

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MUNDRA SOLAR PV LIMITED
Petitioner

v.

FIRST SOLAR, INC.
Patent Owner.

Case No. IPR2025-01411
U.S. Patent No. 9,666,732

**PETITIONER'S OPPOSITION TO PATENT OWNER'S
REQUEST FOR DISCRETIONARY DENIAL**

TABLE OF CONTENTS

I.	Institution is the Most Efficient Use of the Board’s Resources.....	1
II.	Institution is Appropriate Because the Examiner Failed to Consider Fundamental Contributions of Yablonovitch and Kwark.....	4
III.	Institution is Appropriate Because MSPVL Could not Have Reasonably Expected the ’732 Patent Would be Enforced	7
IV.	Institution is Appropriate Because no National Economic and Security Interests Warrant Discretionary Denial	13
V.	Institution is Appropriate Because the Board can Efficiently Resolve the ’732 Patent Earlier than the District Court, Consistent with the Fintiv Factors	15
VI.	Conclusion	20

TABLE OF AUTHORITIES**Page(s)****Cases**

<i>Amazon.com, Inc., et. al. v. NL Giken Inc.,</i> IPR2025-00407, Paper 14 (Director May 16, 2025)	17
<i>Apple Inc. v. Fintiv, Inc.,</i> IPR2020-00019, Paper 11 (P.T.A.B. Mar. 20, 2020)	<i>passim</i>
<i>Canadian Solar (USA) Incv. First Solar, Inc.,</i> IPR2025-01432, Paper 7 (Director Oct. 24, 2025)	14, 17
<i>Dabico Airport Sols. Inc. v. Axa Power Aps,</i> IPR2025-00408, Paper 21 (P.T.A.B. June 18, 2025)	11, 12
<i>Hulu, LLC v. SITO Mobile R&D IP, LLC,</i> IPR2021-00298, Paper 11 (P.T.A.B May 19, 2021)	16
<i>Intel Corp. v. Proxense LLC,</i> IPR2025-00327, Paper 12 (Director June 26, 2025)	10, 11, 12
<i>JinkoSolar Co., Ltd. v. First Solar, Inc.,</i> IPR2025-01130, Paper 7 (Director Sept. 29, 2025)	14
<i>Microsoft Corp. v. Partec Cluster Competence Ctr. GmbH,</i> IPR2025-00318, Paper 9 (PTAB June 12, 2025)	4
<i>Mundra Solar PV Ltd. v. First Solar, Inc.,</i> C.A. No. 25-462 (D. Del. Apr. 15, 2025)	<i>passim</i>
<i>NeuMoDx Molecular, Inc. v. HandyLab, Inc.,</i> IPR2020-01133, Paper 23 (P.T.A.B. Aug. 6, 2021)	19
<i>Oticon Medical AB v. Cochlear Ltd.,</i> IPR2019-00975, Paper 15 (PTAB Oct. 16, 2019)	4
<i>Shenzen Tuozhu Technology Co., Ltd. v. Stratasy, Inc.,</i> IPR2025-00438, Paper 10 (Director July 17, 2025)	19

<i>Sig Sauer Inc. v. Lone Star Future Weapons, Inc.</i> , IPR2025-00410, Paper 13 (Director Jun. 26, 2025).....	12
<i>Tesla, Inc. v. Intellectual Ventures II LLC</i> , IPR2025-00217, Paper 9 (Director June 13, 2025)	19
<i>Toyota Motor Corp. v. AutoConnect Holdings LLC</i> , PGR2025-00041, Paper 9 (Director Sept. 8, 2025).....	19
<i>Twitch Interactive, Inc. v. Razdog Holdings LLC</i> , IPR2025-00307, Paper 18 (Director May 16, 2025)	18
Statutes	
35 U.S.C. § 103(a)	4

TABLE OF EXHIBITS

Exhibit No.	Description
1001	U.S. Patent No. 9,666,732 to Schultz-Wittmann (“the ’732 Patent”)
1002	File History of U.S. Patent No. 9,666,732
1003	Declaration of Dr. Sanjay Banerjee, Ph.D.
1004	Curriculum Vitae of Dr. Sanjay Banerjee, Ph.D.
1005	Yablonovitch, E., T. Gmitter, R. M. Swanson, and Y. H. Kwark. "A 720 mV open circuit voltage SiO _x :cSi:SiO _x double heterostructure solar cell." <i>Applied Physics Letters</i> , vol. 47, no. 9 (1 November 1985): 1211-1213. (“Yablonovitch”)
1006	Thomas, J. H., & Feigl, F. J. (1972). <i>Electron trapping levels in silicon dioxide thermally grown on silicon</i> . Journal of Physics and Chemistry of Solids, 33(12), 2197–2216 (“Thomas”)
1007	Kragler, G., Bender, H., Willeke, G., Bucher, E., & Vanhellemont, J. (1994). <i>Characterization of SIPOS films by spectroscopic ellipsometry and transmission electron microscopy</i> . Applied Physics A, 58(1) (“Kragler”)
1008	Crabbé, E. F., Hoyt, J. L., Pease, R. F. W., & Gibbons, J. F. (1988). <i>Electrical characterization of polysilicon-to-silicon interfaces</i> . Materials Research Society Symposium Proceedings, 106, pp. 247-52. © Materials Research Society
1009	Ghoshtagore, R. N. (1975). <i>Silicon dioxide masking of phosphorus diffusion in silicon</i> . Solid-State Electronics, 18(5), 399–406. https://doi.org/10.1016/0038-1101(75)90041-6 (“Ghoshtagore”)
1010	Shimakura, K., Suzuki, T., & Yadoiwa, Y. (1975). <i>Boron and</i>

