

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ADVANCED MICRO DEVICES, INC.,
Petitioner,

v.

REALTEK SEMICONDUCTOR CORPORATION,
Patent Owner.

Case IPR2023-00920
U.S. Patent No. 8,006,218

PATENT OWNER'S RESPONSE

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EXHIBIT LISTING

Exhibit No.	Description
EX2001	Declaration of Elizabeth J. Weiskopf in Support of Motion for <i>Pro Hac Vice</i> Admission
EX2002	Declaration of Dr. Shukri Sourì
EX2003	<i>Curriculum Vitae</i> of Dr. Shukri Sourì
EX2004	Reserved
EX2005	Final Deposition Transcript of Dr. Subramanian, dated February 16, 2024
EX2006	Reserved
EX2007	<i>In the Matter of Certain Integrated Circuits, Components thereof, and Products Containing the Same</i> , Inv. No. 337-TA-1350, Initial Determination on Violation of Section 337 (January 19, 2024)
EX2008	Inv. No. 337-TA-1350, Order No. 21: Construing Terms of the Asserted Patents (July 25, 2023)
EX2009	Inv. No. 337-TA-1350, Petition for Review of the ALJ's Initial Determination, Inv. No. 337-TA-1350 (February 2, 2024)
EX2010	Inv. No. 337-TA-1350, Order No. 20: Denying AMD's Motion for Summary Determination (July 25, 2023)

Exhibit No.	Description
EX2011	Webster's New College Dictionary (excerpted)
EX2012	U.S. Patent No. 7,219,324 to Sherlekar et al. ("Sherlekar")
EX2013	Michael Keating et al., <i>Low Power Methodology Manual</i> , Springer (2007) ("LPMM") (excerpts)
EX2014	Reserved
EX2015	Chicago Manual of Style, 16 th Ed. (2010)

Patent Owner, Realtek Semiconductor Corporation, (“Realtek”), respectfully submits this Patent Owner Response (“POR”) pursuant to 37 C.F.R. § 42.120 to the *Inter Partes Review* (“IPR”) petition (“Petition”) filed by Petitioner Advanced Micro Devices, Inc. (“AMD” or “Petitioner”) for claims 1–20 (“Challenged Claims”) of U.S. Patent 8,006,218 (“the ’218 patent,” EX1001).

I. INTRODUCTION

The claimed invention of the ’218 patent represents a groundbreaking advance for circuit design in chips with multiple power domains. Unlike any prior art identified by Petitioner, the claimed invention provides steps for designing a power routing structure in chips with multiple power domains. These steps allow a new automatic placement and routing tool (“APR tool”) to use existing APR tools—which could route power only to single-power-domain integrated circuits—to route powers to multiple power domains. The ’218 patent also discloses a related structure for a user to easily complete the design of the power mesh for the integrated circuit having multiple power domains. EX1001, 2:33-41.

Petitioner has failed to carry its burden to demonstrate unpatentability. At bottom, Petitioner simply fails to fully appreciate—let alone address—the actual invention. For example, Petitioner repeatedly attempts to apply improper claim construction of key claim terms to equate the ’218 patent to power gating systems such as Li or Jiang. In doing so, Petitioner ignores that the invention is not about

power gating, i.e., cutting power off—it utilizes a two layer global power mesh to *provide* two powers to two different power domains separately through a specific routing structure.

When attempting to show obviousness, Petitioner also fails to meet its burden. An invention “composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 401 (2007). Rather, Petitioner must show, but has not, that a POSITA *would* have been motivated to combine the references in a way the claimed invention does. *Personal Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993–94 (Fed. Cir. 2017). This showing must be made without any “hint of hindsight.” *Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 655 F.3d 1364, 1375 (Fed. Cir. 2011).

Although the Board found the Petition sufficient to institute *inter partes* review, upon a full record, the Board should find that Petitioner cannot meet its burden to show obviousness. Patent Owner respectfully requests that the Board find all claims of the ’218 patent not unpatentable.

II. FACTUAL BACKGROUND

A. The Problems with the Prior Art

As integrated circuit devices have become more complicated, different portions of the circuitry of a chip may need different voltages (powers) at the same

time. EX1001, 1:5-42. At the time of the invention of the '218 patent, off the shelf APR tools supported single power domain chips. *Id.*, 1:37-39. But these APR tools did not provide for important steps in designing the power routing structure of chips receiving **multiple** voltages. *Id.*, 1:34-37. Before the '218 patent, power routing was input manually for multiple voltages. EX2002, ¶60. At the time of the '218 patent, there was also no known structure for the user to use to easily complete the design. EX1001, 2:33-41; EX2002, ¶61.

B. The '218 Patent's Improved Power Mesh Arrangement Method and Structure

The '218 patent discloses an improved power mesh arrangement method and related structure to easily complete the design of the power mesh of an integrated circuit receiving multiple voltages. EX1001, 2:33-41. EX2002, ¶¶62-63.

The '218 patent's arrangement method and structure includes a “global power mesh” “to provide the power needed by the first power domain and the second power domain separately.” EX1001, 7:63-66. The global power mesh uses discrete wiring paths for each power needed for the first and second power domains and the ground. *Id.*, 4:31-38, Fig. 4; EX2002, ¶64.

For example, as illustrated below, the global power mesh includes power wires 401 (red) for distributing a first voltage, V_{DD1} , to a first power domain. EX1001, 4:31-38; EX2002, ¶65.

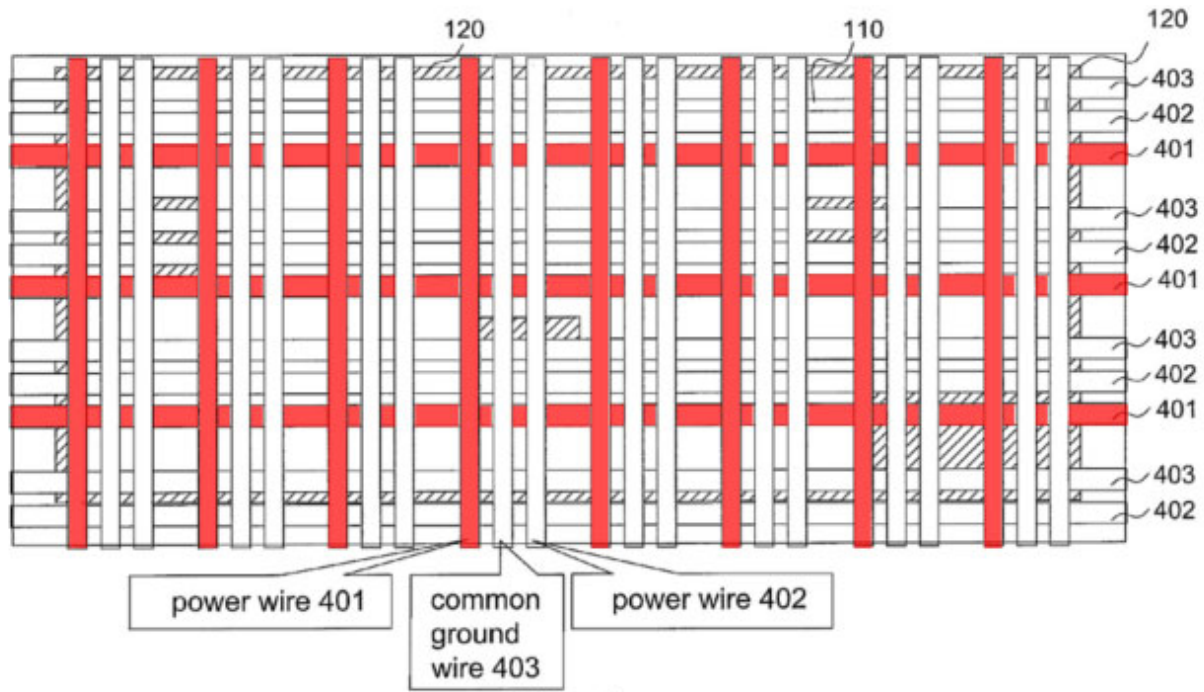
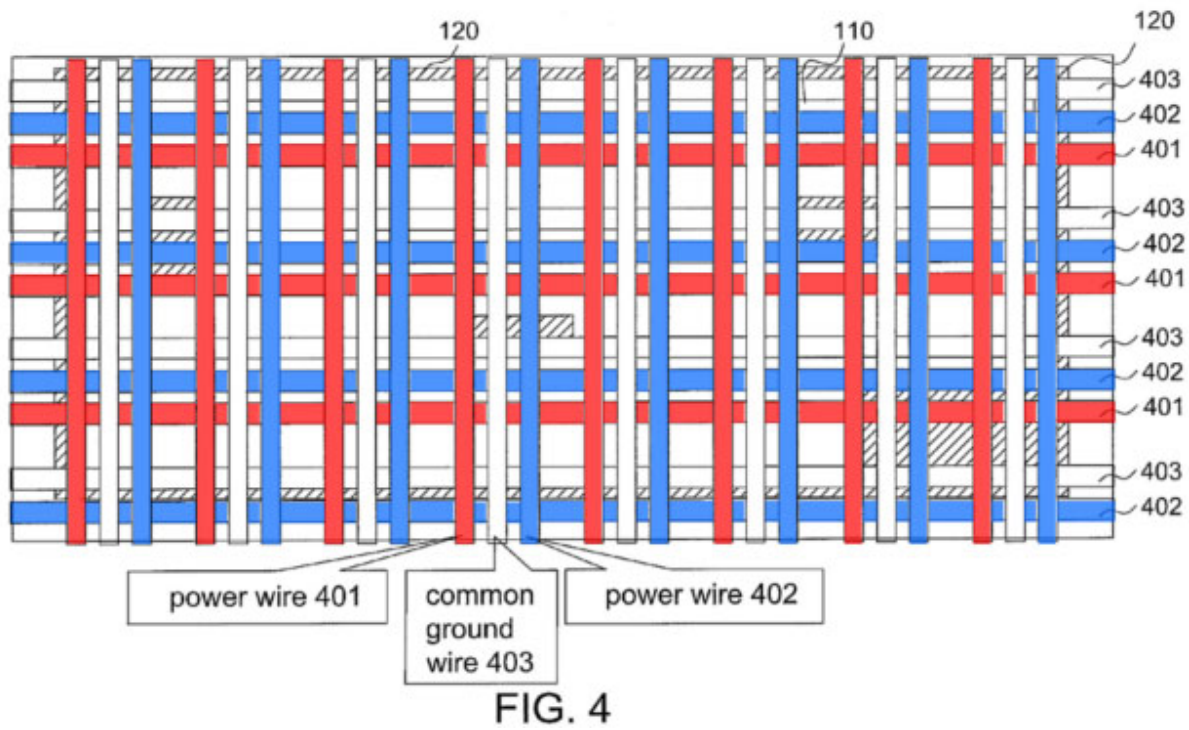


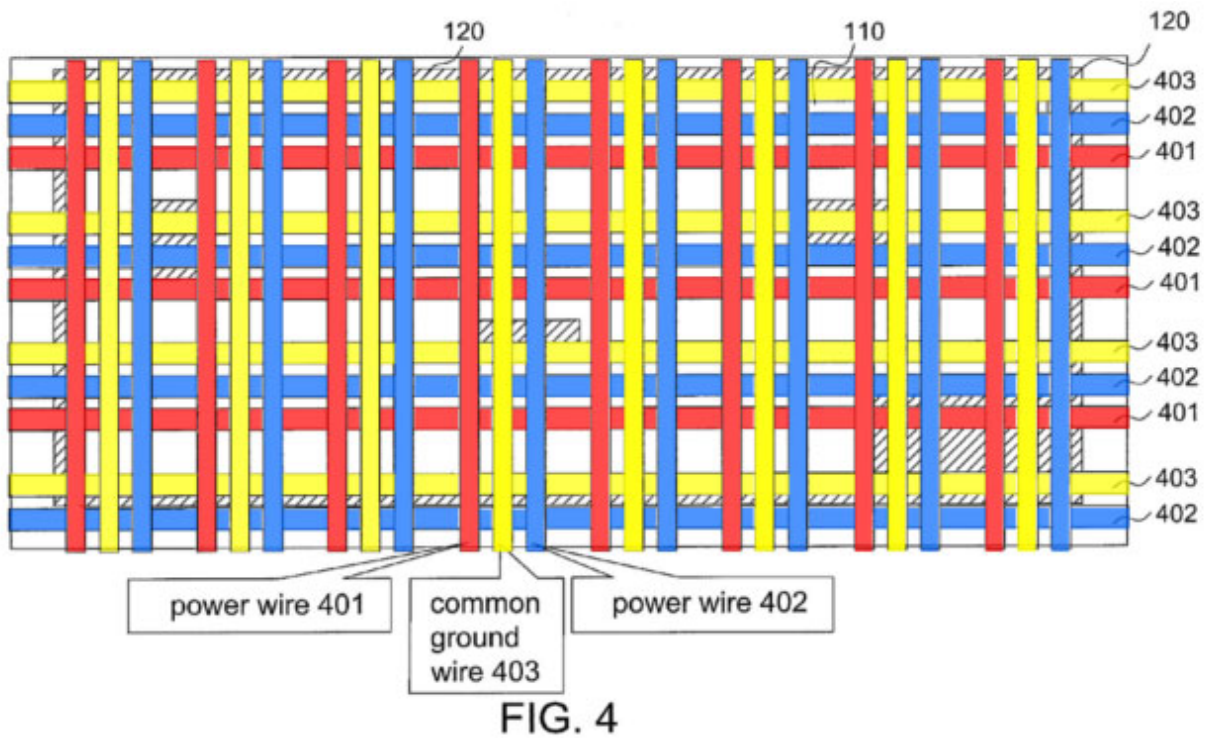
FIG. 4

The global power mesh also includes power wires 402 (blue) for distributing a second voltage, V_{DD2} , to the second power domain. EX1001, 4:31-38; EX2002, ¶66.



