

PGR2025-00069
US Patent No. 12,250,564

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD., and
SAMSUNG ELECTRONICS AMERICA, INC.,

Petitioners,

v.

XIFI NETWORKS R&D, INC.,

Patent Owner.

Case PGR2025-00069

Patent 12,250,564

PATENT OWNER'S SURREPLY

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Patent Owner Exhibit List

Exhibit No.	Description
EX2001	Complaint, <i>XiFi Networks R&D, Inc. v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.</i> , No. 2:24-cv-01057-JRG, Dkt. 1 (E.D. Tex. Dec. 17, 2024).
EX2002	First Amended Docket Control Order, <i>XiFi Networks R&D, Inc. v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.</i> , No. 2:24-cv-01057-JRG, Dkt. 28 (E.D. Tex. Apr. 14, 2025).
EX2003	Plaintiff's First Amended Complaint, <i>XiFi Networks R&D, Inc. v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.</i> , No. 2:24-cv-01057-JRG, Dkt. 13 (E.D. Tex. Mar. 11, 2025).
EX2004	Defendants' Answer and Affirmative Defenses to Plaintiff's First Amended Complaint, <i>XiFi Networks R&D, Inc. v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.</i> , No. 2:24-cv-01057-JRG, Dkt. 31 (E.D. Tex. Jun. 9, 2025).
EX2005	Defendants' P.R 3.3 and 3.4 Invalidity Contentions (Jun. 18, 2025).
EX2006	Table 1 Comparing Select Sections of Almeroth Declaration to Corresponding Sections of Petition (EX1002).
EX2007	[RESERVED]
EX2008	Declaration of Dr. Robert Akl, D.Sc.
EX2009	American Heritage Dictionary (5th Ed., 2012).
EX2010	Andrew S. Tanenbaum, <i>Computer Networks</i> (5th Ed., 2011).
EX2011	U.S. Patent No. 8,078,208
EX2012	U.S. Patent No. 9,560,656
EX2013	Curriculum Vitae of Dr. Robert Akl, D.Sc.

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EX2014	Excerpts from the prosecution history of U.S. Patent No. 11,950,105
EX2015	Excerpts from the prosecution history of U.S. Patent No. 12,169,756
EX2016	[RESERVED]
EX2017	Second Declaration of Dr. Robert Akl, D.Sc.
EX2018	Further excerpts from Andrew S. Tanenbaum, <i>Computer Networks</i> (5th Ed., 2011).
EX2019	International Organization for Standardization and the International Electrotechnical Commission, ISO/IEC 7498-1, Information technology—Open Systems Interconnection—Basic Reference Model: The Basic Model (2d. Ed. corrected and reprinted 1996)
EX2020	Amended Joint Claim Construction Statement, <i>XiFi Networks R&D, Inc. v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.</i> , No. 2:24-cv-01057-JRG, Dkt. 62 (E.D. Tex. Feb 27, 2026).
EX2021	Declaration of Dr. Mark Mahon in Support of Claim Construction, <i>XiFi Networks R&D, Inc. v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.</i> , No. 2:24-cv-01057-JRG
EX2022	Excerpts from the file history of U.S. Patent No. 11,818,591
EX2023	Excerpts from the file history of U.S. Patent No. 11,950,105
EX2024	Excerpts from the file history of U.S. Patent No. 11,849,337
EX2025	Excerpts from the file history of U.S. Patent No. 11,856,414
EX2026	Excerpts from the file history of U.S. Patent No. 12,169,756
EX2027	Excerpts from the file history of U.S. Patent No. 12,114,177

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EX2028	[RESERVED]
EX2029	Excerpts from the file history of U.S. Patent No. 11,974,143
EX2030	Transcript of the Deposition of Dr. Mark Mahon, <i>XiFi Networks R&D, Inc. v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.</i> , No. 2:24-cv-01057-JRG
EX2031	Samsung's Proposed Claim Constructions for the Terms and Phrases Identified for Construction Per Local Patent Rule 4-2, <i>XiFi Networks R&D, Inc. v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.</i> , No. 2:24-cv-01057-JRG (E.D. Tex. Jan. 14, 2026)
EX2032	Curriculum Vitae of Dr. Robert Akl, D.Sc.
EX2033	Declaration of Aaron R. Fahrenkrog in Support of Motion for Pro Hac Vice Admission

I. CLAIM CONSTRUCTION

In their Petition, Petitioners applied plain and ordinary meaning to all claim terms. Pet. at 12-13; EX1002, ¶65. Thereafter, in the district court, Petitioners agreed to several narrowing constructions, while proposing several more that the district court adopted. EX1028 at 7-11; EX1027 at 25-26. Petitioners now request that the Board apply the district court constructions. Reply at 1-4.

II. PETITIONERS' NEW REPLY ARGUMENTS SHOULD BE DISREGARDED

Since shifting claim construction positions to those Petitioner advocated for in the district court, Petitioners' Reply positions are not supported by the Petition and therefore must be disregarded. Petitioners are wrong that "there is no inconsistency between Petitioner's District Court positions and the Petition."¹ *Id.* Petitioners' arguments and evidence applying the district court constructions were not present in their Petition, and in some cases contradict the Petition.

This is a violation of the baseline requirements for a petition—which must “identif[y], in writing and with particularity... the evidence that supports the grounds

¹ Petitioners concede that they proposed narrowed constructions in the district court “to prevent PO from reading the claims overbroadly”—i.e., that Petitioners' requested constructions are narrower than would be permissible applying plain and ordinary meaning. Reply at 1.

for the challenge to each claim.” 35 U.S.C. § 322(a)(3); 37 C.F.R. § 42.204(b)(3)-(5); *Netflix, Inc. v. DivX, LLC*, 84 F.4th 1371, 1377 (Fed. Cir. 2023); *Corephotonics, Ltd. v. Apple Inc.*, 84 F.4th 990, 1001-02 (Fed. Cir. 2023) (“The IPR petition ... must ... identify[] particular portions of prior art on which the petitioner is relying”; Board may not “entertain ‘[s]hifting arguments.’”).

