

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

APEX BEAM TECHNOLOGIES LLC,
Patent Owner

Case IPR2025-00903
U.S. Patent No. 11,546,110

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

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	DISCRETIONARY DENIAL IS NOT APPROPRIATE	8
A.	Settled Expectations Do Not Support Discretionary Denial	8
1.	ABT Has No Settled Expectations.....	8
a)	The '110 Patent Has Been In Force For Less Than Six Years	8
b)	ABT's Recent Acquisition Of The '110 Patent Undermines ABT's Claim Of Settled Expectations.....	9
c)	ABT Plainly Misapplies Dabico Because It (1) Asserts Priority Date Creates Settled Expectations And (2) Overstates The Importance of Actual Notice	10
d)	Invalidation Of Related Chinese Patents Contradicts Any Settled Expectations By ABT	12
2.	Regardless Of Settled Expectations, Discretionary Denial Would Still Be Inappropriate Due To Material Error By The Office.....	14
B.	Discretionary Denial Under Fintiv Is Inappropriate	18
1.	The Fintiv Factors Do Not Support Discretionary Denial.....	18
a)	Factor 1—Neutral—No Stay Has Been Requested In The Litigation.....	18
b)	Factor 2—Favors Referral—The Final Written Decision Is Likely To Issue Before The Scheduled Trial Date.....	18
c)	Factor 3—Favors Referral—Minimal Relevant Investment By The Parties And Expeditious IPR Filing	20
d)	Factor 4—Favors Referral—Apple's Broad Stipulation Eliminates Overlap of Issues Between The IPR And The Litigation.....	21
e)	Factor 5—Neutral—The Parties Are The Same In The IPR And The Litigation	22
f)	Factor 6—Favors Referral—The Merits Of The Petition Are Strong.....	22

g)	Holistic Evaluation Of All Factors	23
2.	Regardless Of The Fintiv Factors, Discretionary Denial Would Still Be Inappropriate Due To Material Error By The Office ..	25
III.	INTER PARTES REVIEW IS AN APPROPRIATE USE OF OFFICE RESOURCES	26
A.	Complex Litigation Makes The PTAB Better Suited To Adjudicate Validity	26
1.	The Litigation Involves 17 Different Patents	26
2.	The Litigation Involves Patents With Diverse Subject Matter ..	27
B.	Substantive Inter Partes Review, Available Only Upon Referral, Would Yield Significant Efficiencies	28
C.	Applicant’s Failure To Attribute Third Party Technical Work Resulted In Material Error And Warrants Inter Partes Review	31
IV.	REFERRAL OF THE INSTANT PETITION IS APPROPRIATE BASED ON EFFICIENCIES GAINED BASED ON PRIOR REFERRAL OF SEVEN PETITIONS CHALLENGING PATENTS ASSERTED IN THE SAME CO-PENDING LITIGATION.....	33
V.	CONCLUSION	34

LIST OF EXHIBITS

APPLE-1001	U.S. Patent No. 11,546,110
APPLE-1002	U.S. Patent No. 11,546,110 File History
APPLE-1003	Declaration of Dr. Narayan Mandayam
APPLE-1004	U.S. Patent Publication No. 2013/0182594 (“Kim”)
APPLE-1005	U.S. Patent Publication No. 2015/0195025 (“Kang”)
APPLE-1006	U.S. Patent No. 10,944,527 File History
APPLE-1007	4G: LTE/LTE-Advanced for Mobile Broadband, Dahlman, 2014
APPLE-1008	U.S. Patent Publication No. 2015/0162966 (“Kim-966”)
APPLE-1009	P.C.T. Publication No. WO 2017/084235 (“Zhang-235”)
APPLE-1010	U.S. Patent Publication No. 2016/0112099 (“Lee”)
APPLE-1011	U.S. Patent Publication No. 2019/0387501 (“Park”)
APPLE-1012	U.S. Patent Publication No. 2010/0202560 (“Luo”)
APPLE-1013	June Munford Declaration
APPLE-1014	Complaint from April 29, 2024
APPLE-1015	Amended Complaint from May 2, 2024
APPLE-1016	Proof of service of the complaint (filed May 14, 2024)
APPLE-1017	Apple Inc.’s Sotera Stipulation

APPLE-1018- APPLE-1135	RESERVED
APPLE-1136	Federal Court Management Statistics—Profiles, June 2025
APPLE-1137	CTIA, “5G in America.” <i>CTIA</i> , CTIA—The Wireless Association, <i>available at</i> https://www.ctia.org/the-wireless-industry/5g-in-america
APPLE-1138	Expert Market Research, “Top 15 5 G Infrastructure Companies in the World 2025,” <i>Expert Market Research</i> , <i>available at</i> https://www.expertmarketresearch.com/blogs/top-5g-infrastructure-companies
APPLE-1139- APPLE-1141	RESERVED
APPLE-1142	TDOC R1-1910225
APPLE-1143	Papasakellariou, Aris, “Re: [98b-NR-Spec-NR_IIOT-Core-213].” 3GPP TSG_RAN_WG1 Archives, 3 Nov. 2019, LISTSERV – list.etsi.org, https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_RAN_WG1;f8c17069.1911A&FT=&P=T&H=&S=
APPLE-1144	Draft Change Request: Introduction of Industrial IoT (NR_IIOT-Core), 3GPP TS 38.213, Rel-16, 3GPP TSG-RAN WG1 Meeting #98bis, Chongqing, China, Oct. 14-20, 2019
APPLE-1145	TDOC R1-1911181
APPLE-1146	TDOC R2-1914882
APPLE-1147	3GPP TR 25.892 V6.0.0 (2004-06) Technical Report (3 rd Generation Partnership Project; Technical Specification Group Radio Access Network; Feasibility Study for Orthogonal Frequency Division Multiplexing (OFDM) for UTRAN enhancement (Release 6)) (“TR-25.892”)