Further, the global power mesh includes ground wires 403 (yellow) for supplying a third ground voltage, V_{GND} , to the power domains as shown below.

EX2002, ¶67.



The wires of the global power mesh couple through a via to wires in two partial local power meshes to reach the power domains below. A given partial local power mesh comprises a power wire 311 (red) and ground wire 312 (yellow). A second partial local power mesh comprises power wire 321 (blue) and ground wire 322 (yellow). EX2002, ¶68.

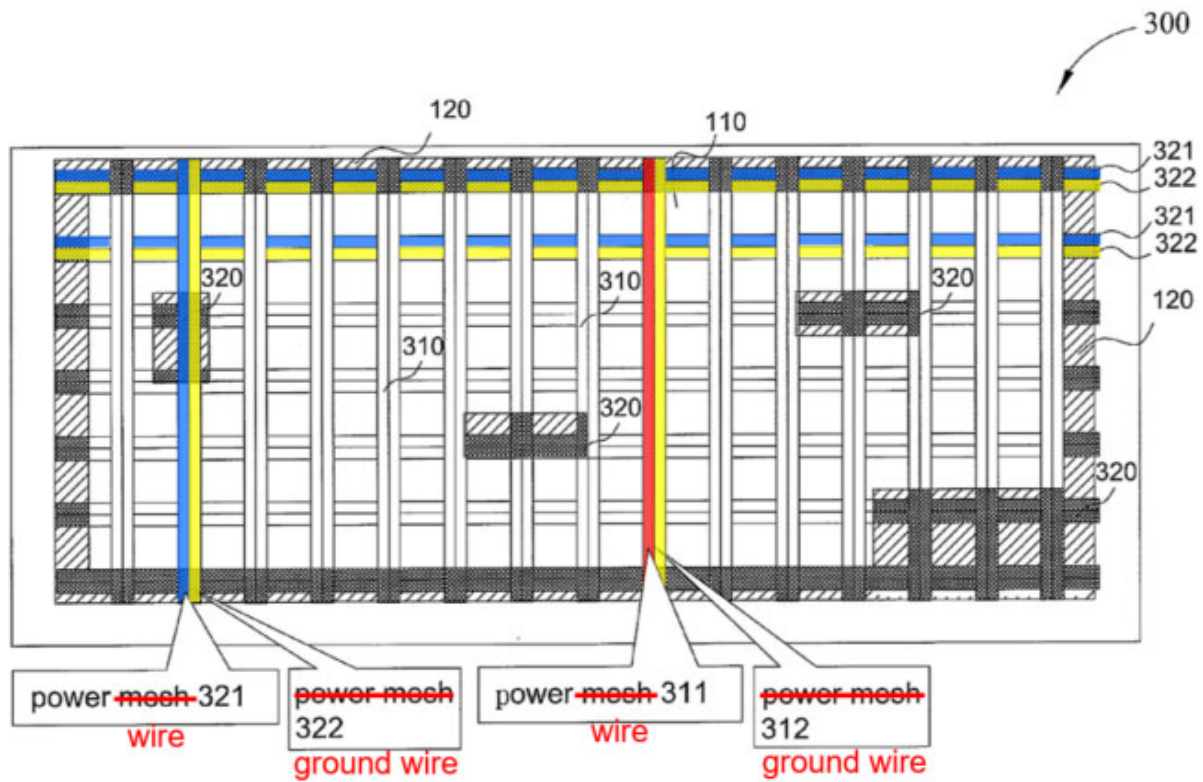
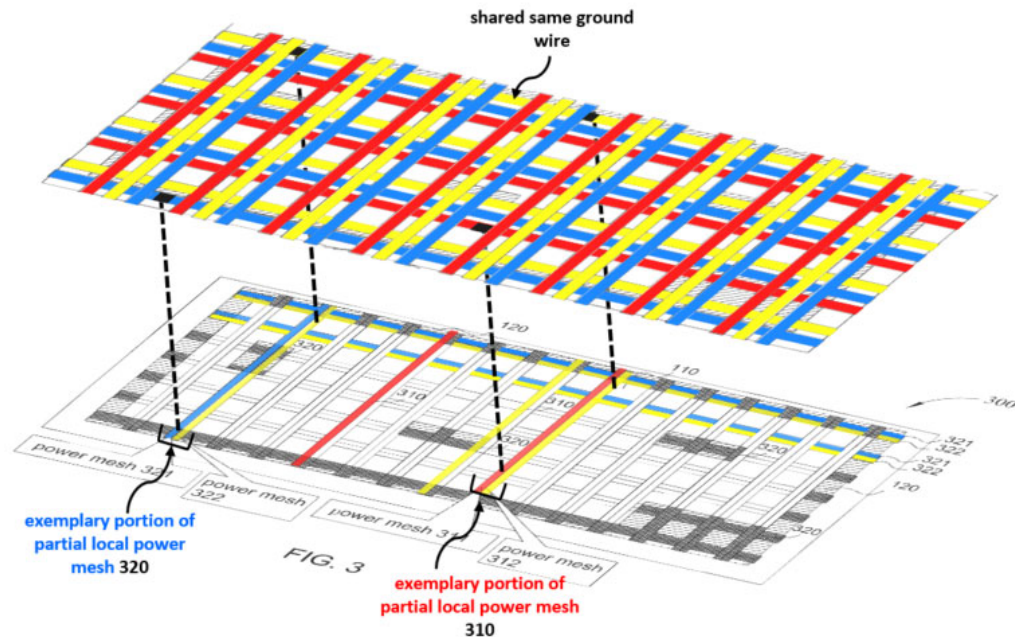


FIG. 3

The global power mesh may include “*one* common ground wire” that is used to supply the ground potential to both of the partial local power meshes. EX1001, 4:31-38, Fig. 4; EX2002, ¶69. This routing structure is illustrated below with V_{GND} shown in yellow, V_{DD1} shown in red, V_{DD2} shown in blue, and vias connecting the wires of different metal layers depicted as black dashed lines.



In this routing structure, when the partial local power meshes 310 and 320 are connected to each of the power domains, the external powers V_{DD1} and V_{DD2} are inputted into the chip circuitry. EX1001, 5:21-29; EX2002, ¶¶69-70.

III. CLAIM CONSTRUCTION

A. “Power Domain”

Realtek contends that the plain and ordinary meaning of “power domain” is a **“portion of the integrated circuit that has a different power requirement from the power requirements of another portion of the integrated circuit.”** EX2002, ¶¶71-72. Dr. Subramanian agrees with this construction and applied it in his declaration. EX2005, 13:17-17:7.

The term “power domain” was previously construed as a “portion of an

integrated circuit whose elements have the same power requirement.” EX2007, 105. This construction fails to recognize that in the context of the ’218 patent, the power domains are different. EX2010, 5. This error, along with a conflation of the terms “first” and “second” power domains, discussed further below, led the ALJ to err in ITC investigation 337-TA-1350, and Realtek is seeking Commission review of the errors. EX2009, 57-64.

B. “First Power Domain”/ “Second Power Domain”

Claim 12[a]-12[b] recite that the first and second partial local power meshes must correspond to the location of the first and second power domains. Realtek contends that a POSITA would understand that **“first power domain” must be different from the “second power domain.”** EX2002, ¶¶73-74. Dr. Subramanian agrees with this construction and applied it in his declaration. EX2005, 20:17-27:18. As Dr. Subramanian testified, two circuit blocks that are driven by the same power supply and have the same power requirements at all points in time, are part of the same power domain. EX2005, 26:13-27:4.

At the ITC, the ALJ erroneously concluded without any proper claim construction analysis that the *first* and *second* power domains may have the same “power requirements.” EX2007, 130-31. Realtek is appealing this error to the Commission. EX2009, 57-62.

The intrinsic and extrinsic evidence shows that the first and second power

domains are different. First, the claims require a “first power domain” and “second power domain” to differentiate between two different power domains. By indicating that there is a first and second power domain, the claim requires that the first and second power domain must have different power requirements. EX2002, ¶74. *Gillette Co. v. Energizer Holdings, Inc.*, 405 F.3d 1367, 1373 (Fed. Cir. 2005) (holding that “first, second, and third” distinguish different claim elements). If all portions of the chip have the same power requirements, then the chip has a single power domain. A single power domain cannot satisfy the “first” and “second” power domain requirement without rendering those terms meaningless.

The specification also makes clear that the '218 patent invented “a power mesh arrangement method utilized in an integrated circuit having **multiple power domains**.” EX1001, Abstract (emphasis added); *id.*, 1:13-33 (describing some portion of the circuitry that could operate at the “normal operating voltage” and also enter “sleeping mode” while other portions remain at “normal operating voltage”). The entire disclosure of the patent, including the examples and figures, involve providing two powers, V_{DD1} and V_{DD2} , to two different portions of chip circuitry. EX1001, 1:12-43, 3:6-64, 4:31-45, 6:16-24, Abstract, 1:57-59, 2:1-3, 2:8-13, 2:20-28, 4:25-38, 5:10-29, claims 1-20, Figs 1-6; EX2002, ¶75. In practice, part of the range of voltages associated with each power may happen to have the same numerical value at some point in time, but the point of the invention is that, since

they are distinct powers carried by separate paths from separate sources (*e.g.*, V_{DD1} and V_{DD2}), they do not have to. EX2002, ¶75.

Finally, the extrinsic evidence also supports a finding that the first and second power domain are different. Both experts agree that the first and second power domains are different. EX2005, 20:17-27:18; EX2002, ¶73.

C. “Having its position corresponding to”

The terms “a first partial local power mesh having its position corresponding to the position of a first power domain” and “a second partial local power mesh having its position corresponding to the position of a second power domain” were previously construed to **“require only that the partial mesh overlap to some degree with its respective domain when viewed from above.”** EX2007, 94 (emphasis added); EX2002, ¶¶76-78. Realtek proposes this construction for the purposes of this proceeding. Dr. Subramanian applies a narrower view, but contends that a construction that permits some overlap would also fall within the scope of the construction of the term that he used. EX2005, 60:22-62:23.

D. “Power Mesh”

The term “power mesh” has previously been construed as **“a network of intersecting wires capable of distributing power.”** EX2007, 91 (emphasis added). Realtek proposes that this construction should apply for the purposes of this

proceeding. Dr. Subramanian agrees with this construction and applied it in his declaration. EX2005, 36:2-37:19; EX2002, ¶79.

E. “Global Power Mesh”

The term “global power mesh” has previously been construed as “**power mesh capable of distributing power to multiple power domains.**” EX2008, 25 (emphasis added); EX2002, ¶80. Realtek proposes that this construction should apply. Dr. Subramanian agrees with this construction and applied it in his declaration. EX2005, 22:16-34:9; EX2002, ¶80.

F. “Local Power Mesh”

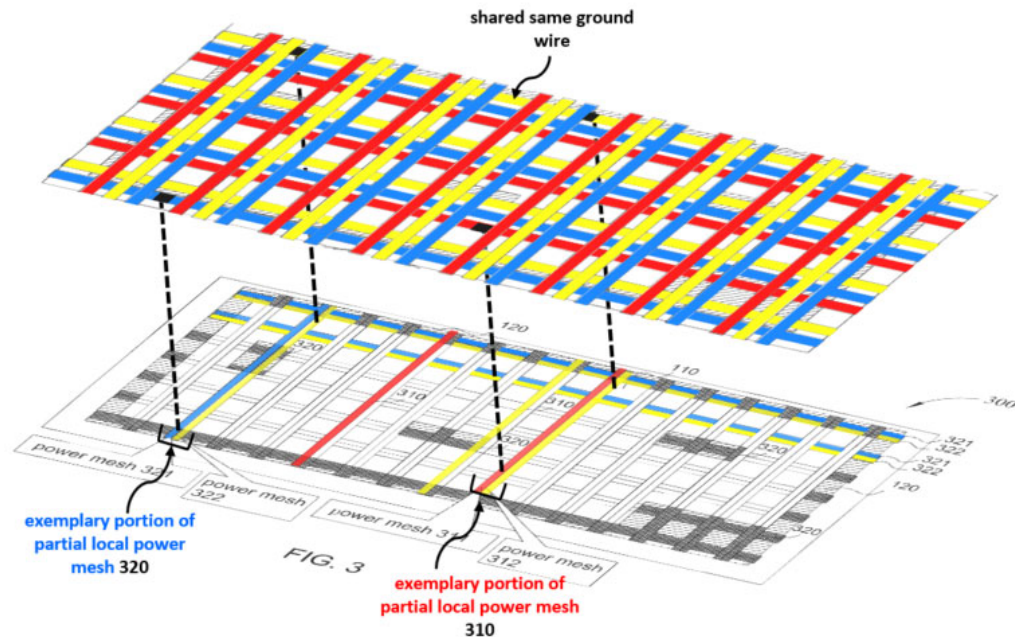
The first local power mesh has previously been found to refer to the first partial local power mesh and the second local power mesh has previously been found to refer to the second partial local power mesh. EX2007, 105. Realtek proposes this construction should apply, which appears undisputed. Petition, 15.

G. “To provide the power needed by the first power domain and the second domain” (Claims 1 and 12)

“To provide the power needed” was previously construed to mean “**to provide the non-zero levels of power needed by the first power domain and second power domain.**” EX2007, 99 (emphasis added). This is the proper construction. A POSITA would understand that the phrase “to provide the power needed” requires some power to be provided. EX2002, ¶¶81-86.