This rule has an exception: a Petitioner may make new arguments in response to a post-institution claim construction proposal by PO or the Board. *Axonics, Inc. v. Medtronic, Inc.*, 75 F.4th 1374, 1384 (Fed. Cir. 2023); *see also Parkervision, Inc. v. Vidal*, 88 F.4th 969, 979–80 (Fed. Cir. 2023). As relevant here, Petitioners themselves agreed to or proposed the constructions (for “virtual MAC interface” and “information regarding bandwidth availability...”) that created the need for the new arguments, unsupported in the Petition. EX1027 at 25-26; EX1028 at 6-11. Therefore, the *Axonics* rule, based on APA fairness concerns, should not apply to Petitioners, and to hold otherwise would reward the gamesmanship *Axonics* sought to avoid. *Axonics*, 75 F.4th at 1384.

Moreover, even when the law allows the opportunity to respond to a claim construction position proposed by the Board or PO, that response should “rel[y] on the same embodiments for each invalidity ground as were relied on in the petition.” *Id.*; *see also Parkervision*, 88 F.4th at 980. Here, Petitioners rely on wholesale new citations of the prior art, including previously unidentified embodiments.

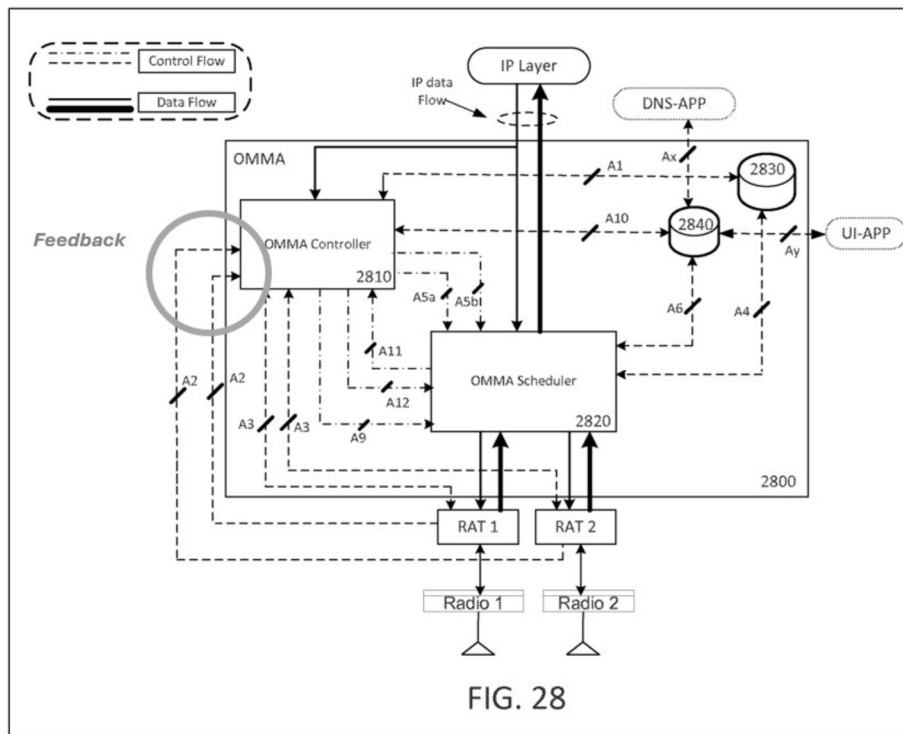
With regard to the “virtual MAC interface,” the Petition does not address whether Chincholi’s OMMA meets the claim construction Petitioners now put forward: (1) “a software- or logical-based interface”; (2) “separately addressable from the recited actual MAC interfaces; and that (3) “obscures the recited actual MAC interfaces from higher protocol stack layers.” EX1028 at 7; Reply at 4. Rather, the Petition argued that the OMMA “virtualizes” through aggregation and, with reference to Chincholi’s Figures 5 and 6, identifies modules that are purportedly functional equivalents to the blocks of ’564 patent’s virtual MAC interface. *See* Pet. at 25-28; EX1002, ¶¶100, 102-104. Indeed, the words “separately addressable” and “obscures” do not appear at all in the Petition. *See, e.g.,* Pet.

As to the “separately addressable” aspect, Petitioners’ Reply improperly pivots to a new embodiment from Chincholi that is not disclosed in the Petition. Reply at 7-9; EX1026, ¶¶33-60. Cited Figures 5 and 6 provide generic descriptions of one “example OMMA layer” (EX1005, [0017]), and they do not disclose how, if at all, Chincholi’s OMMA is “addressable,” nor “*separately* addressable.” Therefore, Petitioners mine for a different embodiment to satisfy this requirement—Figure 31 and corresponding description (EX1005, [0243]-[0245]), which Petitioners argue describes “OMMA-directed signaling to the NT’s OMMA Controller.” EX1026, ¶42.

But every portion of Chincholi cited as support for “separately addressable” in the Reply is cited for the first time—none is contained in the Petition or initial declaration. Reply at 7 (citing for the first time EX1005, [0243]-[0245], Fig. 31); EX1026, ¶¶37-43 (same). Petitioners thus improperly “reli[ed], in [their] Reply submissions, on previously unidentified portions of a prior-art reference to make a meaningfully distinct contention.” *Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1367 (Fed. Cir. 2015).

Nor does Chincholi tie the Figure 31 embodiment to Figures 5 and 6. Rather, “FIG. 31 illustrates an example call flow illustrating signaling corresponding to an example of a RAT availability update procedure described herein,” one of four such figures describing call flows. EX1005, [0243]; *see also* EX1005, [0042] (describing Fig. 31), [0044] (Fig. 33), [0047] (Fig. 36), [0071] (Fig. 59).