- APPLE-1148 “Apple Increases U.S. Commitment to \$600 Billion, Announces American Manufacturing Program.” Apple Newsroom, Apple, Aug. 6, 2025, <https://www.apple.com/newsroom/2025/08/apple-increases-us-commitment-to-600-billion-usd-announces-ambitious-program/>
- APPLE-1149 RESERVED
- APPLE-1150 Machine Translation of Decision on Invalidation Request (No. 561927) concerning Chinese Patent No. CN108023616, China National Intellectual Property Administration, Patent Reexamination and Invalidation Examination Department (May 9, 2023)
- APPLE-1151 Machine Translation of Decision on Invalidation Request (No. 562088) concerning Chinese Patent No. CN108155923, China National Intellectual Property Administration, Patent Reexamination and Invalidation Examination Department (May 25, 2023)
- APPLE-1152 Machine Translation of Decision on Invalidation Request (No. 561715) concerning Chinese Patent No. CN108882365, China National Intellectual Property Administration, Patent Reexamination and Invalidation Examination Department (May 25, 2023)
- APPLE-1153 Machine Translation of Decision on Invalidation Request (No. 561579) concerning Chinese Patent No. CN108923896, China National Intellectual Property Administration, Patent Reexamination and Invalidation Examination Department (May 29, 2023)
- APPLE-1154 Machine Translation of Decision on Invalidation Request (No. 562020) concerning Chinese Patent No. CN111585736, China National Intellectual Property Administration, Patent Reexamination and Invalidation Examination Department (May 30, 2023)

APPLE-1155-
APPLE-1157

RESERVED

APPLE-1158

“Albright Worried Multipatent Trials Ask Too Much Of Jurors,” Law360 (Dec. 18, 2020), at <https://www.law360.com/articles/1337976/albrightworriedmultipatent-trials-ask-too-much-of-jurors>

APPLE-1159

Bifurcation Order – *Videolabs, Inc. v. Asustek Computer, Inc.* 6:22-cv-00720-ADA (WDTX)

APPLE-1160-
APPLE-1166

RESERVED

APPLE-1167

U.S. Patent Application No. 18/089,999 File History

I. INTRODUCTION

Petitioner Apple Inc. (“Apple”) opposes Patent Owner Apex Beam Technologies LLC’s (“ABT”) Request for Discretionary Denial (Paper 8, “Request”). ABT’s Request focuses largely on just two discretionary doctrines: (a) settled expectations, and (b) *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”). But under all relevant considerations, denial of institution is simply inappropriate under either doctrine, and factors that were not addressed by ABT further demonstrate why *inter partes* review would constitute an efficient and otherwise appropriate use of Office resources.

Indeed, even if settled expectations and *Fintiv* considerations weighed in favor of discretionary denial (they do not), and even if other factors did not justify referral for merits consideration (they do), referral of the instant ’904 petition would still be appropriate because (1) the reasons for opposing discretionary denial of the instant petition are nearly identical to reasons deemed sufficient to justify referral of seven petitions challenging patents commonly asserted in the same counterpart litigation, and (2) per *AMD*, referral of this petition with those other seven petitions will render an efficient use of Board resources to address patentability. *Advanced Micro Devices, Inc. v. Concurrent Ventures, LLC*, IPR2025-00478, Paper 10, at 3 (PTAB July 31, 2025) (“*AMD*”) (given prior

institution of petitions challenging other patents asserted in the same co-pending litigation, referral of institution in this proceeding “is an efficient use of Board resources to address the challenged patent as well”).

Institution and merits review of the ’110 patent (one of 17 patents asserted in co-pending litigation¹ (collectively “Asserted Patents”))² would also lead to timely clarity on the scope and validity of rights purported to cover 5G-standard implementations—clarity that enables efficient planning and capital allocation by U.S. manufacturers and investors. Apple is one of these U.S. manufacturers and investors, having recently committed to a \$100 billion U.S. investment through its American Manufacturing Program to build an end-to-end American silicon supply chain and to co-develop and manufacture cellular semiconductor components “crucial for 5G communications” with U.S. partners including Broadcom and GlobalFoundries. *See* APPLE-1148. Apple has committed nearly \$600 billion to

¹ Sixteen of the 17 patents asserted in the Litigation have been challenged in IPRs by Apple. The sole unchallenged patent is U.S. Pat. No. 11,457,426.

² The ’110 patent is related to seven patents amongst the Asserted Patents for which IPRs have been referred for merits review. *See* IPR2025-00896, Paper 10 (PTAB Sept. 3, 2025) (referring IPR2025-00896, IPR2025-00900, IPR2025-00901, IPR2025-00907, IPR2025-00909, IPR2025-00910, IPR2025-00911).

similar initiatives over four years. *Id.* If the Asserted Patents are found unpatentable, early resolution avoids wasteful parallel litigation. And, even if found not unpatentable, by engaging in this validity investigation, the Board will provide certainty and guidance that informs U.S. manufacturers and investors. Either way, substantive engagement by the Board helps to inform scaling of U.S. production. In short, referral for merits review advances efficiency and the public interest by reducing friction and enabling informed investment in American manufacturing tied to 5G technologies.

As to settled expectations, the '110 patent issued in 2023 and therefore has been in force for only two years. Given its relatively recent issue, there can be no reasonable claim of settled expectations, let alone strong settled expectations. *See Advanced Micro Devices, Inc. et al. v. Concurrent Ventures, LLC et al.*, IPR2025-00479 (“AMD”), Paper 10, at 2 (PTAB July 10, 2025) (“...the challenged patent issued in **2021**,³ and Patent Owner has **not** developed strong settled expectations that favor discretionary denial”); *see also Microsoft Corporation v. Edge Networking Systems, LLC*, IPR2025-00617, Paper 12 (PTAB July 31, 2025) (a challenged patent issued in **2021** has “not been in force for a significant period of time”). Indeed, accounting for the recent issue date, Apple’s Petition is an “early

³ All emphasis has been added unless indicated otherwise.

challenge” that serves to promote “robust, predictable patent rights,” which “weigh[s] against discretionary denial.” *Microsoft Corporation v. Edge Networking Systems, LLC*, IPR2025-00617, Paper 12 (PTAB July 31, 2025) (“*Microsoft*”). Apple’s early challenge is presented under the backdrop of more favorable timing than IPR2025-00385, where the proceeding was referred to the merits panel despite trial predating the projected Final Written Decision (“FWD”) deadline by one month. *Zhuhai Cosmx Battery Co. LTD. v. NingDe Amperex Technology Limited*, IPR2025-00385, Paper 9, at 2-3 (PTAB July 2, 2025) (“*Zhuhai*”) (“[a]lthough there may be some inefficiencies with two proceedings operating in parallel, the early challenges to the patents tip the balance against discretionary denial”).