The claims recite “to provide” which requires supplying or making power available. *Timeline, Inc. v. Proclarity Corp.*, No. C05-1013JLR, 2007 WL 321387, at *4 (W.D. Wash. 2007) (providing definition of “provide” as including “to supply or make available (something wanted or needed)”); EX2011 (definition of “provide”). If no power is provided, then the term “to provide” is rendered meaningless because the opposite of what the claim recites would be within the scope. *Wasica Fin. GmbH v. Continental Auto. Sys., Inc.*, 853 F.3d 1272, 1289 n. 10 (Fed. Cir. 2017) (“It is highly disfavored to construe terms in a way that renders them void, meaningless, or superfluous.”); *In re Power Integrations*, 884 F.3d 1370, 1376 (Fed. Cir. 2018) (citing *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 950–51 (Fed. Cir. 2006) (refusing to construe claims in a way that renders other claim limitations meaningless)). The claim does ***not*** recite “to provide the power ***if*** needed” or to “not provide power.” Had the applicants intended this meaning, they would have written the claim differently. EX2002, ¶82.

The intrinsic record further supports that the invention relates to providing ***non-zero*** levels of power (*e.g.*, actually providing power). The global power mesh of the ’218 patent has a wiring structure that includes two power wires to supply the ***working voltages*** V_{DD1} and V_{DD2} needed by the local power meshes and the power domains as illustrated below. EX2002, ¶¶83-85.



In all described embodiments, including even during “sleep” mode, power is actually provided to the circuitry for it to operate. For example, the patent describes a “sleep” mode of operation, in which a “lower voltage” is provided for “maintaining the sleeping mode operation.” EX1001, 1:18-33. There is simply no mechanism contemplated in the patent for the power routing structure to turn the power off or not provide power. EX2002, ¶84.

Petitioner’s apparent construction is that “power needed” can be zero. EX2005, 86:23-88:20. But that argument fails to account for the “to provide” language of the patent claim. If “power needed” is zero, then there is nothing “to provide” and the claim is not met. Further, under Petitioner’s view, the limitation is met even if the circuitry is idle. This renders the term meaningless and is untenable.

EX2002, ¶86. Petitioner’s attempt to read the claims in a manner that is inconsistent with the plain language of the claims and the specification is therefore unreasonably broad and improper. *Amgen Inc. v. Vidal*, No. 2019-2171, 2022 WL 1112817, at *3 (Fed. Cir. Apr. 14, 2022).

H. “Separately” (Claim 12)

Claim 12 recites “a global power mesh . . . to provide the power needed by the first power domain and the second domain separately.” The term “separately” in this context was properly construed to mean “**through separate electrical paths.**” EX2007, 102 (emphasis added); *see also* EX2002, ¶¶87-92; EX2005, 62:24-64:18 (explaining that the term requires that there are “separate paths”). This is the construction that should apply here.

There is still an apparent dispute remaining, however, which is whether the *global power mesh* must have separate electrical paths. Realtek contends that the **global power mesh itself must provide power through separate electrical paths.**

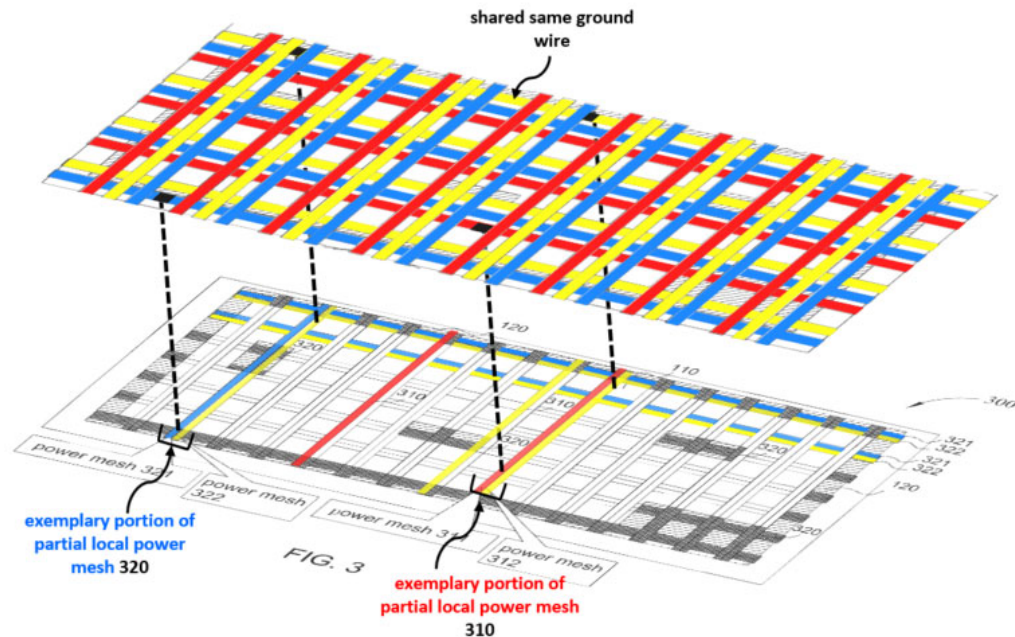
The claim language confirms that it does. The claim itself states:

[G]lobal power mesh, coupling to the first local power mesh and the second local power mesh, **to provide the power** needed by the first power domain and the second domain **separately**[.]

EX1001, cl. 12[c] (emphasis added). The claim limitation offsets the “coupling” limitation by commas indicating that it is a separate phrase from the rest of the limitation “global power mesh . . . to provide the power needed. . . .” *See, e.g., Nobel*

Biocare USA, LLC v. Materialise, N.V., No. SACV0700898CJCMLGX, 2009 WL 10670533, at *5 (C.D. Cal. Apr. 15, 2009) (finding clause offset by comma indicates that it is a separate phrase). The commas make it clear that “separately” modifies “provide,” and cannot be read to modify “coupling.” EX2015 (nonrestrictive clauses are separated by commas). A POSITA would understand that the global power mesh (not the coupling) provides the power separately, *i.e.*, by separate paths. EX2002, ¶88; *Credle v. Bond*, 25 F.3d 1566, 1571-72 (Fed. Cir. 1994) (relying on the placement of commas in construing claim language).

The remainder of the intrinsic evidence is consistent with the global power mesh having separate electrical paths. EX2002, ¶¶89-90. The embodiments, for example, discuss the distinct power wires of the global power mesh that allow power to be provided separately. *Id.*; EX1001, 4:31-36, Fig. 4, 5:14-17. Thus, a POSITA would understand the global power mesh “provide[s]” power “separately” through its discrete wiring structures. EX2002, ¶¶89-90. An example is illustrated below. There is no other mechanism contemplated for providing the power separately in the patent.



Petitioner’s apparent interpretation that separate connections from the global power mesh provides the power separately cannot be correct. **First**, it misunderstands the grammar of limitation 12[c] discussed above, which invites reversible error. See *TriMed, Inc. v. Stryker Corp.*, 514 F.3d 1256, 1258 (Fed. Cir. 2008) (“Because the district court construed the relevant claim language incorrectly, we reverse.”). **Second**, Petitioner’s apparent construction rewrites the claims to state “separately coupling.” Had the patentee intended this meaning, it would have said so. EX2002, ¶91.

Third, Petitioner’s construction ignores the specification which explains the power needed by the first and second power domain is provided “separately” by the wires in the global power mesh. EX2002, ¶92; EX1001, 5:10-20, 6:8-24, 4:25-40,

3:41-64, 4:43-45. Petitioner’s construction is inconsistent with the intrinsic record and should be rejected.

During the ITC hearing, the ALJ construed the term “separately” to require a separate electrical path. EX2007, 102. Yet the ALJ failed to apply his construction in the context of Jiang. EX2009, 69-74. This was improper and led to an erroneous conclusion concerning obviousness. Realtek is appealing this error to the Commission. *Id.*

I. “Same ground wire” (Claims 9, 18, 20)

The claim term “same ground wire” should be construed as meaning a “**single ground wire.**” EX2002, ¶¶93-102. By way of example, claim 18 recites; “wherein the first local ground wire and the second local ground wire *share the same wire* of the global power mesh.”¹

The parties dispute whether the “same ground wire” must be a single wire with Petitioner contending that a mesh of ground wires or all the ground wires of the global power mesh satisfies the claim. Pet., 42-43, 70. Petitioner is incorrect. A POSITA would understand from the intrinsic evidence that the proper construction

¹ The first local ground wire in a ground wire in the first partial local power mesh and the second local ground wire is a ground wire in the second partial local power mesh. EX1001, cls. 7-8, 16-17, 20.

requires a single ground wire, rather than a collection of wires. EX2002, ¶95.

First, the claim language itself supports a single wire construction. If there is not a single wire, then the wire is not the “same”; it would be a different wire. EX2002, ¶96; EX2011, 3 (definition of “same”).

Second, the specification confirms that “same ground wire” is a single wire. The specification explains that there can be “**one** common ground wire 403” of the global power mesh. *Id.*, 4:31-34 (emphasis added); *see also id.*, 5:17-20, 5:39-44, 6:37-40, Fig. 4. Thus, the specification contemplates that the global power mesh may contain one single ground wire that provides the ground potential to the power domains. EX2002, ¶97.

Claims 9, 18, and 20 also use the term “share.” Dr. Subramanian, during his deposition agreed that share requires a 2:1 relationship. EX2005, 232:9-233:8. This confirms that the “same ground wire” of the global power mesh must be a single wire so that it can be shared by the first local and second local ground wires (in a 2:1 relationship). EX2002, ¶98.

Petitioner’s position that a “same ground wire” can be a mesh of ground wires cannot be correct. First, the intrinsic record is clear that a mesh is different from a “wire.” For example, the claims use the terms “wire” and “mesh” separately and makes clear they are different by claiming that “meshes” comprise “wires.” EX2002, ¶99; EX1001, cl. 15 (“The power routing structure according to claim 12, wherein

the global power mesh comprises: at least one ground wire; at least one first power wire that provides the power needed by the first power domain; and at least one second power wire that provides the power needed by the second power domain.”). “[D]ifferent claim terms are presumed to have different meanings.” *Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379, 1382 (Fed. Cir. 2008).

Other claims confirm this conclusion. Claim 15 recites “at least one ground wire.” *See, e.g.*, EX1001, cl. 15. Claim 18, depending on claim 15, must have a different, narrower scope, so the “same ground wire” cannot be multiple wires. EX2002, ¶100; *see, e.g., Alcon Research, Ltd. v. Apotex Inc.*, 687 F.3d 1362, 1367 (Fed. Cir. 2012) (“[D]ependent claim cannot be broader than the claim from which it depends[.]”).

Petitioner’s apparent construction would also include “vias” in the meaning of the term “same ground wire” because vias connect the wires between the two layers of the ground mesh. But the intrinsic record is also clear that a “via” connects wires and is not itself a wire. EX2002, ¶101; EX1001, 4:16-18.

Petitioner’s construction is so overbroad that it renders meaningless the requirement that the “first local ground wire” and “second local ground wire” share the ground wire of the global power mesh because it would rewrite the claims to allow the ground wires of the ***global power mesh*** (not the partial local power meshes) to share “the same ground wire of the global mesh.” Such a construction

cannot be correct. EX2002, ¶102.

At the ITC, the ALJ did not perform a proper claim construction analysis under *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005), improperly stated Realtek took a position on infringement that it did not take, and misconstrued the claim. Realtek is appealing the ALJ's error at the Commission. EX2009.

J. “Global power mesh, coupling to the first local power mesh and the second local power mesh” (claim 12[C])

Claim 12 recites a specific wiring structure:

- “a global power mesh, coupling to the first local power mesh and the second local power mesh,”
- “a first partial local power mesh...coupling to the first power domain,”
and
- “a second partial local power mesh...coupling to the second power domain.”

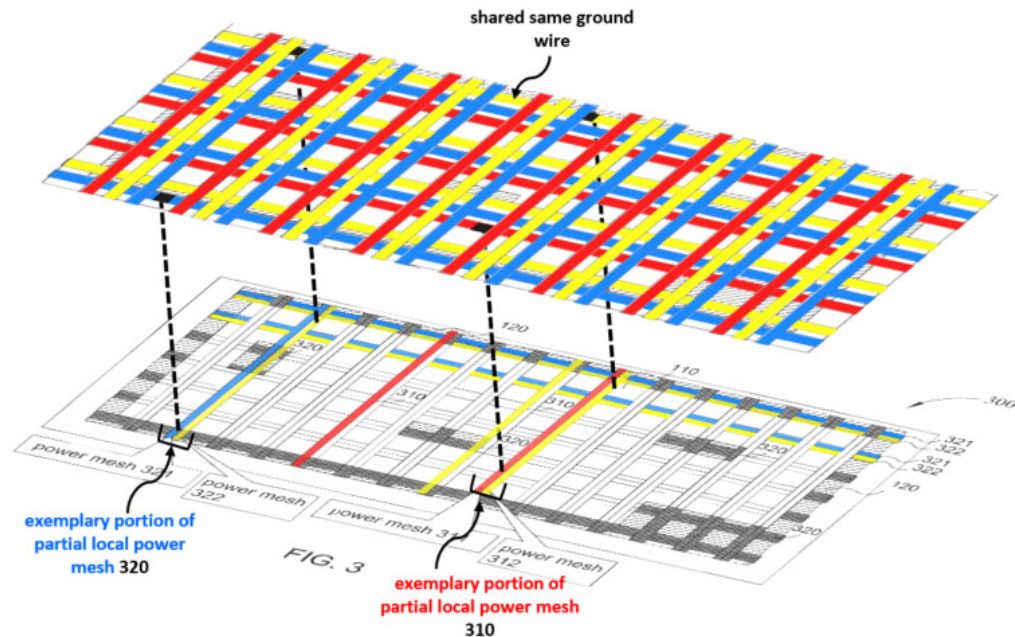
A POSITA would understand that these claim limitations, together, **require a connection from the global power mesh to the first and second partial local power meshes, and a subsequent connection to the first and second power domains.** EX2002, ¶¶103-109.

