

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Marvell Semiconductor, Inc.,

Petitioner,

v.

Credo Technology Group Ltd.,

Patent Owner.

IPR2025-01219

U.S. Patent No. 11,012,252

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

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EXHIBIT LIST

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1001	U.S. Patent No. 11,012,252 to Lam and Chen (“the ’252 patent”)
1002	Certified Prosecution File History for the ’252 Patent (“Prosecution History”)
1003	Declaration of Michael Shuo-wei Chen
1004	U.S. Patent No. 9,882,706 to Lugthart, et al. (“Lugthart”)
1005	U.S. Patent No. 7,445,389 to Aronson (“Aronson”)
1006	U.S. Patent No. 8,516,238 to Cornelius, et al. (“Cornelius”)
1007	Samaan, High-speed Serial Bus Repeater Primer (“Samaan”)
1008	Ars Technica, Why Thunderbolt cables will be expensive until 2013 (Library of Congress Capture)
1009	Intersil, ISL37231 [Datasheet]
1010	U.S. Patent Application Publication No. 2019/0028262 A1 to Kobayashi, et al. (“Kobayashi”)
1011	TE Connectivity, SFP+ High Speed Copper Cable Assemblies
1012	Cisco, Cisco 40GBASE QSFP Modules Data Sheet (Internet Archive Capture)
1013	AppleInsider, Intel details Thunderbolt, says Apple has full year head start (Internet Archive Capture)
1014	macstories, Intel: Apple Transferring Thunderbolt Trademark To Us (Internet Archive Capture)
1015	AnandTech, Intel’s Codename Light Peak Launches as Thunderbolt (Internet Archive Capture)
1016	Ars Technica, The technology inside Apple’s \$50 Thunderbolt cable (Internet Archive Capture)
1017	Gasca, et al., CMOS Continuous-Time Adaptive Equalizers for High-Speed Serial Links
1018	Declaration of June Munford re: Samaan
1019	Excerpts from 10G SFP+ Video
1020	Excerpts from Stauffer, High Speed Serdes Devices and Applications (“Stauffer”)
1021	U.S. Patent No. 7,233,617 to Gorecki (“Gorecki”)
1022	<i>Certain Active Electrical Cables and Components Thereof</i> , ITC Investigation 337-TA-1446, Exhibit 38 to Complaint, Credo’s Infringement Claim Chart Showing Molex’s Infringement of the

Exhibit No.	Description
	'252 Patent
1023	<i>Certain Active Electrical Cables and Components Thereof</i> , ITC Investigation 337-TA-1446, Exhibit 41 to Complaint, Credo's Infringement Claim Chart Showing TE Connectivity's Infringement of the '252 Patent
1024	<i>Certain Active Electrical Cables and Components Thereof</i> , ITC Investigation 337-TA-1446, Exhibit 66 to Complaint, Credo's Domestic Industry Claim Chart for the '252 Patent
1025	SFF-8431 Rev 4.1 + Addendum
1026	Texas Instruments Technical Article, How to Reduce Jitter and Improve Signal Integrity in Source and Sink System Designs Supporting HDMI 2.0
1027	Intel, Thunderbolt™ Networking Bridging and Routing Instructional White Paper
1028	Intel, PCI Express Ethernet Networking White Paper
1029	U.S. Patent No. 9,231,846 to Sinha, et al. ("Sinha")
1030	Excerpts from Prosecution File History of CN2019101555359 to Thermo Scientific Co. Ltd. (Chinese counterpart application to the '252 Patent)
1031	U.S. Patent No. 8,787,430 to Rhagavan, et al. ("Raghavan")
1032	Internet Archive Declaration of Mina Ching re SFF-8636 Rev 1.7
1033	Intel, PCI Express Architecture
1034	Internet Archive Capture, The Wayback Machine, Wikipedia, "PCI Express"
1035	Intel Website Search Results
1036	IAM – "IPBC Global 2025: Acting USPTO Director says IPR use needs to change"
1037	Credo "About" Webpage, https://credosemi.com/about-credo/
1038	In re <i>Certain Active Electrical Cables and Components Thereof</i> , Inv. No. 337-TA-1446, Document Details of EDIS No. 859233, Order Granting Non-Party Marvell Semiconductor Inc.'s Motion to Disqualify Fish & Richardson P.C. (Aug. 11, 2025)
1039	<i>In re Certain Active Electrical Cables and Components Thereof</i> , Inv. No. 337-TA-1446, Notice of Institution (Apr. 14, 2025)
1040	<i>In re Certain Active Electrical Cables and Components Thereof</i> , Inv. No. 337-TA-1446, Notice of Ground Rules (Apr. 18, 2025)
1041	Non-Party Marvell Semiconductor, Inc.'s Motion to Disqualify,