Exhibit No.	Description
	<i>phosphorus diffusion through an SiO₂ layer from a doped polycrystalline Si source under various drive-in ambients</i> Solid-State Electronics, 18(11), 991–997. https://doi.org/10.1016/0038-1101(75)90117-3 (“Shimakura”)
1011	RESERVED
1012	RESERVED
1013	May, Gary S., and Simon M. Sze. <i>Fundamentals of Semiconductor Fabrication</i> . John Wiley & Sons, 2004 (“May”)
1014	Hamasaki M., Adachi T., Wakayama S., & Kikuchi M. (1978). <i>Crystallographic study of semi-insulating polycrystalline silicon (SIPOS) doped with oxygen atoms</i> . Journal of Applied Physics, 49(7), 3987–3992 (“Hamasaki”)
1015	Yablonovitch, E., Swanson, R. M., Eades, W. D., & Weinberger, B. R. (1986). Electron-hole recombination at the Si-SiO ₂ interface. <i>Applied Physics Letters</i> , 48(3), 245–247. https://doi.org/10.1063/1.96570 (“Yablonovitch III”).
1016	Gan, J. Y., & Swanson, R. M. (1990, May). <i>Polysilicon emitters for silicon concentrator solar cells</i> . In <i>Conference Record of the Twenty-First IEEE Photovoltaic Specialists Conference</i> (pp. 245–250). Kissimmee, FL, USA: IEEE. https://doi.org/10.1109/PVSC.1990.111625 (“Gan”).
1017	Kwark, Young Hoon. <i>Sipos Heterojunction Contacts to Silicon</i> . Dissertation. Department of Electrical Engineering, Stanford University. Stanford, CA: Stanford University, 1984. (“Kwark”)
1018	Kwark, Y. H., Sinton, R. A., & Swanson, R. M. (1984, December). <i>SIPOS heterojunction contacts to silicon</i> . In <i>Proceedings of the 1984 International Electron Devices Meeting</i>

Exhibit No.	Description
	(IEDM) (pp. 742–745). IEEE. https://doi.org/10.1109/IEDM.1984.190832 (“Kwark II”)
1019	Kwark, Y. H., & Swanson, R. M. (1987). <i>N-type SIPOS and poly-silicon emitters</i> . <i>Solid-State Electronics</i> , 30(11), 1121–1125. https://doi.org/10.1016/0038-1101(87)90076-1 (“Kwark III”)
1020	Swanson, R. M. (2005, January). <i>Approaching the 29% limit efficiency of silicon solar cells</i> . In <i>Conference Record of the 31st IEEE Photovoltaic Specialists Conference</i> (pp. 889–894). IEEE (“Swanson”).
1021	Neamen, D. A. (2012). <i>Semiconductor physics and devices: Basic principles</i> (4th ed.). McGraw-Hill (“Neamen”)
1022	Green, M. A. (1982). <i>Solar cells: Operating principles, technology, and system applications</i> . Prentice-Hall.
1023	Cook, G., Billman, L., & Adcock, R. (1991). <i>Photovoltaic fundamentals</i> (SERI/TP-220-3957). Solar Energy Research Institute
1024	Neudeck, G. W.; Pak, J. H.; and Bagri, R., “ <i>Poly silicon Contacted Emitter Bipolar Transistors: Fabrication Development</i> ” (1988). Department of Electrical and Computer Engineering Technical Reports. Paper 597.
1025	Wolstenholme, G. R., Jorgensen, N., Ashburn, P., & Booker, G. R. (1987). <i>An investigation of the thermal stability of the interfacial oxide in polycrystalline silicon emitter bipolar transistors by comparing device results with high-resolution electron microscopy observations</i> . <i>Journal of Applied Physics</i> , 61(1), 225-233. https://doi.org/10.1063/1.338861
1026	Patton et. al., “Impact of processing parameters on base current in

Exhibit No.	Description
	polysilicon contacted bipolar transistors" (1985). Stanford University Department of Materials Science and Engineering.
1027	Jorgensen, N., Barry, J. C., Booker, G. R., Ashburn, P., Wolstenholme, G. R., Wilson, M. C., & Hunt, P. C. (1985). <i>TEM investigation of the effect of anneal temperature and arsenic concentration on the polysilicon/thin oxide/single-crystal-silicon emitter of a new high-performance bipolar transistor</i> . In A. G. Cullis & D. B. Holt (Eds.), <i>Microscopy of Semiconducting Materials</i> , 1985 (<i>Institute of Physics Conference Series</i> , Vol. 76, pp. 471). Adam Hilger Ltd.
1028	Wilson, M.C., et. al., <i>Electrical and Microstructural Investigation into the Effect of Arsenic Emitter Concentration on the Enhanced Gain Polysilicon Emitter Bipolar Transistor</i> , (1985) Plessey Research (Caswell), Ltd.
1029	Sah, C. T., Sello, H., & Tremere, D. A. (1959). Diffusion of phosphorus in silicon oxide film. <i>Journal of Physics and Chemistry of Solids</i> , 11(3-4), 288-298. https://doi.org/10.1016/0022-3697(59)90159-8
1030	Tsubo, Y., Komatsu, Y., Saito, K., Matsumoto, S., Sato, Y., Yamamoto, I., & Yamashita, Y. (2000). Phosphorus diffusion from doped polysilicon through ultra-thin SiO ₂ films into Si substrates. <i>Japanese Journal of Applied Physics</i> , 39(10A), L955-L957.
1031	Ni, J., & Arnold, E. (1981). Electrical conductivity of semi-insulating polycrystalline silicon and its dependence upon oxygen content. <i>Applied Physics Letters</i> , 39(7), 554-556.
1032	Thurston, M.O., et. al., "Diffusion of impurities into Silicon through an Oxide Layer", Ohio State University Research Foundation, AD 261201, Contract No. DA-36-039-SC-83874,