Claims 12-18 recite a specific power wiring structure in which a global power mesh provides power and ground ***through*** two partial local power meshes down to

the first and second power domains. In contrast, claim 19 recites a different structure: the global power mesh couples to the power domains without any intermediary partial local power meshes. EX1001, cl.19 (“coupling the first power wire [of a global power mesh] . . . to the first power domain.”).

Based on the differences between the coupling claimed in claims 12 and 19, a POSITA would understand that the coupling relationship between the global power mesh and the power domains is different in claim 12 than it is in claim 19. EX2002, ¶¶104-105. “[D]ifferent claim terms are presumed to have different meanings.” *Helmsderfer*, 527 F.3d at 1382.

This understanding is supported by the intrinsic record. For example, the specification explains that the global power mesh coupling through the partial local power meshes to the power domains. EX1001, 4:31-45, 3:56-64. This is the structure claimed by claim 12. This embodiment is further illustrated in the figures:



See, e.g., CVI/Beta Ventures, Inc. v. Tura LP, 112 F.3d 1146, 1153 (Fed. Cir. 1997) (patent drawings are highly relevant to claim construction); EX2002, ¶¶106-107.

In contrast, another embodiment explains that the local power mesh can be omitted in the invention and “[o]nly the global power mesh 400 is used to conduct the external power into the chip.” EX1001, 6:9-22. This is the embodiment claimed in claim 19. EX2002, ¶108.

Petitioner’s construction of the limitation in element 12[c] permits the global power mesh to connect to the power domain without an intervening connection to the first or second partial local power mesh. But a connection between the power wires of the global power mesh and the power domain is separately claimed in claim 19. As a result, the “coupling” limitation requires a path from the global power mesh

to the partial local power meshes and then to the power domains. Claim 12 and 19 have different scopes because the claims use different phrases to specify the coupling required. EX2002, ¶109; *see Anderson Corp. v. Fiber Composites, LLC*, 474 F.3d 1361, 1370 (Fed. Cir. 2007); *In re Rembrandt Techs., LP*, 496 F. App'x 36, 42-46 (Fed. Cir. 2012).

K. “Wherein the first partial local power mesh comprises: at least one first local ground wire that couples to the ground wire of the global power mesh” (claims 7, 16)

Claims 7 and 16 recite “wherein the first partial local power mesh comprises: at least one first local ground wire that couples to the ground wire of the global power mesh.” A POSITA would understand this limitation to **require ground wiring in which the ground of the global power mesh connects to a ground wire in the first partial local power mesh** (and only then provides ground to the power domain). EX1001, 3:56-60; EX2002, ¶¶110-115. In contrast, claim 19 recites coupling between the global power mesh and the first power domain without an intervening partial local power mesh. A POSITA would understand that these different limitations confer a different coupling relationship. EX2002, ¶¶114-115.

The specification supports this interpretation. With respect to the embodiment of Figure 6, the patent explains that the connection between the global power mesh and the power domains occurs through the grounds of the partial local power mesh. EX2002, ¶111; EX1001, 5:8-10; *see also* EX1001, 5:21-29 (confirming that the

global power mesh provides power to the chip circuitry by connecting to wires in the partial local power meshes).

Petitioner's expert has admitted that Li does not disclose a ground wire in the global power mesh connecting to an intervening local power grid before reaching the power domain. EX2005, 174:16-175:22. As a result, Petitioner's expert tries to construe the "coupling" claim element 16 as permitting "coupl[ing]" through the power domain. This construction cannot be correct because it reads 16 to have the same scope as claim 19, which claims "coupling . . . the ground wire of the global mesh to the first power domain." EX1001, cl. 19. Indeed, that appears to be Petitioner's position. Pet., 51 (applying construction of claims 16-18 to claim limitations 19[c]-[d]), 76-77 (same). These separate claims must have different meanings, and "coupl[ing]" requires a connection independent of the global power mesh's and a partial local power mesh's connection to a separately claimed element—the power domain. EX2002, ¶¶112-115; *see Anderson*, 474 F.3d at 1370; *In re Rembrandt Techs., LP*, 496 F. App'x at 42-46 .

In addition, Petitioner's construction has no intrinsic support. There is no disclosure that a coupling to the partial local power can occur through the power domain. A POSITA would understand that such a structure is contrary to the invention, which deliberately routes power and ground from the global power mesh,

to the partial local power meshes, and then to the power domains. Connecting through the power domain would use excess wiring for no reason. EX2002, ¶116.

IV. LEVEL OF SKILL IN THE ART

For the purposes of this IPR, Realtek does not contest the level of skill in the art set forth in the Petition. EX2002, ¶¶40-43.

V. PETITIONER CANNOT MEET ITS BURDEN TO SHOW OBVIOUSNESS

In making a determination of obviousness, it is not enough that each claimed limitation be found in one or more prior art references. *In re Kotzab*, 217 F.3d 1365, 1371 (Fed. Cir. 2000) (explaining that obviousness “cannot be predicated on the mere identification . . . of individual components of claimed limitations”). Rather, Petitioner must explain in detail how *specific references* could be combined or modified, which combinations of elements in *specific references* would yield a predictable result, and how any *specific combination* or modification would operate or read on the asserted claims. *ActiveVideo Networks, Inc. v. Verizon Commc’ns, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012). Petitioner has not and cannot meet its burden.

To the contrary, Petitioner’s obviousness rationale is generic. Neither Petitioner nor its expert address how or why any *specific references* could or would be combined, which combinations in *specific references* would yield a predictable

result, or how any *specific combination* of elements would operate or read on the asserted claims as required by the claims. Instead, the analysis focuses on generic benefits or functions of the purported modification or combination without ever identifying even a need or desirability for a modification in the first place. Pet., 24, 26-27, 31-33, 40-41, 45-46, 56, 65. This approach is fraught with hindsight bias because it fails to explain why a person of ordinary skill in the art would have combined elements from *specific* references in the way the claimed invention does.

Petitioner's expert testimony here also fails to provide the factual predicates required under cases like *Active Video*. *ActiveVideo*, 694 F.3d at 1327 (any expert testimony must explain in detail how specific references could be combined, which combinations of elements in specific references would yield a predictable result, and how any specific combination would operate or read on the asserted claims). Dr. Subramanian's declaration includes numerous conclusory assertions that do not have any factual support and should be given no weight.

For example, Dr. Subramanian asserts predictability and/or "reasonable expectation of success" (EX1003, ¶¶85, 93, 102, 109, 114, 73, 83, 108, 117; Pet., 23, 27, 33, 37, 40, 41, 45, 46, 65) without explanation and without any factual support for why the specific combination or modification would have been predictable or reasonably expected to meet the limitations of the claimed invention. *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367 (Fed. Cir.

2016). Further, integrated circuits are highly complex and unpredictable. EX2002, ¶55; EX2005, 139:8-146:5; One change in the system may require other changes, testing, and experimentation. EX2002, ¶55; EX2005, 139:8-146:5. As a result, such conclusory rationale in unpredictable fields such as this one, should be rejected. *See Samsung Elecs. Co. v. Elm 3DS Innovations, LLC*, IPR2016-00386, 387, 388, 2017 WL 2713468, at *18-*19, *22-23, *27-28 (PTAB June 23, 2017).

Dr. Subramanian also asserts “routine” application of purportedly known functionality, techniques, or elements (EX1003, ¶¶ 85, 93, 102, 109, 115, 173; Pet., 23, 27, 33, 37, 41, 65) without the factual basis needed for such conclusions. Dr. Subramanian does not explain any “routine” methods that are used to make any modification he identifies. Conclusory testimony should be given no weight. *See, e.g., 37 C.F.R. § 42.65(a); In re Lee*, 277 F.3d 1338, 1345 (Fed. Cir. 2002).

VI. THE PETITION FAILS TO DEMONSTRATE THAT THE CHALLENGED CLAIMS OF THE ’218 PATENT ARE OBVIOUS

A. Grounds 1 and 2: Jiang Alone or in Combination Fails to Disclose Each and Every Limitation Recited in Claims 12-18

Jiang alone or in combination does not teach or suggest the claimed invention. The invention uses a two layer global power mesh that includes separate wires to provide one power to a first power domain and another power to a second power domain separately. In contrast, Jiang concerns power gating, *i.e.*, shutting power off to macros, not “providing power to the first and second power domains.” As

discussed further below, Petitioner *fails* to show Jiang teaches or suggests: (1) macros B and C are “power domains,” (2) a global power mesh, coupling to the first and second partial local power meshes, to provide the power needed to the first and second power domain separately, (3) a two-layer global power mesh, or (4) the ground wiring claimed in the dependent claims. EX2002, ¶¶117-199.

1. Elements 12[a]-[b]: Jiang in view of Jiang2/Jiang3 does not teach or suggest a *first* and *second* power domain

Petitioner fails to establish that Jiang discloses a first and second power domain. Petitioner asserts that macro B is the first power domain and macro C is the second power domain. Pet., 17; *id.*, 18 (“[M]acro B (first power domain)”; *id.*, 20 (“[M]acro C (second power domain)”). But a POSITA would understand that macros B and C are the same power domains because they have the same power requirements; both macros B and C are powered together and power gated together at all times. EX2002, ¶¶121-124; EX1004, 2; *see also* §III.A-B.

Petitioner denies that the macros B and C are gated together and asserts that they are independently power gated. Pet., 22-23. But this is demonstrably false. Jiang repeatedly discloses only two power supply schemes: non-power gated and power-gated. EX1004, 2, 7, Table 1. If the power gates were not operating simultaneously, Jiang would necessarily discuss a third power gating scenario in which only one

macro was gated. *Id.* That is not disclosed, confirming a POSITA’s understanding that macros B and C are gated together. EX2002, ¶¶125-130.

Contrary to the Petition’s assertions that “Each of Jiang’s ‘macros’ is a power domain” (Pet., 18), a POSITA would understand macros to be simply collections of cells. EX2002, ¶¶131-132. Petitioner improperly equates macros with power domains by using extrinsic evidence—Jiang2 and Jiang3. This is improper because Jiang2 and Jiang3 disclose different systems, so their “macros” are not the same structures as those in Jiang. EX2002, ¶¶133-137. Further, Jiang2 and Jiang3, in using the term “power domain,” are not referring to the claimed power domains. EX2002, ¶138. The use of a claim term in the extrinsic record does not demonstrate that a reference teaches the recited structure. *See Seabed Geosolutions (US) Inc. v. Magseis FF LLC*, 8 F.4th 1285, 1287 (Fed. Cir. 2021).

Petitioner has failed to show that Jiang includes a first power domain and a second power domain as those terms are properly construed.

2. Element 12[c]: Jiang alone or in combination fails to teach or suggest element 12[c].

Petitioner misconstrues several limitations in element 12[c] in an attempt to read power-gating into the scope of the claims. *See* §§III.G-H, J. As discussed further below, Jiang is fundamentally different than the claimed invention because the global power mesh does not couple to the first partial local power mesh—it couples

to the sleep transistor in the power domain. This is a different power wiring structure.

Id. Jiang also fails to disclose a global power mesh “to provide the power needed by the first power domain and the second power domain separately.”

a. Jiang does not teach or suggest a global power mesh “coupling” to the first and second partial local power meshes

Petitioner cannot show that the L1 mesh in Jiang couples to the first and second partial local power meshes. To the contrary, the top layer mesh couples to the sleep transistor in the power domains. In the schematic of Figure 1(b), the sleep transistor is shown floating between L1 and L2, but a POSITA would understand that the sleep transistor is actually in the silicon with the rest of the transistors receiving power to perform their functions. EX2002, ¶¶141-142; EX1004, 1-2.

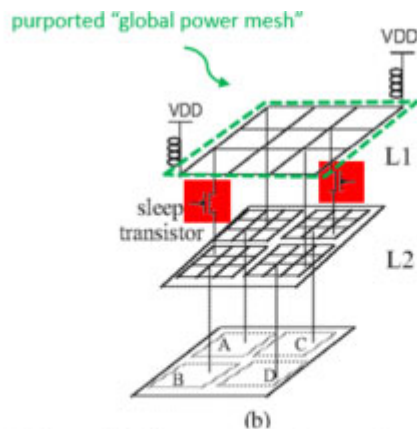


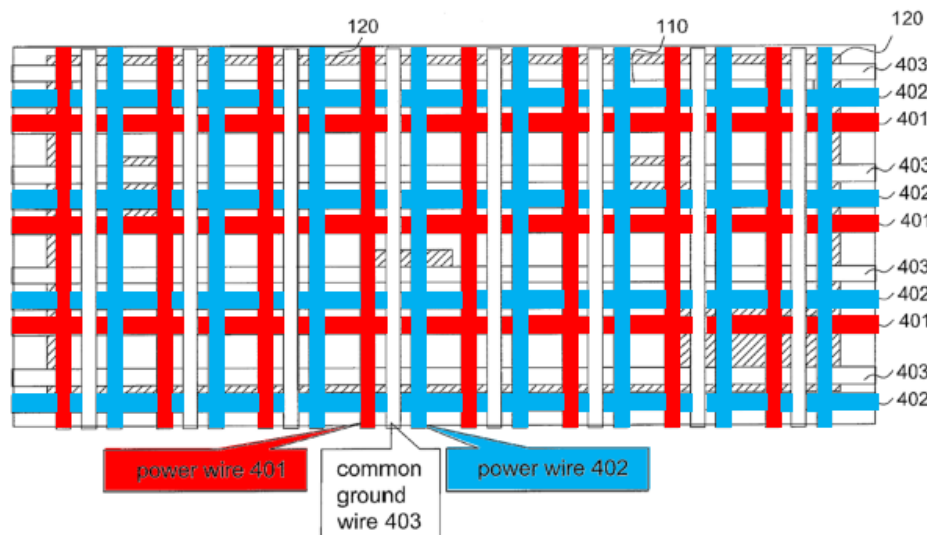
Figure 1. Power supply system (a) normal power supply system (b) power-gating system

As Dr. Souri explains, a POSITA would understand that the sleep transistor is part of the power domain. EX2002, ¶142; *see also* EX2005, 74:16-175:12.