Exhibit No.	Description
	337-TA-1446, Ex. 8 (public version)
1042	“Shutdown Slowdown: What It Means for Patent Enforcement at the ITC,” October 1, 2025, https://www.fr.com/insights/thought-leadership/blogs/shutdown-slowdown-what-it-means-for-patent-enforcement-at-the-itc/
1043	LinkedIn profile of Credo President and CEO William (“Bill”) Brennan, https://www.linkedin.com/in/bill-brennan-a291367a/
1044	LinkedIn profile of Credo CTO Lawrence Cheng, https://www.linkedin.com/in/lawrence-cheng-9b721831/
1045	LinkedIn profile of Credo Chief Research and Development Officer Haoli Qian, https://www.linkedin.com/in/haoli-qian-1a50628/
1046	LinkedIn profile of Credo Vice President of Analog Engineering Arshan Aga, https://www.linkedin.com/in/arshan-aga-5b573a91/
1047	U.S. Patent No. 7,401,985 to Aronson and Light
1048	U.S. Patent App. No. 2007/0237464 to Aronson and Light
1049	<i>In re Certain Active Electrical Cables and Components Thereof</i> , Inv. No. 337-TA-1446, Private Parties’ Ground Rule 5.3 Maximum Scope of the Investigation (Jul. 24, 2025)
1050	Executive Order 14179, “Removing Barriers to American Leadership in Artificial Intelligence” (Jan. 23, 2025)
1051	Office Management and Budget (OMB) Memorandum M-25-21 “Accelerating Federal Use of AI through Innovation, Governance, and Public Trust” (Apr. 3, 2025)
1052	Statement from U.S. Secretary of Commerce Howard Lutnick (Jun. 3, 2025)
1053	<i>In re Certain Active Electrical Cables and Components Thereof</i> , Inv. No. 337-TA-3814, Amended Complaint (Mar. 18, 2025)
1054	Memorandum to All PTAB Judges on Interim Processes from Coke Morgan Stewart (Mar. 26, 2025)
2001	<i>In re Certain Active Electrical Cables and Components Thereof</i> , Inv. No. 337-TA-3814, Complaint (Mar. 13, 2025)
2002	“Credo Introduces PAM4 DSP for High Performance Data Centers and Enterprise Networks,” March 17, 2021, https://credosemi.com/credo-introduces-pam4-dsp-for-high-performance-data-centers-and-enterprise-networks/
2003	“AEC Applications,” https://credosemi.com/products/hiwire-

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	aec/applications/
2004	“Credo Introduces 800G HiWire ZeroFlap AECs to Support AI Backend Networks,” October 10, 2024, available at https://s205.q4cdn.com/511065572/files/doc_news/2024/10/credo-introduces-800g-hiwire-zeroflap-aecs-to-support-ai-backend-networks.pdf
2005	“CREDO Receives Cabling Installation & Maintenance Innovators 2019 Gold Award for HiWire™ Active Electrical Cables (AEC),” October 1, 2019, https://credosemi.com/news/credo-receives-cabling-installation-maintenance-innovators-2019-gold-award-for-hiwire-active-electrical-cables-aec/
2006	“Credo Files AEC Patent Infringement Complaint Against Amphenol, Molex, TE Connectivity, and Volex with United States International Trade Commission,” March 13, 2025, https://investors.credosemi.com/news-events/news/news-details/2025/Credo-Files-AEC-Patent-Infringement-Complaint-Against-Amphenol-Molex-TE-Connectivity-and-Volex-with-United-States-International-Trade-Commission/default.aspx
2007	RESERVED
2008	Order No. 12 Granting Marvell’s Motion to Disqualify Fish, 337-TA-1446, public version
2009	Bert Reiser & Ruthie Wu, Why the International Trade Commission is such an appealing forum for patent disputes,” Reuters (June 11, 2025), https://www.reuters.com/legal/legalindustry/why-international-trade-commission-is-such-an-appealing-forum-patent-disputes-2025-06-11/
2010	Order No. 19 Granting Motion to Amend Procedural Schedule, 337-TA-1446
2011	Respondents’ Initial Invalidity Contentions, <i>In the Matter of Certain Active Electrical Cables and Components Thereof</i> , Inv. No. 337-TA-1446, served June 26, 2025
2012	U.S. Patent No. 10,148,414 (“Lugthart414”)
2013	U.S. Patent No. 7,762,727 (“Aronson727”)
2014	Exhibit B-4 to the ITC Respondents’ preliminary invalidity contentions
2015	Exhibit B-11 to the ITC Respondents’ preliminary invalidity

Exhibit No.	Description
	contentions
2016	RESERVED
2017	Exhibit B-1 to the ITC Respondents' preliminary invalidity contentions
2018	RESERVED
2019	USPTO, "FAQs for Interim Processes for PTAB Workload Management," available at https://www.uspto.gov/patents/ptab/faqs/interim-processes-workload-management

I. Introduction

Patent Owner Credo's request for discretionary denial is rife with inaccuracies and should be rejected. Petitioner Marvell is the true innovator in the field of active electrical cables (AECs), with early patents disclosing the technology. Years later, Credo actively recruited Marvell employees and began developing AEC products. Now, Credo falsely claims to have invented AECs and related technical advancements that were, in fact, pioneered by Marvell.

