

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ZHUHAI COSMX BATTERY CO., LTD.,
Petitioner

v.
NINGDE AMPEREX TECHNOLOGY LIMITED,
Patent Owner

Case IPR2025-00389
U.S. Patent No. 11,923,498

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE

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PETITIONER’S UPDATED EXHIBIT LIST

Exhibit No.	Description
1001	U.S. Patent No. 11,923,498 B2 to Tao (“the ’498 patent”)
1002	Prosecution File History of U.S. Patent No. 11,923,498 B2 (“’498 File History”)
1003	Declaration of Ulrich von Sacken, Ph.D
1004	Curriculum Vitae of Ulrich von Sacken, Ph.D
1005	U.S. Patent Pub. No. 2011/0111276 to Sato <i>et al.</i>
1006	Japanese Patent Pub. No. 2000-67907 to Takemura <i>et al.</i>
1007	U.S. Patent Pub. No. 2011/0104539 to Oh <i>et al.</i>
1008	Japanese Patent Pub. No. 2010-55906 to Kobayashi <i>et al.</i>
1009	Japanese Patent Pub. No. 10-326629 to Maejima <i>et al.</i>
1010	Japanese Patent Pub. No. 11-26008 to Yamauchi <i>et al.</i>
1011	Japanese Patent Pub. No. 2000-285902 to Mizutani <i>et al.</i>
1012	Japanese Patent Pub. No. 2003-068271 to Nakamura <i>et al.</i>
1013	Japanese Patent Pub. No. 2007-165224 to Yoneda <i>et al.</i>
1014	U.S. Patent Pub. No. 2006-0051662 to Kwak <i>et al.</i>
1015	U.S. Patent Pub. No. 2007-0172736 to Fujikawa <i>et al.</i>
1016	Japanese Patent Pub. No. 2008-171593 to Aoki <i>et al.</i>
1017	U.S. Patent Pub. No. 2010-0035144 to Oh <i>et al.</i>
1018	Korean Patent Pub. No. 2013-0085202 to Lee <i>et al.</i>
1019	Agubra <i>et al.</i> , “Lithium Ion Battery Anode Aging Mechanisms”
1020	Smart <i>et al.</i> , “Effects of Electrolyte Composition on Lithium Plating in Lithium-Ion Cells”
1021	Ratnakumar <i>et al.</i> , “Lithium Plating Behavior in Lithium-ion Cells”
1022	Eberman <i>et al.</i> , “Material and Design Options for Avoiding Lithium-Plating during Charging”

Exhibit No.	Description
1023	Wen <i>et al.</i> , “A Review on Lithium-Ion Battery Safety Issues: Existing Problems and Possible Solutions”
1024	Complaint and Exhibit N filed in <i>Ningde Amperex Technology Ltd. V. Zhuhai CosMX Battery Co., Ltd.</i> , Case No. 2:24-ccv-728 (E.D. Tex.)
1025	Unopposed Application for Extension of Time to Answer Complaint, <i>Ningde Amperex Tech. Ltd. v. Zhuhai CosMX Battery Co.</i> , No. 2:24-cv-00728-JRG (E.D. Tex. Dec. 4, 2024), ECF 16
1026	“Nearly two lithium battery fires per week on airplanes in the US alone,” International Association of Fire and Rescue Services (Dec. 19, 2024), <i>available at</i> : https://www.ctif.org/news/nearly-two-lithium-battery-fires-week-airplanes-us-alone .
1027	Docket Control Order, <i>Ningde Amperex Tech. Ltd. v. Zhuhai CosMX Battery Co.</i> , No. 2:24-cv-00728-JRG (E.D. Tex. Feb. 6, 2025), ECF 27
1028	Federal Court Management Statistics (Sept. 30, 2024)
1029	Federal Court Management Statistics (Dec. 31, 2024)
1030	Results charted from LexMachina.com, run on June 2, 2025, for patent cases before District Judge James Rodney Gilstrap
1031	Excerpt of CosMX Invalidity Contentions Cover Pleading, <i>Ningde Amperex Tech. Ltd. v. Zhuhai CosMX Battery Co.</i> , Case No. 2:24-cv-00728-JRG (E.D. Tex. Mar. 12, 2025).
1032	Declaration of John C. Evans
1033	Supplemental Declaration of Ulrich von Sacken, Ph.D.
1034	Deposition Transcript of James Kaschmitter, February 20, 2026
1035	Joint Claim Construction and Prehearing Statement, <i>Amperex Technology Ltd. V. Zhuhai CosMX Battery Co., Ltd.</i> , Case No. 2:24-ccv-728 (E.D. Tex. Oct. 21, 2025)

Exhibit No.	Description
1036	Joint Claim Construction Chart, <i>Amperex Technology Ltd. V. Zhuhai CosMX Battery Co., Ltd.</i> , Case No. 2:24-ccv-728 (E.D. Tex. Dec. 30, 2025)
1037	Agreed Terms from Joint Claim Construction Chart, <i>Ningde Amperex Technology Ltd. V. Zhuhai CosMX Battery Co., Ltd.</i> , Case No. 2:24-ccv-728 (E.D. Tex. Dec. 30, 2025)
1038	Claim Construction Order, <i>Ningde Amperex Technology Ltd. V. Zhuhai CosMX Battery Co., Ltd.</i> , Case No. 2:24-ccv-728 (E.D. Tex., Feb. 17, 2026)
1039	U.S. Patent No. 11,329,352 to Guo et al.
1040	Declaration of James Kaschmitter in IPR2023-00585
1041	U.S. Patent Pub. No. 2004/0096735 to Komatsu
1042	U.S. Patent Pub. No. 2014/0120258 to Anderson
1043	U.S. Patent No. 6,423,446 to Miyazaki