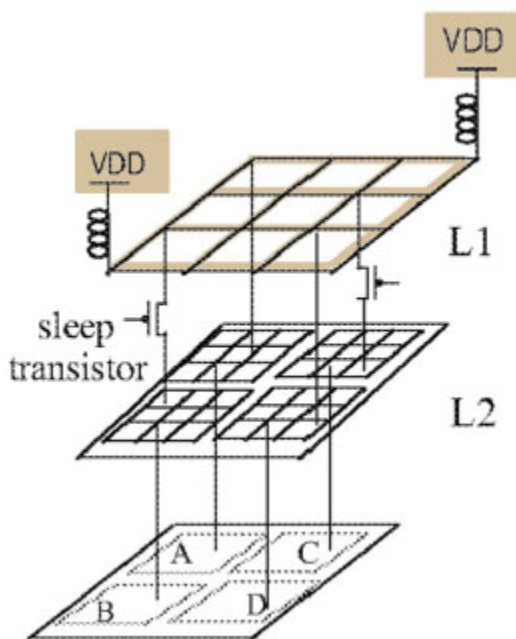
Claim 12 requires a specific routing structure—coupling between the global power mesh and the first partial local power mesh. *See* §III.J. But here, the global power mesh couples to the sleep transistor in the power domain without an intervening first partial local power mesh. EX2002, ¶143; Pet., 21 (“Jiang teaches that . . . ‘sleep transistors are used to connect the local mesh to the global mesh’”). As a result, element 12[c] is not taught or suggested by Jiang.

b. Jiang does not teach or suggest “providing the power needed by the first and second power domains separately”

Claim 12 recites that the global power mesh must “provide the power needed by the first and second power domain separately.” This requires a global power mesh to provide non-zero powers through separate electrical paths. *See* §III.H. An exemplary embodiment of the global power mesh of the ’218 patent is below:



Petitioner cannot show that this limitation is taught or disclosed by Jiang alone or in combination. Jiang's top layer "L1" mesh does not provide the non-zero powers needed by the first and second power domains through separate electrical paths. To the contrary, Jiang's "L1" mesh uses the same wires to provide the same power (V_{DD}) to both macros B and C. The paths of the global power mesh are not separate because the current can flow through any and all of the wires on L1 of Jiang. EX2002, ¶¶148-151.



Petitioner contends that element 12[c] is met by Jiang alone through individually controlled sleep transistors. Pet., 21-23; EX1003, ¶¶41-44. But as shown above, Jiang does **not** teach or suggest individually operable sleep transistors (or first or second power domains). See §VI.A.1.

Element 12[c] further requires that the global power mesh provide non-zero powers to both the first *and* second power domain. *See* §V.B.1. In Jiang, if macro B were gated on and macro C were gated off, the power needed would only be provided to macro B (the purported first power domain) *but not* macro C (the purported second power domain). This does not meet the limitation of claim 12[c] which requires providing power needed to the first *and* second power domains. The only time that occurs is when both gates allow power to flow, at which point the global power mesh is not providing the V_{DD} power “separately.” EX2002, ¶¶145-146.

At his deposition, Dr. Subramanian suggested that even when a power domain is gated off, the circuitry still receives some leakage power. EX2005, 82:21-88:13. But leakage power is not *power needed* as the claims require. When the macro is gated, it is “idle” and does not *need* power and, therefore, does not meet element 12[c]. EX2002, ¶147; EX1004, Abstract (“Power-gating is a technique for saving leakage power by shutting off the idle blocks.”).

c. It would not be obvious to modify Jiang’s sleep transistors to be independently operable

The Petition also asserts an alternative theory, that Jiang’s sleep transistors could be modified to be independently operable, without a basis to make such a modification. Pet., 23. Regardless, independently operable sleep transistors do not meet the claim limitations. *See* §VI.A.2.b. Independently operable sleep transistors

would provide power to the first *or* second purported power domains, not to the first *and* second power domain, as required by claim 12[c]. *Id.* When power is being provided to both macros, the global power mesh is providing the power through the same electrical path, not separately. *Id.*; EX2002, ¶153; *see also* Pet., 36 (showing first and second power wires in electrically connected path).

Petitioner asserts that Jiang could be modified to save power or provide more control. Pet., 23. But as Dr. Souri explains, a POSITA would understand that there is no reason to modify Jiang because macros B and C needed the *same* power at the same time and were idle at the same time, which is why they were switched on and off at the same time. *See* §VI.A.1. Because Jiang’s macros need the same power at the same time, there would be no reason to add additional complexity to Jiang’s system to control the power provided to each macro independently. EX2002, ¶¶154-156.

Petitioner’s arguments also fail because its rationale, that it “would have been a routine application of a known” functionality “with a reasonable expectation of success given its ubiquitous usage,” is conclusory and generic. *See* §V; *Daifuku Co., Ltd. v. Murata Machinery, Ltd.*, IPR2015-00084, 87, Paper 10 at 16 (PTAB May 4, 2015); *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). Petitioner fails to provide any motivation to show a POSITA *would* rather than *could* make the modification.

All Petitioner shows is that independently operable sleep transistors were known in the art, which is insufficient. *In re Kotzab*, 217 F.3d at 1371.

d. It would not be obvious to modify Jiang’s “L1” “global mesh”

Petitioner also contends that it would be obvious to modify Jiang’s top layer to supply independent voltages to the first and second power domains. Pet., 23-27. Petitioner’s analysis is incorrect and should be rejected.

First, Petitioner argues a POSITA would have known to use separate power supplies to save power. Pet., 23 (to “provide more granular control and help reduce power consumption,”), 26 (“to increase Jiang’s power savings”), 27 (to “further save power”). But Jiang already “achieve[d] 47% leakage power saving while maintaining the same performance.” EX1004, 1. Without evidence that there would be additional power savings, a POSITA would not be motivated to modify Jiang. EX2002, ¶¶158-161. For example, a POSITA would recognize that Jiang’s macros received the voltage they were designed to receive and providing a different voltage would not be beneficial. *Id.*

Further, if power were supplied when the macros did not need power (*i.e.*, being power gated), the independent voltage supplies Petitioner proposes would waste power, not save power, which is a further reason that a POSITA would not implement that change. *Id.*; Pet., 26-27 (citing EX1004, 1); *see, e.g., Kinetic*

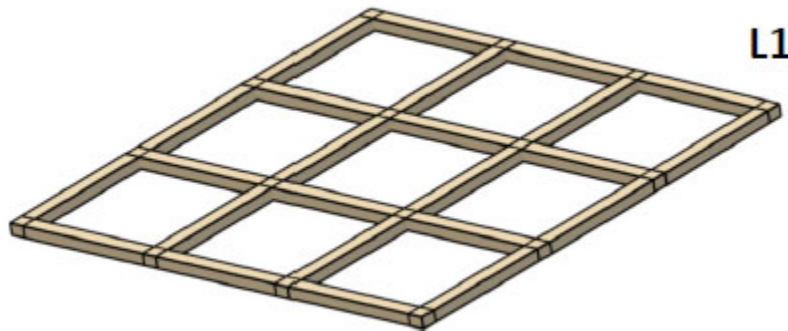
Concepts, Inc. v. Smith & Nephew, Inc., 688 F.3d 1342, 1369 (Fed. Cir. 2012) (reversing district court finding of obviousness, noting: “[b]ecause each device independently operates effectively, a person having ordinary skill in the art, who was merely seeking to create a better device to drain fluids from a wound, would have no reason to combine the features of both devices into a single device”). Finally, integrated circuits are complex, unpredictable, and space constrained. EX2002, ¶55. Adding anything additional to the chip is a complex process because other components must be moved or modified. *Id.* A POSITA would not add components without there being a benefit to doing so, which Petitioner has not identified. *Id.*

Further, Petitioner’s proposal to add multiple separate power supplies to Jiang would interfere with Jiang’s entire premise—to power gate its macros. Jiang’s macros needed one voltage, V_{DD} , and were power-gated in order to study the costs and benefits of power gating in the system. EX1004, 1 (“In this paper, we study and quantify the benefits and costs of the power-gating technique in terms of area and power”). A POSITA would not modify the power routing structure provided in Jiang to change its purpose, particularly when the change would also make it more complicated and require adding additional wiring and/or metal layers when not needed. EX2002, ¶¶158-161; *Medtronic, Inc. v. Teleflex Innovations S.a.r.l.*, 69 F.4th 1341, 1350 (Fed. Cir. 2023) (destruction of the premise of the reference counsels strongly against obviousness).

Petitioner also argues that “[a]pplying independent supply voltages to Jiang’s global power mesh would have been a routine application of a known feature to Jiang’s device with a reasonable expectation of success, given that it was “common practice[.]” Pet., 24, 27. But this is not the test—it is a generic and unsupported recitation that cannot meet Petitioner’s burden to show obviousness. *See* §V. There is simply no need for independent supply voltages in Jiang, and Petitioner has not provided any reason a POSITA **would** modify Jiang in the first place. EX2002, ¶162. All Petitioner has shown is that it was known in the art a chip could include two supply two voltages. This is not enough. *In re Kotzab*, 217 F.3d at 1371; *Kinetic Techs., Inc. v. Skyworks Solutions, Inc.*, IPR2014-00529, Paper 8 at 15 (PTAB Sept. 23, 2014); *ActiveVideo.*, 694 F.3d at 1327.

3. Elements 12[e]-[f]: Jiang alone or in combination fails to disclose a multi-layer global power mesh

Petitioner argues that Jiang discloses a two-layer global power mesh. Pet., 29-30. But Jiang Figure 1(b) discloses a single layer global mesh on “L1.”



In Jiang, only one layer is the most efficient use of metal layers. EX2002, ¶¶167-168. There's no reason to take up space in a semiconductor stack for two layers to distribute a single V_{DD} . *Id.*

Petitioner asserts that Figure 10 discloses that L1 is two metal layers. Pet., 29. But there is no factual support for this assertion. *See* EX1003, ¶27; 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”). Figure 10 is a separate embodiment of Jiang, related to the model in Figure 2 and does not change the disclosure of Figure 1(b). EX2002, ¶166. Petitioner would have needed to provide an obviousness analysis for modifying Figure 1 based on Figure 10 but did not, so its arguments fail. *In re Stepan Co.*, 868 F.3d 1342, 1346 n.1 (Fed. Cir. 2017).

Petitioner offers an obviousness analysis in which Jiang is modified by Li and/or Chiu. Pet., 31-33. But this combination fails for the same reasons discussed in 12[c]. See §VI.2.d.

Petitioner also asserts that there would be a motivation to prevent the global power mesh from shorting. Pet., 33. But shorting was not an issue in Jiang because the L1 “global mesh” in Jiang has only one voltage V_{DD} . A POSITA would understand that shorting is not a concern with the structure of Jiang and would not add an extra metal layer for no reason. EX2002, ¶¶170-171.

At his deposition, Dr. Subramanian asserted that there would be a concern with shorting signal wires. EX2005, 209:1-210:7. But Dr. Subramanian is simply speculating that signals would be routed on L1. Jiang Figure 1(b) does not teach or suggest that signal routing is on L1. EX2002, ¶173.

Dr. Subramanian offered other references in which he asserted that it was well-known that meshes can be two layers. Pet., 30-33. But just because an element was known, does not make it obvious to modify Jiang to include it. *Metalcraft of Mayville, Inc. v. The Toro Co.*, 848 F.3d 1358, 1367 (Fed. Cir. 2017). A POSITA would not add complexity and metal layers without an expected benefit. EX2002, ¶¶170-171.

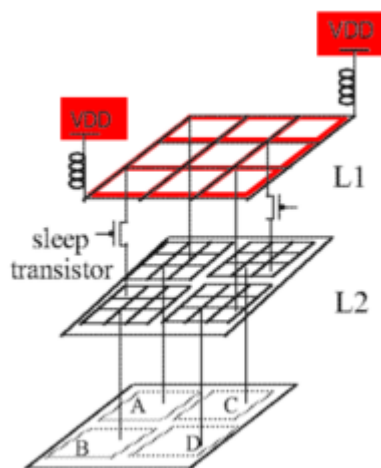
4. Claims 13-18: Jiang alone or in combination fails to disclose the ground routing structure claimed

Each dependent claim (13-18) is not obvious because Jiang alone or in combination does not teach or suggest the elements of claims from which they depend. *See Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1576 n.36 (Fed. Cir. 1987) (“Because [independent] claim 1 is not invalid, the presence of all its limitations in [dependent] claim 6 preserves the latter’s validity.”).