As the result of a clear and material examiner error, the '252 patent issued in 2021. The patent was improperly allowed based on amended claim language that was never meaningfully searched or compared against the prior art. Credo did not assert the '252 patent until March 2025 when Credo launched its litigation campaign against Marvell's customers in district courts and the ITC.

Marvell is not a party in any co-pending litigation involving the '252 patent. Credo's discretionary denial arguments are also unavailing because: (1) "settled expectations" cannot attach to the '252 patent, which issued four years ago; (2) Marvell is not a party to any parallel litigation, therefore *Fintiv* does not apply; and (3) even if *Fintiv* applied, the *Fintiv* factors favor institution because the Petition challenges all claims, the ITC will address only a subset of the claims, a timely final decision is likely, and Marvell acted diligently.

Credo's contradictory positions across related IPRs further undermine its arguments: for the '233 patent, Credo argues for denial because it is no longer asserted in the ITC; but for the '252 and '111 patents, Credo argues for denial because they are asserted in the ITC.

II. Background

Marvell and its subsidiaries are the true innovators behind active electrical cables ("AECs"), which incorporate active components into transceiver assemblies at each end of an electrical cable. This innovation extends range and provides high-speed connectivity in data centers. For example, Marvell's wholly-owned subsidiaries ClariPhy and Inphi filed for patents on technologies necessary for AECs starting by at least 2014. *See, e.g.*, Ex-1004 (U.S. Patent 9,882,706 ("Lugthart")). These patents describe, e.g., AECs with equalization to compensate for transmission line losses on the host side by using preset, cable-independent equalization parameters. *Id.*, Abstract, 3:12-16, 4:10-12, 6:55-7:5, 14:29-31, Fig. 4A.

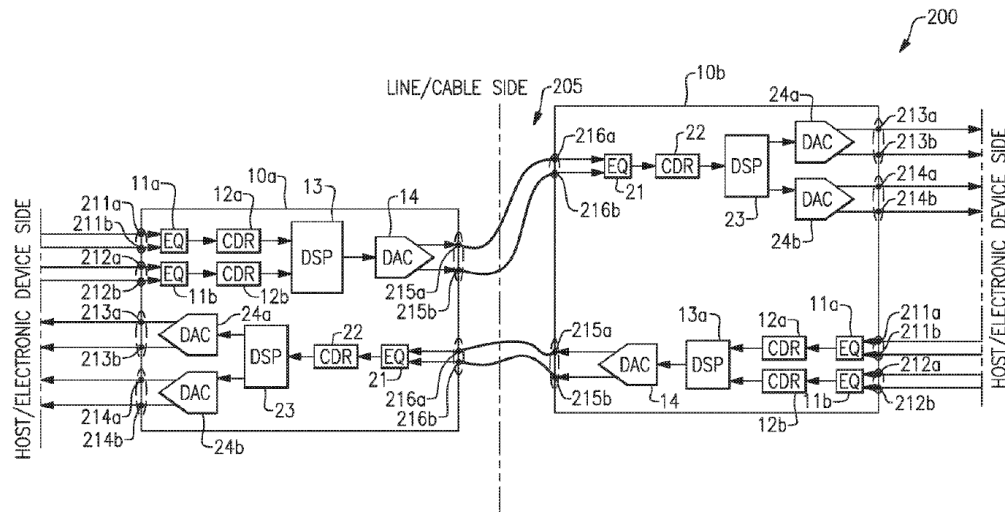


FIG. 4A

Years later, in 2018-2019, Credo filed for patents directed to the use of equalization in AECs. Since then, Credo has claimed to have invented the AEC, taking credit for Marvell’s advancements. Ex-1037 (Credo website) (“Credo invented the Active Electrical Cable (AEC)”); Ex-2001, 10 (“Credo is the original pioneer in active electrical cables (‘AEC’)”); Request, 1.

Credo also systematically and strategically recruited Marvell employees, underscoring Credo’s reliance on Marvell’s expertise and institutional knowledge, rather than its own technical innovation. For example, Credo’s President and CEO (Ex-1043), Credo’s Head of Research and Development (Ex-1045), numerous engineers (Ex-1044, Ex-1046), and Credo’s General Counsel (formerly Marvell’s General Counsel) (Ex-1041) all came from Marvell/Inphi.

