

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

CANADIAN SOLAR INC.,  
Petitioner,

v.

MAXEON SOLAR PTE. LTD.,  
Patent Owner.

---

IPR2024-01194  
Patent 11,251,315 B2

---

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

KOKOSKI, *Administrative Patent Judge*.

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

## I. INTRODUCTION

Canadian Solar Inc. (“Petitioner” or “CSI”) filed a Petition to institute an *inter partes* review of claims 16 and 19 of U.S. Patent No. 11,251,315 B2 (“the ’315 patent,” Ex. 1001). Paper 1 (“Pet.”). Maxeon Solar Pte. Ltd. (“Patent Owner” or “Maxeon”) filed a Preliminary Response. Paper 8 (“Prelim. Resp.”). With Board authorization, Petitioner filed a Reply (“Prelim. Reply,” Paper 9), 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 16 and 19 of the ’315 patent.

### A. Real Parties in Interest

Petitioner identifies CSI and Canadian Solar (USA) Inc. as the real parties in interest. Pet. 2. Patent Owner identifies itself as the real party in interest. Paper 5 (Mandatory Notice), 2.

### B. Related Matters

The parties indicate that the ’315 patent is asserted in *Maxeon Solar Pte. Ltd. v. Canadian Solar, Inc.*, Case No. 2:24-cv-210 (E.D. Tex.), *Maxeon Solar Pte. Ltd. v. REC Solar Holdings AS*, Case No. 2:24-cv-00260 (E.D.

Tex.), and *Maxeon Solar Pte. Ltd. v. Hanwha Sol'ns Corp.*, Case No. 2:24-cv-00262 (E.D. Tex.). Pet. 3; Paper 5, 2.

Petitioner challenges claims 10–15 of the '315 patent in IPR2024-01038 (“1038 IPR”), which was instituted on January 14, 2025. *See Canadian Solar, Inc. v. Maxeon Solar Pte. Ltd.*, IPR2024-01038, Paper 13 (PTAB Jan. 14, 2025). Patent Owner indicates that the '315 patent is also asserted in *Hanwha Sol'ns Corp. v. Maxeon Solar Pte. Ltd.*, IPR2024-01198 (PTAB). Paper 5, 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.

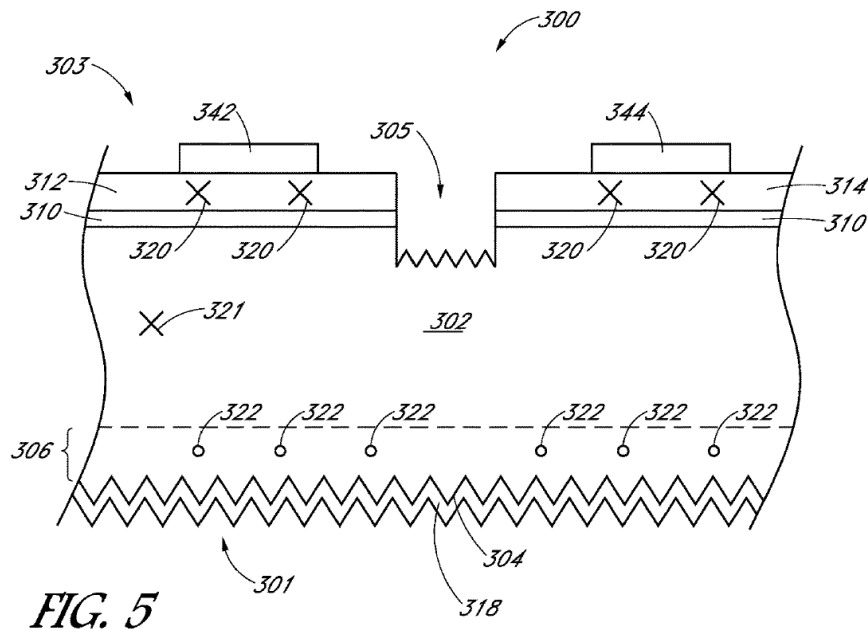


Figure 5 is a cross-sectional view of a solar cell according to an embodiment described in the '315 patent. *Id.* at 1:49–50. Solar cell 300 has front side 301 that faces the sun during normal operation and back side 303

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  $5 \text{ fA/cm}^2$ , improved lifetime, e.g. typical of approximately 10  $\mu\text{sec}$ , 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<sup>2</sup>, poor lifetime, e.g. typical of approximately 3 μsec and no considerable, e.g., >0.5% efficiency increase from the baseline.” *Id.* at 8:51–59.

*D. Illustrative Claim*

Petitioner challenges claims 16 and 19 of the '315 patent, which depend from claim 10, all of which are 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.

16. The solar cell of claim 10, further comprising:
- a second emitter region having metal impurities formed over the dielectric region; and
  - a second metal contact formed over the second emitter region.

*Id.* at 11:5–9.

19. The solar cell of claim 16, wherein the second emitter region comprises polysilicon.

*Id.* at 11:15–16.

*E. Evidence*

Petitioner relies on the following patent evidence.

| Name        | Patent Document                             | Exhibit |
|-------------|---------------------------------------------|---------|
| Hu          | US 4,053,335, published Oct. 11, 1977       | 1017    |
| Swanson-352 | US 4,234,352, published Nov. 18, 1980       | 1015    |
| Li          | US 2011/0214719 A1, published Sept. 8, 2011 | 1005    |

Petitioner relies on the following non-patent literature evidence.

| Name    | Non-Patent Literature Title                                                                                                                                          | Author            | Exhibit |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------|
| King    | <i>Studies of Diffused Phosphorous Emitters: Saturation Current, Surface Recombination Velocity, and Quantum Efficiency</i> , Vol. 37, No. 2, pp. 365–371, Feb. 1990 | R. R. King        | 1006    |
| Marvin  | <i>Analysis of Interdigitated Back Contact Silicon Solar Cells for Space Use</i> , IEEE, pp. 821–827 (1989)                                                          | D. C. Marvin      | 1035    |
| Muller  | <i>Ion implantation for all-alumina IBC solar cells with floating emitter</i> , Energy Procedia 55, pp. 265–271 (2014)                                               | Ralph Müller      | 1008    |
| Ramappa | <i>Diffusion of Iron in Silicon Dioxide</i> , Journal of Electrochemical Society, Vol. 146, No. 10, pp. 3773–3777 (1999)                                             | Deepak A. Ramappa | 1025    |

*F. Asserted Grounds*

Petitioner asserts that claims 16 and 19 would have been unpatentable on the following grounds:

| <b>Claim(s) Challenged</b> | <b>35 U.S.C. §</b> | <b>Reference(s)/Basis</b>                  |
|----------------------------|--------------------|--------------------------------------------|
| 16, 19                     | 103 <sup>1</sup>   | Li, King, Swanson-352, Marvin              |
| 16, 19                     | 103                | Li, Muller                                 |
| 16, 19                     | 103                | Li, King, Swanson-352, Marvin, Hu, Ramappa |
| 16, 19                     | 103                | Li, Muller, Hu, Ramappa                    |

Pet. 3–4. Petitioner relies on the Declaration of Sanjay Banerjee, Ph. D. (“Banerjee Dec.,” Ex. 1003) in support of its contentions.