In addition, claims 15-18 require specific ground wiring that Jiang Figure 1(b) does not teach or suggest. As a result, claims 15-18 are not taught or suggested by Jiang alone or in combination. EX2002, ¶176.

a. Claim 15

Claim 15 recites, among other things, “wherein the global power mesh comprises: at least one ground wire.” Jiang Figure 1(b) does not teach or suggest any ground wires in the global power mesh; it only shows routing for one V_{DD} :



Petitioner argues that there is some inherent disclosure of a ground wire in the global power mesh. Pet., 36 (“To the extent not inherent”). But there is no inherent disclosure of a ground in the global power mesh because ground can be routed in other ways besides a ground in a global power mesh, such as through a via stack down to the substrate. EX1006, 2:61-63; EX2002, ¶178; EX2005, 132:9-11; 46:9-47:5. As a result, there is no inherency. *See, e.g., Endo Pharms. Sols., Inc. v. Custopharm Inc.*, 894 F.3d 1374, 1381 (Fed. Cir. 2018); *Crown Operations Int’l, Ltd. v. Solutia Inc.*, 289 F.3d 1367, 1377 (Fed. Cir. 2002).

Petitioner also asserts it would be obvious to provide grounds through a global power mesh based on Li and Chiu. Pet., 36-37. But Jiang itself teaches away from grounding in the global power mesh by showing grounding in the substrate in Figure 2. EX2002, ¶179. Although this is a separate embodiment, the reference must be considered for all that it teaches. *Beckman Instruments, Inc. v. LKB Produkter AB*, 892 F.2d 1547, 1551 (Fed. Cir. 1989) (a reference “is prior art for all that it teaches”).

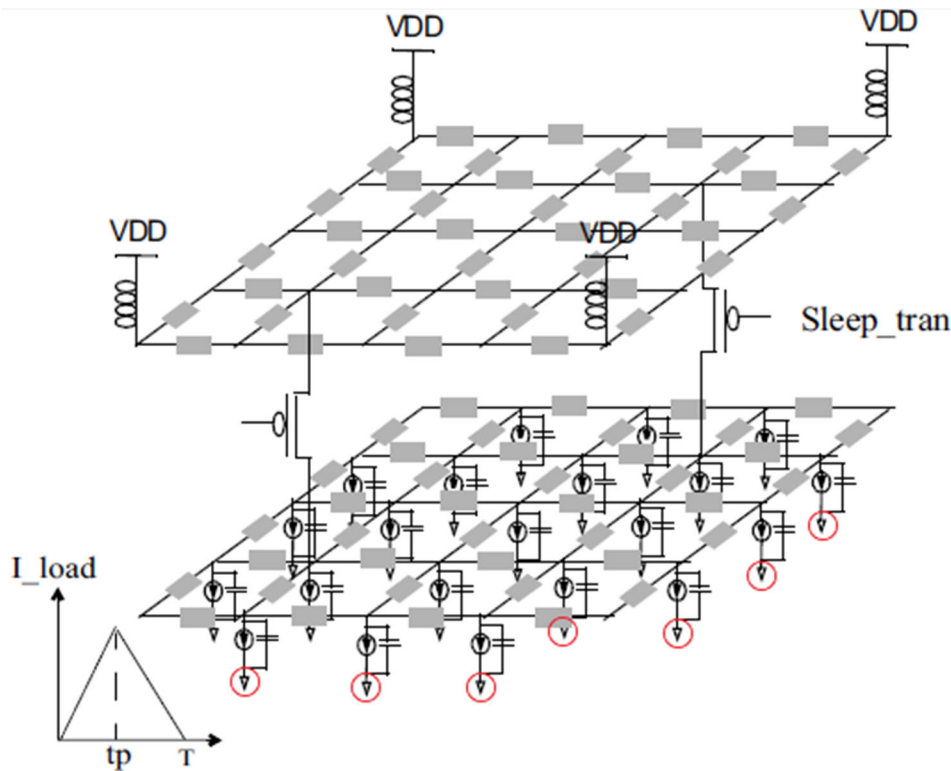


Figure 2. Power gating modeling

Such a disclosure would lead a POSITA to a different routing configuration than that disclosed and claimed in the '218 patent, *i.e.*, implementing a ground in the substrate. EX2002, ¶179. *Monarch Knitting Mach. Corp. v. Sulzer Morat GmbH*, 139 F.3d 877, 885 (Fed. Cir. 1998).

Petitioner argues that a POSITA would have been motivated to provide a ground connection as part of the global power mesh because (1) ground is necessary for the circuit to function and (2) routing through the global power mesh was “routine” and “efficient.” But these arguments are unsupported conclusory assertions that are entitled to no weight. 37 C.F.R. § 42.65(a). These reasons are also

too generic to provide a motivation to modify Jiang. *See ActiveVideo*, 694 F.3d. at 1328. Petitioner also cites the motivations provided with respect to 12[e] and 12[c] (Pet., 37), but those motivations fail for the same reasons discussed with respect to 12[c] and 12[e]. All Petitioner has shown is that it was known to include a ground in a global power mesh, which is insufficient. *In re Kotzab*, 217 F.3d at 137.

As Dr. Souri explains, a POSITA would not be motivated to modify Jiang as Petitioner proposes. The modification would require using additional metal layers, which is not “efficient” when the circuitry in Jiang only requires one V_{DD} . EX2002, ¶180. Without a benefit there can be no motivation to modify.

Petitioner asserts that the modification would have a “known and understood expectation of success.” Pet., 37. But these arguments, and the corresponding expert testimony are conclusory and insufficient to support a finding of obviousness. 37 C.F.R. § 42.65(a).

b. Claim 16

Claim 16 depends on claim 15 and adds the additional limitation “wherein the first partial local power mesh comprises: at least one first local ground wire that couples to the ground wire of the global power mesh.” Jiang does not teach or suggest this limitation because Jiang’s Figure 1(b) does not disclose a ground on the L2 layer. EX2002, ¶184.

Petitioner presents several arguments, all of which fail. *First*, Petitioner argues an inherent disclosure. Pet., 39. But there is no inherency because ground can be routed in other ways, such by a via stack or in the substrate. *See* §§VI.A.4.b, VI.4.3.a.

Second, Petitioner asserts it would be obvious to include a first local ground wire *if* there were a ground wire as part of the global power mesh “to connect” the global power mesh to the power domain or because of the wiring structure of the voltage wires in Jiang. Pet., 40-41. But a POSITA would not be motivated to include a ground wire in the global power mesh of Jiang. *See* §VI.A.2.d.

Petitioner asserts “it was known that partial local power meshes could include local ground wires.” Pet., 39. However, the standard is not whether a POSITA *could* combine the references, but rather that they *would* have been motivated to make this combination. *Personal Web Techs.*, 848 F.3d at 993-94.

Further, as Dr. Sourì explains, Chiu actually teaches away from including a ground in a partial local power mesh because a via stack can be used to route the ground down to the circuitry. EX2002, ¶201; EX1006, 2:55-63. Indeed, a POSITA would know such a connection could provide lower resistance. EX2005, 43:11-19.

Petitioner also argues that a POSITA would be motivated to add ground lines to the local partial local power mesh because it was “known,” or because it was a “routine application of a known functionality.” Pet., 40-41. But Petitioner has not made any such showing that modifying Jiang is a “routine application of known

functionality.” Such conclusory statements are entitled to no weight. 37 C.F.R. § 42.65(a). At best, Petitioner shows that grounds in a purported partial local power mesh of Li were known in one specific chip, which is insufficient. *In re Kotzab*, 217 F.3d at 1371. Dr. Subramanian has not shown that either Li or Chiu or any other reference discloses the wiring at a first power domain that is claimed.

Petitioner also asserts a reasonable expectation of success in modifying Jiang because using ground wires as claimed was purportedly “known” or “common” Pet., 40-41. But this is not the test; it is a conclusory recitation insufficient to meet Petitioner’s burden. *See* §V. Petitioner fails to provide a motivation showing that a POSITA *would* rather than *could* modify Jiang to achieve the claimed invention. 37 C.F.R. § 42.65(a); *Daifuku*, IPR2015-00084, 87, Paper 10 at 16.

c. Claim 17

For claim 17, Petitioner relies on its argument for claim 16. Pet., 42. For the same reasons claim 16 is not obvious, claim 17 is also not obvious. *See* §VI.A.c.

d. Claim 18

Claim 18 recites that the first local ground and the second local ground wire “share the same ground wire of the global power mesh.” The specific wiring required by claim 18 is not taught or suggested by Jiang alone or in combination. §VI.A.4.a-c.

Petitioner asserts that Jiang would “necessarily” use a single ground supply voltage. Pet., 42-43. But Jiang does not disclose this and Petitioner provides no reason to interpret silence as a disclosure of this limitation. Ground wiring can be done in many ways. For example, more than one ground can be supplied in a chip and there is not “necessarily” only one way to do it. EX2002, ¶193.

Even if there were a single ground supply, however, Petitioner’s argument still fails because Petitioner cannot show a single wire of the global power mesh that is shared by the first and second local ground wires as that term is properly construed. §III.I. Petitioner argues that “all the ground wires” would be the “same ground wire.” But “all the ground wires” is not the “same single ground wire” that is “shared” by the first and second local ground wires. EX2002, ¶¶196-198. Such an interpretation conflates the same ground *potential* with the same ground *wire* which is incorrect. *Id.* As shown above, a mesh is a group of wires that can have the same ground potential, but the wires within a mesh are not the same wire. §III.I. Petitioner presents substantially the same argument with respect to Ground 4 and its argument here should be rejected for the same reasons. §VI.C.3.b.

B. Grounds 3a and 3b: Claims 1-11 and 19-20 Are Not Obvious Over Jiang/Jiang2/Jiang3/Li/Chiu and Further in View of Bertolet and/or LPMM

Petitioner's Ground 3 challenges claims 1-11 and 19-20 (the "APR tool claims") based on Grounds 1-2 in further view of Bertolet and LPMM. Petitioner's Ground 3 challenge should be rejected.

First, Petitioner cannot identify any references alone or in combination that discloses the elements of claims 1 or 19, and the Board should reject Petitioner's challenge for this reason alone. *See Par Pharm., Inc. v. Twi Pharm., Inc.*, 773 F.3d 1186, 1194 (Fed. Cir. 2014) (a party alleging obviousness must carry "its burden to prove that all claimed limitations are disclosed in the prior art").

To the contrary, Petitioner argues that there was art that "*could*" perform the steps of the invention or that a POSITA knew "how to." Pet., 44-46; EX1003, ¶¶50, 128. Aside from this being a misrepresentation of the art, it is not the test for obviousness. Petitioner must specify where each element of claims 1 and 19 are found in the prior art, and cannot do so. 37 C.F.R. §42.104(b)(4). This is evident because nowhere in the Petition can Petitioner specify "how any specific combination would operate or read on" the claims, a prerequisite for showing obviousness. *ActiveVideo*, 694 F.3d at 1327–28; *TQ Delta, LLC v. CISCO Sys., Inc.*, 942 F.3d 1352, 1360 (Fed. Cir. 2019) (same).

Petitioner's obviousness analysis should also be rejected because it is based on impermissible hindsight. Petitioner fails to identify any motivation to combine Bertolet and LPMM together to create a modified tool or use APR tools at all with the cartoon schematic of Jiang. Petitioner asserts that a POSITA would use "an" APR tool to implement Jiang's structure. Pet., 44-46. But Petitioner does not endeavor to identify *why* a POSITA would use the tools in Bertolet and/or LPMM. *Id.* A general motivation to use "an" APR tool is not a motivation to use the specific steps claimed. *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 381 F.3d 1371, 1377 (Fed. Cir. 2004). A POSITA would not expect success in performing each of the steps claimed because those steps were not suggested or taught by any reference. EX2002, ¶¶200-232.

1. No reference teaches or suggests the steps of the APR tool claims

Ground 3 relies on a false premise that is stated throughout the Petition: that APR tools were "known" that *could* be used to perform the steps of claim 1. Pet., 7-8, 33, 44-46, 71. Petitioner's own references, Bertolet and LPMM, show that there is no teaching or suggestion to, and there were no tools able to perform the claimed steps alone or in combination.

Bertolet is an article from 1997, nearly ten years before the priority date, and relates to the use of a "custom SKILL program" in a *single power domain* chip.

EX1013, 126; EX2002, ¶¶207-210; EX2005, 266:22-268:24. Programs for single power domain chips do not teach or suggest the steps of claims 1 or 19 for numerous reasons, including because they related to single power domains. EX2002, ¶¶204, 207-210, 215-215.

For example, nothing in Bertolet teaches or suggests performing any step in claims 1 or 19. There is no teaching or suggestion of forming or providing a global power mesh: a network of intersecting wires capable of distributing power to multiple *power domains*. *Id.* Similarly, nothing in Bertolet teaches or suggests forming a first or second partial local power mesh according to the position of a *first or second power domain*, respectively. *Id.* Power domains are not even mentioned in Bertolet. *Id.* Bertolet also fails to disclosure coupling the claimed meshes because the meshes are not ever taught or suggested.

LPMM is a reference related to low power design. EX1012, 61. LPMM references multi-voltage designs but does not teach or suggest any steps of the APR tool claims. EX2002, ¶¶210-212; EX2005, 266:22-268:24. LPMM discusses the use of a Power Network Synthesis (PNS) capability (EX1012, 77-78), but there is no teaching or suggestion that the PNS capability is forming or providing any global or partial local power meshes or coupling those meshes. EX2002, ¶210.

As a result, Petitioner cannot show that these references teach or suggest performing any of elements 1[a], 1[b], 1[c], 1[d], or 1[e] or 19[a]. EX2002, ¶¶204-220. These limitations are completely missing from any disclosure in the art cited.

