

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HANWHA SOLUTIONS CORPORATION,
Petitioner,

v.

MAXEON SOLAR PTE. LTD.,
Patent Owner.

IPR2024-01198
Patent 11,251,315 B2

Before JO-ANNE M. KOKOSKI, JEFFREY W. ABRAHAM, and
AVELYN M. ROSS, *Administrative Patent Judges*.

KOKOSKI, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Hanwha Solutions Corporation (“Petitioner”) filed a Petition to institute an *inter partes* review of claims 10–20 of U.S. Patent No. 11,251,315 B2 (“the ’315 patent,” Ex. 1001). Paper 3 (“Pet.”). Maxeon Solar Pte. Ltd. (“Patent Owner”) filed a Preliminary Response. Paper 9 (“Prelim. Resp.”). With Board authorization, Petitioner filed a Reply (“Prelim. Reply,” Paper 10), and Patent Owner filed a Sur-reply (“Prelim. Sur-reply,” Paper 11), to the Preliminary Response.

Institution of an *inter partes* review is authorized by statute when “the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314 (2018); *see also* 37 C.F.R. § 42.4 (2023). For the reasons discussed below, we determine that Petitioner establishes a reasonable likelihood of prevailing with respect to the unpatentability of at least one claim of the ’315 patent. We also determine that the arguments and evidence of record do not support discretionary denial of the Petition under 35 U.S.C. § 314(a). Accordingly, we institute an *inter partes* review of claims 10–20 of the ’315 patent.

A. Real Parties in Interest

Each party identifies itself as the real party in interest. Pet. 2; Paper 6 (Mandatory Notice), 2.

B. Related Matters

The parties indicate that the ’315 patent is asserted in *Maxeon Solar Pte. Ltd. v. Hanwha Sol’ns Corp.*, Case No. 2:24-cv-00262 (E.D. Tex.), *Maxeon Solar Pte. Ltd. v. Canadian Solar, Inc.*, Case No. 2:24-cv-210 (E.D. Tex.) (“*Canadian Solar*”), and *Maxeon Solar Pte. Ltd. v. REC Solar Holdings AS*, Case No. 2:24-cv-00260 (E.D. Tex.). Pet. 2; Paper 5, 2. The

parties also indicate that the '315 patent is also at issue in *Canadian Solar, Inc. v. Maxeon Solar Pte. Ltd.*, IPR2024-01038 (PTAB), instituted on January 14, 2025, and *Canadian Solar, Inc. v. Maxeon Solar Pte. Ltd.*, IPR2024-01194 (PTAB), instituted on January 24, 2025. Pet. 3; Paper 6, 2.

C. The '315 Patent

The '315 patent is directed to “solar cell fabrication techniques to improve solar cell lifetime, passivation and/or efficiency” and “example solar cells fabricated according to the disclosed techniques.” Ex. 1001, 3:18–21. Figure 5 is reproduced below.

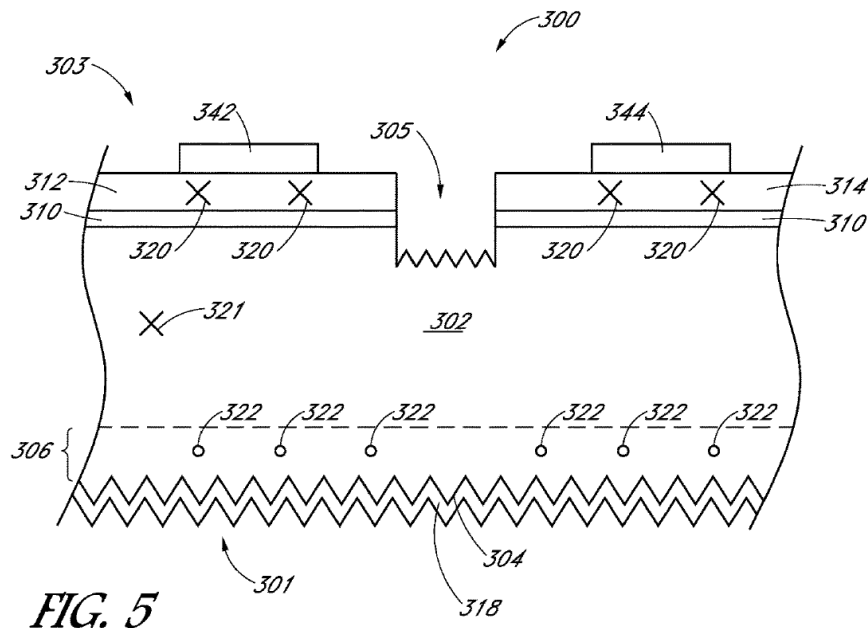


FIG. 5

Figure 5 is a cross-sectional view of a solar cell according to an embodiment described in the '315 patent. *Id.* at 1:49–50. Solar cell 300 has front side 301 that faces the sun during normal operation and back side 303 opposite front side 301. *Id.* at 6:42–44. Silicon substrate 302 can be a N-type silicon substrate, portion 306 of which “can have a doping concentration 322 of approximately less than or equal to $2 \times 10^{18} \text{ cm}^{-3}$.” *Id.* at 6:44–49. Dielectric region 310 is formed over silicon substrate 302,

which can be a tunnel oxide or silicon dioxide. *Id.* at 6:50–53. First and second emitter regions 312, 314 are P-type and N-type polysilicon regions, respectively. *Id.* at 6:54–57. Metal impurities 320 are located in first and second emitter regions 312, 314. *Id.* at 6:57–60. Silicon substrate 302 can have impurities 321 remaining after the gettering process. *Id.* at 6:60–62.

First and second metal contacts 342, 344 are formed on first and second emitter regions 312, 314, respectively, with a trench region 305 separating first and second emitter regions 312, 314. Ex. 1001, 6:63–67. Textured surface 304 on front side 301 is a surface that can provide additional light absorption, and portion 306 of silicon substrate 302 is formed above textured surface 304. *Id.* at 7:1–6. Trench region 305 is also textured for additional light absorption from back side 303. *Id.* at 7:6–9. Anti-reflective region 318, which can be silicon nitride, is formed over textured surface 304. *Id.* at 7:9–12.

The '315 patent describes an example “where a surface, or a portion near the surface, of a silicon substrate was doped at approximately less than or equal to $2 \times 10^{18} \text{ cm}^{-3}$ ” and the solar cell was “heated to a temperature above 900 degrees Celsius.” Ex. 1001, 8:40–45. In this example, “gettering in a polysilicon region of the silicon substrate, improved surface passivation at approximately 5 fA/cm^2 , improved lifetime, e.g. typical of approximately $10 \text{ } \mu\text{sec}$, and a $>0.5\%$ efficiency increase as compared to other solar cells.” *Id.* at 8:45–50. In another example, the silicon substrate was doped at approximately less than or equal to $2 \times 10^{18} \text{ cm}^{-3}$ and the solar cell heated to a temperature below 900 degrees Celsius, “resulting in gettering in a non-polysilicon region of the solar cell, good surface passivation at approximately 2 fA/cm^2 , poor lifetime, e.g. typical of

approximately 3 μ sec and no considerable, e.g., <0.5% efficiency increase from the baseline.” *Id.* at 8:51–59.

D. Illustrative Claim

Petitioner challenges claims 10–20 of the ’315 patent. Pet. 7. Claim 10, the only independent claim, is representative of the challenged subject matter, and is reproduced below.

10. A solar cell, the solar cell having a front side which faces the sun during normal operation and a back side opposite the front side, the solar cell comprising:

- a silicon substrate, wherein a portion of the silicon substrate has a dopant concentration of approximately less than or equal to $2 \times 10^{18} \text{ cm}^{-3}$ and wherein the portion of the silicon substrate is formed at the front side of the solar cell;
- a dielectric region formed over the silicon substrate, wherein the dielectric region is formed over the back side of solar;
- a first emitter region having metal impurities formed over the dielectric region; and
- a first metal contact formed over the first emitter region.