As to *Fintiv*, the trial in counterpart district court litigation⁴ (“Litigation”) is scheduled to occur only after the Board’s deadline to issue a FWD. ABT does not suggest that the district court trial date will be accelerated. Nor could it, as evidence establishes a reasonable expectation otherwise, with median time-to-trial statistics for WDTX resolving to a trial date that is nearly two months after the FWD deadline. *See* APPLE-116, at 37. Further, Apple has eliminated the

⁴ *Apex Beam Technologies LLC v. Apple Inc.*, Case No. 6:24-cv-00223-ADA-DIG (Apr. 29, 2024)

potential for inefficiencies and duplication by stipulating not to advance references asserted in IPR grounds within invalidity grounds advanced in litigation if, and immediately upon, grant of institution, which confirms substantive PTAB review of the same. Notably, in this regard, Apple’s stipulation is consistent in scope with those endorsed for similar purposes. *See, e.g., Shenzhen Touzhu Technology Co. LTD v. Stratasys, Inc.*, IPR2025-00438, Paper 10, at 3 (PTAB July 17, 2025) (“*Shenzhen*”); *Tesla, Inc. v. Intellectual Ventures II LLC*, IPR2025-00217 (“*Tesla*”), Paper 9 (PTAB June 13, 2025) (“*Tesla*”). Thus, if instituted, this proceeding would provide a true substitute for litigation.

The appropriateness of substantive PTAB review is reinforced by factors not addressed by ABT, for example: (1) the implicated ’110 patent is one of 17 patents asserted in co-pending litigation, (2) *inter partes* review serves the public interest by enabling centralized review of the Asserted Patents, rather than forcing distinct validity challenges before the district court, and (3) such centralized review is an appropriate use of Office resources. *See* §III, *infra*; *Dabico Airport Solutions Inc. v. AXA Power APS*, IPR2025-00408, Paper 21 (PTAB June 18, 2025) (“*Dabico*”); *see also Tessel, Inc. v. Nutanix, Inc.*, IPR2025-00322 (PTAB June 12, 2025) (“*Tessel*”) (discretionary denial based on “unfair dealings” when petitioner employees were the inventors). When holistically assessed, the three reasons addressed in §III, *infra*, demonstrate why

discretionary denial is not appropriate, and do so independently of ABT’s failure to justify application of discretion to deny institution.

More specifically, the Asserted Patents span 11 families covering diverse subject matter related to wireless technology. ABT acquired the Asserted Patents from two predecessors—Shanghai Langbo Communication Technology Company Ltd. (“Shanghai”) and PanPsy Technologies, LLC (“PanPsy”), which are identified in the table below:

Shanghai Patents (10 of 16)	10,912,081; 10,462,767; 10,568,113; 11,063,727; 11,374,721; 11,626,904; 10,944,527; 10,951,271; 11,917,581; 11,546,110
PanPsy Patents (6 of 16)	10,979,128; 10,986,695; 11,139,944; 11,637,615; 10,965,434; 11,108,639

As recognized with respect to a dispute involving fewer patents, the “Board is better suited to review a large number of patents involving diverse subject matter.” *Tesla*, at 3; *see also Shenzen*, at 3 (“The large number and vast scope of the patents asserted in the district court litigation weighs against discretionary denial, as the Board is better suited to review a large number of patents involving diverse subject matter.”).

Beyond the large number of Asserted Patents, and the efficiencies gained by

central review of them, ABT's suit against Apple implicates a broad array of technologies. ABT itself characterized the Asserted Patents as relating to "systems and methods for transmission schemes in wireless communication systems."

APPLE-1012, 13. This subject matter spans multiple technical areas within wireless communications, including paging, beam failure recovery, uplink cancellation, antenna virtualization, scheduling, listen-before-talk recovery, and multi-antenna transmission. *See id.*, 13-17. Given this and ABT's track record of filing serial lawsuits accusing widely adopted standard-based technologies, the PTAB resolving the patentability of the 16 challenged patents would yield outsized efficiencies relative to dispute resolution through multiple district courts across multiple forums via serial lawsuits. *Berkshire Hathaway Energy Company, et al. v. BirchTech Corp.*, IPR2025-00274, Paper 23, at 2-3 (PTAB July 2, 2025) ("*Berkshire*") (finding that "resolving the dispute between the parties at the Office would be more efficient" where "litigation between the parties would proceed to several district court trials in different jurisdictions").

Finally, observations concerning the conduct of the patent applicants in its dealings with the U.S. Patent and Trademark Office during original prosecution reveal the appropriateness and need for the Office to conduct a substantive review, as requested. Neither Shanghai nor PanPsy participated in formative 3GPP standard-setting efforts or contributed technical work to 3GPP's

telecommunications standard. *See* APPLE-1147. Shanghai was founded in 2013—and PanPsy was founded even later in 2020. By the time either entity began patenting activity, the various 3GPP standards were long established by others. In offering what it advanced as enabling disclosure for the '110 patent, the named inventor failed to cite and attribute prior art material, depriving the Examiner of critical context that could have materially influenced patentability and inventorship determinations. In acquiring and prosecuting the Asserted Patents under these circumstances, ABT, its predecessors, and the named inventors engaged in conduct inconsistent with the advancement of the technological arts and the integrity of the U.S. patent system—further reinforcing why inter partes review is an appropriate use of Office resources. *See* §III.C, *infra*.

Based on a holistic assessment of the discretionary factors identified above (and further discussed in this Opposition), exercising discretion to deny institution is not appropriate in this proceeding.