Exhibit No.	Description
	Final Report, Columbus, Ohio, March 1961.
1033	Wesoff, E. (2011, June 29). <i>SunPower's Dick Swanson Still Very Much Alive</i> . Greentech Media. https://www.greentechmedia.com/articles/read/sunpowers-dick-swanson-still-very-much-alive
1034	Batra, Shubneesh, Kyle Picone, Keun Hyung Park, Suryanarayana Chattacharya, Sanjay Banerjee, Jack Lee, Monte Manning, and Chuck Dennison. "Study of Lateral Non-Uniformity as a Function of Junction Depth in Ultra-Shallow Junctions and Its Effect on Leakage Behavior in As-Deposited Polycrystalline Si and Amorphous Si Diodes." <i>Solid-State Electronics</i> , vol. 36, no. 7 (July 1993): 955-960. ("Batra")
1035	Declaration of Sylvia Hall-Ellis, Ph.D.
1036	Bellini, Emiliano. "First Solar Probes Potential Infringement of TOPCon Patents." <i>PV Magazine</i> , 19 July 2024.
1037	ARENA Advisory Panel Members for Ultra Low-Cost Solar PV R&D
1038	Solar Cells Market Size, Growth Outlook 2025-2034
1039	Bebon, Joseph. "First Solar Discontinues TetraSun Panel To Focus On CdTe." <i>Solar Industry</i> , 5 July 2016.
1040	Osborne, Mark. "First Solar Ends Heterojunction Foray; Shifts Malaysian Plant to CdTe Series 5 Assembly." <i>PV Tech</i> , 5 July 2016.
1041	First Solar 10k Annual Report
1042	Mundra Solar PV Ltd. Company Profile

Exhibit No.	Description
1043	Siddiqui, Mohammed Ali. "Global Shifts: India's Potential to Benefit from the China Plus One Model." <i>Icon Solar-En Power Technologies Pvt. Ltd.</i>
1044	District of Delaware Median Time to Trial Data

I. Institution is the Most Efficient Use of the Board's Resources

Discretionary denial is unwarranted. The interests of justice, efficiency, and promotion a strong patent system counsel in favor adjudication on the merits.

Institution is warranted because this Petition presents a compelling use of the Board's resources to correct a clear material error in examination. The '732 Patent issued after a single substantive office action, in which the Examiner allowed the claims based on the mistaken belief that the prior art did not teach diffusion of oxygen dopant from a silicon-containing film into a silicon substrate of a solar cell. That premise was incorrect. By the mid-1980's, the use of semi-insulating polycrystalline silicon ("SIPOS") to achieve precisely this diffusion behavior was well-known and extensively documented in pioneering work by R.M. Swanson, both in academia (at Stanford) and industry (at SunPower). Petitioner's grounds, based on Yablonovitch (EX1005) and Kwark (EX1017), both from Swanson's group, squarely address this overlooked property and demonstrate that the claimed subject matter was not patentable over well-established SIPOS solar-cell technology. PO's exhibit (EX2012, 3) acknowledges Swanson's, Yablonovitch's (EX1005), and Kwark's (EX1017) work on "oxygen doped poly silicon emitters (SIPOS)" as the "starting point" for subsequent developments, underscoring that the asserted grounds raise a strong likelihood of unpatentability and warrant institution

Institution is also appropriate under the Board's discretionary framework

because none of the discretionary denial factors are present. There are no settled expectations. PO claims to own “TOPCon technology”¹ (a type of silicon solar cell) patents acquired from TetraSun in 2013, but publicly exited the silicon solar cell market years before TOPCon solar cells existed to focus exclusively on CdTe thin film solar cells. For nearly a decade, PO did not commercialize, license, assert, or otherwise make public its alleged silicon solar cell or TOPCon technology, or any related patent rights such as the '732 Patent. PO instead distanced itself from silicon solar cells, signaling to the market that it did not intend to commercialize such technology.

Only in 2024 did PO announce it had “initiated an investigation” into possible infringement of its legacy TetraSun patents. EX1036 (*First Solar probes potential infringement of TOPCon patents*), 1-3. Even then, PO publicly admitted that it had not yet determined whether its patents actually read on TOPCon technology and would pursue action only “[i]f infringement is discovered.” *Id.* (emphasis added). Having no settled understanding of its own patent rights as late as 2024, PO cannot credibly claim that there were settled expectations. As the Board’s guidance makes clear, prolonged inactivity and absence of real-world application in the relevant field

¹ The '732 Patent doesn't describe “TOPCon,” and PO never explains how or why the '732 Patent “practices TOPCon technology.” See DD Req. 4.

undermines any claim of settled expectations. Market participants—including Petitioner—reasonably believed that PO had no silicon solar cell portfolio.