Ex. 1001, 10:48–61.

A. Evidence

Petitioner relies on the following evidence.

Name	Patent Document	Exhibit
Cousins	US 8,207,444 B2, published June 26, 2012	1007
Smith	US 2013/0240029 A1, published Sept. 19, 2013	1011
Choi	US 2014/0311567 A1, published Oct. 23, 2014	1006

Petitioner relies on the following non-patent literature evidence.

Name	Non-Patent Literature Title	Author	Exhibit
Marvin	<i>Interdigitated Back Contact Silicon Solar Cell Analysis and Design Recommendations for Space Use</i> , Space Systems Division Air Force Systems Command, Report 88-D-TR-90-04 (1990)	D. C. Marvin	1008
Istratov	<i>Gettering in silicon-on-insulator wafers: experimental studies and modeling</i> , Semicond. Sci. Technol. 20 (2005) 568–575	Andrei A. Istratov	1012
Granek	<i>High-Efficiency Back-Contact Back-Junction Silicon Solar Cells</i> (2009) (Ph.D. dissertation, Alfred Ludwig University of Freiburg)	F. Granek	1010

B. Asserted Grounds

Petitioner asserts that claims 10–20 would have been unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
10–17, 19, 20	103 ¹	Choi, Granek, Marvin, Istratov
18	103	Choi, Granek, Marvin, Istratov, Smith
10–15	103	Cousins, Granek, Marvin, Istratov

¹ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, 125 Stat. 284 (2011), revised 35 U.S.C. §§ 102 and 103 effective March 16, 2013. Because the ’315 patent has an effective filing date after March 16, 2013 (Ex. 1001, codes (22), (60)), we refer to the AIA version of Sections 102 and 103.

Pet. 7. Petitioner relies on the Declaration of Dr. Zachary Holman (Ex. 1003) in support of its contentions. Patent Owner submits the Declaration of David L. Carroll, Ph.D. (Ex. 2001) to support its Preliminary Response.

II. ANALYSIS

A. Level of Ordinary Skill in the Art

Petitioner contends that a person of ordinary skill in the art (“POSITA”) would have had “an advanced degree in electrical engineering, mechanical engineering, applied physics, chemistry, materials science, or a related discipline” and “at least one year of experience in designing, developing, or researching the design and/or manufacture of solar cells or related technologies.” Pet. 23. Alternatively, Petitioner contends that a POSITA would have had “a bachelor’s degree in one of the aforementioned disciplines” and “at least two years of experience designing, developing, or researching the design and/or manufacture of solar cells or related technologies.” *Id.* Petitioner also states that “[l]ess work experience may be compensated for by a higher level of education, and vice versa.” *Id.* at 23–24 (citing Ex. 1003 ¶¶ 37–41). Patent Owner responds that, for purposes of the Preliminary Response, it “applies [Petitioner’s] level of ordinary skill.” Prelim. Resp. 13.

On this record, we preliminarily adopt Petitioner’s undisputed proposed definition because it appears to be consistent with the cited prior art and the disclosure of the ’315 patent. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (explaining that specific findings regarding ordinary skill level are not required “where the prior art itself reflects an appropriate level and a need for testimony is not shown” (quoting *Litton*

Indus. Prods., Inc. v. Solid State Sys. Corp., 755 F.2d 158, 163 (Fed. Cir. 1985))).

B. Claim Construction

We construe each claim “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R. § 42.100(b). Under this standard, claim terms are generally given their plain and ordinary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). Only those terms in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Realtime Data LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019).

Based on the record before us, we determine that no claim term requires express construction for purposes of this Decision.

C. Asserted Obviousness over Choi, Granek or Marvin, and Istratov

Petitioner contends that claims 10–17, 19, and 20 would have been obvious over the combination of Choi, Granek or Marvin, and Istratov. Pet. 35–62.

1. Overview of Choi

Choi is directed to “a solar cell which is capable of improving reliability and maximizing efficiency.” Ex. 1006 ¶ 7. Choi’s Figure 1 is reproduced below.

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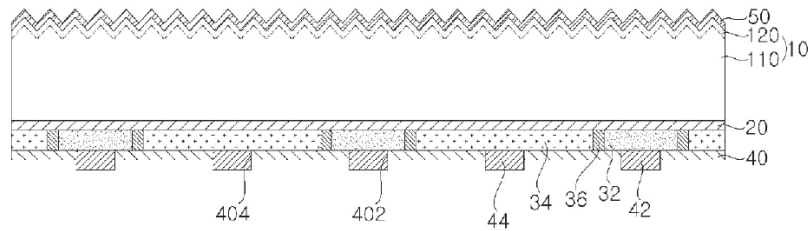


Figure 1 is a sectional view of a solar cell described in Choi. *Id.* ¶ 22. Solar cell 100 includes semiconductor substrate 10 (which includes base area 110 and front surface field layer 120), tunnelling layer 20, first conductive type area 32, and second conductive type area 34. *Id.* ¶¶ 23, 24, 29. First and second conductive type areas 32 and 34 are spaced from each other by barrier area 36. *Id.* ¶ 23. First and second electrodes 42 and 44 are connected to first and second conductive type areas 32 and 34, respectively. *Id.*

Choi teaches that semiconductor substrate 10 may “include a crystalline semiconductor (for example, crystalline silicon) containing a first conductive-type dopant.” Ex. 1006 ¶ 25. “[F]ront surface field layer 120 is an area where the first conductive-type dopant is doped at a concentration higher than the semiconductor substrate 10” and “prevents electrons and holes separated by incident light from being recombined and then decay on the front surface of the semiconductor substrate 10.” *Id.* ¶ 29. “[T]he first conductive-type dopant may be an n-type impurity such as a Group V element including phosphorous (P), arsenic (As), bismuth (Bi), antimony (Sb) or the like,” or “may be a p-type impurity such as a Group III element including boron (B), aluminum (Al), gallium (Ga), indium (In) or the like.” *Id.* ¶ 25. When base area 110 has an n-type impurity as the first conductive-type dopant, “second conductive type area 34 forming a tunnel junction

through the tunneling layer 20 with the base area 110 may be a p-type.” *Id.*
¶ 26. Alternatively, base area 110 and first conductive type area 32 may be a p-type and the second conductive type area 34 may be an n-type. *Id.*

Choi further teaches that barrier area 36 is disposed between, and separates, first conductive type area 32 and second conductive type area 34. Ex. 1006 ¶ 38. “[B]arrier area 36 may include a variety of materials for substantially insulating the first conductive type area 32 from the second conductive type area 34” such as “undoped insulating material (for example, oxide or nitride) or the like.” *Id.* ¶ 39. In addition, insulating layer 40 formed on first conductive type area 32, second conductive type area 34, and barrier layer 36 to prevent “undesired connection between” first and second conductive type areas 32 and 34 “and an improper electrode connection (that is, the second electrode 44 in case of the first conductive type area 32, and the first electrode 42 in case of the second conductive type area 34) and passivates the first and second conductive type areas 32 and 34.” *Id.* ¶ 42. Insulating layer 40 includes first opening 402 and second opening 404, exposing first and second conductive areas 32 and 34, respectively. *Id.*

2. Overview of Granek

Granek analyzes the passivation quality of different phosphorous-doped front surface field diffusion profiles. Ex. 1010, 117. Granek reports that a lowly-doped front surface field “results in high quantum efficiency . . . because the Auger recombination inside the highly doped region and the surface recombination velocity are low.” *Id.* at 120. According to Granek, “for the poorly passivated surfaces, highly doped and deep diffusion profiles are optimal in order to minimize the surface recombination” and, “for the well passivated surfaces, an optimal diffusion profile is lowly doped and shallow.” *Id.* at 122–123. Granek concludes that “[t]he best solar cell

efficiency of 20.8 % was obtained with deep diffused Gaussian profile of the” front surface field. *Id.* at 141. Granek further states that “the distribution of the efficiency of solar cells with the deep diffused [front surface field] was lowest, proving the processing stability of the deep diffused phosphorous profiles.” *Id.* at 141–142. Granek also notes that “[t]he efficiency of the analyzed solar cells decreased to 18.0 % for solar cell with the [front surface field] doping profiles with the lowest sheet resistance.” *Id.* at 142.