Petitioner’s expert references his earlier testimony, attempting to connect the Reply to the Petition. EX1026, ¶37 (citing EX1002, ¶¶107-108). But that initial testimony highlights one particular signaling call path—“A2”—with regard to a different limitation (“information regarding bandwidth availability”):



EX1002, ¶107 (citing EX1005, Fig. 28 (annotations added)); *see also* Pet. at 29-30 (same). Meanwhile, the description of Figure 31 that Petitioners cite in Reply with regard to the virtual MAC interface discusses the separate “A3” signaling call path. EX1005, [0243]. Petitioners’ expert’s reference back to analysis of an element of a different embodiment related to a different limitation cannot make the Reply’s analysis of Figure 31 related to the Petition.

As to “obscures ... from higher protocol stack layers,” Petitioners and their expert also rely heavily on totally new portions of Chincholi, including reference to “MSDUs” in Table 1—which were never previously cited with regard to the virtual MAC interface. *See* Reply at 6 (citing EX1005, [0128], [0138], [0172]-[0178] & Table 1); EX1026, ¶¶44-50, 74 (citing EX1005, [0138], [0171]-[0173], [0176-179]

& Table 1). Consequently, PO's expert Dr. Akl was never able to opine on Petitioners' Table 1 virtual MAC interface arguments.

Moreover, certain of Petitioners' Reply arguments are contradictory to those in the Petition. The Petition argued that the "information regarding bandwidth availability" limitation "merely requires a component capable of receiving feedback statistics regarding the available resources of the wireless transceivers" and that Chincholi met the limitation via disclosure of feedback statistics. Pet. at 28-29; EX1002, ¶¶105-108. The Petition and accompanying declaration said nothing about feedback being "current." *Id.* In Reply, Petitioners and their expert now argue for the first time that more than "mere[]" statistics are required, as their proposed construction requires information to be "current," for the first time arguing Chincholi discloses "current" information. Reply at 10-11; EX1026, ¶¶61-70. These arguments are without merit—but made for the first time after PO's opportunity to contest them with evidence and expert testimony had passed. *See infra*, Section III.A.2; *see also Corephotonics*, 84 F.4th at 1001-1002.

The Board should disregard these new arguments. *See Netflix*, 84 F.4th at 1377-1378 (argument based on new embodiment forfeited because not raised in petition); *Ariosa*, 805 F.3d at 1367 (reply cannot rely "on previously unidentified portions of a prior-art reference to make a meaningfully distinct contention."); *see also Parkervision*, 88 F.4th at 980; *Axonics*, 75 F.4th at 1384; *Apple Inc. v. Omni*

MedSci, Inc., No. 2023-1034, 2024 WL 3084509, at *6 (Fed. Cir. June 21, 2024); *Dropbox, Inc. v. Datanet, LLC*, IPR2024-00079, 2025 WL 1203665, at *16 (P.T.A.B. Apr. 25, 2025) (“*Axonics* controls here, because the Reply Brief relies on the same embodiments ... that are cited in the Petition.”).

It would be similarly inappropriate for Petitioners to continue to assert the Petition’s plain and ordinary meaning arguments while operating under narrowed constructions in the district court. Pet. at 12-13; EX1002, ¶65; EX1027; EX1028. “It is axiomatic that claims are construed the same way for both invalidity and infringement.” *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1330 (Fed. Cir. 2003). The Director has made clear that only in rare circumstances may a Petitioner take inconsistent claim construction positions before the Board and in the district court. *Revvo Techs., Inc. v. Cerebrum Sensor Techs, Inc.*, IPR2025-00632, Paper 20 at 4 (Nov. 3, 2025) (precedential). While a petitioner’s inconsistent positions may be excused based on sufficient explanation (*id.* at 5), a petitioner “may proffer a different, broader construction before the Board when the district court *already has rejected* petitioner’s narrower construction”—not when the district court has accepted it (*Revvo Techs., Inc. v. Cerebrum Sensor Techs., Inc.*, IPR2025-00632, Paper 36 at 4 (Jan. 26, 2026) (*Revvo II*) (emphasis in original)). Were Petitioners to continue to put forward plain and ordinary meaning here, the Petition should be terminated. *Revvo II*, Paper 36 at 3 (petitioners may not “have it both ways”); *see*

also, e.g., Apple Inc. v. Theta IP, LLC, IPR2024-00817, Paper 31 at 19-20 (Nov. 24, 2025) (evaluating *Revvo* in final written decision).

III. THE PETITION DOES NOT ESTABLISH THAT THE APPLIED REFERENCES RENDER THE CHALLENGED CLAIMS UNPATENTABLE

A. Chincholi Lacks Limitations Common to All Challenged Claims

1. “virtual MAC interface”

Petitioners’ Reply, despite improper new arguments and evidence, confirms that Chincholi does not disclose the claimed “virtual MAC interface,” either under plain and ordinary meaning or the district court’s construction. *See* Paper 17 (POR), Section VI.A.1; *see also supra*, Section II.

First, Chincholi’s OMMA is not “separately addressable,” notwithstanding the Reply’s new argument that “WTRUs in Chincholi send signaling messages regarding their availability to the OMMA of associated NTs.” Reply at 7. “Separately addressable from the recited actual MAC interfaces” means that the virtual MAC interface has its own address that it uses for purposes of transferring data. *See* POR at 12; EX2017, ¶¶53-55; EX2010 at 17 (“An address field within each packet specifies the intended recipient.”), *id.* at 34 (discussing “addressing”). This is consistent with the way Chincholi uses the term “address”—to indicate the destination where data is sent. *See, e.g.,* EX1005, [0004]; [0007]; [0200]; [0383].

Nothing in the Reply demonstrates that the OMMA Controller itself has an address, let alone an address to which any data is sent. *See id.*; EX1026, ¶¶37-43, 56-57. Rather, Chincholi discloses only that the NT and WTRU have addresses, and messages pass through the OMMA, which acts like an aggregator and so does not have its own address, identifier, endpoint, or interface. Chincholi's OMMA merely receives IP packets and distributes them among the RAT protocol stacks, operating as a pass-through. EX1005 [0243]-[0245]; EX2017, ¶¶78-79. In sum, the OMMA does not serve as a proxy for an actual MAC interface or multiple actual MAC interfaces, as the virtual MAC interface of the '564 patent does. EX2017, ¶54.