II. DISCRETIONARY DENIAL IS NOT APPROPRIATE

A. Settled Expectations Do Not Support Discretionary Denial

1. ABT Has No Settled Expectations

a) The '110 Patent Has Been In Force For Less Than Six Years

The '110 patent issued in 2023, and thus, has been in force for around two years—not long enough to establish a legitimate claim to settled expectations,

much less strong settled expectations. *See, e.g., AMD*, at 2 (“Additionally, the challenged patent issued in 2021, and Patent Owner has not developed strong settled expectations that favor discretionary denial”), at 3 (“most of the challenged patents have not been in force for a significant period of time (issued in 2020, 2020, 2021 and 2024)”) and “Patent Owner has not developed strong settled expectations that favor discretionary denial”); *Zhu Hai*, at 2 (“[T]he challenged patents have not been in force for a significant period of time (issued in 2024, 2023 and 2021), and, accordingly, Patent Owner has not developed strong settled expectations that favor discretionary denial.”). Indeed, relative to the recent issuance, post grant challenges to such young patents have been consistently characterized as “early” and “favor[ing] robust, predictable patent rights and weigh[ing] against discretionary denial.” *See Micron Technology, Inc. v. Yangtze Memory Technologies Co. Ltd.*, IPR2025-00190, Paper 21, at 3 (PTAB June 25, 2025) (patent issued in 2021 deemed “issued recently”).

b) ABT’s Recent Acquisition Of The ’110 Patent Undermines ABT’s Claim Of Settled Expectations

ABT’s recent acquisition of the ’110 patent in 2021 also undermines any claim to settled expectations favoring discretionary denial. ABT acquired the Asserted Patents recently, long after the PTAB became a common venue for efficiently resolving disputes over patent validity. By 2021, the PTAB’s role was

well established, with over one thousand petitions filed that year alone to enable assessment and confirmation of validity across a wide range of technologies, including telecommunications. *See* USPTO, PTAB Trial Statistics FY2021. With reasonable diligence attendant to the patent purchase, ABT could not legitimately conclude that this patent would be free of inquiry into validity, much less free of such an inquiry in the PTAB, a forum created by Congress for precisely that purpose.

c) ABT Plainly Misapplies *Dabico* Because It (1) Asserts Priority Date Creates Settled Expectations And (2) Overstates The Importance of *Actual Notice*

Citing to *Dabico*, ABT argues that “strong settled expectations” exist because the ’110 patent claims priority to a foreign application that was filed in 2016. Req., at 10. Despite its citation, ABT’s argument is flatly inconsistent with *Dabico*, which endorsed patent issuance as the relevant metric—not proclaimed priority to a foreign application. This stands to reason, as a patent owner cannot reasonably have settled its expectations on an unendorsed, unexamined application that remains subject to rejection by the Office. Issuance, rather than priority, is the right guidepost for assessing settled expectations. ABT fails to identify any authority suggesting otherwise. Certainly, no support is found in *Dabico* as the claimed priority to a series of applications with the earliest priority date in 2009. Yet, despite the presence of an earlier priority date—thus presenting an option

between applying the issue date or an earlier priority date—the *Dabico* decision focused on the issue date.

The language used in *Dabico* further confirms that issue date controls for establishing settled expectations. Indeed, based on a 2017 issuance of the challenged patent, it had “**been in force** almost eight years, creating settled expectations.” *See Dabico*, at 2. In other words, reference to “almost eight years” implicitly refers to the issue date of the challenged patent in relation to the date of the decision.

ABT further argues that Apple had actual notice of the ’110 patent since December 2022. *Req.*, at 10-11. ABT’s arguments, however, are inapposite, as *Dabico* makes clear that the distinction between actual notice and constructive notice is not meaningful. *Id.* at 3 (“As such, actual notice of a patent or of possible infringement is not necessary to create settled expectations.”). That is, in *AMD*, *Shenzen*, and *Zhuhai*, all bearing on patents issued in 2021 or earlier, notice was assumed, and yet, settled expectations were not deemed to be strong nor referral denied. *AMD*, at 2 (challenged patent issued in 2021); *Shenzen*, at 3 (challenged patents issued in 2020, 2020, 2021, and 2024); *Zhuhai*, at 2 (challenged patents issued in 2021, 2023, and 2024).

d) Invalidation Of Related Chinese Patents Contradicts Any Settled Expectations By ABT

Invalidation of Chinese patents related to a subset of the Asserted Patents also contradict ABT's settled expectations and instead confirm the public's settled expectation that the challenged claims may be unpatentable. The China National Intellectual Property Administration (CNIPA) has fully invalidated the patent rights of Chinese counterparts of 6 of the Asserted Patents: U.S. Pat. Nos. 10,912,081 (CN111585736A, CN108882365B), 11,063,727 (CN108023616B), 10,462,767 (CN108923896), 11,917,581 (CN108923896), 10,944,527 (CN108155923), and 11,546,110 (CN108155923). *See* APPLE-1050; APPLE-1051; APPLE-1052; APPLE-1053; APPLE-1054.

The invalidation decisions were issued in May 2023—almost two years before the petition in this proceeding (and all related proceedings). In other words, ABT has been on notice of invalidating prior art before this proceeding, which removes any reason for ABT to claim settled expectations. There is no evidence that ABT has taken any further action despite being on notice of these invalidations. For instance, ABT has not asked the Office to reexamine any of relevant U.S. patents (10,912,081, 11,063,727, 10,462,767, 11,917,581, 10,944,527, 11,546,110) in light of the prior art considered in the Chinese invalidation proceedings.

More specifically, there is a large degree of overlap between the claims of the '110 Patent and those of CN108155923 invalidated by the CNIPA. Compare APPLE-1051, at 3 (claim 1), and APPLE-1001, 29:6-26 (claim 1). Both sets of claims generally focus on the following similar elements:

- A first wireless radio signal,
- A first radio signaling,
- The first wireless radio signal is sent by K antenna port groups and the antenna port group includes a positive number of antenna ports,
- The antenna port group is one of K antenna port groups,
- The first signaling is used to determining a first time resource pool,
- An antenna virtualization vector is associate with the first antenna port group,
- A first antenna virtualization vector is an antenna virtualization vector available to the sender/base station in the first time resource pool,
- A second antenna virtualiation vector is available to the receiver/user equipment in the first time resource pool, and
- K is a positive integer greater than 1.

Based on this correspondence, the CNIPA's examination of CN108155923 is highly pertinent to the Challenged Claims of this proceeding and weighs against exercising discretion.

