB determines that the information presented at the institution stage presents a compelling unpatentability challenge, that determination alone demonstrates that the PTAB should not discretionarily deny institution under *Fintiv*.

Guidance Memo at 4-5. In *Commscope Techs. LLC v. Dali Wireless, Inc.*, the Director clarified that PTAB panels should “only consider compelling merits if they first determined that *Fintiv* factors 1–5 favored a discretionary denial.” IPR2022-01242, Paper 23 at 4 (P.T.A.B. Feb. 27, 2023) (precedential). As explained above, here *Fintiv* factors 1–5 do favor discretionary denial.

The Director also explained that “*the compelling merits standard is a higher standard* than the standard for institution set by statute” as it requires a showing that “it is *highly* likely that the petitioner would prevail with respect to at least one

challenged claim,” rather than being “more likely than not.” *Id.* at 3-4 (citing *Opensky Indus., LLC v. VLSI Tech. LLC*, IPR2021-01064, Paper 102 at 49 (P.T.A.B. Oct. 4, 2022) (precedential)). Petitioner includes a bare statement that the “Petition also presents compelling merits,” without any attempt at explaining why the asserted grounds meet this higher standard. Pet., 97. And, as explained in detail above, Hanwha’s Petition fails to meet this higher standard. In particular, Hanwha’s Petition asserts flawed motivations to combine the asserted references and fails to establish a reasonable expectation of success in doing so. Petitioner’s asserted grounds fall well short of meeting the reasonable likelihood standard, let alone the higher compelling merits standard.

For at least these reasons, Hanwha’s Petition does not present a compelling unpatentability challenge that would warrant institution despite the other *Fintiv* factors, on balance, weighing in favor of denial. Accordingly, the Board should exercise its discretion to deny institution under § 314(a).

VI. CONCLUSION

For the reasons above, Hanwha fails to show a reasonable likelihood that any of the Challenged Claims is unpatentable as obvious in view of the cited art. Maxeon, therefore, respectfully requests that the Board deny institution.

Respectfully submitted,

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CERTIFICATE OF WORD COUNT (37 C.F.R. § 42.24(d))

1. This Patent Owner Preliminary Response complies with the type-volume limitation of 14,000 words, comprising 8,657 words, excluding the parts exempted by 37 C.F.R. § 42.24(a)(1).

2. This Patent Owner Preliminary Response complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word 2016 in 14-point Times New Roman font.

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CERTIFICATE OF SERVICE (37 C.F.R. § 42.6(e))

I certify that the above-captioned **PATENT OWNER'S PRELIMINARY RESPONSE UNDER 37 C.F.R. § 42.107(a)** and associated Exhibits 2003, 2006, 2009-2011, and 2021-2024 were served in their entireties on November 29, 2024, upon the following parties via electronic mail:

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