3. Overview of Marvin

Marvin reports on studies conducted to assess the utility of Interdigitated Back Contact (IBC) solar cells for space applications. Ex. 1008, 5. Marvin explains that “[a] subset of all the possible design parameters was selected for study in order to have a manageable task,” including “cell thickness, contact width, spacing and thickness, front surface field doping and thickness, and light intensity.” *Id.* at 9. Marvin reports:

In order to regain more of the performance lost by doubling the cell thickness from 25 μm to 50 μm , the use of a graded front surface doping field was investigated. The previous design used a 0.5 μm thick front surface field (FSF) uniformly doped at 5E18. It was found that by replacing this with a Gaussian doping profile with a characteristic width of 15 μm and a peak concentration of 1E18, the [end of life] efficiency [of the solar cell] was 11.49% with a 10 μm collector region spacing. This feature restored most of the lost performance.

Id. at 17. Marvin concludes that end of life performance is maximized when “[t]he FSF is graded over 15 μm with a peak doping concentration of 1E17 to 1E18 cm^{-3} .” *Id.* at 25.

4. Overview of Istratov

Istratov investigates the impact of buried oxide, which separates the device area from the substrate in silicon-on-insulator wafers, on the efficiency of traditional gettering techniques for iron and copper. Ex. 1012, 568. Istratov reports that the solubility of iron in silicon dioxide is 4.5 to 5.5 times less than in silicon at temperatures from 1020° C to 1100° C. *Id.* Istratov also reports that the solubility of copper in silicon dioxide is half of that in silicon at 1150° C and 3.3 times higher than in silicon at 690° C. *Id.*

5. Claim 10

Petitioner contends that Choi teaches most of the limitations of claim 10. Pet. 47–56. For example, Petitioner contends that Choi teaches “a silicon substrate” (semiconductor substrate 10), “a dielectric region formed over the silicon substrate, wherein the dielectric region is formed over the back side of solar” (tunneling layer 20), and “a first emitter region having metal impurities formed over the dielectric region” (second conductive type area 34). *Id.* at 49, 51–55. With respect to the “a portion of the silicon substrate has a dopant concentration of approximately less than or equal to $2 \times 10^{18} \text{ cm}^{-3}$ ” limitation of claim 10, Petitioner contends that “[a] POSITA would have been motivated to combine Granek’s or Marvin’s FSF dopant concentration with Choi’s FSF to dope a solar cell with the claimed dopant concentration with a reasonable expectation of success.” *Id.* at 50–51 (citing Ex. 1003 ¶¶ 238–248). Patent Owner responds that Petitioner does not establish that the asserted prior art teaches the “a portion of the silicon substrate has a dopant concentration of approximately less than or equal to $2 \times 10^{18} \text{ cm}^{-3}$ ” or “a first emitter region having metal impurities formed over the dielectric region” limitations of claim 10.

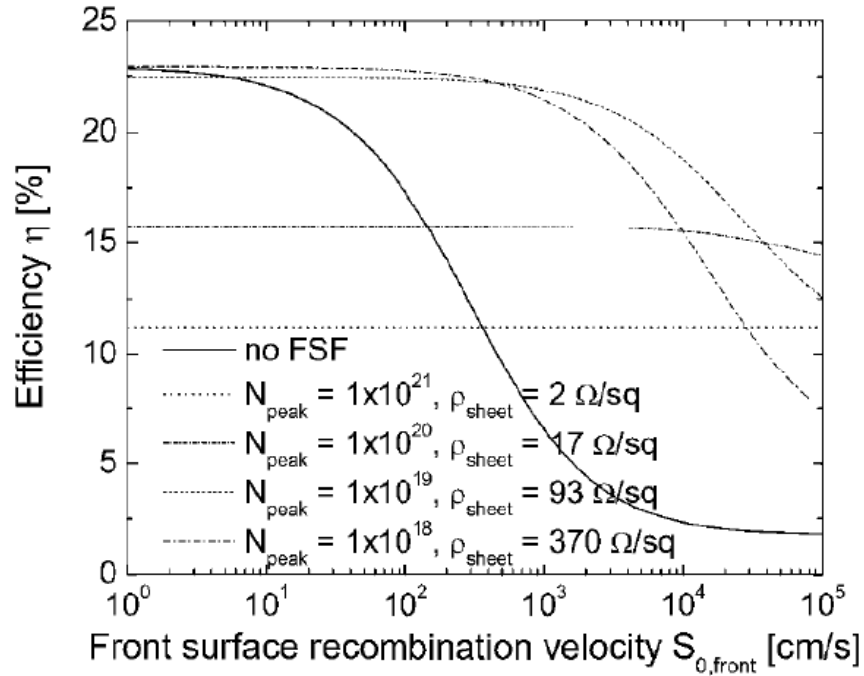
a. *“a portion of the silicon substrate has a dopant concentration of approximately less than or equal to $2 \times 10^{18} \text{ cm}^{-3}$ ”*

Petitioner contends that Choi teaches “a portion of the silicon substrate . . . wherein the portion of the silicon substrate is formed at the front side of the solar cell” because semiconductor substrate 10 (1) may be crystalline silicon; (2) includes base area 110 containing a low doping concentration of a first conductive type dopant; and (3) includes front surface field (“FSF”) 120, which is formed by doping the front side of semiconductor substrate 10 with a first conductive type dopant. Pet. 49 (citing Ex. 1006 ¶¶ 24, 29, 74). Petitioner acknowledges that, although “Choi discloses the FSF region has a higher dopant concentration than the semiconductor substrate to reduce recombination,” it “leaves the precise concentration to a POSITA’s skill and discretion.” *Id.* at 36–37 (citing Ex. 1006 ¶¶ 26, 29; Ex. 1003 ¶ 185). Petitioner contends that a POSITA would have been motivated to look to Granek or Marvin “for details regarding the FSF field region dopant concentration.” *Id.* at 37. In particular, Petitioner points to Granek’s teaching “that an FSF with a dopant concentration of approximately $1 \times 10^{18} \text{ cm}^{-3}$ provided the highest solar cell efficiency of all the dopant concentrations analyzed,” and to Marvin’s teaching that “FSF effectiveness is relatively constant over a rather broad” dopant concentration range of 1×10^{17} to $1 \times 10^{18} \text{ cm}^{-3}$. *Id.* at 50 (citing Ex. 1010, 120–122; Ex. 1008, 15).

Patent Owner argues that Granek “determine[s] the dopant concentration of the FSF layer in correlation to the stack system $\text{SiO}_2/\text{SiN}_x$ passivation layers for the highest solar efficiency,” and, “[u]nlike Granek, Choi does not disclose a stack system $\text{SiO}_2/\text{SiN}_x$ passivation layers on its FSF layer.” Prelim. Resp. 18–20 (citing Ex. 1010, 119–120; Ex. 2001

¶¶ 57–58). Patent Owner argues that, because Petitioner does not address “the impact of Granek’s stack system of $\text{SiO}_2/\text{SiN}_x$ passivation layers on solar efficiency, [Ppetitioner] fails to show why it would have been obvious to a POSITA to modify Choi based on Granek’s teachings.” *Id.* at 21 (citing Ex. 2001 ¶ 59). Patent Owner further argues that Petitioner “fails to show why it would have been obvious to a POSITA to modify Choi with Granek, in view of other references with surface passivation structures similar to Choi’s . . . that disclose optimum dopant concentrations for highly-efficient solar cells higher than” approximately less than or equal to $2 \times 10^{18} \text{ cm}^{-3}$ as claimed. *Id.* at 21–24. Patent Owner also argues that, contrary to Petitioner’s contentions, “Granek reported a highest efficiency of 20.8% for a solar cell with a dopant concentration of $3.8 \times 10^{18} / \text{cm}^3$ of the FSF layer.” *Id.* at 26 (citing Ex. 1010, 131–132).

