

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CANADIAN SOLAR INC.,
Petitioner,

v.

MAXEON SOLAR PTE. LTD.,
Patent Owner.

IPR2024-01038¹
Patent No. 11,251,315 B2

JOINT NOTICE OF CONSOLIDATED EXHIBITS

¹ IPR2024-01194 has been consolidated with the instant proceeding.

Pursuant to the Board’s March 7, 2025 Order Consolidating Proceedings (Paper 23), Petitioner Canadian Solar Inc. hereby submits that Petitioner’s Exhibits 1001-1002 1004-1022 and 1024-1068 in the IPR2024-01194 proceeding are substantially identical in the instant IPR2024-01038 proceeding. In addition, as a result of the consolidation, Petitioner submits and will file the following “new” exhibits in the consolidated proceeding that correspond to exhibits in the IPR2024-01194 proceeding not found in the IPR2024-01038 proceeding: New Exhibit 1100 (was previously Exhibit 1003 in IPR2024-01194); New Exhibit 1101 (was previously Exhibit 1023 in IPR2024-01194); New Exhibit 1102 (was previously Exhibit 1069 in IPR2024-01194); and New Exhibit 1103 (was previously Exhibit 1087 in IPR2024-01194). Also, previous Exhibit 1070 and Exhibit 1071 in IPR2024-01194 are identical to Exhibit 1069 in the instant IPR2024-01038 proceeding. Petitioner’s Updated Exhibit List is attached as Appendix A.

Patent Owner hereby submits that exhibits 2004-2009 and 2015-2018 in the IPR2024-01194 proceeding are substantially identical to the same-numbered exhibits in the instant IPR2024-01038 proceeding. In addition, as a result of the consolidation, Patent Owner filed Exhibit 2020, which was Exhibit 2001 in IPR2024-01194. Patent Owner’s Updated Exhibit List, which was filed at Paper 24, is attached as Appendix B.

Dated: March 21, 2025

Respectfully submitted,

/Samuel N. Tiu/

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Counsel for Patent Owner

CERTIFICATE OF SERVICE

I hereby certify that on this 21st day of March, 2025, a copy of the foregoing and accompanying exhibits, has been served in its entirety by electronic mail on the following counsel of record for patent owner:

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Dated: March 21, 2025

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APPENDIX A

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CANADIAN SOLAR INC.,
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v.

MAXEON SOLAR PTE. LTD.,
Patent Owner.

IPR2024-01038¹
Patent No. 11,251,315 B2

PETITIONER'S UPDATED EXHIBIT LIST

¹ IPR2024-01194 has been consolidated with the instant proceeding.

Exhibit #	Reference Name
1001	U.S. Patent No. 11,251,315 to Smith et al. (“315 Patent”)
1002	File History of U.S. Patent Application No. 16/877,255
1003	Declaration of Sanjay Banerjee, Ph.D. Regarding U.S. Patent No. 11,251,315
1004	Curriculum Vitae of Sanjay Banerjee, Ph.D.
1005	U.S. Patent Pub. No. 2011/0214719, “Method of Fabricating a Back-Contact Solar Cell and Device Thereof.” (“ <u>Li</u> ”)
1006	King, Sinton and Swanson, “Studies of Diffused Phosphorous Emitters: Saturation Current, Surface Recombination Velocity, and Quantum Efficiency,” IEEE Transactions On Electron Devices, Vol 37, No. 2 (Feb. 1990) (“ <u>King</u> ”)
1007	Marvin and Froedge, “Interdigitated Back Contact Silicon Solar Cell Analysis and Design Recommendations for Space Use,” AD-A220-414 (Sept. 30, 1989) (“ <u>Marvin-DTIC</u> ”)
1008	Muller et al., “Ion Implantation for All-Alumina IBC Solar Cells with Floating Emitter,” Energy Procedia 55 (2014), 265-271 (“ <u>Muller</u> ”)
1009	Reserved
1010	Luque and Hegedus, Handbook of Photovoltaic Science and Engineering (2002) (“ <u>Luque</u> ”)
1011	Neuhaus and Munzer, <i>Industrial Silicon Wafer Solar Cells</i> , Advances in OptoElectronics, 1-15, at 11 (2007) (“ <u>Neuhaus</u> ”)
1012	U.S. Patent No. 7,468,485 to Swanson (“ <u>Swanson-485</u> ”)
1013	Complaint, <i>Maxeon Solar Pte. Ltd. v. Canadian Solar, Inc.</i> , Case No. 2:24-cv-210 (E.D. Tex., filed March 25, 2024)
1014	U.S. Patent Pub. No. 2007/0256728