Moreover, for a virtual MAC interface to be “separately addressable from the recited actual MAC interfaces,” the virtual MAC interface must intervene between higher protocol layers sending data down the protocol stack and the actual MAC interfaces. *See* EX2017, ¶¶54, 80. In a new argument, the Reply points to a “message” about RAT availability to satisfy this element. Reply at 7. However, this is not a data transfer. Moreover, the message comes from the physical layer *below* the actual MAC interfaces, and not above. *See* EX1005, [0243]-[0245]; EX1026, ¶¶37-43.

Second, Chincholi's OMMA does not “obscure the recited actual MAC interfaces from higher protocol stack layers.” Because the actual MAC interfaces sit at the MAC sublayer of layer 2, the actual MAC interfaces must be obscured to

anything above layer 2, and the virtual MAC interface itself must be located in layer 2 in order to obscure anything above it. *See* EX2010 at 300. While Petitioners concede that “Chincholi’s OMMA operates as a common layer immediately above the MAC layers,” it is clear that the OMMA sits at layer 3. EX1026, ¶49. This is because it can communicate directly with layer 4 (which only an adjacent layer can) and because it performs layer 3 packet routing functions. POR at 40-42; EX2017, ¶¶88-89; EX1005, [0139], [0171]-[0186], [0369]-[0370]; EX2018 at 42-44; EX2019, § 7.5.4.2.2. Therefore, OMMA does not obscure the actual MAC interfaces from layer 3, a protocol stack layer higher than the actual MAC interfaces.

Moreover, Petitioners’ new argument that Chincholi’s reference to MSDUs means that actual MAC addresses are obscured is incorrect. Reply at 6. Petitioners’ argument that the MSDUs “lack MAC headers having actual MAC addresses” (*id.*) misses the point: a lack of header or address does not obscure the existence of the *interface itself* from higher layers. In fact, Chincholi separately makes the actual MAC interfaces and their associated addressing information available to the OMMA and, as explained by Patent Owner’s expert, does not disclose a virtual MAC interface that obscures those actual MAC interfaces from higher layers. EX2017, ¶¶80-81; EX1005, [0192]. Rather than obscuring the existence of the actual MAC interfaces as required by the construction, Chincholi merely “combines packets from

different RATs,” leaving the existence of the many RATs apparent as the OMMA forwards the packets. *Id.* The reference to MSDUs is a red herring.

Additionally, Petitioners are wrong that “Chincholi’s OMMA embodies all of the functionality that the ’564 associates with the ‘virtual MAC interface.’” Reply at 9. PO does not “quibble” with the comparison between functional blocks—PO pointed out that (1) the Petition does not explain at all why or how those blocks are equivalent; and (2) when examined, the blocks serve different functions. POR at 36-39; EX2017, ¶¶84-87. On Reply, Petitioners provide no further explanation for why Chincholi’s traffic shaping module is the functional equivalent of the ’564 patent’s ultra-streaming block or why Chincholi’s MAC resource reservation module is the equivalent of the ’564 patent’s processing block. Reply at 9. Moreover, Petitioners’ expert’s contention that Chincholi’s IP QoS Scheduler module 603 is equivalent to the ’564 patent’s decision block because it has “decision-making functionality” is incorrect. EX1026, ¶¶58-59. The decision block of the challenged claims does not perform generic decision-making functions, but rather specific ones: “determin[ing] the size and type of data stream being received, and the type of processing necessary to put the stream in a format where it is capable of being transmitted.” EX1001 at 3:31-34. Separating individual QoS streams is not equivalent to that functionality. EX1005, [0143]; EX2017, ¶85. Finally, PO indeed disputes that dependent claims 4-6 are met (*see* Reply at 9); each requires the virtual MAC interface and other

disputed claim limitations that are absent from claim 1, merely with a more specific virtual MAC interface that is also not present in Chincholi. EX1001, 13:21-28.

In all, Petitioners' new, strained, and unsupported arguments cannot demonstrate that Chincholi discloses the virtual MAC interface.

2. “resource monitoring interface” that “feeds information regarding the bandwidth availabilities”

The Petition fails to show that Chincholi discloses a “resource monitoring interface” that “feeds “information regarding the bandwidth availabilities of the first and second wireless transceivers” because Chincholi’s feedback relates to channel quality, not bandwidth availability, and because it is not “current,” as required by the district court claim construction.

Petitioners and their expert previously argued that “[a] POSITA would have understood that the ‘resource monitoring interface formed in the processing interface’ merely requires a component capable of receiving feedback statistics regarding the available resources of the wireless transceivers.” Pet. at 28 (citing EX1002, ¶105). Supporting that point, Petitioners pointed to portions of Chincholi that describe the collection of feedback metrics, including “averages.” EX1005, [0161], Table 2.

Now operating under the district court claim construction proposed by Petitioners that requires “current” bandwidth availability information, Petitioners no

longer argue that “merely” statistics would qualify. Though Petitioners concede that Chincholi discloses feedback metrics that “reflect the average state of the system,” they now argue Chincholi “does not exclude current resource-availability information.” Reply at 10. But the examples cited by Petitioners are inapposite.