Marvell initiated this IPR to resolve critical issues that impact the marketplace. Certainty regarding the validity of the '252 patent is essential to providing clarity to customers, partners, and industry decision-makers. Uncertainty over these claims would stall investment and development in AI infrastructure, leaving buyers and innovators hesitant to move forward. Prompt resolution in this already-pending IPR will provide a faster and more efficient path to clarity than protracted, additional litigation. For these reasons and as detailed in Section IV below, Board review is necessary to rectify these errors and ensure only valid, truly innovative claims remain in force.

III. The *Fintiv* Factors Do Not Favor Discretionary Denial

A. Credo's *Fintiv* Analysis Ignores That Marvell Is Not A Party To Any Parallel Proceeding

Credo's *Fintiv* analysis ignores that Marvell is not a party to any parallel litigation. The Office consistently rejects discretionary denial where the petitioner is not involved in related proceedings, even if they have business ties to named defendants. *See Google v. Mullen*, IPR2025-00124, Paper No. 14 at 11, 41 (PTAB May 12, 2025), Paper No. 8, 31-32 (Feb. 14, 2025) (*Fintiv* factor 5 neutral where the petitioner was a non-defendant but submitted declarations, produced documents, and shared counsel with the defendant; IPR instituted); *Charter Communications v. Adaptive Spectrum*, IPR2025-00088, Paper No. 14 at 13

(PTAB Nov. 8, 2024), Paper 10 at 4 (Apr. 2, 2025) (factor 5 weighs against discretionary denial where at least one petitioner was not a party to the parallel litigation, even if obligated to indemnify a defendant).

Credo's reliance on *Docker Inc. v. Intellectual Ventures II LLC* is misplaced. IPR2025-00840, Paper 9, at 2 (Sept. 19, 2025). That case involved a much older patent (12 years) and overlapping post-grant proceedings—none of which apply here. The '252 Patent is just over four years old and does not overlap with post-grant proceedings. Here, the underlying facts instead point to substantial examiner error and the necessity of PTAB review to ensure sound patentability determinations—precisely what Congress intended the IPR process to address.

Marvell is exercising its statutory right to file an IPR because, although Credo did not name Marvell directly in litigation, its actions are effectively aimed at Marvell's technology and business interests. Credo has initiated suits exclusively against Marvell's customers, specifically asserting claims based on Marvell's retimer chips as the accused products. Ex-1022, 000004, 000007, 000009-10, 000013; Ex-1023, 000008, 000010, 000013, 000002.

B. Factors 2 and 3 Weigh Against Discretionary Denial Because Marvell Filed Expeditiously

Fintiv factors 2 (timing) and 3 (investment in the parallel proceeding) strongly favor institution. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11, at

5-6. The ITC Investigation’s target date is currently scheduled for December 17, 2026—just 58 days before the final written decision (FWD) deadline (February 13, 2027)—far closer than in Credo’s cited cases. Ex-2010.

The ITC case has already experienced delays and is likely to be postponed further. The schedule was already shifted by two months due to disqualification of Complainant’s counsel. Ex-1038. Additionally, as a result of the recent government shutdown, there have already been significant delays at the ITC. Ex-1042. The ITC schedule is therefore likely to change in light of disruptions and postponed deadlines caused by the shutdown since October 1, 2025.

Marvell filed this IPR promptly. Marvell filed its petition within two months of receiving a subpoena, and promptly after resolving counsel disqualification in the parallel ITC investigation. Marvell has never been sued on this patent, and its actions are consistent with Board precedent for diligence. *See Fintiv*, Paper 11, at 11 (petitioner filing “the petition expeditiously” weighs “against exercising the authority to deny institution”); *Savant Technologies v. Feit Electric*, IPR2025-00260, Paper 16, at 3 (Dir. June 12, 2025) (IPR instituted; petitioner filed “less than three months” after district court case); *Nikon v. Optimum Imaging Techs.*, IPR2024-01373, Paper 17, at 18-19 (Apr. 23, 2025) (three-month interval); *Hanwha Sols. v. Maxeon Solar*, IPR2024-01198, Paper 17, at 32-34 (PTAB Feb. 26, 2025) (“expeditiously” filed “fewer than four months”).

Further, Credo's cited cases are readily distinguishable. In *Caihong Display Devices v. Corning*, discretionary denial was granted due to "strong settled expectations" after the patent had been in force for 14 years—unlike the current four-year-old '252 patent. IPR2025-00439, Paper 18, at 2 (Dir. July 10, 2025). In *Arashi Visionus LLC v. GoPro Inc.* the petitioner was the ITC respondent and substantial ITC investment had occurred, whereas here Marvell is not a party to any parallel proceeding. IPR2025-00017, Paper 11 (Apr. 28, 2025).