Exhibit #	Reference Name
1015	U.S. Patent No. 4,234,352 (“ <u>Swanson-352</u> ”)
1016	Seibt et al., “Gettering in silicon photovoltaics: current state and future perspectives,” phys. stat. sol. (a) 203, No. 4, 696–713 (2006) (“ <u>Seibt</u> ”)
1017	U.S. Patent No. 4,053,335 to Hu (“ <u>Hu</u> ”)
1018	Ferre, et al., “Simultaneous gettering and emitter formation in multicrystalline-Si wafers by annealing phosphorus doped amorphous silicon compounds,” Applied Physics Letters 98, 022102 (2011) (“ <u>Ferre</u> ”)
1019	Vahanissi et al., “Gettering of Iron in Silicon Solar Cells with Implanted Emitters,” IEEE Journal of Photovoltaics (Volume: 4, Issue: 1, January 2014) (“ <u>Vahanissi</u> ”)
1020	U.S. Patent Pub. No. 2010/0105190 A1 (“ <u>Tomas</u> ”)
1021	Buonassisi, et al. “Transition metals in photovoltaic-grade ingot-cast multicrystalline silicon: Assessing the role of impurities in silicon nitride crucible lining material,” Journal of Crystal Growth 287 (2006) 402–407 (“ <u>Buonassisi</u> ”)
1022	2013 Renewable Energy Data Book, U.S. Department of Energy (2013) (“ <u>REDB-2013</u> ”)
1023	Declaration of Sylvia Hall-Ellis
1024	Curriculum Vitae of Sylvia Hall-Ellis
1025	Ramappa and Benley, “Diffusion of Iron in Silicon Dioxide,” Journal of the Electrochemical Society 146(1) 3773-3777 (1999) (“ <u>Ramappa</u> ”)
1026	U.S. Patent Pub. No. 2006/0118868 A1 (“ <u>Yoshimura</u> ”)
1027	Reserved

Exhibit #	Reference Name
1028	Liu et al., “Direct Observation of the Impurity Gettering Layers in Polysilicon-Based Passivating Contacts for Silicon Solar Cells,” ACS Appl. Energy Mater. 2018, 1, 2275–2282 (“ <u>Liu-1</u> ”)
1029	Liu et al., “Effective impurity gettering by phosphorus- and boron-diffused polysilicon passivating contacts for silicon solar cells,” Solar Energy Materials and Solar Cells 179 (2018) 136–141 (“ <u>Liu-2</u> ”)
1030	DocketNavigator Report
1031	Fintiv Study https://www.law360.com/articles/1436071/print?section=ip
1032	Senator Tillis Letter
1033	Reserved
1034	Reserved
1035	Marvin and Froedge, “Analysis of Interdigitated Back Contact Silicon Solar Cells for Space Use,” IEEE (1989) (“ <u>Marvin-IEEE</u> ”)
1036	Rohatgi et al, “High-Throughput Ion-Implantation for Low-Cost High Efficiency Silicon Solar Cells,” Energy Procedia 15 (2012), 10-19 (“ <u>Rohatgi</u> ”)
1037	Reserved
1038	Reserved
1039	Reserved
1040	NTIS Signed Attestation re: “Interdigitated Back Contact Silicon Solar Cell Analysis and Design Recommendations for Space Use” (“ <u>ADA220414</u> ”)
1041	Kiyota et al., “Phosphorus Direct Doping from Vapor Phase into Silicon for Shallow Junctions,” J. Electrochem. Soc. 141(8) 2241-2244 (August 1994) (“ <u>Kiyota</u> ”)