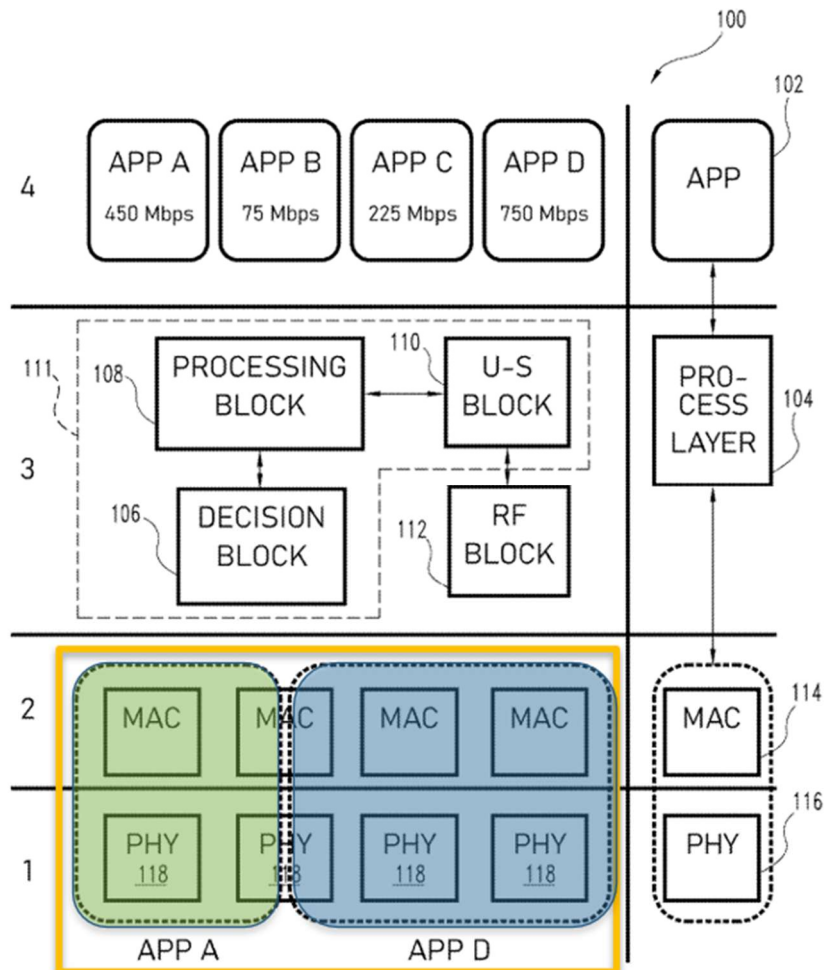
Petitioners point to Chincholi’s disclosure that, “[a]t startup, the OMMA layer may receive the available bandwidth of each of the one or more RATs.” Reply at 10-11 (citing EX1005 [0167]). But “[a]t startup,” no bandwidth is yet being used. Rather, the OMMA layer receives “the total channel bandwidths supported by” individual RATs. EX1005, [0163]. Understanding total channel bandwidth availability does not indicate real-time or current bandwidth usage, or what bandwidth remains available.

Petitioner also argues that Chincholi discloses the “information” limitation because it “discloses dynamic RAT switching based on ‘instantaneous channel quality/availability of the RATs.’” Reply at 11 (quoting EX1005 [0154]). But this disclosure refers to channel quality, based on criteria such as “low throughput, low RSSI, transmission control protocol (TCP) re-ordering trigger, high medium access delay, and high end-to-end delay.” EX1005, [0155]. These types of channel characteristics do not relate to bandwidth availability, but rather to quality of service. There is no disclosure of “current” bandwidth availability information based on these types of feedback.

Petitioners have pivoted from their original plain and ordinary meaning argument, meant to capture the disclosure of their primary reference and assert new, contradictory ones to meet their chosen, narrower district court claim construction, all while failing to show that Chincholi disclose the limitation. *See also supra*, Section II.

3. “do not prevent”

Petitioners’ Reply arguments confirm that Chincholi does not disclose the “do not prevent” limitation, which recites that utilization of certain bandwidth portions “do not prevent” another wireless networking device from utilizing remaining portions of available bandwidth of the same transceiver resources. EX1001, 13:5-13. Petitioners claim that “Figure 1 does not disclose *simultaneous* use of different portions of available bandwidth by different users.” Reply at 15. But that is exactly what Figure 1 shows: APP A and APP D sharing the second MAC/PHY pair:



EX1001, Fig. 1 (annotations added); EX2017, ¶100 (“A POSITA would understand the plain and ordinary meaning to be that two devices or two applications could share a single MAC/PHY pair at the same time.”).

PO previously argued that the Petition does not identify any portion of Chincholi that expressly discloses simultaneous sharing of transceiver resources by two applications or devices; Petitioners have no response on Reply. POR at 53. Indeed, Petitioners appear to concede that their argument regarding “multi-WTRU multi-IP flow cases” alone does not disclose this limitation, having no answer for

PO's point that Chincholi's packets are queued and distributed sequentially and therefore that transceiver resources are not shared. Reply at 14 (citing POR 52-53).

Rather, Petitioners rely solely on the fact that Chincholi uses the word "OFDMA" without explaining how OFDMA would be implemented within Chincholi. *Id.* at 14-15. Chincholi discloses operating only in pre-OFDMA 802.11 standards; nor do Chincholi, Petitioners, or their expert describe how a POSITA would know to modify those standards to allow for implementation of OFDMA. EX1005, [0116]; EX2017, ¶103; POR at 55.

Petitioners are wrong that Chincholi's disclosure of "contention" suggests "sharing an operating frequency." EX1026, ¶87. Rather, "contention" implies competition for a resource—wherein the loser is "locked out"—and this disclosure shows that Chincholi does not disclose this limitation. EX2017, ¶101; POR at 53-54.

4. "without requiring disassociation"

Petitioners claim that Chincholi discloses the "without requiring disassociation" limitation via "[d]uplicating packets across RATs during switching." Reply at 16. Petitioners point to passages in Chincholi where multiple RATs carry certain duplicated packets, *id.* (citing EX1005, [0255], [0381]), but this does not suggest that *both* RATs carrying the duplicated packets will form associations with the actual MAC and PHY interfaces. Rather, these passages merely describe a

typical “break before make” situation where only one RAT is selected (and “replace[s]” the other RAT) based on feedback metrics or QoS requirements. EX1005, [0255]; [0381]. A POSITA would view Chincholi as a typical break-before-make system under which a first association is broken before another is made. *See* EX2017, ¶107.