I. INTRODUCTION

Patent Owner's Response (POR) fails to rebut Petitioner CosMX's compelling evidence that all challenged claims are unpatentable. CosMX established that the '498 patent's purported invention—insulating positive active material across from the negative electrode's lead connection—was a well-known technique for preventing lithium plating. This is not surprising, as both experts agree lithium plating prevention is critical for avoiding “catastrophic” failure. EX1033, ¶39; EX1034, 27:4-28:2, 28:3-7; 28:15-25.

PO merely repackages three arguments from the POPR that the Board correctly rejected at institution: (1) Takemura teaches away from using insulating tape (it does not); (2) Takemura fails to disclose or suggest to a POSA tape having a length greater than the second recess's length (it does); and (3) Sato fails to disclose a battery with first and second recesses (it does). PO's arguments are contradicted by the evidence and their own expert.

First, Takemura recognizes insulating tape as an alternative technique to removing active material. EX1033, ¶¶20-34. Second, *prioritizing safety* over performance parameters—as both experts agree is paramount—a POSA would have understood from Takemura's disclosure to size insulating tape wider and longer than its opposed recess, as reinforced by multiple references. EX1033, ¶¶39-51. Third, PO's narrow reading of Sato ignores the disclosure as a whole,

which explicitly discloses a first recess in the positive electrode and a second recess in the negative electrode, as PO's expert admitted. EX1033, ¶¶52-64.

II. GROUNDS 1-6: PO'S RECYCLED ARGUMENTS AGAINST THE SATO-TAKEMURA COMBINATIONS FAIL.

A. A POSA would have been motivated to combine the teachings of Takemura's insulating tape placement and size with Sato.

The Board correctly agreed the Petition provided rational reasons to combine Sato and Takemura. DI, 26. Yet the POR leads off again alleging Takemura teaches away from tape. POR, 7-22. As before, the Board should reject this argument because: (1) Sato's second tape is the starting point in the combinations, (2) Takemura's alternative techniques for preventing lithium plating are interchangeable, (3) advantages of insulating tape counter PO's overstated disadvantages, (4) lithium plating concerns at Takemura's electrode end apply equally to Sato's recesses, and (5) legal precedent squarely supports Petitioner's rationales. EX1033, ¶15.

1. Sato's disclosure of the claimed "second insulating glue layer" is the starting point for the Sato-Takemura combinations.

Petitioner established that Sato discloses a "second insulating glue layer,"—a "polypropylene adhesive tape" located on the "positive electrode surface facing the negative lead" to "prevent lithium deposition." Pet. 33; EX1005, ¶[0137]; EX1003, ¶¶139-140. PO's expert agreed. EX1034, 132:3-12. Starting with Sato's second tape, a POSA would have looked to prior-art insulating tapes (e.g.,

Takemura's "conventional" battery, Figures 8-9) for teachings on tape placement (i.e., location and sizing). Pet., 5, 19-23, 33-35; EX1003, ¶¶111-113, 143-144.

Takemura's strategic tape placement aligns with Sato's use of "polypropylene adhesive tape" to prevent lithium plating, thereby motivating a POSA to combine the references to prevent lithium plating and short-circuiting. Pet., 19-23, 36, 65-66; EX1003, ¶¶111-113, 143-144; EX1033, ¶16.

PO and Mr. Kaschmitter attack a strawman, arguing there would be no "motivat[ion] to combine the tape of Takemura's Figures 8 and 9 with Sato's battery." EX2018, ¶23; EX2015, ¶69; EX1034, 89:24-90:3. Rather than addressing the asserted combination, PO attacks Takemura in isolation. PO points to Takemura's Figure 4 embodiment, which removes active material opposite the recess and places tape only at the electrode's end. POR, 8-11, 15-16. PO then argues it would not have been obvious to "relocate" Takemura's tape (*e.g.*, POR, 10) opposite the recess. *Id.*

But Petitioner never proposed "relocating" Takemura's tape in Grounds 1-6. Sato's express disclosure of adhesive tape opposite the negative electrode recess/lead is the starting point, rendering PO's relocation argument irrelevant. Pet., 19-23, 34-36, 65-66 (citing EX1005, ¶[0137]); EX1003, ¶¶139-140; EX1033, ¶¶17-19.

2. Takemura’s alternative techniques for preventing lithium plating do not teach away from a “second insulating glue layer.”

As Petitioner explained, a POSA would have been motivated to combine Takemura’s tape placement with Sato to prevent lithium plating. Pet., 19-23, 33-38; EX1003, ¶¶111-113. Indeed, Takemura discloses two alternative options suitable for doing so. EX1033, ¶¶20-27.