C. Factors 1 and 4: The ITC Will Not Resolve All Patentability Disputes—Minimal Overlap Exists

Fintiv factors 1 (stay in parallel proceeding) and 4 (issue overlap with parallel proceeding) weigh against discretionary denial due to minimal overlap between this IPR and the ITC investigation. *Fintiv*, Paper 11, at 5-6. This Petition challenges all fourteen claims of the '252 patent; the ITC will adjudicate at most a narrowed subset. *Fintiv*, Paper 11, at 9. Although Credo asserts that all fourteen claims of the '252 patent are being challenged using the same references in both proceedings, this assertion is misleading and does not reflect practical realities before the ITC. Request, 12. ITC practice routinely reduces the number of asserted claims prior to hearing, and recent investigations before ALJ Elliot have resolved far fewer claims at trial than those originally asserted.

In this investigation, the ITC began with 53 claims across three Credo patents, but ALJ Elliot’s Ground Rules require a final case-narrowing disclosure capped by a “Maximum Scope.” Ex-1039; Ex-1040, 000014-15. Credo is already narrowing its case at the ITC. Ex-1049 (listing a maximum scope of 50 claims across three patents). Consistent with ITC practice, complainants typically reduce to a handful of claims per patent before trial:

Inv. No. (337-TA-)	Number Patents	Number Claims Instituted	Number Claims at Hearing	Percent Reduction	Claims / Patent at Hearing
1400	6	74	14	82%	2.3
1396	2	28	11	61%	5.5
1389	2	29	6	79%	3.0
1380	5	102	19	81%	3.8
1376	5	51	7	86%	1.4
1370	3	17	15	12%	5.0
1350	3	15	13	13%	4.3
1346	1	13	11	15%	11.0
1330	4	50	39	22%	9.8
1318	5	36	13	64%	2.6
Average	3.6	41.5	14.8	64%	4.1

ALJ Elliot’s last ten investigations resolved an average of 4.1 claims per patent claims at hearing—far fewer than the fourteen currently asserted by Credo for the ’252 patent. It is virtually certain this Petition will address more claims

than the ITC ultimately decides for the '252 patent, strongly weighing against discretionary denial. *See POSCO v. ArcelorMittal*, IPR2024-01377, Paper 11, at 15-16 (Mar. 18, 2025) (factor 4 “weighs heavily against discretionary denial” where Petition “addresses 16 more claims” than the ITC).

Credo’s argument that Marvell relies on the same prior art and invalidity arguments as those asserted in the ITC case is misplaced. Request, 12-15. Critically, Marvell is not a respondent in the ITC, cannot control what art or claims are raised by the respondents, and is entitled to rely on its own prior art. That the Respondents chose to include Marvell art only demonstrates what Credo cannot ignore – that Marvell is the true innovator in this space, and that while Credo’s patents are invalid, Marvell’s patents are valid and infringed by Credo. Factor 4 requires the Board to assess the actual “claims, grounds, arguments, and evidence presented in the parallel proceeding,” not hypothetical overlap. *Fintiv*, Paper 11, at 12; *Samsung Electronics v. SiOnyx*, IPR2024-01431, Paper 21, at 16 (Apr. 10, 2025) (factor 4 weighs against discretionary denial where the ITC will not adjudicate invalidity of claims challenged in petition); *see also Samsung Electronics v. Dynamics*, IPR2020-00504, Paper 16, at 9 (Oct. 13, 2020) (factor 4 does not support denial where non-overlapping claims remain in the IPR).

D. Factor 6: Other Circumstances Favor Institution

Fintiv factor 6 considers “[o]ther circumstances that impact the Board’s exercise of discretion, including the merits.” *Fintiv*, Paper 11, at 5-6. Here, the proceeding is distinguished by clear examiner error, strong merits, urgent public interest—including AI infrastructure and national security—and the absence of Marvell from the ITC case. These considerations make IPR institution both efficient and necessary to ensure proper review.

IV. Institution is Warranted Due to Material Examiner Error and the Strong Technical Merits of the Petition

A. The Examiner Failed To Search For Limitation [1e] and Analyze Disclosures Of Limitation [1e] In Presented Prior Art

As originally filed, claim 1 attempted to cover the basic structure of an active electrical cable: a cable with connectors carrying out clock and data recovery. Ex-1002, 000050. However, Marvell’s own U.S. Patent 9,882,706 (“Lugthart”) already taught AECs years before, and the Examiner rightly rejected Credo’s attempt to patent AECs. Ex-1002, 000613-614. In response, Credo amended the claim to move a dependent claim (as-filed claims 3, 10, and 17) into independent claim 1, forming what is now limitation [1e]: “the respective transceivers each employing fixed, cable-independent, equalization parameters.” Ex-1001, Claim 1; Ex-1002, 000629, 000637.