Petitioners claim that disabling a low-quality RAT could be make-before-break because “[n]owhere in PO’s cited passages does Chincholi suggest that low-quality RATs are disabled *before* switching to better-quality RATs.” Reply at 16. This ignores the state of the art at the time of Chincholi: break-before-make was typical and the default. EX2017, ¶¶105-107. Unless explicitly discussed, a POSITA would not have understood a system to employ make-before-break.² Chincholi does not discuss forming a second association without breaking the first, and therefore, a POSITA would expect that the second association would require disassociation, especially where the disclosure specifically discusses “disabl[ing]” the lower quality

² Petitioners’ expert appears to recognize that Chincholi does not explicitly disclose make-before-break, opining that “at a minimum, ‘make before break’ would have been obvious to implement in Chincholi.” EX1026, ¶97. However, it would not have been obvious. *See* EX2017, ¶¶105-107; ¶117 (POSITA not motivated to combine break-before-make system with make-before-break system).

RAT. *Id.*; EX1005, [0154]-[0155].

B. The Petition Does Not Establish that Chincholi in View of Secondary References Renders Any Challenged Claim Unpatentable

1. Lack of Motivation to Combine Chincholi and Clegg

Petitioners' Reply talks past PO's points regarding Clegg. Reply at 17-19. PO did not assert that Petitioners advocate for Clegg's ultra-wide band tuner itself to be incorporated into Chincholi, but rather that a POSITA would not be motivated to incorporate aspects of Clegg into Chincholi's disparate system, nor to undertake the extensive technical reworking required to do so. EX2017, ¶115. This is true even as to modifying "Chincholi's monitoring and response techniques" with "Clegg's teachings for addressing carrier-specific interference within bandwidth channels." Reply at 18. A POSITA would not have been motivated to combine Chincholi with Clegg because the two references solve different technical problems at different layers of the IEEE 802.11 protocol stack using entirely different mechanisms. EX2017, ¶115; EX1009 at 3:11-56. A POSITA would understand that substituting Clegg's PHY-layer carrier-selection techniques into OMMA would not improve OMMA's RAT-selection functionality because the two mechanisms operate at different protocol layers and make different types of decisions. *See* EX2017, ¶¶114-118; *Medtronic, Inc. v. Teleflex Innovations S.à.r.l.*, 69 F.4th 1341, 1351 (Fed. Cir. 2023).

2. Lack of Motivation to Combine Chincholi/Clegg and Choi

As in the Petition and accompanying materials, Petitioners' Reply is again devoid of any reason that a POSITA would be motivated to combine Chincholi and Clegg with Choi. Rather, Petitioners merely assert that such a combination would be technically possible, and that Choi's "channel-quality-selection teachings would predictably improve Chincholi's feedback-based multi-RAT system." Reply at 18-19. But Petitioners identify no failing in Chincholi that would lead a POSITA to be motivated to supplement it with teachings from Choi. Indeed, as to a related patent, Dr. Almeroth concedes that a POSITA would not be motivated to combine a feedback system with Chincholi. *See Samsung Elecs., Co. v. XiFi Networks R&D, Inc.*, IPR2025-01206, EX1026, ¶102 ("My opinion does not require using Riggert to replace Chincholi's feedback architecture. Chincholi already discloses an OMMA architecture that collects feedback metrics from RATs...").

Choi would not predictably improve Chincholi. Choi optimizes the operating channel of a single IEEE 802.11 Basic Service Set, whereas Chincholi manages traffic across multiple heterogeneous RATs. EX1016, Abstract; EX1005, [0003]-[0007]. A POSITA would not be motivated to combine such disparate systems.

IV. THE PETITION DOES NOT ESTABLISH THAT THE CLAIMS OF THE '564 PATENT ARE INVALID UNDER SECTIONS 101 OR 112

A. The Petition Fails to Demonstrate that the '564 Patent Is Directed to Ineligible Subject Matter

1. The '564 Patent Meets Step 1

Petitioners largely ignore the substance of PO's Step 1 improvement, which contains two parts: first, "the fact that it is the claimed virtual MAC interface that performs ... bandwidth allocation decision-making" and, second, "that it does so while sitting at the MAC sublayer of layer 2 of the protocol stack." POR at 68. Petitioners make no attempt to rebut that the '564 patent discloses the specific improvement of a virtual MAC interface that performs bandwidth allocation decision-making, an essential inventive improvement of the '564 patent.

The '564 patent discloses specific improvements to the functioning of wireless networking devices and the "insatiable demand for more bandwidth" by introducing an architecture that (1) determines wireless bandwidth demand from one or more applications, (2) defines virtual MAC and virtual PHY layers that determine available resources in the actual MAC and PHY layers, and (3) allocates available resources to satisfy the bandwidth demands of the one or more applications. *See* EX1001 at 1:54-56, 3:58-67, 4:61-5:13, 12:16-24. In particular, the '564 patent introduces a processing layer into the MAC sublayer to "manage signals" between the upper layers and the actual MAC and PHY layers, allowing for more efficient

bandwidth allocation decisions with greater granularity than prior wireless networking devices. *Id.* at 2:56-65, 4:46-49, 4:61-5:13, 6:4-8, Fig. 4.

This architecture addresses the inefficient use of channels and bands used by previous conventional wireless network architectures and allows the system of the '564 patent to make allocation decisions at a more granular level and with reduced latency by evaluating bandwidth requirements and available transceiver resources together, rather than treating each resource in isolation. *See id.* at 1:54-60, 2:56-3:3; *see also id.* at 4:24-40, 6:4-8. Portions of multiple transceiver bandwidths may be grouped or allocated to satisfy an application's bandwidth requirement via the processing interface. *See id.* at 4:30-40, 12:6-11, 12:25-30; *see also id.* at 2:56-3:3, 3:51-57, 4:24-40, 6:4-8, Fig. 1. These virtual interfaces operate between the network layer and the physical layer to manage signals from applications before those signals are sent to the actual MAC and actual PHY layers, monitoring current bandwidth availability of the multiple transceivers in the resource monitoring interface and making dynamic allocation decisions transparently to meet bandwidth needs at the virtual MAC interface. *Id.* at 4:46-49 12:25-34. This integration of virtual MAC logic, transparency, resource monitoring interface logic, and current bandwidth availability information in every challenged claim allows the system to efficiently allocate transceiver resources to satisfy bandwidth requirements of different applications running on wireless networking devices. *See id.* 3:51-57; *see also id.* at