First, regarding Figures 8-9, Takemura discloses placing an insulating tape 7 on the positive electrode active material layer 3 adjacent opposite negative lead 2 and exposed portions of the negative current collector 6. EX1006, ¶¶[0003], [0008], FIGS. 8-9; Pet., 33-36; EX1003, ¶¶[0138]-[0148]; EX1033, ¶23. PO’s expert, Mr. Kaschmitter, acknowledged applying tape was “common” to “prevent those lithium ions from ever seeing...a metal part.” EX1034, 30:13-24; EX1033, ¶¶25-26. Second, Takemura’s Figures 3 and 7 disclose an alternative: removing active material from the positive electrode current collector 5 opposite the negative current collector/lead. EX1006, ¶¶[0018]-[0020], [0035], FIG. 7.

Takemura confirms these approaches are interchangeable, stating that “positive electrode active material layer 3 opposite the beginning of the winding end of the negative electrode is covered with insulating tape 7 to prevent lithium metal deposition, *but instead of* covering it with insulating tape 7, the active

material in this portion *may be* removed.”¹ EX1006, ¶[0021]. That is, taping and active-material removal are both suitable options.² EX1033, ¶27.

PO’s assertion that Takemura disparages tape misreads Takemura. According to PO, Takemura’s Comparative Example 1—which highlights advantages of removing active material in one embodiment—is a teaching away. POR, 11-15. This is legally and factually wrong.

Precedent is clear: obviousness cannot be overcome merely because “some teachings in the prior art conflict with others.” *Medichem S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165-66 (Fed. Cir. 2006). Nor does obviousness require an “‘improvement’ in a categorical sense” when choosing among known techniques. *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1380-81 (Fed. Cir. 2023). When a known technique is a “suitable option” addressing the same problem, “there is a motivation to combine.” *Id.*

Takemura does not discourage insulating tape use. EX1033, ¶¶20-27. Quite the contrary—as explained above—Takemura teaches insulating tape and active

¹ Emphasis added unless otherwise noted.

² PO and Mr. Kaschmitter contradict their assertion that Takemura teaches away from tape by recognizing Takemura’s techniques are “alternatives.” POR, 18; EX2015, ¶116; EX1034, 30:13-32:25.

material removal as interchangeable alternatives for preventing lithium plating.

EX1008, ¶¶[0008], [0021]; EX1003, ¶¶108-112; EX1033, ¶¶23-27. Accordingly, Takemura reinforces—not undermines—that insulating tape is a suitable and obvious solution.

3. Advantages of Takemura’s tape placement counter PO’s overstated purported disadvantages.

Tape offers advantages over removing active material, a point Mr. Kaschmitter acknowledged when admitting that insulating tape was a widely-adopted, reliable safety measure “to prevent short-circuiting.” EX1034, 21:4-16, 30:13-24, 32:7-15; EX1033, ¶¶28-32. As Dr. von Sacken explained, applying tape has been common practice “to solve safety and performance problems such as short-circuiting, lithium (Li) plating, and undesirable thermal expansion.” EX1003, ¶[0039]; EX2015, ¶42.

Using insulating tape avoids precision demands of pattern coating and risks of electrode damage from ablation—active material removal techniques. EX1033, ¶¶29-30. Pattern coating involves tighter machinery alignment controls compared to rolling tape on a continuously-coated electrode and leaves “uneven edges.” EX1034, 46:2-10; EX1033, ¶30; EX1042, ¶¶[0004]-[0008]; EX1043, 2:32-4:22. And as Mr. Kaschmitter confirmed, laser ablation can form “burrs” in the active material. EX1034, 46:22-47:19 ; EX1039, 1:24-39; EX1040, ¶49 (ablation “can

create defects such as dislocations and burrs in the areas treated with the laser beams.”); EX1033, ¶31.

Moreover, PO’s assertion that combining Takemura’s teachings with Sato would “create new problems,” namely “increas[ing] battery thickness,” is unfounded. POR, 22. Sato already includes tape—two pieces, as claimed. Modifying Sato’s tape placement based on Takemura’s teachings would not increase battery thickness. EX1033, ¶32.

Lastly, PO incorrectly alleges that “Takemura does not support the use of tape to prevent lithium deposition.” POR, 17. Takemura expressly discloses that covering positive active material opposite exposed metal with tape prevents lithium plating. EX1006, ¶[0008]; EX1033, ¶33. Mr. Kaschmitter confirmed “taping” was a “common technique[] for preventing lithium plating.” EX1034, 30:13-24.

Takemura’s alternative techniques—strategically placing insulating tape or removing active material—entail known tradeoffs, without discouraging either solution. EX2018, ¶36; EX1033, ¶34; EX1034, 42:8-10 (“there’s tradeoffs”). For example, a POSA would have applied tape instead of removing active material when desiring simpler manufacturing and proven reliability for preventing short-circuit. EX1033, ¶34.