2. *Regardless Of Settled Expectations, Discretionary Denial Would Still Be Inappropriate Due To Material Error By The Office*

Even if ABT could claim any settled expectations, those expectations are offset and overcome by material error in the examination of the '110 patent. In *Anthony Inc. v. ControlTec LLC* (“*Anthony*”), “challenged patents [that] have been in force for approximately eighteen and seventeen years” did not support discretionary denial because “Petitioner appears to show a material error by the Office.” IPR2025-00559, Paper 12, at 2 (PTAB July 16, 2025). Here, the '110 patent is more than ten years younger than the patents at-issue in *Anthony*, and thus, any material error in the examination of the '110 patent weighs much more heavily in favor of it being an “appropriate use of Office resources to review the potential error.” *Id.*

Like *Anthony*, the material error in examination of the '110 patent results from premature allowance reflecting the Examiner’s lack of appreciation for relevant prior art. *Anthony*, at 2 (noting that “the patent examiner erred by overlooking the teachings of Carter” in issu[ing] a notice of allowance of both patent applications as the first office action). Indeed, in original examination of the '110 patent, only double patent rejections were issued, which were addressed by terminal disclaimers with respect to claims 1-20.

More specifically, more-relevant prior art, such as Kim, (which is applied in

the instant petition) was not cited during prosecution of the '110 patent. This omission denied the Examiner an opportunity to fully assess the true state of the art, both substantively and with respect to inventorship. Indeed, the Examiner erred by failing to issue any prior-art rejections during examination based on such art. *Ecto World, LLC, et al. v. RAI Strategic Holdings, Inc.*, IPR2024-01280, Paper 13 at 5 (PTAB May 19, 2025) (precedential).

Indeed, examination by the Office within a pending continuation of the '110 patent⁵ further confirms Kim's materiality to patentability of the '110 patent. Specifically, prosecution of the '999 application resulted in rejections of claims reciting features substantially similar to those recited in the '110 patent claims based on Kim:

6. Claim(s) 1-20 are rejected under 35 U.S.C. 103 as being unpatentable over Kim (US 2013/0182594 A1) in view of Kim* (US 20150162966 A1) (Both references from Case IPR2023-00603).

APPLE-1167, 29⁶.

The Examiner's analysis for pending claims of the '999 application is pertinent to the '110 patent claims given the similarity in recited features. As shown below,

⁵ U.S. Patent Application No. 18/089,999 ("the '999 application").

⁶ The Kim* referred to by the examiner is Kim-966 from the Petition grounds.

the '110 patent and the pending claims of the '999 application each recite similar features:

'110 Patent	'999 Application
A method for multi-antenna transmission in a user equipment, comprising:	A method for multi-antenna transmission in a user equipment, comprising:
receiving a first radio signal; and	receiving a first radio signal; and
receiving a first signaling;	receiving a first signaling;
wherein the first radio signal is transmitted by K antenna port groups; the antenna port group includes a positive integer number of antenna port(s);	wherein the first radio signal is transmitted by K antenna port groups; the antenna port group includes a positive integer number of antenna port(s);
a first antenna port group is one of the K antenna port groups;	a first antenna port group is one of the K antenna port groups;
the first signaling is used to determine a first time resource pool;	the first signaling is used to determine a first time resource pool that

	comprises a collection of time resources for shared use;
a second antenna virtualization vector is associated with the first antenna port group;	a second antenna virtualization vector is associated with the first antenna port group;
the second antenna virtualization vector is an antenna virtualization vector available to the user equipment in the first time resource pool; and	the second antenna virtualization vector is an antenna virtualization vector available to the user equipment in the first time resource pool;
the K is a positive integer greater than 1;	and the K is a positive integer greater than 1;
the first radio signal includes one or more of PSS (Primary Synchronization Signal), SSS (Secondary Synchronization Signal), MIB (Master Information Block)/SIB (System Information Block) or CSI-	the first radio signal includes one or more of PSS (Primary Synchronization Signal), SSS (Secondary Synchronization Signal), MIB (Master Information Block)/SIB (System Information Block) or CSI-

RS (Channel State Information Reference signal);	RS (Channel State Information Reference signal);
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The Examiner's prior art mapping is also similar to that applied in the instant Petition. *See* APPLE-1067, 29-45. Indeed, the Examiner walks through using Figure 5 in a similar manner. *See id.*, 32.

B. Discretionary Denial Under *Fintiv* Is Inappropriate

As discussed below, holistic weighing of the *Fintiv* factors favor institution. *Fintiv*, Paper 11 (PTAB Mar. 20, 2020) (precedential).

1. The Fintiv Factors Do Not Support Discretionary Denial

a) Factor 1—Neutral—No Stay Has Been Requested In The Litigation

Because no motion to stay has been filed (Factor 1), the outcome of a motion to stay cannot be inferred, nor the existence of stay known. *Sand Revolution II, LLC v. Continental Intermodal Group – Trucking LLC*, IPR2019-01393, Paper 24, at 7 (June 16, 2020) (informative). This factor is therefore neutral.

b) Factor 2—Favors Referral—The Final Written Decision Is Likely To Issue Before The Scheduled Trial Date

While ABT points to a scheduled trial date of December 7, 2026, (Req., at 6; Ex. 2001), ABT acknowledges the trial is scheduled to begin several weeks after the FWD deadline. And with so many patents asserted, it is likely that the patents

would be tried in tranches—or not even tried at all (depending on how many patents actually remain by trial). Indeed, accounting for the median time-to-trial statistics in the Western District of Texas (WDTX), trial is more likely to occur in January 2027 or later—well after the projected FWD deadline of November 18, 2026. *See, e.g., Zhuhai Cosmox Battery Co., LTD. v. Ningde Amperex Technology Limited*, IPR2023-00587, Paper 12, at 11 (PTAB Sept. 22, 2023) (considering statistical data showing delays in trial schedules when weighing proximity to FWD). Even if trial were to conclude as scheduled, disposition of post-trial motions may take 9-10 months⁷ such that final resolution of the Litigation would extend well beyond the FWD deadline. These trial and post-trial expectations tip Factor 2 against denial.