PO's attempt to conflate trade disputes with patentability is misplaced. The Petition concerns unpatentability of the '732 Patent, not trade remedies, and PO identifies no legitimate national security or economic interest rationale for denial. In fact, Petitioner's production of non-Chinese TOPCon cells advances U.S. supply-chain objectives, while PO's thin-film business is technologically and commercially unrelated. Moreover, PO's generalized discussion of national economic and security interests is inaccurate and appears to be drawn from another IPR with different facts.

Finally, PO's *Fintiv* arguments (DD Req. 10-12) are conclusory and unpersuasive. MSPVL promptly filed this Petition to ensure efficient resolution to the '732 Patent's unpatentability. At the anticipated institution date (February 2026), the parallel Delaware case will be in its infancy: the parties will have exchanged *initial* contentions and claim construction will not yet have begun. EX2016, 16. By the projected *final written decision* date (February 2027), the Delaware case will not have reached final contentions, expert discovery, or dispositive motions. EX2016, 16. Moreover, Petitioner has provided a comprehensive *Hybrid-Sotera* stipulation eliminating meaningful overlap, ensuring that institution serves efficiency, fairness, and the Board's mission of improving patent quality.

For these and other reasons below, the Director should institute this Petition.

II. Institution is Appropriate Because the Examiner Failed to Consider Fundamental Contributions of Yablonovitch and Kwark

MSPVL's requested IPR represents an appropriate and efficient use of the Board's resources because it seeks to correct a clear material error in the allowance of the '732 Patent—an error arising from the Examiner's failure to identify and consider highly relevant prior art. *See Microsoft Corp. v. Partec Cluster Competence Ctr. GmbH*, IPR2025-00318, Paper 9 at 3 (PTAB June 12, 2025) (“Petitioner appears to show a material error by the Office and it is an appropriate use of Office resources to review the potential error.”); *Oticon Medical AB v. Cochlear Ltd.*, IPR2019-00975, Paper 15 at 19 (PTAB Oct. 16, 2019) (precedential in relevant part) (finding “error in the prosecution” where the examiner failed to locate and consider relevant prior art relied on in the petition).

The prosecution of the '732 patent (Application No. 14/829,999) was exceptionally brief and involved only a single prior art rejection. EX1002, 239. The Examiner issued one Non-Final Office Action on April 13, 2016, rejecting the pending independent claim and certain dependent claims under pre-AIA 35 U.S.C. § 103(a) over Wenham (U.S. Patent No. 6,821,875) in view of Fukushima (WO2007/125903A1). EX1002, 239-49. However, the Examiner indicated that pending claims 15 and 16 would be allowable if rewritten in independent form because, while the “closest prior art” Rana (U.S. Patent App. Pub. No.

2010/0075485) disclosed a related structure, “Rana does not teach that the oxygen dopant diffuses into the upper surface of the substrate.” EX1002, 246-247.

The applicant amended the independent claim to incorporate the limitations of pending claim 15 (corresponding to limitations [1d.1] through [1d.3]), which include several requirements involving an oxygen dopant in the amorphous silicon-containing compound. EX1002, 263-67. Following resolution of a §112 issue (EX1002, 305-10, 321-27), the Examiner issued a Notice of Allowance on January 30, 2017 (EX1002, 337), expressly reiterating that allowance was based on the perceived absence in the prior art of “oxygen dopant diffuses into the upper surface of the substrate.” EX1002, 342.

That reasoning was incorrect. As Petitioner's expert Dr. Sanjay Banerjee explains, SIPOS—essentially polysilicon incorporating oxygen—was well known to exhibit precisely this diffusion property decades before the '732 Patent's priority date. EX1003, ¶¶50, 115. Petitioner's asserted prior art, Yablonovitch (EX1005) and Kwark (EX1017), both published in the mid-1980s by R.M. Swanson's group at Stanford, describe SIPOS solar cells exhibiting diffusion of oxygen dopant into the silicon substrate during annealing. Petition (Paper 1), 51-52, 34-40. These references confirm that the alleged “missing” feature was a fundamental, well-characterized property of SIPOS long before the filing of the '732 Patent.

Indeed, PO's own exhibit, EX2012, corroborates this history. In describing

the “historical development” of passivated contact technology, EX2012 cites Yablonovitch (EX1005) and Kwark (EX1017) as key 1980s work at Stanford demonstrating “excellent open-circuit voltages” from SIPOS-based solar cells, and identifies R.M. Swanson’s supervision of Kwark’s doctoral work (EX1017) on “oxygen doped poly silicon emitters (SIPOS)” as “a starting point for the renaissance of poly-Si-based passivating contacts.” EX2012, 3.

The record further suggests that these SIPOS references (Yablonovitch and Kwark) were likely known to a co-inventor of the ’732 patent but never disclosed. Denis De Ceuster, a named inventor of the ’732 Patent, “spent 12 years at SunPower [under R.M. Swanson], where he was the Director of Cell R&D,” before founding TetraSun (which would be acquired by First Solar). EX1037, 3; EX2010, 1. Public records show Denis De Ceuster and R.M. Swanson are co-inventors of issued U.S. patents, including ones filed after the ’732 Patent. *See, e.g.*, U.S. Pat. No. 9,774,294. Given his long collaboration with R.M. Swanson and the proximity in timing between his departure from SunPower (2009) and the filing of the ’732 Patent, De Ceuster almost certainly knew of the SIPOS work described in Yablonovitch and Kwark. Applicant TetraSun itself publicly promoted its technical team’s roots in SunPower and its record of innovation in silicon solar technology. EX2010, 2 (TetraSun’s technical team has “significant expertise in silicon PV R&D *and a track record of innovation at companies like SunPower*”) (emphasis added); EX2009, 1

(TetraSun's technical expertise stems from its "world records for silicon cell efficiencies at companies like SunPower Corp."); EX2011, 2. Yet, despite this background, none of the relevant SIPOS references were cited during prosecution, and there is no indication the Examiner was aware of this body of art.