The Examiner allowed the claims based on this new limitation. However, the Examiner never searched for this new limitation in the prior art, relying only on the terms from as-filed claim 1. Ex-1002, 000455-458 (“ethernet,” “cable,” “cdr,” “transceiv*,” “transmit*,” “receiv*,” “active,” “modulat*,” “pair,” “conduct,” etc.), 000629. After the amendment, the Examiner’s search strategies remained unchanged, omitting any specific review for the terms in limitation [1e]. *Compare* Ex-1002, 000455-458, *with* 000514-520. Even though the new limitation recited fixed, cable-independent, equalization parameters, the Examiner never searched for “fixed,” “cable-independent,” “equalization,” or “parameters.” *Id.* Without examining the relevant art for these limitations, the Examiner found claim 1 allowable based on their inclusion. Ex-1002, 000558. This constitutes reversible error, as Patent Office policy and the Board’s decisions require searching for every claim limitation to determine patentability. MPEP §§904-904.04; 35 U.S.C. § 102(a); *Ex Parte* Daniel James Brown and Diana Jordan, Appeal No. 2017-005003, Decision at 7 (PTAB Mar. 5, 2018) (“reversible error” to ignore a claim limitation).

Moreover, the record demonstrates that the prior art—overlooked by the Examiner—not only discloses active electrical cables generally but also teaches limitation [1e]. The Applicant twice disclosed another patent and publication related to Aronson (Ex-1002, 000002, 000451, 000640), both of which teach that

transceivers “provide equalization...in the host board traces. Such equalization could be fixed...” Ex-1005, 13:49-14:5; Ex-1047, 13:49-14:55; Ex-1048, [0104]-[0112]. As in *Taiwan Semiconductor Mfg. Co. v. Marlin Semiconductor Ltd.*, where the Examiner missed relevant disclosures in the prior art teaching the claim limitation, the Office here made a material error affecting patentability that warrants institution. IPR2025-00847, Paper 11 at 3 (PTAB Sep. 3, 2025).

Additional prior art, including Lugthart itself, also teach limitation [1e]. Pet., 42-49, 81-87; *see also infra* §IV.C. Lugthart describes transceivers performing “equalization to compensate for transmission line losses on the host side,” with equalization that does not depend on the cable Ex-1004, 9:10-25. Although Lugthart-993 was used to reject other claim limitations, the Examiner overlooked its strong teachings for [1e]. Ex-1002, 000673.

Had the Examiner searched for [1e], they would have easily found prior art demonstrating that the use of fixed, pre-programmed, or pre-set equalization parameters for host-side channels was well-known. Ex-1020, 000020-24; Ex-1017, §§1.1.1-1.1.2 at 000025-29; Ex-1021, 7:18-33, 1:65-67 (FIR filter “typically includes a one or more taps having fixed or pre-programmed...coefficients.”); Ex-1007, ¶227. These established technical practices were confirmed in textbooks and industry standards. The references also show that host-side equalization, not

dependent on any particular cable, was routine. Ex-1005, 13:49-54, 14:50-57 (discussing host-facing equalizations).

B. The Present IPR Remedies the Examiner’s Error

The current Petition presents at least two grounds that independently teach the challenged claims. Pet. 17-18. Ground 1 (Cornelius in view of Samaan) introduces new art. Ground 3 (Lugthart in view of Aronson) revisits the disclosures that were overlooked, not reviewed, and not properly cited by the Examiner. The prosecution record shows Applicant did not dispute that Lugthart-993 disclosed limitations [1pre]-[1d]. Ex-1002, 000637, 000547-558 (Examiner’s determination that Lugthart-993 disclosed all limitations of as-filed claims 1, 8, and 15, and 2, 9, and 16). The ’252 patent would not have issued but for these errors, and institution is necessary for a proper patentability review.

C. Prior Art Demonstrates Clear Unpatentability

The merits of the three grounds presented in the petition are strong. The grounds also provide a clear and straightforward disclosure of the limitation.

1. Grounds 1 & 3 each clearly teach limitation [1e]

First, contrary to what Credo argues (Request, 18-20), Cornelius provides clear teaching of “employing fixed, cable-independent equalization parameters.” Cornelius teaches two distinct methods of determining equalization parameters: factory presetting (Ex-1006, 11:52-55 (“parameters for these circuits may be

calibrated or otherwise determined by the manufacture[r] and stored as presets for loading during operation.”)), and runtime determination (*Id.*, 11:55-59 (“[i]n other embodiments ... these parameters may be determined while the system is connected[,]” “during power up, restart, or other periodical or event-based time.”)). Factory presetting provides equalization parameters that are fixed in use. To argue otherwise, as Credo does would render the alternative method meaningless.