4. Lithium plating concerns at Takemura’s electrode end apply equally to Sato’s recess.

The Board correctly found Takemura’s “different ultimate approach...does not diminish Takemura’s teachings of a known size and placement that was conventionally used in the art.” DI, 24-25. PO alleges overlooked “shortcomings”—that Takemura applies tape only opposite the negative electrode’s bare end, not the recesses in Figure 4 (because active material is removed). POR, 19-22, 28-30. PO’s “shortcomings” sidestep what the Sato-Takemura combination teaches. POR, 19-22, 28-30.³

Sato already discloses tape on the positive active material “facing” the second recess. EX1005, ¶[0137]; EX1033, ¶¶35-36. Takemura teaches that any positive active material opposite the exposed current collector surface and lead “*has to be covered* with masking tape” (or removed) to prevent lithium plating. EX1006, ¶[0008]. Takemura’s lithium-plating concerns for bare electrode ends apply equally to Sato’s recesses, motivating a POSA to place—and appropriately

³ PO takes Dr. von Sacken’s testimony out of context. POR, 9, fn. 4, 28. He acknowledged Takemura does not disclose recesses formed “*in the* positive material layer” and “*in the* negative active material,” but never asserted Takemura’s bare ends are not recesses. He clarified when deposed: “I should have qualified that to say ‘doesn’t show a first recess *in the center of* the electrode.’” EX2020, 26:15-18.

size—Sato’s second tape opposite the second recess. *Infra*, Section II.C; EX1003, ¶¶111-113; EX1033, ¶¶37-38.

5. Petitioner’s obviousness rationales squarely align with precedent.

PO’s response to precedent in the Institution Decision also falls short. POR, 21-22 (addressing *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784 (Fed. Cir. 2021); *EWP Corp. v. Reliance Universal Inc.*, 755 F.2d, 898 (Fed. Cir. 1985)).

Intel is on point. The Board rejected a combination because the secondary reference described “problems” with a prior-art switch. *Intel*, 21 F.4th at 799-800. But the Federal Circuit reversed, holding obviousness requires only a “suitable option,” not necessarily the best one. *Id.* Even with known drawbacks, the prior-art switch provided a “way” to improve performance, which was sufficient for obviousness. *Id.* Likewise here, Takemura’s “conventional” battery using insulating tape provides a known “way” to improve battery safety by preventing lithium plating. EX1033 ¶24. Thus, taping is a suitable option a POSA would have considered. EX1033 ¶¶32-34.

PO’s reliance on differences between Takemura and the claims conflicts with Federal Circuit precedent. In *EWP Corp.*, the court held that even “significant differences” do not defeat obviousness where the prior art provides a “clear teaching” of the claimed invention; rather, a “reference must be considered for everything it teaches...and is not limited to the particular invention it is describing

and attempting to protect.” 755 F.2d at 906-07. That principle applies here.

Takemura teaches the concept at issue—placing insulating tape on positive active material opposite the negative recess/lead to prevent lithium plating. EX1003, ¶¶111–113. Wrapping tape around the negative electrode end does not diminish Takemura’s teachings regarding the tape’s location, size, and benefits. EX1033, ¶¶28-32.

Addressing *KSR*, PO argues Petitioner “rel[ies] on a different size and placement of Takemura’s tape.” POR, 22. But Takemura expressly teaches that any positive active material susceptible to lithium plating “has to be covered” with insulating tape. EX1006, ¶[0008]. Applying Takemura’s teaching, a POSA would have been motivated to extend Sato’s insulating tape beyond the recess. EX1033, ¶¶49-51.

None of PO other citations support its flawed arguments. POR, 21-22 (citing *Chemours*, *Galderma*, and *Ravgen*).

Chemours is inapposite. POR, 1, 10, 52. The Federal Circuit reversed that obviousness finding because the proposed modification undermined a critical prior-art feature—a narrow molecular-weight distribution. 4 F.4th at 1376-77. By contrast here, Takemura teaches insulating tape placement to prevent lithium plating. EX1006, ¶¶[0008], [0021]. Petitioner did not alter Takemura’s tape-minimizing embodiments, but rather applied Takemura’s tape placement teachings

to Sato—which already employs insulating tape on positive active material.

EX1033, ¶¶16-19.

PO’s reliance on *Galderma* is misplaced. POR, 1, 21. There, the Federal Circuit *reversed* a finding of no motivation to combine. 737 F.3d at 736-39.

Likewise here, Takemura’s preference for removing material does not teach away from masking active material with insulating tape. EX1033, ¶¶20-27.

Lastly, PO’s reliance on *Ravgen* is flawed. There, the Board found no motivation to add a component that would have damaged the prior-art system. IPR2021-01054, Paper 51 at 26, 38-40. Here, Petitioner added nothing new to Sato’s battery, instead simply adjusting tape size based on Takemura’s teachings. EX1003, ¶¶138-147; EX1033, ¶18.

B. Sato-Takemura renders obvious a “second insulating glue layer” having “a length larger than a length of the second recess.”

PO’s expert Mr. Kaschmitter admitted it was known to size insulating tape longer than the recess length to “account for potential misalignment.” EX1034, 38:23-39, 40:3-15. This is unsurprising. Prioritizing safety above other design considerations, a POSA would have been motivated to avoid the catastrophic risk of short-circuiting. EX1033, ¶39; EX1034, 25:18-21 (“explosion” is “worst-case scenario”), 27:4:28:2 (“lithium plating” can lead to “catastrophic situation”). Given Takemura’s teachings, the only sensible way for a POSA to size Sato’s second tape to avoid lithium plating is having it extend wider and longer than the opposing

recess. Pet., 37-39; EX1003, ¶¶149-155; EX1034, 73:20-74:1 (admitting to use “bigger” tape to account “tolerancing”), 77:7-13 (“want to block around the edges of that recess”). Consistent with Takemura and other prior-art references, a POSA would therefore size the tape in the Sato-Takemura combination beyond the recess length. EX1033, ¶39; EX1034, 53:19-54:1.