Even if trial were to occur slightly before FWD (and there is no reason to believe that will occur here given the scheduled trial date), early challenge to recently-issued patents tip the balance against discretionary denial. Indeed, in

⁷ *See, e.g., ACQIS LLC v. ASUSTeK Computer, Inc.*, No. 6:20-cv-00966 (W.D. Tex.) (approximately 10 months between verdict in March 2024 and final judgment in January 2025), and *VideoShare, LLC v. Google LLC*, No. 6:19-cv-00663 (W.D. Tex.) (approximately 9 months from verdict in November 2021 to final judgment in August 2022).

Zhuhai, a FWD was expected to issue one month *after* the trial in the counterpart litigation, and yet, discretionary denial was not deemed appropriate because “early challenges to the patents **tip the balance** against discretionary denial.” *Zhuhai*, at 2-3. Here, Apple’s Petition similarly represents an early challenge (around two years of issuance) to the ’110 patent, which tips the balance against discretionary denial, even if trial were to occur before the FWD and result in some inefficiencies with two proceedings operating in parallel.

Factor 2 therefore favors referral for merits consideration.

c) Factor 3—Favors Referral—Minimal Relevant Investment By The Parties And Expeditious IPR Filing

Investment in the district court proceeding remains low because discovery has not begun. This weighs against discretionary denial as IPRs can inform ongoing litigation. *See, e.g., Crowdstrike Inc. v. Webroot, Inc.*, IPR2023-00126, Paper 9, at 10 (PTAB May 5, 2023) (early-stage investment weighs against denial).

ABT’s own conduct confirms the lack of meaningful investment. Although it previously asserted the ’110 patent against a different defendant, it took no steps to diligently prosecute its claims until filing suit against Apple. And in its suit against Apple, ABT delayed more than ten months in filing a Case Readiness Status Report (CRSR) after it was permitted under the court’s Order Granting

Procedure (OGP) to do so.⁸ This abject failure, and refusal to move the Litigation forward, suggests ABT itself did not consider expeditious resolution of the '110 patent a priority, and it cannot now credibly argue that the district court proceeding reflects substantial investment.

Apple's Petition was also timely under § 315(b), and ABT fails to demonstrate any evidence of gamesmanship in any perceived delay of filing. Rather, the timeline to filing reflects Apple's good-faith efforts to engage in FRAND negotiations. Multiple IPRs also promote efficiency by addressing related patents cohesively.

Fintiv Factor 3 therefore favors referral for merits consideration.

d) Factor 4—Favors Referral—Apple's Broad Stipulation Eliminates Overlap of Issues Between The IPR And The Litigation

Apple has filed a broad stipulation that mitigates concerns about duplicative efforts, committing not to pursue in the Litigation any invalidity grounds based on printed publications or patents that could have been raised in the IPR. APPLE-

⁸ ABT's timeline to file the CRSR was triggered by Apple's response to the complaint by July 19, 2024. ABT then delayed filing to May 20, 2025. This delay matters because the CRSR is the trigger for the WDTX patent OGP's milestones and deadlines.

1031. This stipulation extends beyond *Sotera* to include “combinations of the prior art references asserted as part of a ground in this proceeding with unpublished system prior art or any other type of prior art,” thereby avoiding duplication of effort and inefficiencies by ensuring minimal overlap even if litigation is not stayed upon institution. That is, the stipulation also addresses combinations of the prior art references asserted as part of a ground in this proceeding with system prior art, thereby addressing the efficiency concerns raised in in *Motorola Solutions, Inc. v. Stellar, LLC*, IPR2024-01205, Paper 19, at 4 (PTAB Mar. 28, 2025) (“*Motorola*”).

Fintiv Factor 4 therefore favors referral for merits consideration.

e) Factor 5—Neutral—The Parties Are The Same In The IPR And The Litigation

While the parties in the Litigation are the same as here (Factor 5), this factor alone does not favor denial, particularly where, as here, the Petition demonstrates strong merits of unpatentability.

f) Factor 6—Favors Referral—The Merits Of The Petition Are Strong

As set forth in the Petition, the ’110 patent claims are plainly unpatentable over prior art. The grounds advanced in this proceeding demonstrate satisfaction of the features deemed allowable in original examination based on the teachings of

Kim, Dahlman, and Kim-966. *See* Pet., 1. Indeed, the Examiner issued a Notice of Allowance without any prior-art rejections, despite the claims reciting features that were known in the art, as disclosed by Kim, Dahlman and Kim-966. *Id.* The Petition demonstrates that the elements mistakenly believed by the Examiner to be new were in fact plainly known in the prior art. The grounds are strong and support referral of institution.

Fintiv Factor 6 therefore favors referral for merits consideration.

g) Holistic Evaluation Of All Factors

As discussed above, each *Fintiv* factor is either neutral or favors referral, and thus, all *Fintiv* factors weigh against denial on discretion. Decisions on discretion recently issued in *Shenzen* and *Tesla* further confirm that it would be inappropriate to exercise discretion based holistic weighing of the *Fintiv* factors in this case.

More specifically, in *Shenzen*, petitioner’s “broad stipulation” was found to weigh against discretionary denial given a complex counterpart litigation involving nine patents spanning six distinct families. *Shenzen*, at 3. In *Tesla*, the petitioner similarly filed a “broad stipulation” in relation to a counterpart litigation involving eleven patents spanning nine different families. *Tesla*, at 2-3. The facts are even more favorable in this proceeding, as Apple has filed a stipulation of similar scope as those filed in *Shenzen* and *Tesla*, and yet, the counterpart litigation is even more complex, involving more (17) asserted patents (16 of which have been challenged

in IPRs) spanning across more (11) distinct families.

Compared to *Tesla*,⁹ discretionary denial is even less appropriate than in this proceeding for at least two additional reasons:

(1) In *Tesla*, the scheduled trial date unambiguously preceded the FWD by about two months. In contrast, trial in the present proceeding is scheduled after the FWD; and

(2) In *Tesla*, the parties had progressed further in litigation, with the *Markman* hearing scheduled three months prior to the expected date of an institution decision. In the present proceeding, the parties have substantially less investment in the Litigation, with the *Markman* hearing not scheduled until November 21, 2025, after the November 18, 2025, due date for a decision on institution in this proceeding.