2:65-3:3, 6:4-8. At the time of invention, conventional network architecture could not share transceiver resources in this way. *See id.* at 1:54-60. This novel architecture, including the use of the virtual MAC interface and resource monitoring interface for bandwidth allocation, represents a concrete improvement for wireless networking devices.³

Rather than addressing the substance of this concrete improvement, Petitioners' Reply arguments regarding Step 1 depend entirely on the incorrect premise that the claims do not require a layer 2 location for the processing layer—including the virtual MAC interface and the resource monitoring interface. Reply at 20-21. But as explained above, the agreed construction for “virtual MAC interface” mandates a layer 2 location for the processing interface. *See* EX1028 at 7; EX1001,

³ This claimed novel architecture distinguishes the '564 patent from that in Petitioners' cited cases, where ineligibility was based on a lack of recited “particular architecture” or “any particular assertedly inventive technology for performing [claimed] functions.” Reply at 20-21; *Ericsson Inc. v. TCL Commc'n Tech. Holdings, Ltd.*, 955 F.3d 1317, 1328 (Fed. Cir. 2020); *Two-Way Media Ltd. v. Comcast Cable Commc'ns, LLC*, 874 F.3d 1329, 1337-38 (Fed. Cir. 2017).

12:25-27 (“at least one virtual MAC interface and at least one resource monitoring interface formed in the processing interface...”); *see supra* Section III.A.1.⁴

2. The ’564 Patent Meets Step 2

Petitioner makes two incorrect arguments with regard to Step 2: (1) that the processing layer is not located in layer 2; and (2) that the processing layer, including the virtual MAC interface and the resource monitoring interface, constitute only “conventional components performing conventional functions.”

First, as explained above, pursuant to both the construction of virtual MAC interface and the understanding of a POSITA, the processing layer is located in layer 2. *Supra* Section IV.A.1; *see also* Section III.A.1. This choice to form the virtual MAC and resource monitoring interfaces departed from conventional Wi-Fi architectures, and the formation of virtualized interfaces in Layer 2 that operate transparent to upper layers allows for making efficient bandwidth allocation

⁴ Nor was the district court’s construction of “information” a rejection of a layer 2 location of the processing interface. EX1027 at 16. Rather, the district court stated “[t]he disputed language states nothing about the *source* of the information,” and that “[r]ather, it limits the information’s *content*.” *Id.* A POSITA viewing the claim as a whole would view the processing interface as having a layer 2 location. *See* EX2017, ¶¶70; *see also id.*, ¶¶63-69.

decisions with greater granularity. EX1001 at 2:56-3:3, 4:46-49, 4:61-5:14, 6:4-8, Fig. 4.

Second, the processing layer of the '564 patent does not contain merely conventional components, nor do they perform conventional functions. Rather, the challenged claims are directed to novel methods and architecture for a virtual MAC interface (with “transparent” decision-making) and resource monitoring interface (feeding back current bandwidth availabilities) that, together, provide for: (1) the simultaneous maintenance and dynamic allocation of multiple Wi-Fi transceivers having different bandwidth availabilities and frequency bands; and (2) the identification and exclusion of unavailable bandwidth portions in order to allocate available, non-contiguous bandwidth portions to satisfy bandwidth requirements. *See supra*, Section IV.A.1; *see also* EX1001, 12:45-60.

B. The Petition Fails to Demonstrate that the '564 Patent's Claims Lack Adequate Written Description

1. “transparent”

On Reply, Petitioners again require too much for written description. They have agreed that a POSITA would view “transparent” as meaning “unaware of the operation of the processing interface,” and have no trouble applying it. Reply at 4, 12-14; EX1028 at 8. Further, PO's expert explained how the specification suggests the claimed transparency to a POSITA. EX2017, ¶¶96-98, 129-130. There is no evidence to negate that a POSITA would not view the inventor as “in possession of

the invention.” *PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1306 (Fed. Cir. 2008).

2. “evaluating data transfer characteristics”

Petitioners again ignore that written description is evaluated from the point of view of a POSITA, and discount that a POSITA would understand this claim limitation from the specification’s references. EX2017, ¶¶132-133 (citing EX2010 at 405; EX1001, 5:1-8, 6:65-7:44, 9:9-35, Figs. 7 & 11). “*Ipsis verbis*” disclosure is not required. *Fujikawa v. Wattanasin*, 93 F.3d 1559, 1570 (Fed. Cir. 1996); *Purdue Pharma L.P. v. Faulding Inc.*, 230 F.3d 1320, 1323 (Fed. Cir. 2000).

3. “resource monitoring interface”

Petitioners assert that a POSITA would understand the “resource monitoring interface” to have its plain and ordinary meaning and have no trouble applying that plain and ordinary meaning with regard to their Section 103 grounds. *See* Reply at 4, 10-12; EX1026, ¶¶7, 61-70; EX1028 at 9; *see also* Pet. at 28-31; EX1002, ¶105. Nor is there any indication that a POSITA, in possession of the claim language, would not understand that the RF block and feedback capabilities described in the specification to demonstrate that the inventor was in possession of the invention. EX2017, ¶¶134-137; EX1001, 3:40-45, 4:54-60, 8:29-32; *PowerOasis*, 522 F.3d at 1306.

4. “adapted to emit radio waves in ... different bands of frequencies”

The Reply erroneously states that “Figure 1 shows no radios at all.” Reply at 24. Indeed, Figure 1 depicts “transceiver resources 118,” which are defined as being “various radios and receivers.” EX1001 at 3:61-64; Fig. 1. Nor does Petitioners’ argument regarding the district court complaint contradict that a POSITA would understand this limitation. *See* EX2017, ¶¶138-140.

5. “creating associations”

Petitioners are incorrect that Figure 1 does not disclose creating associations with multiple recipients. Reply at 25. A POSITA would understand that APP A and APP D in Figure 1, each sharing the MAC/PHY pairs, could represent multiple recipients. EX2017, ¶¶100, 141-143, 145; EX1001, Fig. 1. There is no inconsistency between the concept of association generally and the complaint describing multiple associations as an innovation of the ’564 patent. EX1018, ¶34.