Ignoring what Sato-Takemura suggested to a POSA, PO contends “none of the references relied upon by Petitioner” teach the claimed (non-critical) glue layer length. POR, 23-27. Not so. EX1033, ¶40. Moreover, obviousness does not turn only on what a reference literally spells out, but also “inferences” a POSA “would reasonably be expected to draw therefrom.” *In re Preda*, 401 F.2d 825, 826 (C.C.P.A. 1968); *In re Burckel*, 592 F.2d 1175, 1179 (C.C.P.A. 1979).

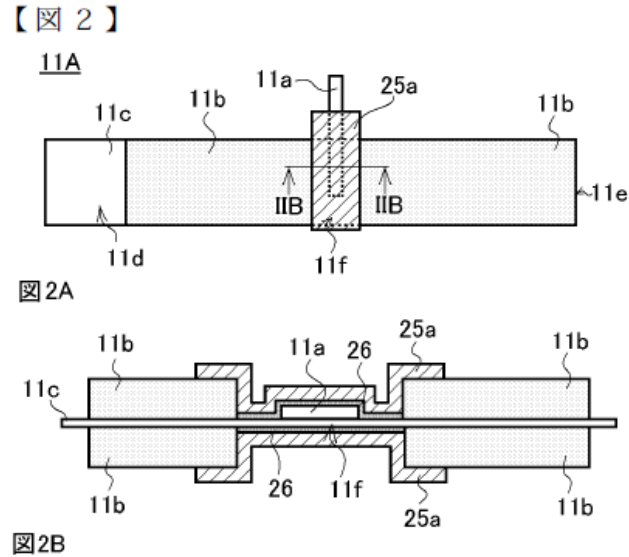
1. Petitioner’s rationale to extend Sato’s second tape slightly beyond the length and width of the opposing recess is rooted in Takemura and the prior art.

Takemura is clear: when positive active material faces an exposed negative current collector surface/lead, the active material “*has to be covered* with masking tape” to prevent lithium plating. EX1006, ¶[0008]. Takemura’s Figures 8-9 unquestionably show the insulating tape extending beyond the recess width, as Mr. Kaschmitter admitted. Pet., 36-37; EX1003, ¶¶150-151; EX1034, 141:14-142:2. This overextension is deliberate—accommodating alignment variances between the electrodes and obstructing positive ion releases tangential to the recess.

EX1003, ¶152; EX1033, ¶41; EX1034, 142:3-12 (admitting Takemura extends tape wider to be “cautious”); EX1008, FIGS. 2A-B; EX1010, ¶[0019]; EX1041, ¶[0227]-[0228]. Takemura’s instruction in paragraph [0008] along with Figures 8-9 suggests to a POSA what was already well-known—and advantageous—extend tape past the recess length. Pet. 36-39. EX1003, ¶153; EX1033, ¶41.

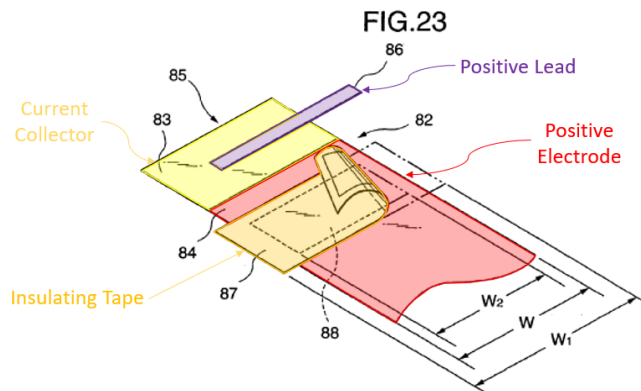
Dr. von Sacken’s corroboration does not supplant these teachings (*see* POR, 23); it confirms a POSA’s understanding from Sato and Takemura. EX1003, ¶¶149-155. He explained that extending tape beyond the recess length is the most reliable way to insulate positive active material while accounting for alignment variances. EX1003, ¶152. Mr. Kaschmitter similarly acknowledged a POSA would “increase[e] the size of the tape” to account for “potential misalignment.” EX1034, 38:23-39.

This basic premise is reinforced by Yamauchi, Kobayashi, and Komatsu, which likewise teach overextending insulation tape to ensure coverage despite manufacturing tolerances. EX1033, ¶¶42-46 (citing EX1010, ¶[0019] (tape wider to insulate even if placement “deviates slightly relative to the position of the second electrode tab”)); EX1008, Figures 2A-B (insulating tape extends beyond recess length and width); EX1041, ¶¶[0227]-[0228], FIGS. 23, 25); EX1003, ¶37-73, 152. Mr. Kaschmitter confirmed additional references show tape longer and wider than the opposing recess. EX1034, 150:20-151:17.