II. ANALYSIS

*A. Level of Ordinary Skill in the Art*

Petitioner contends that a person of ordinary skill in the art (“Skilled Artisan”) would have had “an advanced degree involving the discipline of electrical engineering, applied physics, chemistry, or materials science, and at least two years of experience designing, developing, or researching in the field,” or “a bachelor’s degree in electrical engineering, applied physics, or materials science, and at least three years of experience designing, developing, or researching in the field.” Pet. 11 (citing Ex. 1003 ¶47). Patent Owner states that, for purposes of the Preliminary Response, it “applies CSI’s level of ordinary skill.” Prelim. Resp. 13.

---

<sup>1</sup> 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.

On this record, we preliminary 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 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 determined that no claim term requires express construction for purposes of this Decision.

### *C. Asserted Obviousness over Li and King, Swanson-352, or Marvin*

Petitioner contends that claims 16 and 19 would have been obvious over the combination of Li and King, Swanson-352, or Marvin. Pet. 37–58.

#### *1. Overview of Li*

Li is directed to “methods of fabricating back-contact solar cells and devices thereof.” Ex. 1005 ¶ 3. Figure 3 is reproduced below.

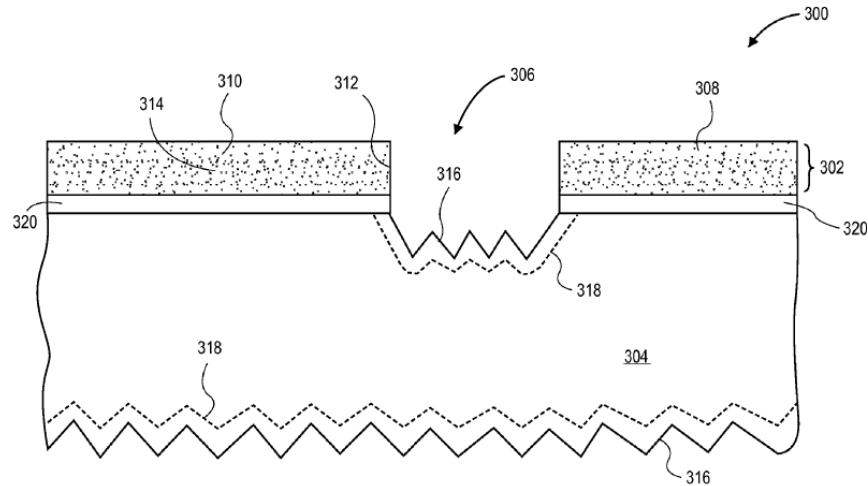


**FIG. 3**

Figure 3 is a cross-sectional view of a back-contact solar cell according to one embodiment described in Li. *Id.* ¶ 14. Back-contact solar cell 300 includes material layer 302 disposed above substrate 304. *Id.* ¶ 36. Trench 306 separates N-type region 308 and P-type region 310. *Id.* P-type region 310 includes dopant concentration 312 directly adjacent to trench 306 approximately equal to dopant concentration 314 in the center of P-type region 310. *Id.* Material layer 302 is a poly-crystalline silicon layer, and substrate 304 is a single-crystalline silicon substrate. *Id.* ¶ 37. P-type region 310 includes boron dopant impurity atoms, and N-type region 308 includes phosphorous dopant impurity atoms. *Id.* Trench 306 is disposed entirely through material layer 302 and into substrate 304. *Id.* ¶ 38. Surfaces of substrate 304 not covered by material layer 302 include textured surface 316, and N-type dopants 318 are included at or near these non-covered surfaces. *Id.* Dielectric film 320 is disposed directly between material layer 302 and substrate 304 and is composed of silicon dioxide, and can be a tunnel oxide barrier layer film. *Id.* ¶ 39.

Figure 5B is reproduced below.

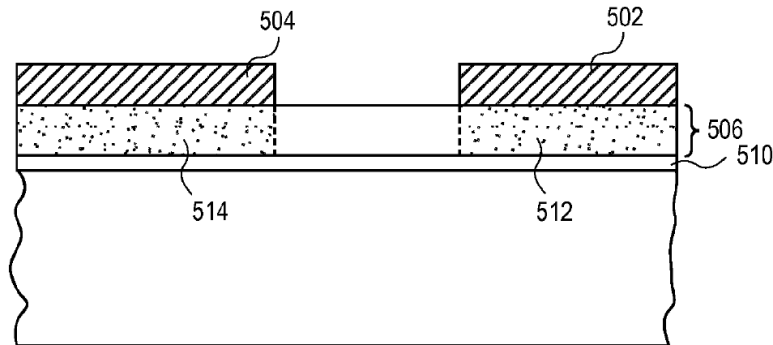


**FIG. 5B**

Figure 5B is a cross-sectional view of a step in the fabrication of a back-contact solar cell described in Li. Ex. 1005 ¶ 17. Dielectric film 510 is formed directly below material layer 506 and above substrate 508 (not labeled). *Id.* ¶ 43. Li teaches that “heating N-type dopant source layer 502 and P-type dopant source layer 504 includes transferring N-type dopants and P-type dopants, respectively, into portions 512 and 514, respectively, of material layer 506.” *Id.* ¶ 45. Li further teaches that “heating N-type dopant source layer 502 and P-type dopant source layer 504 includes heating at a temperature of approximately 950 degrees Celsius.” *Id.*