Second, Cornelius explicitly teaches that the manufacturer presets are used to, on one end, “to calibrate the path from a host to a near end of the cable,” and, on the other, “the path from the cable to a device or other host.” Ex-1006, 11:59-62; Pet. 44-45. The equalization parameters used to calibrate these paths do not depend on the characteristics of any connecting cable because the paths lie outside of the cable.

Moreover, Credo’s argument that Marvell mixes alternative embodiments is without merit. Cornelius teaches both when and how the equalization parameters can be calibrated, e.g., through manufacturer presetting, and where such calibration routines can be applied, e.g., “[t]hese or other routines may be used to calibrate the path from a host to a near end of the cable, 60 the path through the cable, and the path from the cable to a device or other host.” Ex-1006, 11:51-62. Applying one of the calibration routines to paths explicitly contemplated by Cornelius is not mixing embodiments.

2. Ground 2 clearly teaches limitation [1e]

Contrary to Credo's assertions, Marvell does not use Dr. Chen's testimony to fill gaps, nor does Marvell assume that "fixed" parameters are cable-independent. There is no need to do so, as Ground 2 clearly teaches "cable-independent" equalization parameters that are also "fixed."

First, Ground 2 clearly teaches cable-independent equalization parameters. Lugthart teaches employing "equalization to compensate for transmission line losses on the host side" without the cable. Ex-1004, 9:10-25. Aronson similarly teaches employing equalization to compensate losses "in the host board traces" and preemphasizes "for driving the PCB traces at [the other] end of the cable[.]" Ex-1005, 14:50-57. As in Cornelius, these equalizations do not depend on the characteristics of any particular cable. Credo disregards these clear teachings, as well as the discussion of these disclosures in the Petition and Dr. Chen's declaration. Pet. 82-84. As discussed further below, at no point does Marvell rely on Dr. Chen's testimony to equate "fixed" equalization parameters with "cable-independent" parameters.

Second, Ground 2 clearly teaches that these equalization parameters, which do not depend on cable characteristics, are fixed. For example, on the host side, Aronson teaches, and Marvell cites, "equalization to compensation for high frequency loss in the host board traces" (Ex-1005, 13:49-54) and that "[s]uch

equalization could be fixed[.]” Ex-1005, 13:54-56; Pet. 83. Similarly, at the other end of the connection, Aronson discloses that “for driving the host PCB traces at this end of the cable, an output driver is provided with optional preemphasis . . . The preemphasis could be fixed . . .” Ex-1005, 14:50-57; Pet. 83. There is no need to equate “cable-independent” to “fixed” equalization parameters because Ground 2 explicitly teaches both.

V. There Are No Settled Expectations That Warrant Denial Because the '252 Patent Issued Less Than Five Years Ago

Credo cannot claim “settled expectations” for the '252 patent, which issued approximately 4 ½ years ago, on May 18, 2021. Director-level decisions uniformly reject discretionary denial for patents under six years old. *Berkshire Hathaway Energy v. Birchtech*, IPR2025-00274, Paper 23, at 3 (Dir. July 2, 2025) (no “strong settled expectations” for 2019 and 2020 patents); *Cambridge Indus. USA v. Applied Optoelectronics*, IPR2025-00434, Paper 11, at 2-3 (Dir. June 26, 2025) (no settled expectations for 2019 and 2020 patents); *Webgroup Czech Republic v. Dish Technologies*, IPR2025-00467, Paper 14, at 2 (Dir. July 16, 2025) (no settled expectations for 2019 and 2021 patents); *Zhuhai CosMX Battery Co. v. Ningde Amperex Technology*, IPR2025-00385, Paper 9, at 2 (Dir. July 2, 2025) (no settled expectations for 2021 patent).

Credo’s argument that there is no “bright-line rule on when settled expectations become settled” is unavailing. Request, 16. Recent PTAB precedent has established a settled expectations period of *at least six years* post-issuance. *Shenzhen Tuozhu Technology Co., Ltd. v. Stratasys, Inc.*, IPR2025-00438, Paper 10 at 2 (Jul. 17, 2025) (no “strong settled expectations” where patent was in force under five years); *Kahoot! AS v. Interstellar, Inc.*, IPR2025-00696, Paper 12 at 2 (Jul. 31, 2025) (“strong settled expectations” where patent was “in force *for over six years*”) (emphasis added). Credo’s cited decision in *Dabico Airport Solutions Inc v. HydraFacial LLC* involved a patent that was “in force almost *eight years.*” IPR2025-00408, Pap. 21 at 3 (June 18, 2025). The Director further recognized that 35 U.S.C. § 286, which specifies a six-year damages period, “align[ed] with other approaches to settled expectations and incentives.” *Id.*, at 3; *see iRhythm Technologies v. Welch Allyn*, IPR2025-00363, Paper 10, at 3 (Dir. Jun. 6, 2025) (“settled” over 12 years); *see also Intel v. Proxense* IPR2025-00327, Paper 12, at 2-3 (Dir. Jun. 26, 2025) (“settled” over 9 years). None of these authorities support “settled expectations” for the ’252 patent, which issued just over four years before the Petition was filed.