In short, the '732 Patent was allowed based on a fundamental misunderstanding—that oxygen diffusion from a silicon-containing film into a silicon substrate was unknown in the art. The Yablonovitch and Kwart references conclusively demonstrate that this feature was well known, extensively studied, and publicly documented decades earlier. Petition (Paper 1), 51-52, 34-40. Institution is therefore warranted to correct the Office's error in failing to consider this material prior art and to ensure that the validity of the '732 Patent is properly assessed on the merits.

III. Institution is Appropriate Because MSPVL Could not Have Reasonably Expected the '732 Patent Would be Enforced

The Petition should be instituted because no producer of TOPCon solar cells could have reasonably anticipated, much less developed "settled expectation", that the '732 Patent would be enforced.

As context, there are two principal categories of solar cell technologies: (1) silicon solar cells, and (2) thin film solar cells. EX1038, 5-7. Silicon solar cells account for the large majority of the global market, while thin film solar cells make up most of the remainder. *Id.* TOPCon solar cells are a type of silicon solar cell.

EX2012, Abstract, 1-5; EX2003, 42-44; EX2005, 2; EX2008. Cadmium telluride (CdTe) solar cells, by contrast, are a type of thin film solar cells. EX2009, 1 (“First Solar makes cadmium telluride glass substrate-based thin film PV panels.”); EX1038, 6-7. As PO itself concedes, CdTe thin film solar cells are highly “technologically distinct” from silicon solar cells. DD Req. 7; *see also* EX2015, 28.

PO is a CdTe-based thin film solar cell manufacturer. EX2009, 1. It does **not** produce silicon solar cells (including TOPCon solar cells) of any kind, and otherwise does **not** participate in the silicon solar cell market. PO only entered the silicon solar cell market in 2013 (four years after the purported priority date of the '732 Patent) when it acquired TetraSun from Japanese oil company JX Nippon Oil & Energy Corporation. EX2009, 1; EX2010, 1; EX2011, 1.

From 2013-2016, PO produced TetraSun silicon solar cells in Malaysia. EX1039, 1; EX1036, 1 (“First Solar produced PV modules using TetraSun technology at its Malaysian factory until 2016” before “ending its production of crystalline silicon solar panels.”). In 2016, PO publicly announced it was exiting the silicon solar cell market and was discontinuing TetraSun (or any other silicon solar cells) products. EX1039 (*First Solar Discontinues TetraSun Panel to Focus on CdTe*), 1; EX1040 (*First Solar ends heterojunction foray; shifts Malaysian plant to CdTe Series 5 assembly*), 2-4 (“CdTe thin-film manufacturer First Solar is discontinuing development and production of its hybrid heterojunction silicon cell

and module technology, acquired via the acquisition of start-up TetraSun.”). As PO’s Chief Operating Officer Tymen de Jong explained:

“TetraSun is a sound technology for space-constrained rooftops and served largely as a hedge against CdTe technology competitiveness that had challenged us in the past,” he adds. “With the success of our CdTe roadmap reflected in our record 22.1 percent cell efficiency, along with the proven higher energy yield and **superior performance inherent in our thin-film technology**, that hedge is **no longer needed.**”

EX1039, 2 (emphasis added), *see also* 1-2 (explaining that CdTe products require “full attention”). In short, PO entered the silicon solar cell market “as a hedge against” its CdTe products, but then publicly abandoned that hedge once it was “no longer needed.”

De Jong’s statement about the “superior performance” of CdTe thin film cells over silicon cells accurately reflects how PO would publicly position itself for nearly the next decade. Since 2016, PO has continued to be a public voice of criticism and disparagement of silicon solar cells, which it views as the primary competition to its CdTe solar cells. For example, PO’s most recent 10k begins its “Company Overview” by stating that its CdTe modules provide an “alternative to conventional crystalline silicon PV solar modules,” and it opens its “Business Strategy” by identifying the “advantages [of CdTe] relative to competing crystalline silicon modules.” EX1041, 5.

While PO publicly criticized and downplayed silicon solar cell technology, its legacy TetraSun patents (including the '732 Patent) sat dormant for more than a decade. Only in 2024 did announce it had “initiated an investigation” into silicon solar cell producers “for potential infringement” of its TetraSun patents. EX1036 (*First Solar probes potential infringement of TOPCon patents*), 1-3. In that announcement, PO stated:

If infringement is discovered, we intend to challenge the ability of potential infringers to legally manufacture, assemble, and sell infringing TOPCon technology by pursuing enforcement, licensing, and/or other measures to safeguard our rights.

Id., 3. Thus, ***even as of 2024***, PO publicly admitted that it had not yet “discovered” whether any of its TetraSun patents read on TOPCon technology, and that it was only beginning an “investigation” and planning a course of action “[i]f infringement is discovered.” *Id.* If PO itself did not have a settled view of whether its patents covered TOPCon in 2024, it is unreasonable to suggest that MSPVL should somehow have developed “settled expectations” about enforcement.