## *2. Overview of King*

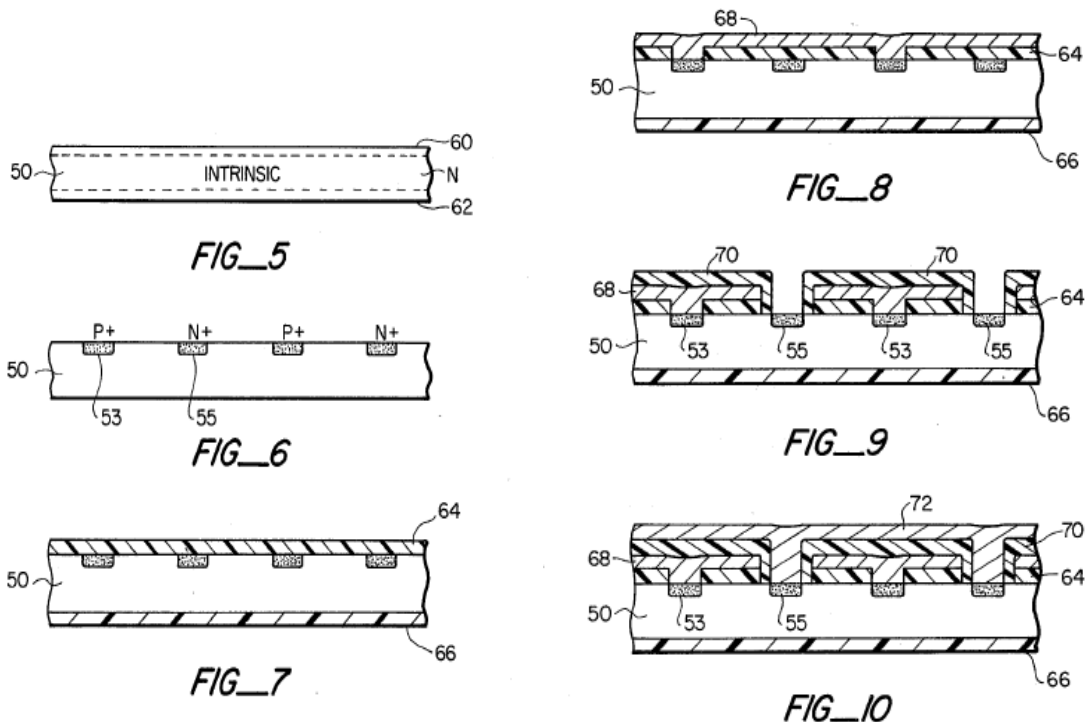
King reports on studies in which “[t]he surface recombination velocity  $s$  for silicon surfaces passivated with thermal oxide, is experimentally determined as a function of surface phosphorous concentration for a variety of oxidation, anneal, and surface conditions.” Ex. 1006, 365 (emphasis omitted). King reports that, “of a back-contacted cell in which sunside diffusion is used mainly to reduce surface recombination, not to collect current, the optimum emitter is the one with the lowest” emitter saturation current density  $J_0$ . *Id.* at 369. King states that for

untextured surfaces, this corresponds to an emitter with a surface phosphorous concentration  $N_{D, \text{surf}}$  of approximately “ $1 \times 10^{18} \text{ cm}^{-3}$  that is as thin as possible.” *Id.* King also provides experimental results that show “an emitter with these specifications is probably near optimum in  $J_0$  when it has a textured front surface, as well.” *Id.*

King concludes that “ $s$  increases sublinearly in  $N_{D, \text{surf}}$  for the doping range from  $2 \times 10^{15} \text{ cm}^{-3}$  to  $1 \times 10^{18} \text{ cm}^{-3}$ ” and “[b]etween  $4 \times 10^{18} \text{ cm}^{-3}$  and  $1 \times 10^{18} \text{ cm}^{-3}$ ,  $s$  is linear with respect to  $N_{D, \text{surf}}$ .” Ex. 1006, 370. According to King, “[t]his dependence of  $s$  on  $N_{D, \text{surf}}$  has a profound effect on the emitter saturation current densities for passivated emitters.” *Id.*

### 3. Overview of Swanson-352

Swanson-352 “relates to thermophotovoltaic conversions systems and to photovoltaic cells useful therein.” Ex. 1015, 1:6–10. Swanson-352 describes the fabrication of a photovoltaic cell from the bottom side up by referring to Figures 5–10, reproduced below.



Figures 5–10 illustrate in cross section the steps of fabricating the photovoltaic cell described in Swanson-352. *Id.* at 2:52–54. Starting with Figure 5, intrinsic or lightly doped N-type silicon substrate 50 is provided, wherein “the doping of the bulk substrate material is  $10^{14}$  dopant atoms per cubic centimeter or less.” *Id.* at 4:42–45. Shallow diffused regions 60, 62 are formed in opposing surfaces of substrate 50 by diffusion of an N-type dopant such as phosphorous to a depth of 0.1 micron. *Id.* at 4:45–49. Swanson-352 teaches that the maximum surface dopant concentration of diffused regions 60, 62 is  $10^{18}$  atoms per cubic centimeter. *Id.* at 4:49–51. In Figure 6, P+ regions 53 and N+ regions 55 are selectively diffused into the surface of substrate 50; the maximum doping concentration of each region is on the order of  $10^{21}$  atoms per cubic centimeter. *Id.* at 4:52–59. Silicon oxide layers 64, 66 are then formed on the surface of substrate 50 (Figure 7), and electrical interconnect pattern 68 is deposited over silicon oxide layer 64 and P+ regions 53 (Figure 8). *Id.* at 4:60–61, 5:5–8. Silicon oxide insulating layer 70 is formed over the surface, and the silicon oxide overlying N+ regions 55 is removed as shown in Figure 9. *Id.* at 5:28–31. Second electrical interconnect pattern 72 is then formed on the surface to interconnect N+ regions 55 (Figure 10). *Id.* at 5:34–36.

#### *4. Overview of Marvin*

Marvin reports on studies conducted to assess the utility of Silicon Interdigitated Back Contact (IBC) solar cells for space applications. Ex. 1035, 821. 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 823. Marvin reports:

Some additional consideration was given to optimization of the front surface field region and the doped contact spacing. The previous design used a 0.5  $\mu\text{m}$  thick front surface field (FSF) uniformly doped at  $5\text{E}18$  and 20  $\mu\text{m}$  region spacing. It was found that by replacing this with a Gaussian doping profile with a characteristic width of 15  $\mu\text{m}$  and a peak concentration of  $1\text{E}17$ , the [end of life] efficiency [of the solar cell] was 12.3% with a 10  $\mu\text{m}$  collector region spacing.

*Id.* at 826. Marvin concludes that end of life performance is maximized when “[t]he FSF is graded over 15  $\mu\text{m}$  with a peak doping concentration of  $1\text{E}18\text{ cm}^{-3}$ .” *Id.* at 827.