Further, Credo’s statement that “Credo has invested in, relied on, and commercialized the challenged patents for half a decade” is irrelevant to the settled expectation analysis. Request, 17. Credo has not cited any authority supporting

the application of settled expectations in circumstances where the patent is less than six years old and the dispute involves direct industry competitors rather than non-practicing entities.

Moreover, Marvell is an active competitor in the AEC market and filed this Petition with diligence and before being sued for patent infringement, in line with the Patent Office's guidance favoring early PTAB review and before any litigation involving the '252 patent. See Ex-1036 (“[W]e want to incentivize these early [post-grant review] challenges . . . wait[ing] until . . . sued for infringement . . . is not what the AIA intended”).

VI. Inter Partes Review Is An Appropriate Use of the Board's Resources in View of Compelling National Security, Economic, and Public Interest Considerations

Credo asserts that the '252 patent covers high-speed cables essential for artificial intelligence data centers (Request, 4-5), yet its litigation strategy against Marvell's customers in the ITC and two district courts is aimed at suppressing competition among leading U.S. AEC suppliers—threatening artificial intelligence infrastructure essential to national security and economic growth. The imperative to support national security and economic interests far outweigh any argument for discretionary denial.

A. National Policy Demands Patent Review for AI Leadership

Executive Order 14179 calls for the U.S. to “sustain and enhance America’s global AI dominance” for economic competitiveness and national security. Ex-1050, 000001. OMB Memorandum M-25-21 instructs agencies to “remove barriers to innovation” and speed AI deployment. Ex-1051, 000001-2, 000005. The Commerce Department recognizes AI’s critical national security role and has committed to identifying vulnerabilities and threats to these systems. Ex-1052, 000001-2. The ’252 patent, as asserted, directly conflicts with these goals by hindering market access and innovation in foundational technologies needed for AI leadership.

B. The ’252 Patent Targets Foundational AI Technologies

Credo asserts the ’252 patent against AECs, which are a backbone of high-speed, energy-efficient data center connectivity. Ex-2001, ¶¶18-21, ¶42; Ex-1053 (accusing AECs); Ex-1049, 000001. It is undisputed that AECs are indispensable for scaling modern, AI-driven networks and offer substantial cost and power savings over alternatives. Request, 4; Ex-2001, ¶¶18–19; Ex-2003, 3; Ex-2002, 1-2. Credo’s aggressive assertion threatens access to these critical technologies.

C. National Security and Economic Interests Strongly Favor Institution

The Director’s March 26, 2025 memorandum confirms “[c]ompelling economic... or national security interests” weigh against discretionary denial. Ex-

1054, 000002. PTAB review is essential to prevent unpatentable claims from bottlenecking economic progress and hampering AI infrastructure. *Cuozzo Speed Techs., L.L.C. v. Lee*, 579 U.S. 261, 279-80 (2016); *Thryv, Inc. v. Click-To-Call Techs., LP*, 590 U.S. 45, 54 (2020).

The '252 patent was asserted not only against Marvell's products but broadly across numerous companies building out the U.S. AEC industry—targeting components central to national AI infrastructure. Ex-2001, ¶¶2, 14-21. Credo's actions threaten to inflate costs and restrict access to crucial AECs.

The Director should deny the Request and the Board should review the petition on the merits, allowing the Office to fulfill its mandate to remove barriers to responsible AI deployment and to uphold U.S. technological leadership.

VII. Conclusion

Petitioner Marvell respectfully requests that Patent Owner's discretionary denial request be denied.

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

This Petitioner's Opposition Brief to Patent Owner's Request for Discretionary Denial of Institution of *Inter Partes* Review complies with the limitation of 20 pages, as counted using the Microsoft Word software that was used to prepare this paper, in accordance with the Interim Director Discretionary Process III.C.iii.

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that on November 13, 2025, true and correct copies of the Petitioner's Opposition Brief to Patent Owner's Request for Discretionary Denial of Institution of *Inter Partes* Review and Exhibits 1036-1054 were served in their entirety via email on all parties to this proceeding at the addresses indicated:

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