On this record, we are persuaded that Petitioner sufficiently establishes that the combination of Choi and Granek teaches “a portion of the silicon substrate has a dopant concentration of approximately less than or equal to $2 \times 10^{18} \text{ cm}^{-3}$ ” as recited in claim 10. In particular, Granek teaches that “[a] lowly doped FSF results in high quantum efficiency,” and Granek’s Figure 7-1, reproduced below, shows that the highest efficiencies are expected when the dopant concentration is $1 \times 10^{18} \text{ cm}^{-3}$. Ex. 1010, 120–121.



Granek's Figure 7-1 reports the "[i]nfluence of the front surface recombination velocity ($S_{0, front}$) on the efficiency of the back-junction n-type Si solar cells with different phosphorus FSF diffusion profiles (one-dimensional PC1D simulations)." Ex. 1010, 121. Granek's Figure 7-3, reproduced below, similarly shows that the amount of recombination is lowest at dopant concentration values around $1 \times 10^{18} \text{ cm}^{-3}$.

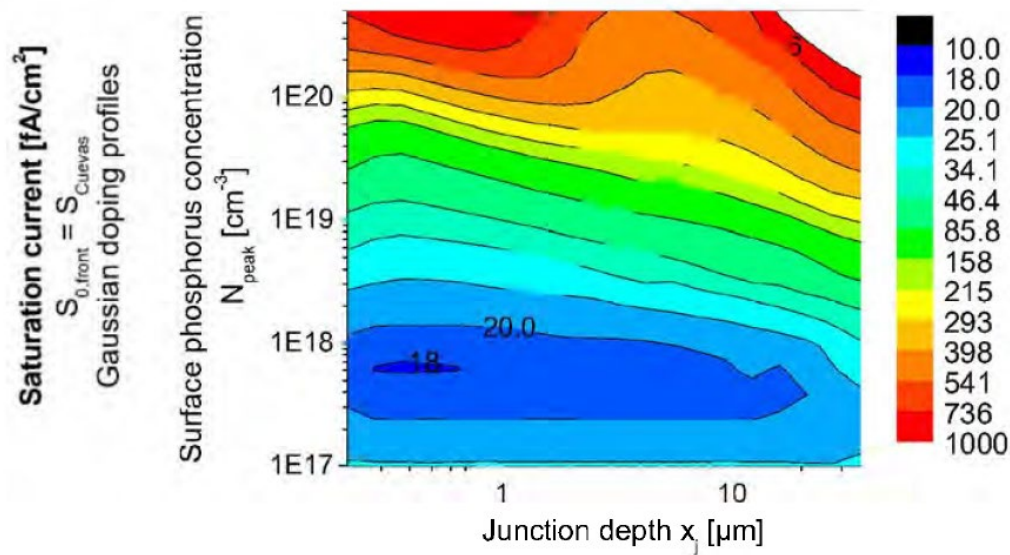


Figure 7-3 presents “[e]mitter saturation current densities (J_{0e}) of the phosphorus doped Gaussian diffusion profiles calculated in a wide range of surface phosphorus concentrations and junction depth” for passivated diffusion profiles. *Id.* at 122. From these simulations, Granek concludes that “for the well passivated surfaces, an optimal diffusion profile is lowly doped and shallow.” *Id.* at 123.

Granek also performed experiments in which fabricated solar cells were analyzed to study the effect of FSF diffusion profiles on solar cell performance. Ex. 1010, 124–126, 131. Granek reports that “[t]he highest efficiency of 20.8% was achieved” for a deep diffused FSF with a phosphorus concentration of $3.8 \times 10^{18} \text{ cm}^{-3}$ (Profile FSF5). *Id.* at 126, 131. Dr. Holman credibly testifies:

Based on my own experience, it is difficult to predict the final dopant concentration of a semiconductor layer when performing an experiment varying diffusion conditions, and Granek does not explain why lower dopant concentrations were not studied experimentally. Although Granek’s experiment resulted in an FSF dopant concentration of $3.8 \times 10^{18} \text{ cm}^{-3}$, Granek’s experimental results validate his simulation results that a low FSF dopant concentration is desirable. Moreover, a person of ordinary skill in the art, looking at both Granek’s simulation results and experimental results in conjunction, would have expected that a FSF dopant concentration of about $1.0 \times 10^{18} \text{ cm}^{-3}$ would have achieved a higher efficiency.

Ex. 1003 ¶ 153. We are persuaded, on this record, that Granek’s disclosures and Dr. Holman’s explanations thereof are sufficient to show that Granek teaches that dopant concentrations of 1×10^{18} achieve the highest solar efficiency.

We considered Patent Owner’s arguments and find them unavailing at this stage of the proceeding. For example, in arguing that “[u]nlike Granek,

Choi does not disclose a stack system of $\text{SiO}_2/\text{SiN}_x$ passivation layers on its FSF layer,” Patent Owner overlooks Choi’s teaching that “anti-reflective film 50 may be a single film selected from the group consisting of a silicon nitride film, a silicon nitride film containing hydrogen, a silicon oxide film, a silicon oxide nitride film, MgF_2 , ZnS , TiO_2 and CeO_2 , or a multilayer film including a combination of two or more thereof.” Prelim. Resp. 20 (citing Ex. 2001 ¶ 58); Ex. 1006 ¶ 32. Moreover, on this record, Dr. Carroll’s testimony that “due to the structural differences between the surface passivation structures of Choi and Granek, a POSITA would not have been motivated to adopt Granek’s teachings to modify Choi” is conclusory and does not adequately explain why structural differences undermine Petitioner’s proposed combination of Choi and Granek. *See* Ex. 2001 ¶¶ 56–59.

We also disagree, on this record, with Patent Owner that a POSITA would not have found it obvious to modify Choi based on Granek’s teachings because Lamers² and Desa³ have “similar passivation structures as Choi’s” and “disclose optimum dopant concentrations for highly effective solar cells higher than the claimed ‘dopant concentration of approximately less than or equal to $2 \times 10^{18} \text{ cm}^{-3}$.’” Prelim. Resp. 21–22. Lamers reports that “the optimum doping level was found to be $[3 \times 10^{18} \text{ cm}^{-3}]$ ” and “high-efficiency IBC cells” have “a top efficiency of 19.1%.” Ex. 2002, 2, 4. Desa teaches that “[w]ith optimized cell parameters, an efficiency of 19%

² M.W.P.E. Lamers, *Towards 21% efficient N-Cz IBC based on screen printing*, 26th European Photovoltaic Solar Energy Conference and Exhibition (2011) (Ex. 2002, “Lamers”).

³ Mohd K. Mat Desa, *Optimization of p-type Screen Printed Interdigitated Back Contact Silicon Solar Cell with Aluminum Back Surface Field*, IJET-IJENS Vol:14 No:02, 69–80 (2014) (Ex. 2003, “Desa”).

can be achieved,” and shows that this efficiency is achieved with a dopant concentration around $1 \times 10^{19} \text{ cm}^{-3}$. Ex. 2003, 73, 76 (Fig. 5(c)). Granek reports a higher solar cell efficiency (20.8%) than both Lamers (19.1%) and Desa (19%). Ex. 1010, 141; Ex. 2002, 4; Ex. 2003, 73. Moreover, as set forth above, the record indicates that Choi and Granek have similar structures, which undermines Patent Owner’s argument that a POSITA would have considered Lamers and Desa instead of Granek due to having “surface passivation structures similar to Choi’s.” Prelim. Resp. 21–22.