### 5. Analysis

Claims 16 and 19 depend from, and include all the limitations of, independent claim 10. Ex. 1001, 11:5–9, 11:15–16. Petitioner contends that Li teaches most of the limitations of claim 10. Pet. 35–54. For example, Petitioner contends that Li teaches “a silicon substrate” (silicon substrate 508), “a dielectric region formed over the silicon substrate, wherein the dielectric region is formed over the back side of solar” (dielectric film 510 formed above silicon substrate 508, which may be composed of silicon dioxide), and “a first emitter region having metal impurities formed over the dielectric region” (P-type region 310 and N-type region 308). *Id.* at 38, 42–54. Petitioner also maps Li’s P-type region 310 and N-type region 308 to claim 16’s recitation of “a second emitter region having metal impurities formed over the dielectric region.” *Id.* at 43–54. 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 it would have been obvious to a Skilled Artisan to use a dopant concentration within the recited range based on the teachings of King, Swanson-352, or Marvin. *Id.* at 39–41.

Patent Owner responds that Petitioner does not show that Li teaches “a first emitter region having metal impurities formed over the dielectric region” and “a second emitter region having metal impurities formed over the dielectric region.” Prelim. Resp. 14–31.

a. *First and Second Emitter Regions*

Petitioner acknowledges that, although Li does “not state that its polysilicon ‘emitter regions’ ‘*have metal impurities*,’ the Skilled Artisan would have understood that this limitation is inherently disclosed because Li’s doping method (heating above 900°C) would necessarily and inevitably result in metal impurities gettering from the silicon substrate into *both* polysilicon doped regions of” material layer 506 “in the same way described in the 315 Patent.” Pet. 47 (citing Ex. 1003 ¶¶ 157–172, 193) (alterations in original). In particular, Petitioner contends that a Skilled Artisan would have recognized that substantial metal impurities were known to exist in all multi-crystalline silicon substrates, including those contemplated by Li. *Id.* at 47–48 (citing *id.* at 19–20 (§ VI.A.3); Ex. 1003 ¶¶ 90–92, 159). Petitioner contends that “combining gettering and dopant diffusion into a single heating step was standard practice in the solar cell industry.” *Id.* at 48 (citing Ex. 1003 ¶¶ 87–89). Petitioner also contends that “publications before and after December 2014 show that metallic impurities are transferred from silicon substrates into polysilicon layers, including through thin silicon oxide layers” through the gettering process “that necessarily occurs when Li’s solar cell is heated at the disclosed 950°C processing temperature.” *Id.* at 48 (citing Ex. 1003 ¶¶ 159–170); *see also id.* at 48–53 (explaining that Hu teaches that heating at 1000°C or less results in getterable impurities being trapped in the polycrystalline film, and Ramappa,

Liu-1,<sup>2</sup> and Liu-2<sup>3</sup> confirm that gettering would have occurred despite Li's 1–2 nm thick silicon dioxide dielectric layer). Petitioner further contends that the specification of the '315 patent evidences inherency because it states that heating at temperatures above 900° C can be sufficient for gettering metal impurities through the dielectric layer, and heating at temperatures at or below 900°C would be insufficient for gettering. *Id.* at 53–54 (citing Ex. 1001, 5:10–39; Ex. 1003 ¶ 172).

Patent Owner argues that Petitioner “not only assumes that Li's dielectric film allows diffusion of metal impurities during a gettering process, but also misinterprets the teachings of the cited references to wrongly conclude that” Li's heating and diffusing of dopants would necessarily have resulted in the presence and gettering of impurities in Li's doped polysilicon region. Prelim. Resp. 17 (citing Pet. 53). For example, Patent Owner argues “Liu-2 directly contradicts CSI's argument that ‘iron diffuses readily across silicon dioxide layers even much thicker (50–100nm)’” than the 1–2 nm layer used by Li because Liu-2 shows that, “for samples with a 4-nm thick thermal oxide interlayer, ineffective gettering is observed for all diffusion temperatures.” *Id.* at 19–20 (citing Ex. 1029, 139–140, Fig. 3; Ex. 2001 ¶ 58; Pet. 49); *see also id.* at 23 (arguing that Liu-2 contradicts Petitioner's claim that Ramappa shows that iron diffuses across thick silicon dioxide layers). Patent Owner also argues that “Liu-2 teaches

---

<sup>2</sup> An Yao Liu, *Direct Observation of the Impurity Gettering Layers in Polysilicon-Based Passivating Contacts for Silicon Solar Cells*, ACS APPL. ENERGY MATER. 1, pp. 2275–2282 (2018) (Ex. 1028, “Liu-1”).

<sup>3</sup> An Yao Liu, *Effective impurity gettering by phosphorous- and boron-diffused polysilicon passivating contacts for silicon solar cells*, SOLAR ENERGY MATERS. AND SOLAR CELLS 179, pp. 136–141 (2018) (Ex. 1029, “Liu-2”).

that a variety of structural and process dependent variables influence whether an oxide layer will allow effective gettering,” and Petitioner “has not demonstrated that all of these variables are disclosed by Li such that gettering of metal impurities through Li’s dielectric film is inevitable.” *Id.* at 21 (citing Ex. 2001 ¶ 60).

Patent Owner further argues that Liu-2 “contradicts CSI’s claims related to the teachings of Hu and Ramappa.” Prelim. Resp. 21. In particular, Patent Owner argues that Petitioner “claims that Hu teaches ‘metal impurities in the silicon substrate would have naturally and inevitably gettered to the backside polysilicon ‘material layer’ of Li,’” but Liu-2 teaches that “undoped (or intrinsic) polysilicon films have an ‘inability . . . to getter bulk impurities.’” *Id.* at 21–22 (citing Pet. 49; Ex. 1029, 139) (alterations in original). Patent Owner argues that Petitioner “makes no attempt to reconcile the teachings of Liu-2 with Hu regarding the gettering effectiveness of polysilicon layers.” *Id.* at 22. Patent Owner additionally argues that in view of the disclosure in Liu-2 and Hu of oxide layers that prevent gettering, Petitioner “fails to reconcile how it can assert that Ramappa’s 100 nm oxide layer could allow for gettering.” *Id.* at 24 (citing Ex. 2001 ¶¶ 55–64). According to Patent Owner, “the art demonstrates that ‘it [is] difficult to assess and quantify the blocking mechanisms of the oxide interlayer’ without at least the information about its numerous variables, such as formation processes, temperatures, densities, dopants, thickness, etc.” *Id.* (citing Ex. 1029, 140; Ex. 2001 ¶ 65) (alterations in original).