Against this backdrop, MSPVL reasonably could have expected the '732 Patent would not be enforced. The Director has specifically recognized that where a PO exits a market and sits on its rights, “settled expectations” do not arise merely from the passage of time. In *Intel Corp. v. Proxense LLC*, the Director explained that notwithstanding the age of the patents, facts such as whether a patent “may not

have been commercialized, asserted, marked, licensed, or otherwise applied in a petitioner's particular technology space" are "considerations that weigh against a patent owner's claim of settled expectations and bears on the Director's discretion." IPR2025-00327, Paper 12 at 2-3 (Director June 26, 2025).

Those considerations apply in full here. Before 2024, the '732 Patent had not been commercialized (at least since PO exited silicon in 2016), had never been asserted, and there is no evidence or indication has ever been marked on a product or licensed or even applied in the TOPCon technology space. To the contrary, PO's own 2024 announcement concedes that it needed to conduct an "investigation" to "discover" "if" any of its TetraSun patents could be licensed or enforced in the TOPCon technology space. EX1036, 1-3. Under *Intel*, these facts weigh strongly against any claim of settled expectations and in favor of institution. *Intel*, IPR2025-00327, Paper 12 at 2-3.

PO's contrary argument rests on the '732 Patent having been issued for eight years, and alleges that the Board does not institute IPRs on patents that have been issued longer than "the six-year threshold." DD Req. 3-6. That is not the law or standard. As the Board has made clear, "there is no bright-line rule on when expectations become settled." *Dabico Airport Sols. Inc. v. Axa Power Aps*, IPR2025-00408, Paper 21 at 3 (P.T.A.B. June 18, 2025). Recent decisions confirm that the analysis is highly fact-dependent and turns on the patent's real-world use—

commercialization, assertion, licensing, and relevance to the petitioner's technology space—not simply its age. *See e.g., Intel*, IPR2025-00327, Paper 12.

PO relies on *Sig Sauer* (IPR2025-00410) and *Dabico* (IPR2025-00408) as supporting its position, but those cases are distinguishable. DD Req. 3-4. In *Sig Sauer*, the Director granted discretionary denial of institution of a patent issued for ten years, but unlike the present case, the patent owner there had commercialized its patent, and the petitioner had “developed a competing product.” *Sig Sauer Inc. v. Lone Star Future Weapons, Inc.*, IPR2025-00410, Paper 13 at 2 (Director Jun. 26, 2025) (citing PO's DD Req. (Paper 8) at 28-29, *see also* 4-5). Also, unlike the present case, the petitioner was aware of the challenged patent over the entire decade of issuance, as the petitioner hired the lead inventor of the challenged patent before issuance. IPR2025-00410, Paper 8 (PO's DD Req.) at 28-29, 2-5.

In *Dabico*, unlike here, the petitioner failed to address settled expectations in its opposition the discretionary denial brief (*see* Paper 17) despite Office's guidance to do so. As such, the Director relied on the length of issuance as a standalone factor for determining settled expectations. *Dabico Airport Sols. v. AXA Powers APS*, No. IPR2025-00408, Paper 21 at 2–3 (Director Jun. 18, 2025). In fact, the Director noted that “[t]here may be persuasive reasons” regarding settled expectations in favor of institution, but “Petitioner does not provide any.” *Id.* That is not the case here.

PO also contends that settled expectations arise because PO's 2013

acquisition of TetraSun was “widely publicized.” DD Req. 6-7. But PO’s equally public decision to discontinue TetraSun and exit from the silicon market all together undercuts any such claim. The fact that a PO subsidiary briefly sold silicon modules in 2015 says nothing about “settled expectations” in 2025 regarding this unmarked, unlicensed, uncommercialized, and unapplied ’732 Patent.

PO also asserts that “MSPVL likely first became aware of First Solar’s ownership in TOPCon technology in April 2013.” DD Req. 6. That is impossible—MSPVL wasn’t incorporated until June 2015. EX1042. In any case, awareness that a company exists does not create “settled expectations,” particularly under the circumstances described above where the company operates in a technology space different from the subject matter of an uncommercialized, unmarked, unasserted, and unlicensed patent.

Finally, PO wrongly assumes “MSPVL entered the TOPCon market no later than 2022.” DD Req. 5 (citing EX2004-EX2005). However, as PO concedes, this date refers to MSPVL “announcing [a] manufacturing facility,” not entering the market. *Id.* MSPVL did not sell TOPCon solar cells until 2024. EX2007.

IV. Institution is Appropriate Because no National Economic and Security Interests Warrant Discretionary Denial

PO attempts to misdirect by framing broader solar cell trade disputes as relevant to this patentability proceeding. They are not. As an initial matter, PO’s two-page section on national economic and security interests is riddled with factual

inaccuracies and recycled arguments copied from unrelated proceedings. *See JinkoSolar Co., Ltd. v. First Solar, Inc.*, IPR2025-01130, Paper 7 at 12 (Director Sept. 29, 2025); *see also Canadian Solar (USA) Incv. First Solar, Inc.*, IPR2025-01432, Paper 7 (Director Oct. 24, 2025). No such circumstance exists here.

First, PO asserts that “duplicative” review before the Board “undermines” IP rights. DD Req. 8. This is baseless. This Petition is the only post-grant proceeding ever filed challenging the '732 Patent, and there is no duplication of any kind.