⁹ The court has indicated it does not believe that it is fair to a jury to consider more than three patents at a time. *See* APPLE-1058; *see also* APPLE-1059 (example of bifurcation order delineating larger case into tranches). A trial for any given patent across the seventeen patents is therefore likely to occur later than the currently scheduled date.

2. *Regardless Of The Fintiv Factors, Discretionary Denial Would Still Be Inappropriate Due To Material Error By The Office*

Even if there are any inefficiencies resulting from parallel litigation, those inefficiencies are offset and overcome by material error in the examination of the '110 patent. In *Microsoft Corp. v. Partec Cluster* (“*Microsoft II*”), “the scheduled district court trial [being] set to precede the expected final written decision due date by a month” did not warrant discretionary denial “because of Petitioner’s showing of material error during patent examination.” IPR2025-00318, Pap. 9, at 3 (PTAB June 12, 2025). Here, the timing is more favorable than *Microsoft II*, as the scheduled trial date of the Litigation is *after* the projected FWD. Thus, any material error in the examination of the '110 patent is a much more “appropriate use of Office resources to review the potential error.” *Id.*; *see also Padagis US LLC v. Neurelis Inc.*, IPR2025-00464, Paper 12, at 3 (PTAB July 16, 2025) (“Petitioner appears to show a material error by the Office, and it is an appropriate use of Office” despite “a scheduled district court trial date that precedes the date projected for a Board final written decision”).

Further, as discussed in §§II.A.2, the Examiner materially erred in prosecution of the '110 patent, which is demonstrated by rejections of substantially similar claim features in a pending continuation application based on Kim. *Supra*, §II.A.2; *see Microsoft Corp. v. Partec Cluster*, IPR2025-00318, Paper 9, at 3

(PTAB June 12, 2025).

III. *INTER PARTES* REVIEW IS AN APPROPRIATE USE OF OFFICE RESOURCES

Referral of institution is further appropriate because, as *Dabico* confirms, the application of discretion turns in part on whether instituting review represents an appropriate use of Office resources. Here, various factors discussed, particularly below, make that showing clear. Together, these factors confirm that this proceeding is not only appropriate for PTAB review, but also a prudent use of the Office's resources.

A. Complex Litigation Makes The PTAB Better Suited To Adjudicate Validity

1. The Litigation Involves 17 Different Patents

As noted previously, the Litigation involves 17 patents spanning 11 distinct families, and many of these patents has been in force for less than six years. These circumstances present “a large number” of patents and thus, “the Board is better suited to review” their validity. *See Tesla*, at 3 (litigation involving 11 patents spanning 9 different families). *See also Tesla, Inc. v. US Navy*, IPR2025-00341 (“*Tesla IP*”), Paper 12, at 2 (PTAB June 13, 2025) (same); *Shenzhen*, at 3 (litigation involved 9 different patents spanning 6 different families). The present dispute involves more patents spanning more families than the counterpart litigations implicated in *Tesla*, *Tesla II*, and *Shenzen*. Asking a jury to consider such a large

number of patents within a single trial is consequently even more unreasonable presently than doing so in each of *Tesla*, *Tesla II* and *Shenzen*. Simply put, the PTAB is better suited to review the validity of sixteen of the seventeen patents. For this reason alone, *inter partes* review in this proceeding is an appropriate use of Office resources.

2. *The Litigation Involves Patents With Diverse Subject Matter*

Beyond the large number of patents implicated, the Litigation is also complex. The technical subject matter spans multiple, distinct technology aspects. This diversity is reflected in 14 distinct base prior art references being applied across the IPR proceedings, each of which further incorporates different prior art combinations tailored to the specific claim limitations at issue. Such variation underscores that the patents do not implicate a single, unified invalidity theory, but instead require separate and highly technical analyses of discrete 5G functionalities—ranging from physical layer signaling techniques to higher-layer protocol operations. This fragmentation of issues makes it impractical for a lay jury to resolve the full scope of validity disputes in a single trial, while reinforcing that the PTAB, with its technical expertise and ability to adjudicate multiple parallel proceedings, is uniquely equipped to handle the breadth and complexity of these claims efficiently and consistently.

B. Substantive *Inter Partes* Review, Available Only Upon Referral, Would Yield Significant Efficiencies

The PTAB is uniquely situated to provide efficient review of the '110 patent given the complex validity issues not only at issue in this proceeding, but 18 others implicating other Asserted Patents in the Litigation. *Inter partes* review in this proceeding (and the 18 other proceedings) thereby serves the public interest by centrally settling patent validity, rather than forcing distinct validity challenges before the district court. This promotes the AIA's objectives of improving patent quality and reducing unwarranted litigation burdens on the public and industry participants. *See* 35 U.S.C. § 311; H.R. Rep. No. 112-98, pt. 1, at 48 (2011) (noting role of IPR in providing "a quick and cost effective alternative[] to litigation").

Such centralized review is crucial because ABT's track record demonstrates a propensity to assert the patents against adopters of widely-used standards-based technology. ABT has already established a pattern of aggressive enforcement of the '110 patent and related patents. It has also contended that practicing the 5G standard implicates its patents, and it has repeatedly filed lawsuits targeting companies that implement products interoperable with 5G. The high likelihood of future assertions against entities practicing related wireless communication technologies and the underlying wireless communications standard reinforces the

importance of validity investigation of the '110 patent and related patents. Indeed, in enforcing the Asserted Patents, ABT simply accuses the practice of the 5G standard, and it has already filed 6 distinct district court litigations. Further litigation is, therefore, more than reasonably likely, and addressing validity at the PTAB would serve to resolve a key question that will otherwise need to be addressed multiple times over, in less efficient forums that do not bring the benefit of perspective from highly technical PTAB judges.

According to the Cellular Telecommunications Industry Association (CTIA), the 5G standard, to which ABT claims its patents are essential, is used “all over the country” to “create the future and enhance America’s economic competitiveness” across multiple critical industries, such as healthcare and transportation. *See* APPLE-1137. Institution of this proceeding thereby resolves validity, and in doing so, helps create greater predictability for practicing entities within this technology domain. It further creates significant downstream efficiencies for the Patent Office, the courts, and the public by resolving validity once and for all at a single time in a single forum.