In order to rely on inherency to establish the existence of a missing claim limitation in an obviousness analysis, “the limitation at issue necessarily must be present, or the natural result of the combination of elements explicitly disclosed by the prior art.” *PAR Pharma, Inc. v. TWi*

*Pharms., Inc.*, 773 F.3d 1186, 1195–96 (Fed. Cir. 2014). Petitioner, therefore, must show that metal impurities are necessarily present in Li’s N-type region 308 and P-type region 310 formed over dielectric film 320 (the claimed “first emitter region” and “second emitter region” “formed over the dielectric region.”). On this record, we are persuaded that Petitioner sufficiently establishes that the natural result of the structures and processes described in Li is the gettering of metal impurities from substrate 304 to N-type region 308 and P-type region 310 in material layer 302, such that N-type region 308 and P-type region 310 contain metal impurities.

In particular, Dr. Banerjee testifies, with objective evidentiary support, that “multicrystalline silicon substrates were known to contain substantial concentrations of metal impurities.” Ex. 1003 ¶ 90 (citing Ex. 1010, 283; Ex. 1021, 402; Ex. 1020 ¶ 6). Hu teaches that when a semiconductor body (substrate) and polycrystalline layer are subjected to processing steps at temperatures ranging from 870° C to 1000° C, “getterable impurities such as copper, lithium, sodium, potassium, iron, cobalt, nickel, chromium, and gold will diffuse to, and become trapped in,” the polycrystalline layer. Ex. 1017, 5:61–6:3. Ramappa and Liu–2 teach that a silicon dioxide layer placed between the substrate and the polycrystalline layer does not impede the gettering of metal impurities at increased diffusion temperatures. *See* Ex. 1025, 3775 (Ramappa stating “for a given SiO<sub>2</sub> thickness, there exists a diffusion temperature beyond which the oxide fails to mask the silicon bulk from iron impurity incorporation”); Ex. 1029, 139 (Liu-2’s Figure 3(a) illustrating gettering effectiveness), 140 (“At lower diffusion temperatures, the samples with no oxide show the best gettering efficiency, but a similar efficiency can be achieved in the presence of a thin [approximately 1.3 nm] chemical oxide by increasing the diffusion

temperature.”), 141 (“at optimum polysilicon fabrication conditions (very thin oxides combined with sufficiently high diffusion temperatures), the blocking effect [of the oxide layer] is small, enabling the removal of more than 99.9% of the bulk iron”). Liu-2 also teaches that, “[f]or samples with a 4-nm thick thermal oxide interlayer, ineffective gettering is observed for all diffusion temperatures.” *Id.* at 140. Taken together, these disclosures indicate that metal impurities are gettering to the polysilicon layer at temperatures above 900° C, even in the presence of a 1.3 nm silicon dioxide layer.

Li teaches that dielectric film 320 (disposed between polycrystalline material layer 302 and substrate 304) “is composed of silicon dioxide and has a thickness approximately in the range of 1–2 nanometers,” and teaches heating the cell at approximately 950° C to transfer N-type and P-type dopants to the N-type and P-type regions in material layer 302. Ex. 1005 ¶¶ 39, 45; *see also id.* ¶ 43 (“dielectric film 510 is composed of silicon dioxide and has a thickness approximately in the range of 1–2 nanometers”). Because Petitioner sufficiently establishes that, in the presence of a thin (approximately 1.3 nm) silicon dioxide layer, metal impurities are gettering to the polysilicon layer at temperatures above 900° C, and Li teaches a silicon dioxide layer of 1–2 nm heated at 950° C, we are persuaded, on this record, that Petitioner sufficiently shows that Li’s N-type region 308 and P-type region 310 (“first emitter region” and “the second emitter region”) contains metal impurities that are gettering from substrate 304 to material layer 302 when heated to 950° C.

We considered Patent Owner’s arguments and find them unavailing at this stage of the proceeding. For example, while we agree with Patent Owner that Liu-2 and Hu both describe silicon dioxide layers that lower

gettering effectiveness, Liu-2 also describes conditions (similar to those present in Li) under which the silicon dioxide layer does not impede gettering, and Hu describes a blocking silicon dioxide layer that is significantly thicker than the 4 nm layer Liu-2 teaches is ineffective for gettering. Ex. 1029, 139–141; Ex. 1017, 8:20–9:55 (Example 1). We also disagree with Patent Owner that Liu-2 contradicts Ramappa’s teaching that iron diffuses across thick silicon dioxide layers. *See* Prelim. Resp. 19–20, 23. Not only does Liu-2 recognize that “[t]he diffusivity of iron in SiO<sub>2</sub> . . . is known to increase with increasing temperature, although the reported diffusivities in the literature vary by a few orders of magnitude,” Liu-2 cites Ramappa as “report[ing] a strong segregation of Fe into the SiO<sub>2</sub>.” Ex. 1029, 140, 141 (reference 45).

For these reasons, and based on the record before us, we are persuaded that Petitioner establishes a reasonable likelihood of showing that Li discloses “a first emitter region having metal impurities formed over the dielectric region” and “a second emitter region having metal impurities formed over the dielectric layer.”

*b. Other Limitations*

At this stage of the proceeding, Patent Owner does not address Petitioner’s specific contentions with respect to the other limitations of claims 10, 16, and 19 (which depends from claim 16). We reviewed Petitioner’s contentions for all the elements of claims 10, 16, and 19, as well as the supporting evidence. Pet. 37–42, 54–58. Based on the record before us, we are persuaded that Petitioner’s discussion of the particular structures and methods in Li, King, Swanson-352, and Marvin establishes a reasonable likelihood that the combined teachings of Li with King, Swanson-352, or

Marvin disclose or suggest all of the limitations of claims 10, 16, and 19. *Id.* at 37–58.

*6. Motivation to Combine*

Petitioner contends that it would have been obvious “to combine Li’s back contact solar cell with the front portion doping concentration of  $1 \times 10^{18} \text{ cm}^{-3}$  or less as disclosed in King, Swanson-352, or Marvin.” Pet. 32–33. Petitioner contends that Li, King, Swanson-352, and Marvin “all relate to solar cell design and in particular, **back-contact** solar cells” and are analogous art. *Id.* at 32. Petitioner also contends that King teaches a front doping concentration of  $1 \times 10^{18} \text{ cm}^{-3}$  or less “was the ‘optimum’ for back-contact solar cells,” and Swanson-352 teaches “to use it as the maximum concentration for this portion of a back-contact solar cell.” *Id.* at 33 (citing Ex. 1003 ¶ 126). Petitioner contends that Marvin likewise teaches “that for space applications, a ‘peak doping concentration of  $1\text{E}18 [1 \times 10^{18}] \text{ cm}^{-3}$ ’ or lower with a ‘Gaussian doping profile with a characteristic width of 15 [micrometers]’ resulted in better efficiency metrics than higher doping concentrations.” *Id.* (citing Ex. 1035, 826–827) (alterations in original). Petitioner contends:

Given Li’s acknowledgement that “[e]fficiency is an important characteristic of a solar cell as it is directly related to the solar cell’s capability to generate power” and that “[a]ccordingly, techniques for increasing the efficiency of solar cells are generally desirable” (EX1005, ¶0005), the Skilled Artisan reviewing Li would further have been motivated to select the efficient front doping concentration disclosed by any of King, Swanson-352, or Marvin. EX1003, ¶128.