Exhibit #	Reference Name
1042	French, “Polysilicon: a versatile material for microsystems,” Sensors and Actuators A 99 (2002) 3-12.
1043	Green, “Intrinsic concentration, effective densities of states, and effective mass in silicon,” J. Appl. Phys. 67, 2944 (1990) (“ <u>Green</u> ”)
1044	Henry, “Limiting efficiencies of ideal single and multiple energy gap terrestrial solar cells,” J. Appl. Phys. 51, 4494 (1980) (“ <u>Henry</u> ”)
1045	Birkmire et al., “Harnessing the Sun with Thin-Film Photovoltaics,” NREL (April 1999) (“ <u>Birkmire</u> ”)
1046	Ghoshtagore, “Silicon Dioxide Masking of Phosphorus Diffusion in Silicon,” Solid-State Elements Vol. 18 (1975) (“ <u>Ghoshtagore</u> ”)
1047	Muller et al., “Ion Implantation for All-Alumina IBC Solar Cells with Floating Emitter,” Energy Procedia 55 (2014), 265-271, https://www.sciencedirect.com/science/article/pii/S1876610214013022 (“ <u>Muller Science Direct Webpage</u> ”)
1048	IEEE Xplore, “IEEE Xplore Resources and Help: Publication Dates,” https://ieeexplore.ieee.org/Xplorehelp/ieee-xplore-training/working-with-documents#publication-dates
1049	IEEE Xplore King Entry, https://ieeexplore.ieee.org/document/46368
1050	U.S. Patent No. 8,124,502
1051	Science Direct Liou Entry, https://www.sciencedirect.com/science/article/abs/pii/092702489290104W
1052	IEEE Xplore Yang Entry, https://ieeexplore.ieee.org/document/6924717
1053	Reserved
1054	IEEE Xplore Marvin Entry, https://ieeexplore.ieee.org/document/74564

Exhibit #	Reference Name
1055	WO 2007/022955 A1
1056	IEEE Xplore Slaoui Entry, https://ieeexplore.ieee.org/document/1190463
1057	Science Direct Kalkofen Entry, https://www.sciencedirect.com/science/article/abs/pii/S0921510704003654
1058	Wiley Online Library Seibt Entry, https://onlinelibrary.wiley.com/doi/abs/10.1002/pssa.200664516
1059	Science Direct Haarahiltunen Entry, https://www.sciencedirect.com/science/article/abs/pii/S0921510708005163
1060	IEEE Xplore Holt Entry, https://ieeexplore.ieee.org/abstract/document/4922483
1061	Semantic Scholar Ferre Entry, https://www.semanticscholar.org/paper/Simultaneous-gettering-and-emitter-formation-in-by-Ferre%CC%81-Mart%C3%ADn/1d060d97443c0ccad7bc812e7cc12b2c0afedbe1
1062	Science Direct Paviet-Salomon Entry, https://www.sciencedirect.com/science/article/abs/pii/S0921510712005661
1063	IEEE Xplore Cho Entry, https://ieeexplore.ieee.org/document/6925554
1064	Science Direct Reimann Entry, https://www.sciencedirect.com/science/article/abs/pii/S0022024810000758
1065	Science Direct Bentzen Entry, https://www.sciencedirect.com/science/article/abs/pii/S0921510708005060

Exhibit #	Reference Name
1066	IEEE Xplore Mutoh Entry, https://ieeexplore.ieee.org/document/1348791
1067	IEEE Xplore Bello Entry, https://ieeexplore.ieee.org/document/1529625
1068	IEEE Xplore Stavrides Entry, https://ieeexplore.ieee.org/document/1488115
1069	<i>Maxeon Solar PTE. Ltd. v. Canadian Solar, Inc.</i> , No. 2:24-cv-210 (E.D. Tex. July 12, 2024), Plaintiff Maxeon Solar PTE. Ltd.’s Disclosure of Asserted Claims and Infringement Contentions
1070	E.D. Tex. Patent Rule 3-6
1071 [NEW]	Declaration of James L. Mullins, Ph.D.
1072 [NEW]	Curriculum Vitae of James L. Mullins, Ph.D.
1073 [NEW]	Liu et al., “Direct Observation of the Impurity Gettering Layers in Polysilicon-Based Passivating Contacts for Silicon Solar Cells,” ACS Appl. Energy Mater. 2018, 1, 2275–2282
1074 [NEW]	Screen capture of ACS Applied Energy Materials created by James L. Mullins from ACS Publications website on February 7, 2025 at URL: https://pubs.acs.org/doi/epdf/10.1021/acsaem.8b00367?ref=article_openPDF
1075 [NEW]	Screen capture of ACS Applied Energy Materials created by James L. Mullins from Purdue University Libraries OPAC on February 7, 2025 at URL: https://purdue.primo.exlibrisgroup.com/discovery/fulldisplay?docid=alma99169300001901081&context=L&vid=01PURDUE_PUWL:PURDUE&lang=en&search_scope=MyInst_and_CI&adaptor=Local%20Sea