Given the ubiquitous nature of 5G—a global standard supported by billions of devices—the risk of further litigation on this patent is not speculative. It is reasonably foreseeable because patent litigation against companies offering products that support 5G and similar standards has been both serial and prolific.

Beyond Apple, numerous other companies manufacture or implement 5G devices, including but not limited to those against which the patent has been asserted thus far. In alleging infringement by Apple, ABT mapped its asserted patents (including the '110 patent) to “5G standards” and then further identified alleged practicing entities, including “Samsung, TCL, OnePlus, and ZTE...” APPLE-1012, 12 (citing email correspondence from ABT’s Managing Director to Apple counsel). These statements reveal ABT’s belief that the '110 patent implicates broad adoption by companies for allegedly infringing activity, which have not yet been subject to suit. *See* APPLE-1138. ABT itself has therefore highlighted that its asserted patents, including the '110 patent, purport to cover 5G features. *Id.*

Finally, *inter partes* review of this proceeding is also consistent with recent discretionary guidance regarding counterpart litigation that “would proceed to several district court trials in different jurisdictions...” *Berkshire*, at 2-3. There, such litigation resulted in *inter partes* review being deemed to represent an efficient use of Office resources. ABT’s serial litigation activity suggests Apple will not be the last defendant accused of infringement. ABT’s assertion of 17 patents, therefore, both in the Litigation and any future litigations against companies supporting 5G wireless communication technology is likely to span multiple district court trials across multiple jurisdictions. Under these circumstances, “resolving the dispute between the parties at the Office would be

more efficient.” *Berkshire*, at 2.

C. Applicant’s Failure To Attribute Third Party Technical Work Resulted In Material Error And Warrants *Inter Partes* Review

Inter partes review is also an appropriate use of Office resources in the instant case because, in acquiring the Asserted Patents (including the ’110 patent), ABT, its predecessors, or named inventors conducted themselves in a manner that impeded the substantive examination of the subject patent by the examiner, thus compromising the integrity of this patent and, for that matter, the integrity of the U.S. patent system.

ABT’s predecessors—Shanghai and PanPsy—did not originate technical content underlying the Asserted Patents. *See, e.g.*, APPLE-1142; see also APPLE-1143; APPLE-1144; APPLE-1145; APPLE-1146; APPLE-1147. Instead, they gained access to publicly available technical materials developed by others, incorporated that content into their applications, and presented them to the Office, passing them off as their own without attribution or disclosure of true origin. By failing to inform the Office that the claimed subject matter was derived from prior technical developments authored by third parties, Shanghai and PanPsy deprived the handling examiner of context that should have been made available to inform a fulsome search for prior art and consideration of patentability, both substantively and regarding inventorship. This conduct is unhelpful, and it threatens the

integrity of the patent system, which relies on applicants to disclose material information. Here, tactics by ABT's predecessors call into question the quality of prosecution earlier performed, and despite this flowing in part from patent applicant conduct, it nevertheless demonstrates that Office resources would be well spent in referring this petition for substantive review of its grounds, if only to promote patent system integrity and claim only what they have truly invented.

Recent decisions on discretion highlight the importance of equity-based considerations in assessing whether to allocate the limited resources of the Office to substantive consideration of IPR grounds that present a basis for unpatentability, e.g., party conduct rising to unfair dealings have been deemed pertinent to the exercise of discretion because such conduct reflects whether *inter partes* review represents an appropriate use of Office resources. While the facts in these decisions happened to implicate petitioner conduct, the theories implicate fairness more generally and beg for considerations of fairness in relation to the conduct of petitioners and patent owners, as it relates to a decision on whether to exercise discretion in denying institution.¹⁰

¹⁰ In *Analog Devices, Inc. v. Number 14 B.V.*, IPR2025-00550 (PTAB July 16, 2025) ("*Analog Devices*"), a party's use of Patent Office resources to apply for and

**IV. REFERRAL OF THE INSTANT PETITION IS APPROPRIATE
BASED ON EFFICIENCIES GAINED BASED ON PRIOR
REFERRAL OF SEVEN PETITIONS CHALLENGING PATENTS
ASSERTED IN THE SAME CO-PENDING LITIGATION**

Indeed, even if settled expectations and *Fintiv* considerations weighed in favor of discretionary denial (they do not), and even if other factors did not justify referral for merits consideration (they do), referral of the instant '904 petition would still be appropriate because, as recognized in *AMD*, its referral yields an efficient use of Board resources when accounting for earlier referral of co-pending petitions challenging seven other concurrently asserted patents in the same lawsuit. *AMD*, at 3 (given prior institution of petitions challenging other patents asserted in

be issued a patent was deemed to preclude later use of Office resources by that same party to advocate for unpatentability of the issued patent. Similarly, in *Tessel*, denial was based on “unfair dealings” when petitioner employees were the inventors. And in *Realtek Semiconductor v. Parkervision*, IPR2025-00324, Paper 11, at 2-3 (PTAB June 25, 2025), “fairness” and “equity” were invoked to limit joinder for time-barred petitioners, allowing it only in “exceptional circumstances.”

the same co-pending litigation, referral of institution in this proceeding “is an efficient use of Board resources to address the challenged patent as well”).¹¹

V. CONCLUSION

For the reasons set forth above, Apple requests denial of Patent Owner’s Request for Discretionary Denial.

Respectfully submitted,

Date: September 10, 2025

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¹¹ The ’110 patent is related to seven patents amongst the Asserted Patents for which IPRs have been referred for merits review. *See* Footnote 2.

CERTIFICATION UNDER 37 CFR § 42.24(d)

Under the provisions of 37 CFR § 42.24, the undersigned hereby certifies that the word count for the foregoing Petitioner's Opposition to Patent Owner's Request for Discretionary Denial totals 6,827 words, which is less than the 14,000 allowed under 37 CFR § 42.24.

Respectfully submitted,

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e)(4), the undersigned certifies that on September 10, 2025, a complete and entire copy of this Petitioner's Opposition to Patent Owner's Request for Discretionary Denial and all supporting exhibits were provided via email to the Patent Owner by serving the correspondence email addresses of record as follows:

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