*Id.* at 34 (alterations in original).

Patent Owner argues that King, Swanson-352, and Marvin “disclos[e] outdated and incompatible solar cell configurations that a Skilled Artisan

would not have considered when determining a suitable dopant concentration for the portion of the silicon substrate at the front side of the solar cell in Li.” Prelim. Resp. 38. Patent Owner argues that King, Swanson-352, and Marvin are directed to IBC cells that “included thick silicon oxide passivation layers formed over both sides of the silicon substrate,” whereas “Li does not disclose using a passivation oxide layer on the front side of its substrate 508.” *Id.* at 40–41 (citing Ex. 1006, 366; Ex. 1015, 4:45–62; Ex. 1035, 822; Ex. 2001 ¶ 89). Patent Owner further argues “more recent references, such as Granek<sup>[4]</sup> (EX2015), that show higher dopant concentrations on the front surface of substrates to eliminate the need for a thick oxide passivation layer, as in the solar cell configurations of King, Swanson-352, and Marvin.” *Id.* at 38–39. Patent Owner also argues that “an ‘optimum’ dopant concentration will vary based on design parameters,” and, therefore, King, Swanson-325, and Marvin do not disclose optimum dopant concentrations. *Id.* at 45 (citing Ex. 1035, 827; Ex. 2001 ¶ 95).

At this stage of the proceeding, Petitioner, with supporting testimony from Dr. Banerjee, provides adequate reasons why using the front portion doping concentration of  $1 \times 10^{18} \text{ cm}^{-3}$  or less as disclosed in King, Swanson-352, or Marvin with Li’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. 32–35 (and evidence cited therein). We acknowledge that Patent Owner disagrees, but find that Patent Owner’s disagreement raises issues of fact

---

<sup>4</sup> F. Granek, *Front Surface Passivation of N-Type High Efficiency Back-Junction Silicon Solar Cells Using Front Surface Field*, SOLAR ENER. MATS. AND SOLAR CELLS, 91 (7) (2007) (Ex. 2015, “Granek”).

that are best resolved on a full trial record. Accordingly, we find that Petitioner shows sufficiently that a Skilled Artisan would have had reason to combine the disclosures set forth in Li and King, Swanson-352, or Marvin with a reasonable expectation of success in arriving at the subject matter of claim 10. *See* Pet. 32–37.

### *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 16 and 19 would have been obvious over the combined teachings of Li and King, Swanson-352, or Marvin.

#### *D. Asserted Obviousness over Li and Muller*

Petitioner contends that claims 16 and 19 would have been obvious over Li and Muller. Pet. 63–70.

##### *1. Overview of Muller*

Muller compares *n*-type IBC solar cells with a low-dose ion-implanted front floating emitter (FFE) passivated by Al<sub>2</sub>O<sub>3</sub> with low-dose ion implanted front surface field (FSF) passivated by SiO<sub>2</sub>. Ex. 1008, 265. Muller measures doping profiles using electrochemical capacitance-voltage (ECV) profiling after ion implantation of doses of boron in the FFE and phosphorous in the FSF. *Id.* at 267. Muller’s experiments included implanted doses of  $1 \times 10^{14} \text{ cm}^{-2}$ ,  $3 \times 10^{13} \text{ cm}^{-2}$ , and  $1 \times 10^{13} \text{ cm}^{-2}$ . *Id.* Muller reports “peak doping concentrations in the range of  $1 \times 10^{17}$  to  $2 \times 10^{18} \text{ cm}^{-3}$ ” after implantation of boron or phosphorous and furnace annealing. *Id.*

Muller concludes:

Ion implantation is suitable to form lowly doped regions acting as front surface fields (FSF) or front floating emitter (FFE) in *n*-type IBC solar cells. Very low saturation densities ( $J_0$ ) in the range of 10 to 15 fA/cm<sup>2</sup> have been achieved for textured

FSF samples passivated with a  $\text{SiO}_2/\text{SiN}_x$  stack. These profiles strongly depend on the surface recombination velocity and therefore suffer from UV-illumination degrading the  $\text{SiO}_2$  passivation quality. For textured FFE samples  $J_0$  values down to  $5 \text{ fA/cm}^2$  were measured with an  $\text{Al}_2\text{O}_3$  passivation. This configuration turned out to be quite stable against UV-irradiation.

Ex. 1008, 271. Muller reports that “[f]ully ion implantable and co-annealed IBC solar cells with an  $\text{Al}_2\text{O}_3$  passivation on both sides featuring a weakly boron doped front floating emitter (FFE) were successfully fabricated ( $\eta = 21.8\%$ ).” *Id.* According to Muller, under UV-illumination, “[t]he efficiency of FSF cells dropped dramatically by more than 50% while the FFE cells lost only about 1% absolute.” *Id.*

## 2. Analysis

Relying on its arguments regarding the combination of Li with King, Swanson-352, or Marvin, Petitioner contends that “Li disclose[s] all elements of Claim 10, 16, and 19, except for the dopant concentration of the substrate’s front portion.” Pet. 68 (citing *id.* at 37–58). With respect to the “a portion of the silicon substrate has a dopant concentration of approximately less than or equal to  $2 \times 10^{18} \text{ cm}^{-3}$  and wherein the portion of the silicon substrate is formed at the front side of the solar cell” limitation of claim 10, Petitioner contends that “[u]sing an ‘n-type’ silicon substrate similar to Li, Muller taught the benefits and advantages to a back-contact solar cell of having the substrate’s front portion be ion-implanted with a ‘boron doped front floating emitter’ at a peak doping concentration of approximately  $2 \times 10^{18} \text{ cm}^{-3}$ .” *Id.* (citing Ex. 1008, 267, 269). Petitioner further contends that it would have been obvious to combine Li and Muller “to replace the phosphorous diffused front portion of Li with the ion-implanted boron-doped FFE at the dopant concentration taught by Muller

because” the combination “would result in increased solar cell efficiency and better stability under UV illumination, as Muller taught.” *Id.* (citing Ex. 1003 ¶¶ 210–221); *see also id.* at 63–65 (explaining that, in the proposed combination, Muller’s ion-implanted boron-doped FFE replaces Li’s phosphorous (N-type) doped front portion 520).