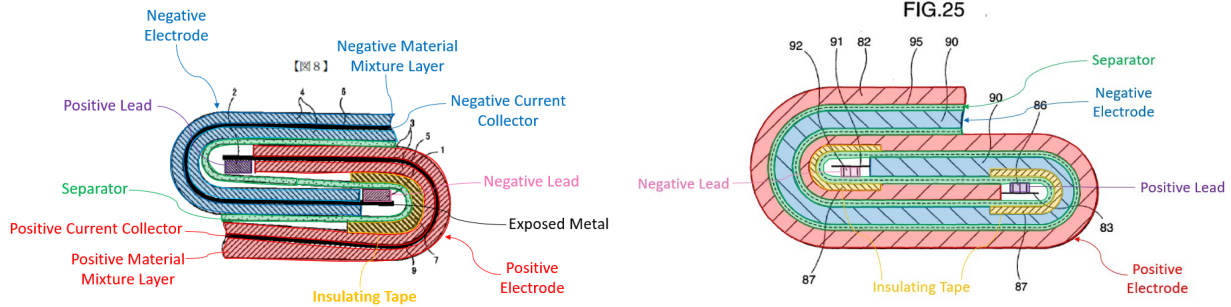


EX1008, FIGS. 2A (longer length), 2B (wider width).

Additionally, Komatsu—featuring a tape arrangement similar to Takemura—discloses insulating tape wider and longer than the negative electrode’s bare end. EX1041, ¶¶[0227]–[0228]. Consistent with Komatsu, a POSA would have understood Takemura’s tape extends beyond the bare end because all active material opposite the recess/lead “has to be covered with masking tape.” EX1006, ¶[0008]; EX1033, ¶45.



EX1041, FIG. 23 (annotated).



EX1006, FIG. 8 (annotated); EX1041, FIG. 25 (annotated).

Thus, Dr. von Sacken’s testimony underscores what the prior art already conveys to a POSA: extend tape beyond the recess’s width and length, ensuring insulation even with misalignment. EX1033, ¶46.

2. The ’498 patent does not allege criticality for insulating glue layer length.

Petitioner explained that sizing Sato’s second tape beyond the recess’s dimensions would reliably guard against lithium plating and catastrophic short-circuiting. Pet., 39 (citing *Iron Grip* (when sole distinction is a “variable,” patentee must prove criticality by “unexpected results”); EX1003, ¶154. The ’498 patent identifies no criticality in tape length and PO offers no unexpected results evidence. EX1033, ¶¶47-48. Contrary to PO’s suggestion (POR, 30-31), tape length is not a patentable distinction.

3. A POSA would have been motivated to use wider and longer tape for safety.

Petitioner explained that wider and longer tape promotes safety, ensuring positive active material remains insulated from exposed metal, even when there are

electrode alignment variances. Pet., 36-39; EX1003, ¶152 (citing EX1022, 51). Mr. Kaschmitter confirmed this safety rationale during his deposition. EX1034, 33:10-14, 38:23-39:8 (admitting to “increasing the sizing of the tape” to “account for potential misalignment”). Safety is prioritized in battery manufacture above performance, including storage capacity. EX1034, 24:9-17, 28:15-25 (admitting to prioritize preventing short-circuiting over performance parameters “in almost all cases”). Accordingly, a POSA would have understood in view of Takemura to size Sato’s tape longer and wider than the recess to avoid potential catastrophic explosion. Pet., 38; EX1033, ¶¶49-50.

PO’s assertion that Sato “undercuts” Petitioner’s obviousness rationale, by describing a tape with the same width as the associated recess, misses the point. POR, 23-24. Petitioner relies on Takemura—not Sato—for tape sizing. Pet., 36-39; EX1003, ¶¶149-155. Moreover, PO’s argument relates to Sato’s first tape (for the positive lead), not the second tape facing the second recess (for the negative lead). POR, 23 (citing EX1005, ¶[0113]); EX1033, ¶51. Because lithium plating occurs at the negative electrode, alignment concerns are far greater for the second tape, positioned on the electrode opposite the recess, which is therefore more sensitive to manufacturing tolerances. EX1033, ¶51.

C. Sato discloses having both a “first recess” in the positive electrode and a “second recess” in the negative electrode.

1. Sato discloses “*at least one* of the positive electrode and the negative electrode” includes a recess, meaning *both* electrodes can include a recess.

Sato unambiguously discloses there can be both a “first recess” in the positive electrode and a “second recess” in the negative electrode. EX1005, ¶¶36, 94; Pet. 11-12 (citing EX1005, ¶36), 23 (citing EX1003, ¶115), 26-27, 29-30, 41 (citing EX1005, ¶94); EX1003, ¶¶115, 174, 274 (citing EX1005, ¶94); EX1033, ¶52. PO’s contrary argument lacks credibility.

Sato expressly states the lead attachment position “is preferably located in the region from 1/4 to 3/4” of the electrode and “*at least one* of the positive electrode and the negative electrode satisfies [these] conditions for the lead attachment position.” EX1005, ¶[0094]. Dr. von Sacken spent an entire page in his first declaration setting the foundation for his opinions by explaining this disclosure in Sato. EX1003, ¶115. He explains this means “*both* the positive electrode *and* the negative electrode *can have a recess* for accommodating the positive lead and the negative lead, respectively.” EX1003, ¶115. PO turns a blind eye to this analysis and Sato’s disclosure.

Belying PO’s argument, Mr. Kaschmitter admitted that Sato’s paragraph [0094] means “one *or both*” of the positive electrode and the negative electrode have a recess. EX1034, 127:23-128:11. That understanding is reinforced

throughout Sato’s summary, detailed description, and claims. EX1005 ¶[0013] (same “at least one” language); ¶[0036] (active-material removal for “at least one” electrode); claim 6 (same “at least one” language), ¶[0051] (“at least one” metal element), ¶[0067] (“at least one” element), ¶[0082] (“at least one” material); EX1034, 117:22-118:2, 121:14-19, 122:12-19 (acknowledging “at least one” in claim 6, ¶13, ¶36 means “one or both”). Thus, there is no dispute Sato discloses having both a “first recess” in the positive electrode and a “second recess” in the negative electrode. EX1033, ¶¶53-60; EX1003, ¶115.