Patent Owner further argues that Petitioner “has not sufficiently established that a POSITA would have had a reasonable expectation of success that the proposed modification [of Choi with Granek] would be successful.” Prelim. Resp. 27 (citing Ex. 2001 ¶ 68). In particular, Patent Owner argues that “achieving [Granek’s] simulated highest solar cell efficiency not only depends on the dopant concentration of the FSF layer, but also on other solar cell parameters,” such as “improving solar cell optics, reduction of recombination losses, and minimization of electrical shading.” *Id.* at 28 (citing Ex. 2001 ¶ 68).

At this stage of the proceeding, Petitioner, with supporting testimony from Dr. Holman, provides adequate reasons why using the front portion doping concentration of $1 \times 10^{18} \text{ cm}^{-3}$ or less taught in Granek with Choi’s back contact solar cell would have been a “predictable use of prior art elements according to their established functions.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 401 (2007); *see* Pet. 39–41 (and evidence cited therein). We acknowledge that Patent Owner disagrees, but find that Patent Owner’s disagreement raises issues of fact that are best resolved on a full trial record. Accordingly, we find that Petitioner shows sufficiently that a POSITA would have had reason to combine the disclosures set forth in Choi with

Granek with a reasonable expectation of success in arriving at the subject matter of claim 10. *See* Pet. 36–41.

Patent Owner further argues that Petitioner does not explain “why a POSITA would have been motivated to adopt *only* Marvin’s dopant concentration of the FSF layer—while ignoring solar cell thickness—in an attempt to improve Choi’s solar cell efficiency.” Prelim. Resp. 30 (citing Ex. 2001 ¶ 71). In particular, Patent Owner argues that Marvin “demonstrates that increasing the thickness of Marvin’s solar cell decreases the solar cell efficiency for the dopant concentration of $1 \times 10^{18} \text{ cm}^{-3}$.” *Id.* at 29 (citing Ex. 2001 ¶ 70). Marvin, however, recognizes that “breakage can be a significant problem for silicon cells 50 μm or less in thickness,” and notes that thicker cells “offer added mechanical strength at some expense of [end of life] efficiency.” Ex. 1008, 21. Marvin also finds that the change in efficiency at higher thicknesses of 65 and 80 μm is around 2%. *Id.* A POSITA may weigh the disadvantages of increased cell thickness against potential advantages. *See Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (stating that “a given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine”); *see also Winner Int’l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000) (“The fact that the motivating benefit comes at the expense of another benefit, however, should not nullify its use as a basis to modify the disclosure of one reference with the teachings of another. Instead, the benefits, both lost and gained, should be weighed against one another.”).

For these reasons, and based on the record before us, we are persuaded that Petitioner establishes a reasonable likelihood of showing that the combination of Choi and Granek or Marvin discloses “a portion of the

silicon substrate has a dopant concentration of approximately less than or equal to $2 \times 10^{18} \text{ cm}^{-3}$.”

b. “a first emitter region having metal impurities formed over the dielectric region”

Petitioner contends that “[a] POSITA would have recognized the claimed ‘first emitter region’ corresponds to Choi’s second conductive area 34” and that “Choi’s tunneling layer 20 is the claimed ‘dielectric region.’” Pet. 54 (citing Ex. 1003 ¶¶ 254–266). Petitioner next contends that Choi teaches semiconductor substrate 10 contains a first conductive-type dopant that may be an n-type impurity such as phosphorous, arsenic, bismuth, or antimony, or a p-type impurity such as boron, aluminum, gallium or indium. *Id.* (citing Ex. 1006 ¶ 25). Petitioner further contends that “Choi teaches that each of the first and second conductive type areas 32, 34 is doped with either p- or n-type impurities in different embodiments.” *Id.* (citing Ex. 1006 ¶¶ 26, 36, 37). Petitioner contends that “because a POSITA would have understood that at least bismuth, aluminum, gallium, and indium are metals, a POSITA would have understood that Choi’s first and second conductive type areas 32, 34 are doped with metal impurities.” *Id.* Based on the record before us, we are persuaded that Petitioner’s discussion of the particular elements in Choi establishes a reasonable likelihood that Choi discloses “a first emitter region having metal impurities formed over the dielectric region” as recited in claim 10. *Id.* at 51–55.

Petitioner alternatively contends that Choi combined with Istratov teaches a first emitter region having metal impurities because “Istratov teaches the accumulation of iron and copper in the polysilicon layer during a heating step, and Istratov’s figures show higher iron and copper concentrations in the polysilicon layer than in the silicon substrate and oxide

layers after heating.” Pet. 55 (citing Ex. 1012, 570–571, Figs. 2, 4, 5). Patent Owner responds that Petitioner does not “show how it would have been obvious to a POSITA to modify Choi with Istratov without impermissible hindsight bias or changing Choi’s principle of operation.” Prelim. Resp. 46–51.

On this record, we are not persuaded that Petitioner adequately establishes that a POSITA would have been motivated to combine Choi with Istratov as proposed. Petitioner argues that, “[u]pon identifying detrimental levels of metal impurities in a solar cell substrate, a POSITA would have been motivated to add Istratov’s gettering process to the Choi-Granek or Choi-Marvin cell to trap impurities in the polysilicon layer—*i.e.*, an emitter—thereby reducing recombination.” Pet. 43. Neither Petitioner nor Dr. Holman adequately explain, however, why a POSITA would have been concerned with the levels of metal impurities in the substrate, what level of metal impurities would be “detrimental,” or what detriment the metal impurities would cause. In that regard, Petitioner does not direct us to, nor do we discern, any teachings in Choi regarding the presence of metal impurities in the silicon substrate, let alone iron and/or copper impurities such as those described in Istratov. Instead, Petitioner’s arguments that a POSITA would have been motivated to modify Choi’s solar cell with Istratov’s gettering process appear to be premised on Petitioner’s knowledge of the ’315 patent itself. *See KSR*, 550 U.S. at 421 (stating that the fact finder must be aware “of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning”). Accordingly, we find that Petitioner does not establish a reasonable likelihood of showing that a POSITA would have had reason to combine the disclosures set forth in

Istratov with Choi, Granek or Marvin with a reasonable expectation of success in arriving at the subject matter of claim 10.

c. Other Limitations

At this stage of the proceeding, Patent Owner does not address Petitioner's specific contentions with respect to the other limitations of claim 10. We reviewed Petitioner's contentions for all the elements of independent claim 10, as well as the supporting evidence. Pet. 47–56. Based on the record before us, we are persuaded that Petitioner's discussion of the particular structures and methods in Choi, Granek, and Marvin establishes a reasonable likelihood that the combined teachings of Choi with Granek or Marvin disclose or suggest all of the limitations of independent claim 10. *Id.*

6. Claims 11–17, 19, and 20

Petitioner also contends that the combined teachings of Choi, Granek or Marvin, and Istratov disclose or suggest all of the limitations of claims 11–17, 19, and 20, which ultimately depend from claim 10. Pet. 56–62. At this stage of the proceeding, Patent Owner does not address Petitioner's contentions with respect to claims 11–17, 19, and 20. *See* Prelim. Resp. We reviewed Petitioner's contentions with regard to claims 11–17, 19, and 20, and are persuaded that Petitioner establishes a reasonable likelihood that the combined teachings of Choi and Granek or Marvin disclose or suggest all of the limitations of these dependent claims as well. Pet. 56–62.

7. Conclusion

Based on the current record, and for the reasons set forth above, we determine that Petitioner establishes a reasonable likelihood of showing that

claims 10–17, 19, and 20 would have been obvious over the combined teachings of Choi and Granek or Marvin.