Exhibit #	Reference Name
	rch%20Engine&tab=Everything&query=any,contains,ACS%20Applied%20Energy%20Materials
1076 [NEW]	Screen capture of Direct Observation of the Impurity Gettering Layers in Polysilicon-Based Passivating Contacts for Silicon Solar Cells created by James L. Mullins from Google Scholar on February 7, 2025 at URL: https://scholar.google.com/scholar?hl=en&as_sdt=0%2C47&q=Direct+Observation+of+the+Impurity+Gettering+Layers+in+Polysilicon-Based+Passivating+Contacts+for+Silicon+Solar+Cells&btnG=
1077 [NEW]	Liu et al., “Effective impurity gettering by phosphorus- and boron-diffused polysilicon passivating contacts for silicon solar cells,” Solar Energy Materials and Solar Cells 179 (2018) 136–141
1078 [NEW]	Screen capture of Journal of Solar Energy Materials and Solar Cells (Online) created by James L. Mullins from Purdue University Libraries OPAC on February 8, 2025 at URL: https://purdue.primo.exlibrisgroup.com/discovery/fulldisplay?docid=alma99155237560001081&context=L&vid=01PURDUE_PUWL:PURDUE&lang=en&search_scope=MyInst_and_CI&adaptor=Local%20Search%20Engine&tab=Everything&query=any,contains,Solar%20Energy%20Materials%20and%20Solar%20
1079 [NEW]	Screen capture of Effective impurity gettering by phosphorus- and boron-diffused polysilicon passivating contacts for silicon solar cells created by James L. Mullins from Google Scholar on February 8, 2025 at URL: https://scholar.google.com/scholar?hl=en&as_sdt=0%2C47&q=Effective+Impurity+Gettering+by+Phosphorus-and+Boron-Diffused+Polysilicon+Passivating+Contacts+for+Silicon+Solar+Cells&btnG=
1080 [NEW]	Rohatgi et al, “High-Throughput Ion-Implantation for Low-Cost High Efficiency Silicon Solar Cells,” Energy Procedia 15 (2012), 10-19

Exhibit #	Reference Name
1081 [NEW]	From ResearchGate, Rohatgi et al, “High-Throughput Ion-Implantation for Low-Cost High Efficiency Silicon Solar Cells,” Energy Procedia 15 (2012), 10-19
1082 [NEW]	Screen capture of Journal Energy Procedia. created by James L. Mullins from Purdue University Libraries OPAC on February 8, 2025 at URL: https://purdue.primo.exlibrisgroup.com/discovery/search?vid=01PURDUE_PUWL:PURDUE&tab=Everything&search_scope=MyInst_and_CI&query=any,contains,Energy%20Procedia%20
1083 [NEW]	Screen capture of High-Throughput Ion-Implantation for Low-Cost High Efficiency Silicon Solar Cells created by James L. Mullins from Google Scholar on February 8, 2025 at URL: https://scholar.google.com/scholar?hl=en&as_sdt=0%2C47&q=High-Throughput+Ion-Implantation+for+Low-Cost+High-Efficiency+Silicon+Solar+Cells&btnG=
1084 [NEW]	Muller et al., “Evaluation of implantation annealing for highly-doped selective boron emitters suitable for screen-printed contacts,” Solar Energy Materials & Solar Cells 120 (2014), 431-435
1085 [NEW]	Supplemental Declaration of Sanjay Banerjee, Ph.D.
1100 [NEW]	Previously EX1003 in IPR2024-01194 – Declaration of Sanjay Banerjee, Ph.D.
1101 [NEW]	Previously EX1023 in IPR2024-01194 – Declaration of Sylvia D. Hall-Ellis
1102 [NEW]	Previously EX1069 in IPR2024-01194 – Patent Trial and Appeal Board Rules of Practice for Briefing Discretionary Denial Issues, and Rules for 325(d) Considerations, Instituting Parallel and Serial Petitions, and Termination Due to Settlement Agreement (Fed. Register, Apr. 19, 2024)

Exhibit #	Reference Name
1103 [NEW]	Previously EX1087 in IPR2024-01194 – Supplemental Declaration of Sanjay Banerjee, Ph.D.