Patent Owner responds that Petitioner’s “proposed combination of Li and Muller creates an entirely new solar cell, which would not have been obvious to create without the benefit of hindsight in view of the ’315 patent.” Prelim. Resp. 48 (citing Ex. 2001 ¶¶ 100–103). Patent Owner argues that Petitioner’s proposed insertion of Muller’s ion-implanted FFE process steps for the front side of Li’s solar cell would involve additional processing steps, including adding an ion-implanting process, adding aluminum oxide and silicon nitride passivation layers, and reversing Li’s order of fabrication to ion-implant the front dopant regions first. *Id.* at 49–50 (citing Pet. 63, 67). Patent Owner also argues that Petitioner’s “proposed modification of Li’s fabrication process increases the number of processing steps, which expressly contradicts Li’s objective to achieve ‘a reduction in the sheer number of process operations.’” *Id.* at 50 (citing Ex. 1005 ¶ 24; Ex. 2001 ¶ 103).

At this stage of the proceeding, Patent Owner does not address Petitioner’s specific contentions with respect to the other limitations of claims 16 (including the limitations of claim 10) or 19. *See* Prelim. Resp. We reviewed Petitioner’s contentions for all the elements of claims 16 and 19, as well as the supporting evidence. Pet. 68–70. Based on the record before us, we are persuaded that Petitioner’s discussions of the particular structures and methods in Li and Muller establishes a reasonable likelihood

that the combined teachings of Li and Muller teaches or suggests all of the limitations of claims 16 and 19. *Id.*

We are also persuaded, on this record, that Petitioner, with supporting testimony from Dr. Banerjee, provides adequate reasons why using the ion-implanted front floating emitter and aluminum oxide and silicon nitride passivation of Muller with Li would have been a “predictable use of prior art elements according to their established functions.” *KSR*, 550 U.S. at 401; *see* Pet. 63–65 (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 Skilled Artisan would have had reason to combine the disclosures set forth in Li and Muller with a reasonable expectation of success in arriving at the subject matter of claims 16 and 19. *See* Pet. 63–67.

#### *E. Remaining Grounds*

Petitioner contends that claims 16 and 19 would have been obvious over the combination of Li, Hu, Ramappa, and King, Swanson-352, or Marvin, and the combination of Li, Muller, Hu, and Ramappa. Pet. 70–75. Having already determined that Petitioner establishes a reasonable likelihood of establishing that claims 16 and 19 would have been obvious over the combination of Li and King, Swanson-352, or Marvin, and the combination of Li and Muller, we need not address these grounds in full. We offer the following comments in response to the parties’ arguments and evidence to provide guidance to the parties.

Petitioner argues that, to the extent that Patent Owner disputes that Li does not inherently disclose the first and second “emitter region having metal impurities” limitations of claims 10, 16, and 19, “it would have been

obvious to the Skilled Artisan that such metal impurities would be present in both emitter regions due to gettering during Li's dopant diffusion step, as taught by Hu and Ramappa." Pet. 70. In particular, Petitioner argues that "Hu and Ramappa confirm that Li's heating of the polysilicon material layer at 950°C during formation of the oppositely-doped emitter regions would result in metallic impurities being getterred from Li's multicrystalline silicon substrate, through the 1–2 nm silicon dioxide layer, and into the doped emitter regions." *Id.* at 75 (citing Ex. 1003 ¶ 243).

Patent Owner responds that Hu discloses "a region where the polycrystalline layer is separated from the silicon by an oxide layer and gettering does not occur." Prelim. Resp. 32 (citing Ex. 1017, 8:39–44). Patent Owner also argues that "Ramappa does not contemplate gettering or the diffusion of metal impurities from a silicon oxide layer into a polysilicon layer." *Id.* at 34 (citing Ex. 1025; Ex. 2001 ¶ 79). Patent Owner argues that "applying Hu's and Ramappa's teachings to Li's structure, a Skilled Artisan would have concluded that no metal impurities are getterred into Li's polysilicon material layer 506 due to the presence of Li's silicon dioxide film 510 between its substrate 508 and polysilicon material layer 506." *Id.* at 37 (citing Ex. 2001 ¶ 83).

As set forth above, Hu teaches that getterable impurities diffuse to, and become trapped in, a polycrystalline layer when subjected to processing steps at temperatures ranging from 870° C to 1000° C, and describes a blocking silicon dioxide layer that is significantly thicker than the silicon dioxide layer described in Li. *See* Ex. 1017, 5:61–6:3, 8:20–9:55 (Example 1); § II.C.5.a, *supra*. Ramappa teaches that a silicon dioxide layer placed between the substrate and the polycrystalline layer does not impede the gettering of metal impurities at increased diffusion temperatures. *See*

Ex. 1025, 3775 (Ramappa stating “for a given SiO<sub>2</sub> thickness, there exists a diffusion temperature beyond which the oxide fails to mask the silicon bulk from iron impurity incorporation”); § II.C.5.a, *supra*. On this record, and based on these disclosures, we question whether a Skilled Artisan would have concluded that no metal impurities are gettered into Li’s polysilicon material layer due to the presence of Li’s silicon dioxide layer as Patent Owner argues. We also find that Patent Owner’s argument that “Ramappa discloses that silicon dioxide acts as an impurity sink and does not readily allow iron to pass from the silicon dioxide layer to the silicon bulk” raises issues of fact that are best resolved on a full trial record. Prelim. Resp. 36; *see id.* at 34–37.

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. 8–9; Prelim. Reply. Patent Owner argues that we should exercise our discretion under 35 U.S.C. § 314(a) and not institute trial. Prelim. Resp. 50–63; 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”).<sup>5</sup>

---

<sup>5</sup> 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.

Here, neither party has filed a motion to stay. Petitioner contends that Judge Gilstrap, the presiding judge in the district court litigation, “is likely to grant a stay” (Prelim. Reply 1; Pet. 9), and Patent Owner disagrees (Prelim. Resp. 51–53; Prelim. Sur-reply 1–3). Each party offers data regarding the number of stays granted and denied by Judge Gilstrap in support of their speculation about how Judge Gilstrap would rule on a motion to stay should one be filed, and each party disagrees with the opposing party’s data and analysis. Pet. 9; Prelim. Reply 1–3; Prelim. Resp. 51–53; Prelim. Sur-reply 1–2.