D. Asserted Obviousness over Choi, Granek or Marvin, Istratov, and Smith

Petitioner contends that claim 18 would have been obvious over the combination of Choi, Granek or Marvin, Istratov, and Smith. Pet. 62–67.

1. Overview of Smith

Smith describes a solar cell in which a trench structure separates the P-type doped region from the N-type doped region, “thereby preventing recombination in a space charge region where the doped regions would have touched.” Ex. 1011, code (57). Smith’s Figure 2 is reproduced below.

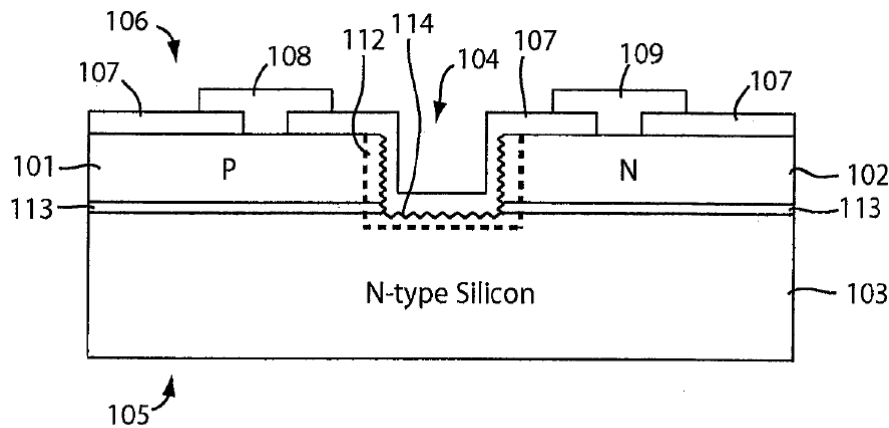


FIG. 2

Figure 2 is a sectional view of a solar cell structure described in Smith. *Id.* ¶ 9. Doped regions 101 and 102 are on backside 106 opposite front side 105. *Id.* ¶ 16. Doped regions 101 and 102 are formed on thin dielectric layer 113; doped region 101 is a P-type doped region and doped region 102 is an N-type doped region. *Id.* ¶¶ 16–17. Substrate 103 is an N-type silicon wafer. *Id.* ¶ 17. Trench 104 with randomly textured surface 114 and passivation region 112 separates doped regions 101 and 102. *Id.* ¶¶ 19, 21. Dielectric silicon nitride 107 is deposited in trench 104. *Id.* ¶ 22. Interdigitated metal contact fingers 108 and 109 are formed through silicon

nitride 107 to make an electrical connection to doped regions 101 and 102, respectively. *Id.* ¶ 24.

Smith explains that the described trench structure addresses issues relating to polysilicon parasitic space charge recombination because “trench 104 separates the doped regions 101 and 102 so they are not physically in contact,” which “prevents the space charge region from existing in either polysilicon film.” Ex. 1011 ¶ 25. Additionally, “the resulting accumulation layer under the trench 104 repels minority carriers to improve surface passivation” and “the textured surface 114 in the trench 104 increases solar radiation collection.” *Id.* According to Smith, “[t]hese advantageously help increase solar cell efficiency.” *Id.*

2. Claim 18

Claim 18 depends from claim 16, which depends from claim 10, and additionally recites “wherein a trench region separates the first emitter region from the second emitter region.” Ex. 1001, 11:12–14. Petitioner contends that “[a] POSITA would have been motivated to implement the Choi-Granek-Istratov or Choi-Marvin-Istratov cell with a trench as taught by Smith to improve efficiency.” Pet. 63. Petitioner contends “Smith teaches that, for cells with polysilicon doped regions (*e.g.*, Choi’s), directly abutting p-type and n-type doped regions adversely affect efficiency” due to recombination in the space charge region where the doped regions touch, and further “teaches that a trench addresses known adverse effects on efficiency from directly touching doped regions.” *Id.* at 63–64. Petitioner contends that “[a] POSITA would have been motivated by Smith’s express teaching to add a trench to the Choi-Granek-Istratov or the Choi-Marvin-Istratov cell.” *Id.* at 64 (citing Ex. 1003 ¶¶ 344–345).

A showing of obviousness must be supported by an articulated reasoning with rational underpinning to support a motivation to modify the prior art teachings. *KSR*, 550 U.S. at 417. We are not persuaded that Petitioner establishes why a POSITA would attempt to improve Choi's solar cell by looking to Smith. Choi teaches that when first conductive type area 32 contacts second conductive type area 34, "shunt is generated and performance of the solar cell 100 is deteriorated," and "barrier area 36 is interposed between the first conductive type [area] 32 and the second conductive type area 34" to "prevent[] unnecessary shunt." Ex. 1006 ¶ 38. Neither Petitioner nor Dr. Holman adequately explains, on this record, why modifying Choi's solar cell in view of the teachings of Smith would be an improvement on what Choi already provides, or why Choi's barrier area 36 is deficient in any respect, such that a POSITA would have looked to a reference like Smith.

In an obviousness analysis, we must avoid analyzing the prior art through the prism of hindsight. Instead, we must "cast the mind back to the time the invention was made" and "occupy the mind of one skilled in the art who is presented only with the references, and who is normally guided by the then-accepted wisdom in the art." *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553 (Fed. Cir. 1983). Petitioner's arguments that a POSITA would have been motivated to modify Choi's solar cell with Smith's trench appear to be premised on Petitioner's knowledge of the '315 patent itself. *See KSR*, 550 U.S. at 421 (stating that the fact finder must be aware "of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning").

Accordingly, on this record, Petitioner has not demonstrated a reasonable likelihood that it would prevail in showing that claim 18 would

have been obvious over the combined teachings of Choi, Granek or Marvin, Istratov, and Smith.

E. Asserted Obviousness over Cousins, Granek or Marvin, and Istratov

Petitioner contends that claims 10–15 would have been obvious over the combined teachings of Cousins, Granek or Marvin, and Istratov.

Pet. 67–78. Having already determined that Petitioner establishes a reasonable likelihood of establishing that claims 10–15 would have been obvious over Choi and Granek or Marvin, we need not address this ground in full. We offer the following comments in response to the parties’ arguments and evidence to provide guidance to the parties.

Petitioner contends that “[w]hile Cousins provides a range ‘of 100 to 500 Ω/sq ’ for the sheet resistance of the n-type doped region 105 . . . it leaves the selection of other parameters (*e.g.*, dopant concentration) to a POSITA’s skill and discretion.” Pet. 68 (citing Ex. 1007, 2:49–55; Ex. 1003 ¶¶ 362–365). Petitioner contends that “[a] POSITA would have been motivated to look to Granek and Marvin to fill in the implementation details regarding the dopant concentrations of Cousin’s doped region 105.” *Id.* Specifically, Petitioner contends that “[a] POSITA would have understood from Figure 7-4 of Granek that, for practical FSF depths, Cousins’ sheet resistance of 100 to 500 Ω/sq is consistent with the FSF dopant concentration of approximately $1 \times 10^{18} \text{ cm}^{-3}$ from Granek.” *Id.* at 68–69 (citing Ex. 1007, 2:49–55; Ex. 1010, 123 (Fig. 7-4); Ex. 1003 ¶¶ 365–365).

Patent Owner argues that Petitioner does not explain “why a POSITA would have been motivated to look to Granek’s surface passivation structure—which is structurally different from Cousins’s surface passivation structure—to determine a front surface dopant concentration in Cousins.”

Prelim. Resp. 32–33. Patent Owner argues that the surface passivation

structure in Cousins's solar cell is thinner than the surface passivation structure in Granek's solar cell, and Petitioner does not address the impact of the thickness of Granek's stack system of SiO₂/SiN_x passivation layers on solar cell efficiency. *Id.* at 36–37.