Dated: March 21, 2025

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on this 21st day of March, 2025, a copy of the foregoing and accompanying exhibits, has been served in its entirety by electronic mail on the following counsel of record for patent owner:

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APPENDIX B

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CANADIAN SOLAR INC.,
Petitioner

v.

MAXEON SOLAR PTE. LTD.,
Patent Owner

Case IPR2024-01038¹
U.S. Patent No. 11,251,315

PATENT OWNER'S UPDATED EXHIBIT LIST

¹ IPR2024-01194 has been consolidated with the instant proceeding.

Pursuant to the Board's Order on Consolidation of Proceedings dated March 7, 2025 (Paper 23), Patent Owner Maxeon Solar Pte. Ltd. hereby submits an updated exhibit list. Exhibits 2001, 2004-2009, and 2015-2018 were previously filed in this proceeding. Exhibit 2020, which is newly filed herewith, was filed as Exhibit 2001 in IPR2024-01194.

PATENT OWNER'S EXHIBIT LIST

Exhibit	Description
2001	Declaration of David Carroll, Ph.D. in Support of Patent Owner Preliminary Response
2002	<i>Intentionally Left Blank</i>
2003	<i>Intentionally Left Blank</i>
2004	Results charted from DocketNavigator.com Document Search, run on October 8, 2024, for Motion to Stay Pending <i>Inter Partes</i> Review Decided by Judge Rodney Gilstrap
2005	Results charted from DocketNavigator.com Document Search, run on October 8, 2024, for Motion to Stay Pending <i>Inter Partes</i> Review Decided by Judge Rodney Gilstrap with "Stipulated/Agreed" Motions Removed
2006	Federal Court Management Statistics (June 30, 2024)
2007	Order Denying Maxeon Partial Motion to Dismiss (Dkt. 26), <i>Maxeon Solar Pte. Ltd. v. Canadian Solar, Inc.</i> , Case No. 2:24-cv-00210-JRG (E.D. Tex.), July 3, 2024
2008	Docket Control Order (Dkt. No. 33), <i>Maxeon Solar Pte. Ltd. v. Canadian Solar, Inc.</i> , Case No. 2:24-cv-00210-JRG (E.D. Tex.), August 7, 2024
2009	Canadian Solar Inc.'s Invalidity Contentions, <i>Maxeon Solar Pte. Ltd. v. Canadian Solar, Inc.</i> , Case No. 2:24-cv-00210-JRG (E.D. Tex.), September 6, 2024
2010	<i>Intentionally Left Blank</i>
2011	<i>Intentionally Left Blank</i>
2012	<i>Intentionally Left Blank</i>
2013	<i>Intentionally Left Blank</i>
2014	<i>Intentionally Left Blank</i>

Exhibit	Description
2015	Granek et al., "Front surface passivation of n-type high-efficiency back junction silicon solar cells using front surface," <i>Solar Energy Materials and Solar Cells</i> , 91(7) (2007)
2016	"Nanotechnology improves solar cell efficiency," <i>EarthSky</i> , August 28, 2007 (accessible at https://earthsky.org/humanworld/nanotechnology-improves-solar-cell-efficiency ; last accessed October 14, 2024)
2017	"New Plastic Solar Cell Breaks Efficiency Record," <i>ScienceDaily</i> , April 20, 2007 (accessible at https://www.sciencedaily.com/releases/2007/04/070419140902.htm), last accessed October 14, 2024)
2018	Capshaw-Mack, C., "Power Games: Project seeks to improve methods of harnessing solar energy," <i>Winston-Salem Journal</i> , August 4, 2013 (accessible at https://journalnow.com/news/local/article_1d243ff0-fc9e-11e2-b607-001a4bcf6878.html ; last accessed October 15, 2024)
2019	<i>Intentionally Left Blank</i>
2020 New	Declaration of David L. Carroll, Ph.D. in Support of Patent Owner Preliminary Response for IPR2024-01194

Respectfully submitted,

Date: March 12, 2025

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CERTIFICATE OF SERVICE

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Date: March 12, 2025

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