We, however, decline to speculate on how Judge Gilstrap may rule on a future motion for a stay should one be filed. Accordingly, in view of the fact that no motion for a stay has been filed, 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.

Trial for the parallel district court litigation is scheduled for January 26, 2026, which is two days after the projected due date for a Final Written Decision in this proceeding. Patent Owner acknowledges that the

median time-to-trial data for the Eastern District of Texas is consistent with the current trial date. Prelim. Resp. 54–55.

Petitioner argues that factor 2 weighs against exercising our discretion to deny institution because the projected date for the Final Written Decision around the same time as the scheduled trial date. Prelim. Reply 3 (citing Guidance Memorandum at 9). Patent Owner contends that “[g]iven the close proximity between the district court’s trial date and the projected deadline for the PTAB’s Final Written Decision, *Fintiv* factor 2 is neutral.” Prelim. Resp. 55; *see also* Prelim. Sur-reply 2–3 (arguing factor 2 is neutral because the trial date is “at or around the same time” as the projected statutory deadline for a final written decision).

Because the evidence demonstrates that the trial date, supported by the median time-to-trial data, at or around the projected deadline for the Final Written Decision, we determine that *Fintiv* factor 2 is neutral.

*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 this factor weighs “strongly” in its favor because it filed its Petition expeditiously and “institution occurs months before the scheduled *Markman* hearing.” Prelim. Reply 3–4; Pet. 9. Petitioner also indicates that although discovery has begun, fact and expert discovery do not close until August and October 2025, respectively, “leaving the bulk of discovery ahead.” Prelim. Reply 4.

Patent Owner contends the parties have spent “considerable resources” in the district court action, including exchanging infringement and invalidity contentions, discovery requests, and substantial document

productions. Prelim. Resp. 56. Patent Owner contends that “the investment in the district court remain similar to that in *Sand Revolution II, LLC v. Continental Intermodal Group — Trucking LLC*,<sup>[6]</sup> where *Fintiv* factor three did not weigh against exercising discretion to deny institution.” Prelim. Sur-reply 3–4.

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 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 4; Pet. 8–9; see *Fintiv* at 9–11. Thus, we determine that *Fintiv* factor 3 weighs 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 factor favors institution because it stipulates “it will not assert in any district court or ITC litigation that Claims 16 and 19 are invalid on the basis of any ground raised or that reasonably could have been raised during this IPR.” Pet. 9.

---

<sup>6</sup> *Sand Revolution II, LLC v. Continental Intermodal Group — Trucking LLC*, IPR2019-01393, Paper 24 (PTAB June 16, 2020) (informative) (“*Sand Revolution*”).

Patent Owner argues that Petitioner asserts the same grounds in the Petition that it asserts in the district court action, and this overlap is “mitigated only slightly” by Petitioner’s stipulation. Prelim. Resp. 58. Patent Owner contends Petitioner’s stipulation does not mitigate the risk of duplicative proceedings or conflicting decisions to the same degree as a *Sotera*<sup>7</sup>-type stipulation because Petitioner could raise in the district court proceeding a ground asserted in the Petition with respect to a claim that is not at issue in the IPR. Prelim. Resp. 58–60.

Although the parties dispute whether Petitioner’s stipulation is a *Sotera*-type stipulation, there is no dispute that the stipulation does mitigate, at least to some extent, concerns of potentially conflicting decisions. Prelim. Reply 4–5; Prelim. Resp. 58–60; *see Sand Revolution* at 12. Accordingly, we determine that *Fintiv* factor 4 weighs 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. The parties agree that the parties in this IPR are the same as those in the parallel district court litigation. Pet. 9; Prelim. Resp. 60.

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.

---

<sup>7</sup> *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 19 (PTAB Dec. 1, 2020) (precedential) (“*Sotera*”).

*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. Petitioner contends “[t]he strength of the Petition should weigh strongly against discretionary denial.” Pet. 8. Patent Owner contends Petitioner failed to present a *prima facie* case of obviousness. Prelim. Resp. 62–63.

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* factors 1 and 2 are neutral, factors 3 and 4 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.

*G. Multiple Petitions*

As noted above, the present Petition is the second petition filed by Petitioner challenging the patentability of the ’315 patent. Petitioner asserts that institution of the present Petition, in addition to the earlier

filed 1038 IPR, is warranted because (1) the 1038 IPR did not challenge dependent claims 16 and 19 because Patent Owner had not yet alleged infringement of these claims when the petition was filed, there is no overlap in claims between the two sets of petitions, and any additional burden on the Board or on Patent Owner resulting from multiple petitions should be negligible. Pet. 1, 4–8. Patent Owner notes that this is the second petition filed by Petitioner with respect to the '315 patent, but does not otherwise address Petitioner's claim that it needs a second petition. *See Prelim. Resp.* 58 n. 14.

Based on the particular circumstances presented here, we determine Petitioner presents a reasonable explanation that a second petition is warranted in order to challenge claims 16 and 19, which were asserted in the district court litigation after the earlier petition was filed. We also note that this proceeding and the 1038 IPR proceeding can be coordinated and that a similar or common schedule can be adopted, thus decreasing the inconvenience to Patent Owner. The parties may seek to consolidate the two proceedings, including requesting a consolidated briefing schedule, and/or oral hearing, which would result in even more efficiencies for the parties.

Thus, given the particular circumstances of this case, Petitioner sufficiently shows that it requires more than one petition to challenge the '315 patent. Accordingly, we decline to exercise our discretion to deny the Petition under § 314(a) on the basis of Petitioner's filing of multiple petitions.

### 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.

IPR2024-01194  
Patent 11,251,315 B2

FOR PETITIONER:

Samuel Tiu  
Joseph Micallef  
Brooke S. Böll  
SIDLEY AUSTIN LLP  
stiu@sidley.com  
jmicallef@sidley.com  
brooke.boll@sidley.com

FOR PATENT OWNER:

Eric J. Klein  
Jeffrey R. Swigart  
Corbin J. Cessna  
VINSON & ELKINS LLP  
eklein@velaw.com  
jswigart@velaw.com  
ccessna@velaw.com

Jason A. Fitzsimmons  
Jennifer Meyer Chagnon  
Christian A. Camarce  
STERNE, KESSLER, GOLDSTEIN & FOX LLP  
jfitzsimmons-PTAB@sternekessler.com  
jchagnon-PTAB@sternekessler.com  
ccamarce-PTAB@sternekessler.com