Granek, however, reports that “[a] detailed study of the loss mechanisms limiting the efficiency of the developed back-contact back-junction silicon solar cell was performed” and “[t]he reduction of the cell efficiency was determined to be 3.9% abs. due to recombination processes, 2.0% abs. due to optical losses, 0.3% abs. due to series resistance effects and 0.7% due to electrical shading.” Ex. 1010, 175. Granek teaches that “[t]he surface recombination rate is proportional to the defect density at the surface,” and “it is beneficial to reduce the density of the surface states” using passivation layers of SiO₂ and SiN_x. *Id.* at 119. Granek also teaches that the surface recombination rate can be lowered by “implement[ing] a doping profile at the surface” to reduce the concentration of one of the carrier types that facilitates the recombination. *Id.* Although Granek does state that “good surface passivation with *thin* SiO₂ and antireflection SiN_x layers have enabled processing of back-junction back-contacted solar cells with efficiencies greater than 21%,” it does not otherwise correlate the thickness of the layers with the efficiency of the cell. *Id.* at 129 (emphasis added). Thus, on this record, Dr. Carroll's testimony that “due to the structural differences between the surface passivation structures of Cousins and Granek, a POSITA would not have been motivated to modify Cousins with the teachings of Granek” does not adequately explain why structural differences undermine Petitioner's proposed combination of Cousins and Granek. *See* Ex. 2001 ¶¶ 76–80.

Petitioner also argues that a POSITA would have been motivated “to add Istratov’s gettering process to the Cousins-Granek or Cousins-Marvin cell to trap impurities in the emitter and thus reduce recombination for the same reasons explained” with respect to the combination of Choi and Granek or Marvin with Istratov. Pet. 70 (citing Ex. 1003 ¶¶ 370–371). Accordingly, Petitioner’s arguments with respect to the combination of Cousins with Istratov have the same shortcomings as discussed above with respect to the combination of Choi and Istratov. *See* Section II.C.5.b, *supra*.

We invite the parties to develop these arguments further at trial, to the extent permitted by our rules.

F. Discretionary Denial under 35 U.S.C. § 314(a)

Under 35 U.S.C. § 314(a) we have discretion to deny institution of an *inter partes* review. *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2140 (2016). Petitioner argues against discretionary denial under 35 U.S.C. § 314(a). Pet. 79–85; Prelim. Reply. Patent Owner argues that we should exercise our discretion under 35 U.S.C. § 314(a) and not institute trial. Prelim. Resp. 58–66; Prelim. Sur-reply. For the reasons set forth below, we do not exercise our discretion to deny institution in view of the parallel district court proceeding.

Institution of an *inter partes* review is discretionary. *See* 35 U.S.C. § 314(a) (authorizing institution of an *inter partes* review under particular circumstances, but not requiring institution under any circumstances); *Cuozzo*, 136 S. Ct. at 2140 (“[T]he agency’s decision to deny a petition is a matter committed to the Patent Office’s discretion.”); *SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1356 (2018) (“[Section] 314(a) invests the Director with discretion on the question whether to institute review” (emphasis omitted)); *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir.

2016) (“[T]he PTO is permitted, but never compelled, to institute an IPR proceeding.”).

We consider several factors when determining whether to deny institution under § 314(a) based on a parallel district court proceeding, specifically

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
2. proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision;
3. investment in the parallel proceeding by the court and the parties;
4. overlap between issues raised in the petition and in the parallel proceeding;
5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board’s exercise of discretion, including the merits.

Apple Inc. v. Fintiv, Inc., IPR2020-00019, Paper 11 at 5–6 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”). We also consider “several clarifications” made by the Director of the United States Patent and Trademark Office (“USPTO”). See USPTO Memorandum, Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation, 2 (June 21, 2022) (“Guidance Memorandum”).⁴

⁴ The Interim Procedure is available under the “Guidance Memorandum” heading on the “Resources and guidance” page for the Patent Trial and Appeal Board, located at <https://www.uspto.gov/patents/ptab/resources>.

1. Factor 1 – Whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted

Under the first *Fintiv* factor, we consider “whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted.” *Fintiv* at 6.

As of the date of the Preliminary Response, neither party filed a motion to stay. Prelim. Resp. 60. Petitioner represents that it “intends to request a stay after institution, and Judge Gilstrap often grants such requests where institution predates *Markman* and the IPR is likely to simplify the issues in the district court.” Prelim. Reply 1. Petitioner explains that “[b]oth circumstances apply here.” *Id.* Petitioner’s recently updated Mandatory Notices indicate that it filed a motion to stay the parallel litigation on February 5, 2025. Paper 15, 4.

Patent Owner asserts that “the result of any . . . motion is pure speculation. And where IPRs are instituted for less than all asserted patents, Judge Gilstrap regularly denies a stay, increasing the speculative nature of Petitioner’s assertion.” Prelim. Sur-reply 1. Patent Owner urges the Board to “decline to infer . . . how the District Court would rule” on any such motion to stay. *Id.*; Prelim. Resp. 60.

We agree with Patent Owner and decline to speculate on how Judge Gilstrap may rule on Petitioner’s motion for a stay. Accordingly, we determine that *Fintiv* factor 1 is neutral.

2. Factor 2 – The proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision

Under the second *Fintiv* factor, we consider the “proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision.” *Fintiv* at 6.

Patent Owner asserts that trial for the parallel district court litigation is scheduled for May 4, 2026, but “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.” Prelim. Resp. 61 (citing Ex. 2021). Patent Owner argues that “the schedule in the *Canadian Solar* proceeding weighs in favor of denial” of institution in this case. *Id.*

Petitioner contends that the final written decision in this *inter partes* review “is expected more than two months **before** trial.” Prelim. Reply 2. Petitioner argues that Patent Owner’s reliance on the *Canadian Solar* trial date is misplaced because the instant Petition includes references and grounds not present in *Canadian Solar* and, therefore, the *Canadian Solar* trial will not address the non-overlapping grounds presented here. *Id.*

The Guidance Memorandum states that “[t]he PTAB will weigh this factor against exercising discretion to deny institution under *Fintiv* if the median time-to-trial is . . . after the projected statutory deadline for the PTAB’s final written decision.” Guidance Memorandum at 9. Because the evidence demonstrates that the trial date, supported by the median time-to-trial data, is more than two months after the projected deadline for the Final Written Decision, we determine that *Fintiv* factor 2 weighs against exercising our authority to deny institution.

We acknowledge Patent Owner’s arguments relating to the *Canadian Solar* trial date, but are not persuaded by them.⁵ The Petitioner in the instant

⁵ We note that the Board instituted trial in the companion *inter partes* reviews of the ’315 patent to the *Canadian Solar* litigation. *See Canadian Solar Inc. v. Maxeon Solar Pte. Ltd.*, IPR2024-01038, Paper 13 (PTAB Jan. 14, 2025); *Canadian Solar Inc. v. Maxeon Solar Pte. Ltd.*, IPR2024-01194, Paper 12 (PTAB Jan. 24, 2025). The final written decisions in

inter partes review is not a party in the *Canadian Solar* litigation. Further, unlike in the *TCO AS*⁶ proceeding cited by Patent Owner, the *Canadian Solar* litigation will not resolve all issues in the instant *inter partes* review, as there is not complete overlap of claims or issues.

Accordingly, factor 2 weighs against exercising our authority to deny institution.

3. Factor 3 – Investment in the parallel proceeding by the court and the parties

Under the third *Fintiv* factor, we consider the “investment in the parallel proceeding by the court and the parties.” *Fintiv* at 6.