Petitioner also began by citing Dr. von Sacken’s analysis of Sato’s paragraph [0094]—Sato’s uncontroversial disclosure of first and second recesses. Pet., 23 (citing EX1003, ¶[0115]). And before even addressing the claims, Petitioner explained Sato’s overarching description—paragraphs [0035]-[0044] regarding Figures 3-5—shows “positive *and* negative active layers (mixture layers 9 on the positive and negative current collectors 10, respectively) *defin[ing] a recess* (exposed portion 12) to connect a lead (lead 11) to the current collector.” Pet., 11-12 (citing EX1005, ¶[0036] (active-material removal for “*at least one* of the positive electrode plate 4 and the negative plate 5”))).

PO alleges (wrongly) that Sato discloses only two configurations: (1) a recess on the positive electrode with no recess on the negative electrode, and (2) a

recess on the negative electrode with no recess on the positive electrode. POR, 31.

As just evinced, PO is wrong.

PO's myopic view focuses only on specific embodiments in ¶¶[0099]–[0143]. PO ignores Sato's disclosure discussed above. EX1033, ¶¶61-62. Tellingly, PO never addresses paragraphs [0094] and [0036], cited in the Petition and elaborated upon by Dr. von Sacken. Pet., 11-12, 23, 39-40; EX1003, ¶115. Any POSA reading Sato would have understood that "*at least one* of the positive electrode and negative electrode" including "a lead attachment position [that] is preferably located in the range from 1/4 to 3/4" discloses a "first recess" in the positive electrode *and* a "second recess" in the negative electrode. EX1033, ¶62.

2. Petitioner did not combine separate embodiments from Sato.

PO mischaracterizes the Petition as "combining" Sato's Battery 1 and Battery 8. POR, 32-36. But as explained above, Petitioner relied on Sato's comprehensive disclosure that both electrodes include a recess. Pet., 11-12, 23; EX1003, ¶115. Petitioner then cited specific embodiments, namely Batteries 1 and 8, for example dimensions and tape placement. Pet., 11-12, 23-29, 33-34, 39-41; EX1003, ¶115 ("Electrodes having dimensions according to the electrodes in Sato's Battery 1 and Battery 8 are *referred to herein for context.*") Referencing dimensions from particular embodiments to interpret Sato's overarching disclosure does not require stitching together multiple embodiments. EX1033, ¶63.

Moreover, contrary to PO's assertions, a POSA would have understood Sato's paragraphs [0136]-[0137] also disclose a battery having first and second recesses, as the Board correctly noted. EX1003, ¶¶127-128, 138-139; EX1033, ¶64; DI, 27. Paragraph [0136] confirms the positive electrode plate of Battery 8 is unchanged from Battery 1, which includes a recess in the positive electrode. EX1033, ¶64. Paragraphs [0136]-[0137] then describe a second recess in the negative electrode. EX1003, ¶¶127-128. Given Sato's repeated teaching of "at least one" electrode having a centrally located recess (EX1005, ¶¶10, 36, 94, claim 6), a POSA would have understood paragraphs [0136]-[0137] as further teaching or suggesting a battery having first and second recesses. EX1033, ¶64; EX1003, ¶136, fn. 5.

D. PO's arguments against the dependent claims fail.

1. Sato discloses claims 2 and 3.

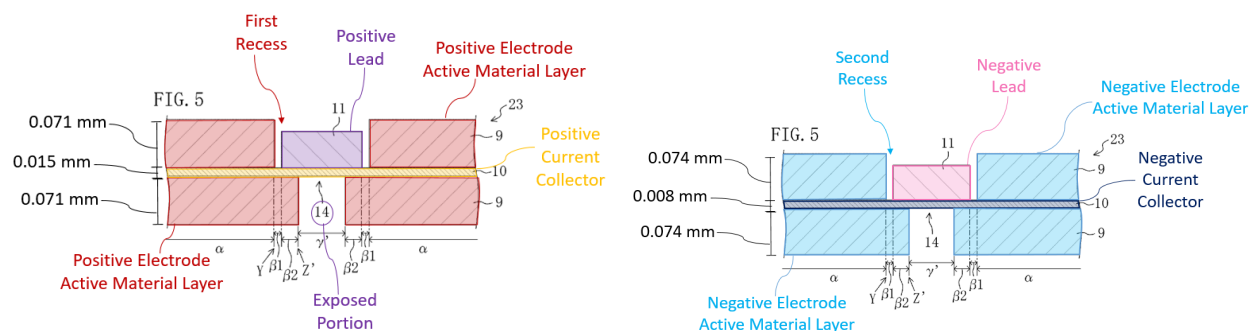
Petitioner demonstrated Sato locates the centers of its first and second recesses within the claimed 1/4 to 3/4 range of the respective electrode length. Pet., 39-40; EX1005, ¶¶[0094], [0104], [0111]-[0113], [0136], [0137]; EX1003, ¶¶115, 156-161. PO's arguments fail as above, relying on the false premise Sato does not disclose first and second recesses (POR, 41-42). EX1033, ¶¶65-67.