Petitioner asserts that these references teach the use of “APR” tools *generally* for multi-voltage circuits. Pet., 44-45. But this is incorrect. Petitioner has not identified a known APR tool that could perform the methods of the claims. EX2002, ¶¶204-220.

Petitioner also cites Li’s in-house automated procedure. Pet., 71. But Li also does not disclose the steps claimed. Li discloses use of a prior design for a single power domain chip to avoid the difficulty in starting from scratch. EX2002, ¶¶217-218. Li explains: “Due to the importance of the stringent time-to-market demand, design reuse has become a common practice in today’s IC industry.” EX1005, 499; *see also id.*, 491. Although Li discloses an “automated” tool for “connecting local logic to the top-level power grid,” that procedure does not teach or suggest coupling to any local power grids. EX1005, 493; EX2002, ¶¶230-31. Even if it did, the remainder of Li teaches away from forming a global or partial local power mesh with an APR tool because a POSITA would be led to reuse prior designs based on Li’s teachings. EX2002, ¶218. This teaching away strongly supports a finding of non-obviousness. *Monarch Knitting*, 139 F.3d at 885.

The other references Petitioner cites do not even pertain to using APR tools. Petitioner never shows that Jiang, Jiang2, Jiang3, or Chiu even mention automated tools, much less APR tools. EX2002, ¶219. As a result, these references cannot teach, suggest, or render any element of claims 1-11 or 19-20 obvious.

Petitioner also cites the '218 patent for the statement that “APR tools were ‘well-known.’” Pet., 44. But the '218 patent refers to the use of APR tools that support single power domain chips. EX2002, ¶222. Dr. Subramanian has not shown that there were any off the shelf APR tools to perform the steps claimed.

Petitioner also cites a press release (EX1025). Pet., 46. However, Petitioner has not shown that the press release is prior art. *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1350 (Fed. Cir. 2016) (requiring showing of public accessibility). Even if it were, if anything, it confirms that the use of an APR tool for multi-voltage designs was not well-known and were uniquely challenging or difficult for a POSITA. EX2002, ¶223. Otherwise, there would be no reason to issue a press release. *Id.* The press release, moreover, does not teach or suggest that a step of the methods of the APR tools were performed. *Id.*

Petitioner asserts that it would have been obvious to a POSITA to use “an APR tool” to form and couple the global and partial local power meshes and power domains. Pet., 46. But this assertion does not meet Petitioner’s burden. Petitioner must show “how any specific combination would operate or read on the asserted

claims,” and failed to do so. *ActiveVideo*, 694 F.3d at 1327–28; *TQ Delta*, 942 F.3d at 1360 (same). There is simply no analysis of whether or not the actual combination proposed reads on the claims and the vagueness of the arguments should be construed against Petitioner. *Liberty Mutual Ins. Co. v. Progressive Casualty Ins. Co.*, CBM2012-00003, Paper 8 at 10 (PTAB Oct. 25, 2012).

2. Petitioner’s analysis is driven by impermissible hindsight

As part of its prima facie obviousness case, Petitioner must show that a POSITA would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so. Petitioner’s modifications are unsupported by any factually or legally sufficient rationale, a harbinger of prohibited hindsight analysis. *See* §V; *TQ Delta*, 942 F.3d at 1361; *Outside the Box Innovations, LLC v. Travel Caddy, Inc.*, 695 F.3d 1285, 1297 (Fed. Cir. 2012).

First, Petitioner combines LPMM and Bertolet (Pet., 43-46), but Petitioner never explains why or how a POSITA would do so. EX2002, ¶¶225-226. Just falling within the same field or being directed to similar techniques has repeatedly been rejected as insufficient. *Securus Techs., Inc. v. Glob. Tel*Link Corp.*, 701 F. App’x 971, 977 (Fed. Cir. 2017); *Microsoft Corp. v. Enfish, LLC*, 662 F. App’x 981, 990 (Fed. Cir. 2016); *Free-Flow Packaging Int’l v Automated Packaging Sys.*, IPR2016-00350, Paper 7 at 11-13 (PTAB June 27, 2016). Even if these references are treated

as separate, as discussed above, neither discloses the steps claimed in claims 1-11 or 19-20. EX2002, ¶¶224-226.

Second, Petitioner argues that it would be obvious to use “an APR tool” because it would save time and effort in chip design and LPMM recommends using “automated power network synthesis” “whenever possible.” Pet., 45. But this is the generic type of motivation that should be rejected. *ActiveVideo*, 694 F.3d at 1328 (to “build something better” or to make it “more efficient, cheaper, or . . . more attractive to your customers” is insufficient as too generic).

In addition, Petitioner fails to identify a motivation to use the Bertolet or LPMM capabilities at all. Petitioner fails to show that a POSITA looking for “an APR tool” to save time and effort in chip design, *would* turn to Bertolet or LPMM’s PNS capabilities, and therefore fails to show any sufficient motivation to combine the references to arrive at the claimed invention. EX2002, ¶228; *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015). The “could” analysis of Dr. Subramanian is improperly “fraught with hindsight bias.” *ActiveVideo*, 694 F.3d at 1327.

Third, Petitioner’s analysis relies on the assumption that a POSITA would combine “APR tools” with Jiang’s power routing structure. Pet., 43-46. But a POSITA would understand that Jiang’s cartoon schematic in Figure 1(b) does not need APR tools; it is a quantitative model used to illustrate the costs and benefits of

power-gating. EX2002, ¶229; EX1004, 1-2. Jiang never contemplates that Figure 1(b) could be turned into a chip (where APR tools might be useful) and a POSITA would understand that such modification would defeat the purpose of Jiang—to model power gating. EX2002, ¶229. Further, a POSITA would not expect any success because nearly the entire chip would have to be created from scratch. EX2002, ¶229; *see Eli Lilly & Co. v. Teva Pharms. Int’l GmbH*, 8 F.4th 1331, 1343-1345 (Fed. Cir. 2021).

Fourth, Petitioner fails to provide any sufficient reasonable expectation of success in combining references to meet the limitations of the claimed invention. *Intelligent Bio-Sys.*, 821 F.3d at 1367. Here, Petitioner’s reasonable expectation of success arguments rests on its mischaracterizations of the prior art, *e.g.*, that Bertolet or LPMM *could* perform the method steps claimed. This is plainly false as discussed in §VI.B.1. Bertolet and LPMM fail to teach or suggest any of the steps claimed and, as a result, a POSITA would not expect them (or some undisclosed modified “APR tool”) to be suitable for use and Petitioner never proposes to modify them. EX2002, ¶230; *see Samsung Elecs.*, 925 F.3d 1373 (affirming Board’s determination of nonobviousness where petitioner failed to demonstrate a reasonable expectation of success).

Thus, the Board should reject Petitioner’s Ground 3 challenge.

C. Ground 4: Claims 12-18 Are Not Obvious Over Li in View of Jiang

1. 12[a]-12[b]: Li alone or in combination does not suggest a local power grid that corresponds to the location of, and couples to, a first and second power domain (core and switch)

Li fails to teach or suggest elements 12[a] or 12[b] because it discloses local power grids in “the local sections.” EX1005, 493. Petitioner misrepresents the disclosure of Li to assert that there are local power grids at the location of the first power domain (Core) and second power domain (Switch). Pet., 54-59, 54 (asserting “Core <0> is a “first power domain.”), 58 (asserting “switch,” is the “second power domain”). But there is no disclosure of where those local sections are. EX2002, ¶¶233-235; *see Novartis Pharms Corp. v. Accord Healthcare, Inc.*, 38 F.4th 1013, 1017 (Fed. Cir. 2022). Thus, a POSITA would not interpret silence as a disclosure and would understand that there are only local power grids in specific undisclosed “local sections.” EX2002, ¶234.

During his deposition, Dr. Subramanian has asserted that Li’s reference to the “local sections” refers to metal layers 2-5, in contrast to the “global sections.” EX2005, 257:4-258:1. But that is not what Li discloses. Had Li been intending to identify the local layers, a POSITA would have expected Li to use the term “local layers.” EX2002, ¶236. Further a POSITA would not understand “local sections” are being contrasted with “global sections” since it is not even a term used in Li. *Id.*

The other disclosures of Li do not teach or suggest placing local grids at the core or switch areas of the chip either. Dr. Subramanian relies on the phrase “at the block level” in Li. EX1003, ¶153. Being formed at “block level,” does not change that at “block level” is still “in the local sections.” EX1005, 493; EX2002, ¶237.

Petitioner also proposes a modification from Jiang to position partial local power meshes according to the positions of their respective power domains because it would be “combining prior art elements according to known methods to yield predictable results.” Pet., 55-56. But this is a generic and unsupported recitation that fails to meet Petitioner’s burden. *See* §V. Petitioner provides no reason a POSITA **would** make a modification even if they **could**. *Qualcomm Inc. v. Bandspeed, Inc.*, IPR2016-00620, Paper 6 at 23 (PTAB Aug. 24, 2016). The purpose of the location of the grids on L2 of Jiang was to illustrate the specific qualitative model discussed in Jiang. EX2002, ¶238. There is no such similar reason to position a local power grid in Li. *Id.* Further, as Dr. Souri explains, a POSITA would not modify Li with Jiang to add “local power grids” in locations where the “local power grids” were not needed because there is no reason to add useless wiring to a space constrained integrated circuit. *Id.* Without a benefit, a POSITA would not modify Li. *Id.*

Because Li is silent on the location of the power grids, Li also does not disclose any of the additional limitations that rely on a first or second partial local

power mesh, including elements 12[a], 12[b], 12[c], 12[d], 14, and 16-18. EX2002, ¶239.

2. 12[c]: Li does not teach or suggest the elements of 12[c]

a. Li does not teach or suggest a global power mesh on metal layers 6 and 7

Petitioner asserts that Li discloses a global power mesh on metal layers 6-7. Pet., 59-60. But there is no teaching or suggestion of any network of intersecting wires capable of distributing VDD_Switch and VDD_Chip to the Core and Switch power domains on metal-6 and metal-7. A POSITA would understand from Figure 3 and the related discussion that metals-6 and 7 disclose only one VDD on metal-6 and metal-7 because the wires themselves are labeled only VDD, suggesting to a POSITA only one voltage. EX2002, ¶¶240; 243. The following demonstrates the wiring shown on the metal 6 and metal 7 layers in Figure 3 (where red shows wires labeled VDD and yellow shows wires labeled ground):

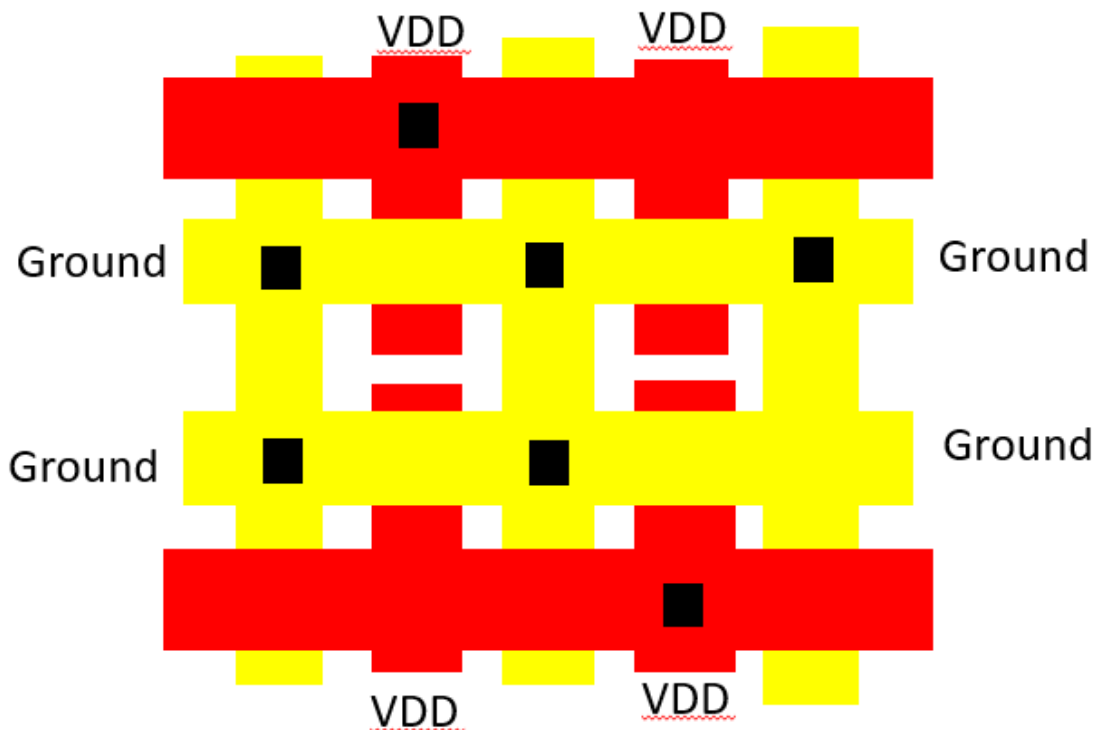


Figure 3 also shows a redistribution layer that labels some wires VDD_Switch and VDD_Chip. But Dr. Subramanian explained that he is not relying on the redistribution layer (RDL) of Li for the “global power mesh.” EX2005, 85:3-86:20.