Petitioner argues that it “diligently filed its petition fewer than four months after [Patent Owner] filed its complaint—before receiving [Patent Owner’s] infringement contentions and entry of a scheduling order—and the district court has not issued any substantive orders relating to the ’315 patent.” Prelim. Reply 3 (citing *Fintiv* at 10). According to Petitioner, “the *Markman* hearing (Nov. 2025), fact discovery (scheduled to close Nov. 2025), expert discovery (scheduled to close Jan. 2026), and dispositive motions (briefing through Feb. 2026) will occur well after institution.” *Id.* Petitioner further contends that “none of the completed or ongoing work in the district court identified by [Patent Owner] . . . relates to invalidity,” and Patent Owner’s reliance on the *Canadian Solar* litigation “is again

IPR2024-01038 and IPR2024-01194 will issue before the *Canadian Solar* trial date of January 26, 2026.

⁶ *TCO AS v. NCS Multistage Inc.*, PGR2020-00077, Paper 16 at 11–12 (PTAB Feb. 18, 2021) (“Petitioner does not dispute that the trial in the Nine litigation will address the invalidity challenges that are presented in the Petition.”).

inapposite because the [Canadian Solar] trial will not ‘involve[] the same . . . arguments’ as [Petitioner’s] petition.” *Id.*

Patent Owner states that the district court proceeding “is in its early stages, but the parties have already been substantially engaged prior to [Petitioner’s] answer/response deadline.” Prelim. Resp. 62. For example, Patent Owner contends that Petitioner “sought early dismissal of one of the named defendants,” Petitioner filed a motion to transfer venue, limited discovery on the issue of venue has been granted, and Patent Owner has served its infringement contentions. *Id.* Patent Owner contends that in *Sand Revolution*,⁷ “*Fintiv* factor 3 *did not weigh against exercising discretion to deny institution* despite that ‘fact discovery [was] still ongoing, expert reports [were] not yet due, and substantive motion practice [was] yet to come.’” Prelim. Sur-reply 3. In addition, Patent Owner alleges that discovery is proceeding in the *Canadian Solar* litigation. Prelim. Resp. at 62. Patent Owner argues that the *Canadian Solar* litigation is relevant because “there is significant overlap in the asserted grounds.” Prelim. Sur-reply 3. Thus, Patent Owner reasons that this factor favors denial of institution or is neutral. *Id.*; Prelim. Resp. 61–62.

We disagree with Patent Owner. In *Sand Revolution*, the district court conducted a *Markman* hearing and entered a related order. *Sand Revolution* at 10. Here, the *Markman* hearing is not scheduled to occur for several months. And although the parties have invested some resources, much work remains to be done in the district court case. The district court litigation appears to be in an early stage, there is no evidence that the district court has

⁷ See, e.g., *Sand Revolution II, LLC v. Cont’l Intermodal Grp. Trucking LLC*, IPR2019-01393, Paper 24 at 10-11 (P.T.A.B. June 16, 2020).

issued any substantive orders related to the '315 patent or the prior art set forth in the Petition, and there is evidence that Petitioner filed its Petition expeditiously. Prelim. Reply 3; Pet. 84–85; *see Fintiv* at 9–11. On this record, we are also not persuaded that the status of the *Canadian Solar* litigation is relevant to our determination here. Thus, we determine that *Fintiv* factor 3 weighs strongly against exercising our authority to deny institution.

4. Factor 4 – Overlap between issues raised in the petition and in the parallel proceeding

Under the fourth *Fintiv* factor, we consider the “overlap between issues raised in the petition and in the parallel proceeding.” *Fintiv* at 6.

Petitioner contends this *inter partes* review “include[s] claims that do **not** overlap with those asserted in [Patent Owner’s] complaint” and infringement contentions in the parallel litigation. Prelim. Reply 4. Petitioner further argues that Patent Owner’s “reliance on [Petitioner’s] invalidity counterclaim to show alleged overlap is premature and not informative of the identity of issues between proceedings, as [Petitioner’s] invalidity contentions are not due for nearly two months.” *Id.*

Patent Owner argues that even though invalidity contentions have not been submitted, “all but one secondary reference ([Smith]) have been identified by [Petitioner] in its counterclaim for invalidity” in the parallel litigation. Prelim. Resp. 63. Furthermore, Patent Owner contends that 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.” *Id.*; Prelim. Sur-reply 3. Patent Owner explains that the fact there is not complete overlap of claims is not dispositive. Prelim. Sur-reply 4 (citing *Samsung Display Co., Ltd. v. Pictiva Displays Int’l Ltd.*,

IPR2024-00855, Paper 12 at 10–11 (PTAB Nov. 19, 2024)). According to Patent Owner, “the only challenged independent claim (claim 10) is also at issue in the district court.” *Id.* Patent Owner also asserts that Petitioner “could have, but did not, provide any stipulation here, *Sotera*^[8] or otherwise.” Prelim. Resp. 64; Prelim. Sur-reply 3.

While some overlap of issues may exist, complete overlap does not exist and resolution of the companion trial will not address the non-overlapping claims or grounds. Furthermore, that Petitioner did not provide any stipulation is not determinative here as a stipulation is not required. *Fintiv*, Paper 11 at 13 (“the degree of overlap is highly fact dependent”); Guidance Memorandum 7. Accordingly, we determine that *Fintiv* factor 4 weighs slightly against exercising our authority to deny institution.

5. Factor 5 – Whether the petitioner and the defendant in the parallel proceeding are the same party

Under the fifth *Fintiv* factor, we consider “whether the petitioner and the defendant in the parallel proceeding are the same party.” *Fintiv* at 6.

When the petitioner and the defendant in the parallel proceeding are the same, this tends to support discretionary denial. *See Sotera* at 19. Based on the present record, we consider *Fintiv* factor 5 to favor discretionary denial.

6. Factor 6 – Other circumstances that impact the Board’s exercise of discretion, including the merits

Under the sixth *Fintiv* factor, we consider “other circumstances that impact the Board’s exercise of discretion, including the merits.” *Fintiv* at 6.

⁸ *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020) (precedential as to § II.A) (“*Sotera*”).

Petitioner contends this factor weighs against discretionary denial because the Petition presents compelling merits. Pet. 85; Pet. Reply 5.

The Director instructs “PTAB panels to only consider compelling merits if they first determined that *Fintiv* factors 1–5 favored a discretionary denial.” *CommScope Techs. LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 23 at 4–5 (PTAB Feb. 27, 2023) (decision on Director review) (precedential). Here, we determine that *Fintiv* factor 1 is neutral, factors 2 through 4 all weigh against exercising our discretion to deny institution, and factor 5 weighs in favor of discretionary denial. Accordingly, when considered in combination, *Fintiv* factors 1–5 do not favor discretionary denial, and we do not consider the question of compelling merits.

7. Conclusion – *Fintiv*

Absent a compelling reason to the contrary, we take “a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review” when evaluating the *Fintiv* factors. *Fintiv* at 6; Guidance Memorandum. Having evaluated all of the factors on this record, we determine that the circumstances presented do not support exercising our discretion under § 314(a) to deny institution of this *inter partes* review.

III. CONCLUSION

Based on the arguments in the Petition and the Preliminary Response, and the evidence of record, we determine that Petitioner establishes a reasonable likelihood that it will prevail on its challenge to at least one claim of the ’315 patent. We also determine that the arguments and evidence of record do not support discretionary denial of the Petition under 35 U.S.C. § 314(a). Accordingly, we institute an *inter partes* review of all the challenged claims on all the challenged grounds.

The factual findings set forth in this Decision are preliminary and provided for the sole purpose of deciding whether to institute a review. Any final findings will be based on the full trial record, including any information presented in a timely filed response to the Petition. *See Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016) (noting that “there is a significant difference between a petitioner’s burden to establish a ‘reasonable likelihood of success’ at institution, and actually proving invalidity by a preponderance of the evidence at trial”) (quoting 35 U.S.C. § 314(a); comparing *id.*, with § 316(e)).

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that an *inter partes* review is instituted with respect to all of the grounds asserted in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial, which shall commence on the entry date of this Decision.

IPR2024-01198
Patent 11,251,315 B2

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