Second, PO wrongly alleges that MSPVL “actively impairs the ability of [] U.S. companies to compete with the infringing products that MSPVL sells by selling those products at below cost.” DD Req. 9. That allegation is false, and India (MSPVL’s country of origin) is not considered a “foreign entity of concern” by the Administration.

Third, PO alleges “MSPVL illegally produces and exports” TOPCon solar cells without identifying any laws that MSPVL has allegedly violated. DD Req. 8. This baseless assertion, again borrowed from PO’s *IPR2025-01130* brief, is an improper smear tactic and highlights the absence of any legitimate discretionary denial argument.

Moreover, the trade investigation cited by PO (DD Req. 9) expressly *excluded* thin film solar cells like First Solar’s CdTe modules its scope. EX2015, 28 (declining to include “out-of-scope thin-film solar modules by First Solar” because

“thin film solar products are produced using different raw materials, manufacturing facilities, manufacturing processes, and production employees, and [] thin film solar products differ significantly in physical characteristics, conversion efficiency, and output from” silicon solar cells). As noted above, PO only produced silicon solar cells in Malaysia from 2013-16 and has never produced silicon solar cells in the United States.

In reality, national economic and security considerations favor institution. China currently produces over 90% of solar cells globally. EX2015, 280; EX1043, 1. Reducing dependence on Chinese solar-cell supply chains is a stated U.S. policy objective under the Administration's “China Plus One” initiative, which encourages diversification of energy sourcing and manufacturing. EX1043, 1-2. PO itself acknowledges this national interest, noting that its CdTe thin-film products “do[] not rely on Chinese crystalline silicon supply chains.” EX1041, 5. But unlike PO, MSPVL actually contributes to that national objective in the technology space by manufacturing non-Chinese TOPCon solar cells.

V. Institution is Appropriate Because the Board can Efficiently Resolve the '732 Patent Earlier than the District Court, Consistent with the *Fintiv* Factors

Institution is also warranted so that the Board may be the first to adjudicate the patentability of the '732 Patent. PO is asserting the '732 Patent for the first time in *Mundra Solar PV Ltd. v. First Solar, Inc.*, C.A. No. 25-462 (D. Del. Apr. 15,

2025) (“Parallel Proceeding”), which remains in its early stages. The ’732 Patent has never before been challenged in a post-grant proceeding and has never been litigated. By contrast, the final written decision in this proceeding is expected by February 2027—about 15 months before the District Court trial. Institution thus allows the Board to resolve patentability well before any District Court judgment.

The factors enumerated in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 6 (P.T.A.B. Mar. 20, 2020) (precedential) further confirm that the Petition should be instituted.

***Fintiv* Factor 1 (stay)** is **neutral** because the Parallel Proceeding may be ultimately stayed. PO argues that MSPVL has not sought a stay of the Parallel Proceeding, and that contentions will have been served in the Parallel Proceeding by the institution date. DD Req. 10-11. PO cites no examples of denials of motions to stay based on preliminary litigation deadlines such as contentions. In any case, motions to stay invoke fact- and case-specific considerations, which is why the Board has repeatedly refused to “attempt to predict” how a District Court will rule on such stay motions. *See, e.g., Hulu, LLC v. SITO Mobile R&D IP, LLC*, IPR2021-00298, Paper 11 at 10-11 (P.T.A.B May 19, 2021) (because “neither party has produced evidence that a stay has been requested[,]” “[w]e decline to infer... how the District Court would rule should a stay be requested”).

PO also fails to mention that the Parallel Proceeding also includes U.S. Pat.

No. 9,130,074, which is involved in both IPR2025-01432 (petitioners Canadian Solar (USA) Inc.) and IPR2025-01130 (petitioners JinkoSolar Co., Ltd.), which are both at the pre-institution stage. Upon institution, all patents-in-suit in the Parallel Proceeding would be in instituted IPRs, meaning a stay would be likely.

PO further notes that MSPVL “initiated” the Parallel Proceeding by seeking a declaratory judgment of non-infringement of the ’732 Patent, but fails to explain how that is relevant to *Fintiv* factor 1. DD Req. 10-11. In any case, PO never challenged subject matter jurisdiction of the Parallel Proceeding, meaning that it acknowledges the **PO** (not MSPVL) initiated the case and controversy between MSPVL and PO over the ’732 Patent by alleging infringement in its demand letters.

***Fintiv* Factor 2 (trial)** weighs **heavily in favor of institution** because the Board’s final written decision is expected to occur **at least 15 months** before the trial in the parallel proceeding. The Board accorded a filing date on August 19, 2025, which means the Board is expected to issue a final written decision by February 2027. *See* Paper 3. The parallel proceeding has scheduled the trial to begin 15 months later in **May 2028**. EX2016, 17. The Board has found that where the projected final written decision precedes the scheduled trial date - *even by far less than 15 months* – this weighs in favor of institution. *See, e.g., Amazon.com, Inc., et al. v. NL Giken Inc.*, IPR2025-00407, Paper 14 at 2-3 (Director May 16, 2025) (“discretionary denial of institution is not appropriate” where “it is likely that a final

written decision in this proceeding will issue before the district court trial occurs”); *Twitch Interactive, Inc. v. Razdog Holdings LLC*, IPR2025-00307, Paper 18 at 2-3 (Director May 16, 2025).