Dr. Souri explains that it makes sense to only include one voltage (VDD) on metals-6 and 7 in the chip disclosed in Li because only certain sections of the chip would receive VDD_Switch and other sections would receive VDD_Chip. EX2002, ¶242; EX1005, 495 (“VDD_chip provides power for all the internal logic except the node controller, packet manager, switch, and HT/SPI-4 ports.”). A POSITA would

not use space in the chip on lower layers, such as the metal-6 or -7, unless there was some reason, such as providing power to the circuitry below. *Id.*

Thus, because Petitioner has not shown a “global power mesh” (§III.E) on metals-6 and 7, Petitioner has failed to show that any claim limitation reciting a global power mesh is met, including 12[c], 12[e]/[f], 13, 15-18. EX2002, ¶¶244-245.

b. Li does not teach or suggest coupling the first and second partial local power meshes to the global power mesh

Petitioner asserts that Li discloses coupling the first and second partial local power meshes to the global power mesh. Pet., 60. But there is no such teaching or suggestion in Li. Rather, Li discloses a connection between the “top-level power grid” and the “local logic” (the chip circuitry). EX1005, 493. Dr. Subramanian asserts that the top-level power grid necessarily also includes connecting the local power grids. EX1003, ¶¶152-153. But this is unsupported speculation. Further, if there is no local grid in the location of the connection, there would not be a connection. EX2002, ¶¶247-249. Further, as Dr. Subramanian himself admitted, there can be connections from the “top-level power grid” to the substrate rather than a connection to a local grid. EX2005, 174:16-175:22.

3. Claims 13-18

Because the elements of claim 12 are not obvious, the elements of the dependent claims are also not obvious. *See Panduit*, 810 F.2d at 576. In addition, as

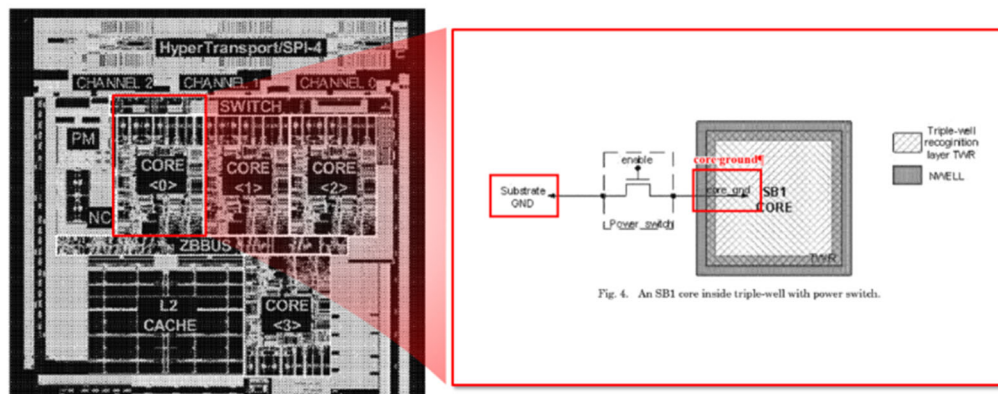
discussed below, because each of the elements of claims 15-18 are not obvious, any claims depending from those claims are also not obvious.

a. Claim 16: Li fails to disclose a first partial local power mesh that comprises at least one first local ground wire that couples to the ground wire of the global power mesh

Claim 16 recites a “first local power mesh that comprises: at least one first local ground wire that couples to the ground wire of the global power mesh.” Petitioner contends that the “global power grid connects to the local logic (power domains) *through* the local power grids.” EX1003, ¶178 (emphasis added); *see also* Pet., 68. But, Dr. Subramanian admitted that the global grid at the core actually connects to the *switch* in the power domain. EX2005, 174:16-175:22; EX2002, ¶253. This is what Li expressly discloses “At the final stage of the layout design, an in-house automated procedure is applied, connecting the local logic to the top-level power grid.” EX1005, 493; EX2002, ¶235.

The ground of the global power mesh drops to the ground in the power domain (in the substrate) for the power switch to operate. EX2002, ¶254. As shown in detail below, the switch connects substrate ground to the core ground. The switch in Li operates to disable the core by cutting off the ground and a POSITA would understand that the ground for the core must be routed through the switch for the switch to operate and for the core to: (1) be “electrically isolated,” (2) be “isolated

from the ground outside the core,” and (3) have a “different internal ground net.” *Id.*; EX1005, 494-95. A POSITA would recognize that the ground connection in Li does not meet the claim limitation as properly construed. *Id.*; see §III.K. Notably too, Li describes the ground wiring at the core in detail and there is no disclosure of a local power grid. A POSITA would understand that there is, in fact, no local power grid at the core and that claim 16 is therefore not taught or disclosed in Li. EX2002, ¶¶251-256.



Petitioner also asserts a theory of inherency that a POSITA would understand that Li’s disclosure “necessarily” requires the connection from the global power mesh through the local grids to the chip circuitry because power would not flow and the chip would be non-functional or local grids would be left floating. Pet., 68-69. This is of course incorrect because as Petitioner’s own expert testified, one can have a direct connection from the top layer to the substrate. EX2005, 46:9-51:17. Further,

as Li discloses, a local power grid is not present in all locations, only in the “local sections.” EX2002, ¶255.

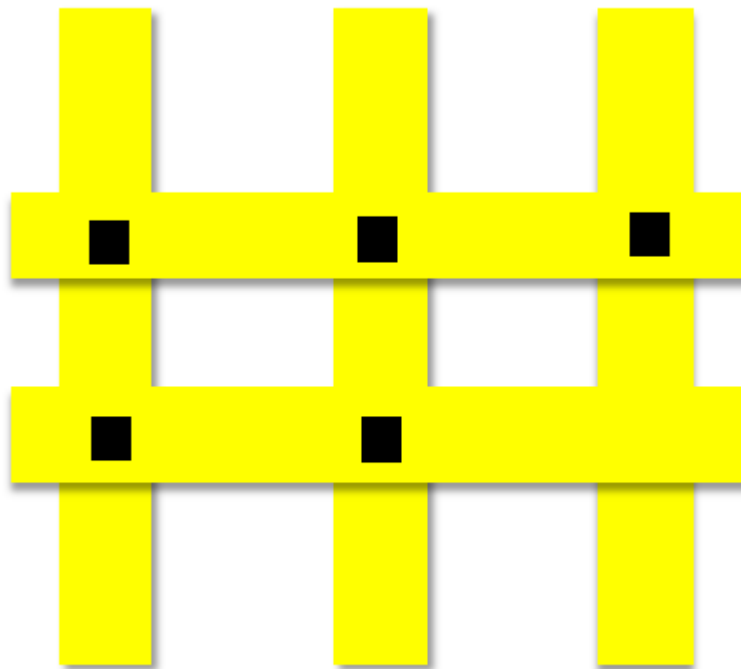
Because Li teaches grounding in the substrate at the core, it teaches away from using a local power grid to route ground potential to the power domain. Any modification to the switching structure to route the ground through a local power mesh would undermine the principal of operation of the switch and render it inoperable. EX2002, ¶253; *In re Ratti*, 270 F.2d 810, 813 (CCPA 1959). Li therefore fails to render claim 16 obvious.

b. Claim 18: Li fails to disclose wherein the first local ground wire and the second local ground wire share the same ground wire of the global power mesh

Li fails to disclose a first local ground wire and a second local ground wire that share the same ground wire of the global power mesh.

First, because claim 16 is not taught or suggested by Li, there is no first local ground wire in the partial local power mesh that couples to the ground wire of the global power mesh, and thus, there is necessarily no “shared ground wire.” EX2002, ¶258. **Second**, Li cannot teach or suggest a single ground wire in the purported global power mesh in metals 6 and 7 that is shared by a first and second local ground wire because Li does not identify any connections shown below metal-6. EX2002, ¶259; EX1005, 493-94, Fig. 3.

Petitioner’s argument for claim 18 relies on misconstruction of the phrase “same ground wire” so that it allows “all” wires having a grounded potential to be the “same ground wire.” Pet., 70. This cannot be correct because it reads out the limitations of the claim. *See* §IV.B.3. The proper construction for “same ground wire” requires a single wire that is shared by *local* ground wires in the partial local power meshes, not many ground wires that are shared by the ground wires of the *global* power mesh, as Petitioner proposes as illustrated below in the context of Figure 3. *Id.*; EX2002, ¶¶261-262.



Petitioner’s construction also cannot be correct because it equates a mesh of

many ground wires with a *single* ground wire. EX2002, ¶263. The intrinsic record distinguishes between single “wires” and “meshes,” the latter being structures comprising multiple wires (and vias). *Id.* For example, the claims use the terms “wire” and “mesh” separately and makes clear they are different by claiming that “meshes” comprise “wires.” *Id.*; *see, e.g.*, EX1001, cl. 15 (“The power routing structure according to claim 12, wherein the global power mesh comprises: at least one ground wire; at least one first power wire that provides the power needed by the first power domain; and at least one second power wire that provides the power needed by the second power domain.”). “[D]ifferent claim terms are presumed to have different meanings.” *Helmsderfer*, 527 F.3d at 1382. There cannot be any reasonable dispute that a wire and a mesh (comprising multiple wires) are different. Similarly, the intrinsic record is clear that a “via” connects wires and is not itself a wire. EX2002, ¶264; *see, e.g.*, EX1001, 4:16-18 (“Besides, the power wires and ground wires of adjacent metal layers having the same electrical property can be interconnected to each other by via”).

Even if Petitioner’s construction were accepted, Petitioner does not show that “all” the ground wires of Li are connected together. Pet., 70. Li does not disclose this, and it is an unsupported conclusion when a POSITA would understand that there may be interruptions in the ground wiring. EX2002, ¶265; EX1005, 493; EX2005, 152:21-153:24.

Petitioner may also contend that the middle vertical wire in Figure 3 is the “same ground wire.” Pet., 38, 67. This cannot be the “same ground wire” of claim 18 because there are no connections shown to the ground wires below. EX2002, ¶266.

Dr. Subramanian agreed that a common ground potential does not satisfy the same ground wire limitation but could not think of an example in which a common “ground reference,” *i.e.*, shared ground potential, would not satisfy the same ground wire limitation under his construction. EX2005, 262:17-264:18. This further underscores the over breadth and incorrectness of Petitioner’s construction. EX2002, ¶267.

Because Petitioner’s argument for claim 18 applies the incorrect claim constructions, incorrectly assumes all wires of the global power mesh are connected together, and constitute a single wire, Petitioner has failed to prove obviousness. In addition, because Li does not teach or suggest *any* ground connections below metal-6, Li cannot meet the limitation of claim 18. EX2002, ¶268.

D. Ground 5: Claims 1-11 and 19-20 are not obvious over Li in view of Jiang and further in view of Bertolet and/or LPMM

Ground 5 relies on Ground 4 in further view of Bertolet and/or LPMM. Pet., 70-77. Ground 5 fails for the same reasons Ground 4 fails. EX2002, ¶¶270-275; §VI.C. Petitioner again fails to show all elements of the claims are disclosed in the

prior art, a prerequisite to obviousness. *See Par Pharm*, 773 F.3d at 1194 (a party alleging obviousness must carry “its burden to prove that all claimed limitations are disclosed in the prior art”). The references, alone or in combination do not teach or suggest the “forming,” “providing,” or “coupling” steps of claims 1[a]-1[e] or 19[a] because Petitioner has not shown any tools exist that performed these steps. EX2002, ¶273.

To the contrary, Petitioner uses hindsight to attempt to piece together the prior art purportedly on the basis that there was an APR tool that “*could*” perform the steps of the invention or that a POSITA knew “how to.” Pet., 71; EX1003, ¶¶50, 128. Aside from this being a misrepresentation of the art, it is irrelevant. Petitioner should have been required to show “how any specific combination would operate or read on” the claims. *ActiveVideo*, 694 F.3d at 1327–28; *TQ Delta*, 942 F.3d at 1360 (same).

Petitioner also fails to provide any motivation to use Bertolet and/or LPMM with Li. Petitioner asserts that a POSITA would know to use some “APR tool” based on the recommendation to use synthesis capabilities in LPMM. Pet., 71-72. But that motivation fails to address: (1) why a POSITA would have combined Bertolet with LPMM and/or Li and/or Jiang, and (2) whether a POSITA would have had any reasonable expectation of success in combining those references to arrive at the

claimed invention. As a result, the only conclusion is that Petitioner's analysis is "fraught with hindsight bias." *ActiveVideo*, 694 F.3d at 1327.

In addition, Petitioner fails to address the fact that Li's power meshes were formed through design reuse. EX1005, 491-42. Petitioner provides no motivation to modify the existing methods and, therefore, fails for this additional reason. EX2002, ¶274; *ActiveVideo*, 694 F.3d at 1328; *see, e.g., Apple Inc. v. Luxembourg S.A.*, IPR2017-02041, Paper 10 at 24-25 (PTAB Mar. 8, 2018) (rejecting petitioner's motivation to combine argument because "Petitioner does not address whether Schull's existing methods of generating a Passwordable ID already attain such uniqueness."); *Stryker Corp. v. Karl Storz Endoscopy America, Inc.*, IPR2015-00764, Paper 13 at 13 (PTAB Sept. 2, 2015) (finding no motivation to combine where there was no explanation "why it would be obvious to add a translator to redundantly perform the function that Petitioner maintains is performed by" the structure in the first reference). A POSITA would be discouraged from implementing a power routing structure of Li with APR tools because Li teaches a methodology for design reuse as a way to modify an existing design and get it to market faster. EX1005, 490-93; EX2002, ¶274. Thus, the teaching away shows non-obviousness. *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994).

Petitioner further incorporates its argument from Ground 3. For all the reasons Ground 3 does not show the claim are patentable, Ground 5 should also be rejected.

§VI.B.

VII. CONCLUSION

For the reasons set forth above, Patent Owner respectfully submits that Petitioner fails to satisfy its burden that the claims of the '218 patent are unpatentable, and the Board should confirm patentability.

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CERTIFICATE OF SERVICE

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