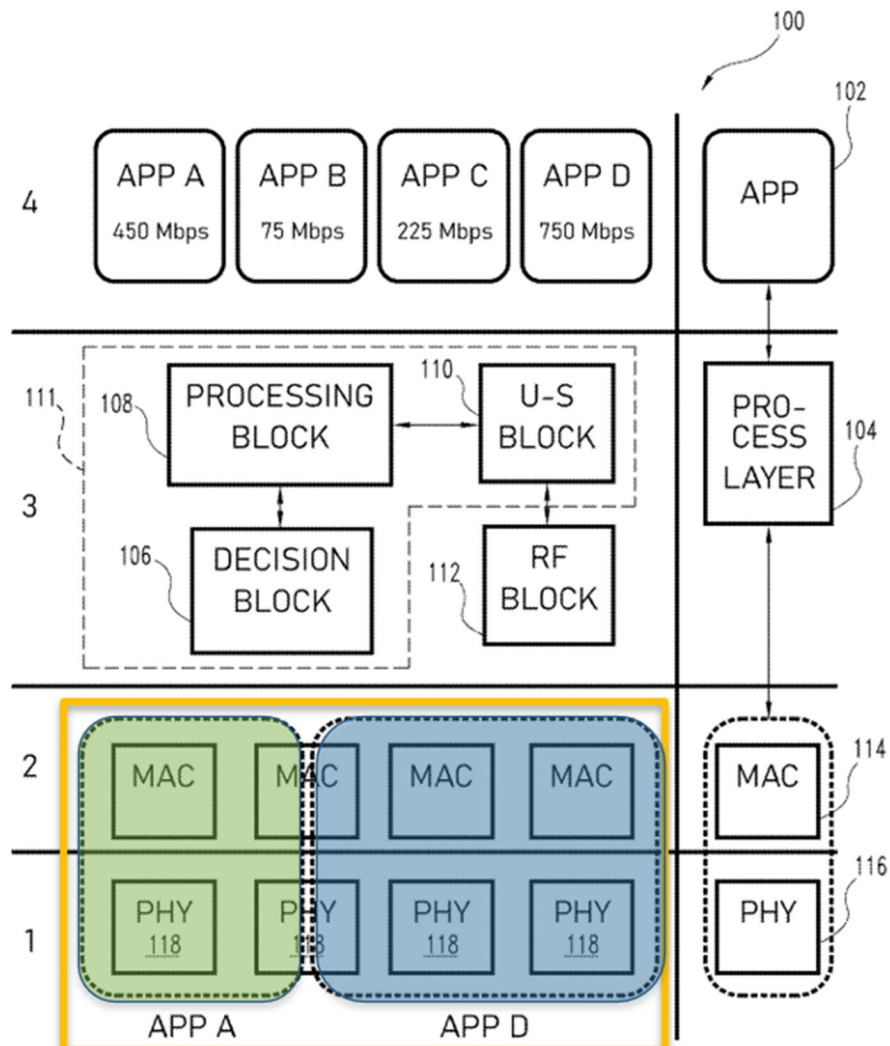
6. “without requiring disassociation”

Petitioners agree this term is understood by its plain and ordinary meaning and have no trouble applying it with regard to their Section 103 grounds. Reply at 4, 15-17; EX1026, ¶¶90-99; EX1028 at 11-12. Further, Petitioners’ Reply arguments are based on the misstatement that a POSITA would not understand what an association is. *See supra*, Section IV.B.5. Consistent with Petitioners’ claim

construction position, a POSITA would understand what “without requiring disassociation” means. EX2017, ¶¶144-146.

7. “do not prevent”

Petitioners agree this term is understood by its plain and ordinary meaning and have no trouble applying it with regard to their Section 103 grounds. Reply at 4, 14-15; EX1026, ¶¶80-89; EX1028 at 9-10. Petitioners are wrong that Figure 1 does not disclose multiple devices sharing bandwidth resources—when that is exactly what it shows with regard to the MAC/PHY pair being used by both APP A and APP D, which could represent multiple devices:



EX1001, Fig. 1 (annotations added); EX2017, ¶¶148-150.

C. The Petition Fails to Demonstrate that the '564 Patent's Claims are Indefinite

1. “partially simultaneously”/“substantially simultaneously”

Petitioners ignore that Federal Circuit law makes clear that “substantially” is a well-understood term. *See Verve, LLC v. Crane Cams, Inc.*, 311 F.3d 1116, 1120 (Fed. Cir. 2002). Similarly, “partially” is also readily understandable. EX2017, ¶152. Moreover, a POSITA would be familiar with TXOPs without needing any disclosure

in the specification, and a POSITA would therefore be informed of the scope of the claim. *Id.*; EX2010 at 309; *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 789 F.3d 1335, 1341-1341 (Fed. Cir. 2015).

2. “better than”

Apparently conceding that data transfer characteristics almost always point in the same direction, Petitioners assert that a POSITA would not know how to resolve the very rare inconsistency to determine which is “better.” Reply at 27; EX2017, ¶¶155-157. But PO already explained that certain characteristics are more important (error rate, latency, and throughput), and a POSITA would have no trouble understanding which were better overall. EX2017, ¶158; *see also S3 Inc. v. NVIDIA Corp.*, 259 F.3d 1364, 1371 (Fed. Cir. 2001) (“patents are written for skilled artisans”).

V. CONCLUSION

The Petition does not establish that any of the challenged claims are unpatentable. PO’s claims should be confirmed.

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US Patent No. 12,250,564

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WORD-COUNT CERTIFICATE

The undersigned certifies that the foregoing Patent Owner Response complies with the type-volume limitation of 37 C.F.R. § 42.24(c)(4) and contains 5,578 words in 14-point Times New Roman font as calculated by the word count feature of Microsoft Office. This word count is inclusive of all text and footnotes but does not include the table of contents, table of authorities, certificates or service or word count, or appendix of exhibits or claim listing.

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