Median time to trial statistics push the trial to **August 2028**: the parallel proceeding was filed in April 2025 and the median time to trial for Delaware over the past year has been 40 months (EX1044). Accordingly, *Fintiv* Factor 2 weighs heavily in favor of institution.

***Fintiv* Factor 3 (investment)** weighs in **favor of institution** because there has been little party and judicial investment into the parallel proceeding. The parties have not worked on any other invalidity issues, depositions, or claim construction, and have only just begun initial discovery in the last couple weeks.

At the expected time of the institution decision (February 2026), the parties in the parallel proceeding will have just exchanged *initial* contentions and disclosures, and will not even have begun claim construction briefing. EX2016, 16. Accordingly, there will be no orders related to the '732 patent at the time of institution. Where, as here, “at the time of the institution decision, the district court has not issued orders related to the patent at issue in the petition, this fact weighs against exercising discretion to deny institution.” *Fintiv*, at *10. In fact, by the expected time of the *final written decision* (February 2027), the parallel proceeding will not even have reached final contentions, let alone expert discovery or dispositive

motions. EX2016, 16. Accordingly, *Fintiv* Factor 3 weighs in favor of institution.

***Fintiv* Factor 4 (overlap)** weighs in **favor of institution** because MSPVL's *Hybrid-Sotera* stipulation eliminates any meaningful overlap between this proceeding and the parallel litigation. MSPVL's broad *Hybrid-Sotera* stipulation additionally excludes system art in combination with the prior art asserted in this Petition. EX2017 (*See* section (ii)). This broad stipulation weighs in favor of institution. *See Tesla, Inc. v. Intellectual Ventures II LLC*, IPR2025-00217, Paper 9 (Director June 13, 2025); *Shenzen Tuozhu Technology Co., Ltd. v. Stratasys, Inc.*, IPR2025-00438, Paper 10 (Director July 17, 2025); *Toyota Motor Corp. v. AutoConnect Holdings LLC*, PGR2025-00041, Paper 9 (Director Sept. 8, 2025). Accordingly, *Fintiv* Factor 4 weighs in favor of institution.

***Fintiv* Factor 5 (parties)** weighs in **favor of institution** because the parties are the same² and the Board's final written decision will issue before trial in the parallel proceeding. Because the parties are the same and the IPR will be resolved before trial, MSPVL will be subject to early estoppel in the parallel proceeding. *See NeuMoDx Molecular, Inc. v. HandyLab, Inc.*, IPR2020-01133, Paper 23 at 13-14

² PO appears to misunderstand factor 5, arguing without explanation or citation that factor 5 "favors denial" because "[t]he parties in both proceedings are the same." DD Req. 12.

(P.T.A.B. Aug. 6, 2021) (“The parties in this proceeding are identical to the parties in the parallel litigation. Because the final written decision in this case will issue before trial in the parallel litigation, this factor weighs against exercising discretion to deny institution.”). Accordingly, *Fintiv* Factor 5 weighs in favor of institution.

***Fintiv* Factor 6 (merits)** weighs in **favor of institution** because, as explained above in Section II, the merits are strong and demonstrate that the Examiner erred in allowing the '732 Patent to issue. PO argues factor 6 “favors denial” “for the reasons stated in the foregoing sections.” DD Req. 12. However, unlike MSPVL’s present Brief, PO’s brief does not address the merits, so PO does not present any reasons that factor 6 favors denial.

PO offers a blanket statement that “[t]here is no good reason for parallel proceedings,” which if true, would render the *Fintiv* analysis meaningless. To the contrary, institution here promotes overall efficiency and preserves the integrity of the patent system by allowing the Board—the expert agency on questions of patentability—to address the '732 Patent while the district court focuses on other issues. This non-overlapping division of expertise ensures that both forums can proceed efficiently without duplication or inconsistency. Accordingly, *Fintiv* Factor 6 weighs in favor of institution.

VI. Conclusion

MSPVL respectfully requests institution.

Dated: November 19, 2025

Respectfully submitted,

By: / David M. Tennant /
David M. Tennant (Reg. No. 48,362)
PAUL HASTINGS LLP
2050 M St., N.W.
Washington, DC, 20036
Telephone: 202.551.1705
Fax: 202.551.1705
davidtennant@paulhastings.com

Counsel for Petitioner
MUNDRA SOLAR PV LIMITED

CERTIFICATE OF SERVICE

I hereby certify that on November 19, 2025, a true and correct copy of the foregoing **PETITIONER'S OPPOSITION TO PATENT OWNER'S REQUEST FOR DISCRETIONARY DENIAL** is being served by electronic mail on Patent Owner's counsel of record listed below, pursuant to it Mandatory Notices:

Sharonmoyee Goswami (Reg. No. 68,806)
Keith R. Hummel (pro hac vice pending)
Donald R. Bunton (Reg. No. 74,364)
CRAVATH, SWAINE & MOORE LLP
375 Ninth Avenue
New York, NY 10001
sgoswami@cravath.com
khummel@cravath.com
dbunton@cravath.com

Dated: November 19, 2025

Respectfully submitted,

By: / David M. Tennant /
David M. Tennant (Reg. No. 48,362)
PAUL HASTINGS LLP
2050 M St., N.W.
Washington, DC, 20036
Telephone: 202.551.1705
Fax: 202.551.1705
davidtennant@paulhastings.com

Counsel for Petitioner
MUNDRA SOLAR PV LIMITED