2. Sato's disclosure renders obvious claim 6.

Sato's Figures and corresponding description disclose or render obvious the claim 6's depth ranges. Pet., 41-43; EX1003, ¶¶168-170.

Figures may be relied on for relative proportions when the reference provides scale information. *Collabo Innovations, Inc. v. Sony Corp.*, 778 F. App'x. 954, 960 (Fed. Cir. 2019) (figures showed relative proportions because “the references are not ‘completely silent’ on the relative dimensions of the openings”); *Paice LLC v. Ford Motor Co.*, 722 F. App'x. 1015, 1022 (Fed. Cir. 2018) (reference “provide[d] some scale information.”).

Sato supplies such scale information. EX1033, ¶¶68-69. Sato discloses thickness values for the electrode plates and current collectors. EX1005, ¶[0104] (positive plate 0.157 mm; current collector 0.015 mm); ¶[0107] (negative plate 0.156 mm; current collector 0.008 mm). Furthermore, Sato describes the thickness of the lower and upper active material layers in Figures 3-5 as having the *same thickness* “Ta.” EX1005, ¶[0039] (“Ta” used to indicate thickness of upper and lower layers 9). Accordingly, a POSA would have understood each positive material layer is 0.071 mm and each negative material layer is 0.074 mm, as the Petition explained. Pet., 41-43; EX1003, ¶¶168-169; EX1033, ¶¶69-70.



EX1005, FIG. 5 (annotations from Pet., 42, 43).

Sato's Figures 3-5 undisputably show active material layer 9 extending above lead 11 in the vertical direction. EX1034, 137:3-15 (acknowledging Sato's Figures 3-5 show the "thickness" of "layer 9 is greater than the thickness of the lead 11"). Given the disclosed material-layer depths and relative size differences between mixture layer 9 and current collector 10, a POSA would have understood the depth (i.e., vertical clearance) between lead 11 and the top of mixture layer 9 falls within a range of 0.005-0.071 mm for the positive electrode and 0.005-0.074 mm for the negative electrode. EX1003, ¶¶168-169; EX1033, ¶71.

PO alleges Sato cannot disclose the recited depth ranges because Sato is silent regarding the thickness of the active material layer relative to the lead. POR, 44-45. But as noted above, Sato discloses the material layers as having the same thickness T_a . EX1005, ¶[0039]. While "[p]atent drawings are not working drawings," one cannot disregard "things patent drawings show clearly." *Application of Mraz*, 455 F.2d 1069, 1072 (C.C.P.A. 1972). Read alongside the specification, Sato's Figures 3-5 "clearly show" depth clearances between lead 11 and material layer 9. EX1003, ¶¶168-169, EX1033, ¶¶70-71.

Even apart from Sato's disclosure, making the leads slightly thinner than the active-material layers would have been obvious as there are only a finite number of solutions for sizing the lead relative to the material layer, as Petitioner and Dr. von Sacken explained. Pet., 41-43; EX1003, ¶170; EX1033, ¶72.

E. A POSA would have been motivated to combine the teachings of Nakamura with Sato, Takemura, and Kobayashi, rendering obvious claims 4, 5, 12, and 13.

A POSA would have been motivated to modify the size of Sato's recesses according to Nakamura's dimensions to preserve active material on the electrode plate. EX1003, ¶¶189-194; EX1033, ¶73. PO's contention that reducing the length of Sato's recess would undermine Sato's crush-test functionality misunderstands Sato—conflating the recess shape and “band” electrode shape. POR, 45-47; EX1005, ¶¶[0010], [0033]; EX1033, ¶¶74-75. Sato's battery flexibility is achieved through staggered coating edges on opposite sides of the current collector. EX1005, ¶¶37-40; EX1033, ¶76. Modifying the recess length to be less than the electrode width, as Nakamura teaches, does not eliminate this staggered-edge structure and is consistent with Sato's design. EX1033, ¶77.

F. PO raises no other arguments against Grounds 3-6.

PO relies on its Ground 1 arguments for Grounds 3-6. POR, 47-49. As above, those arguments fail. EX1033, ¶78.

III. GROUNDS 7-8: PO'S ARGUMENTS AGAINST THE TAKEMURA-OH-539-KOBAYASHI COMBINATIONS FAIL.

- A. A POSA would have been motivated to combine the teachings of Oh-539's lead placement with Takemura and shift Takemura's tape to the recess locations.**
- 1. Petitioner's rationale for combining Oh-539's lead placement with Takemura does not need to address the same problems identified in the '498 patent.**

Petitioner explained a POSA would have been motivated to move each lead in Takemura's Figures 8-9 embodiment from an electrode end to an electrode central portion *to increase the battery discharge rate*. Pet., 83-86; EX1003, ¶¶353-356. Yet PO responds there is no motivation to combine Oh-539's lead placement with Takemura, alleging "Oh-539 has nothing to do with *preventing lithium deposition* or using tape." POR, 53. PO's argument misses the mark. EX1033, ¶¶79-81.

The motivation for combining references "need not be the same motivation that inspired the patent owner." *In re Conrad*, 759 F. App'x 982, 985 (Fed. Cir. 2019); *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1003 (Fed. Cir. 2016) (motivation may arise from interrelated teachings, market demands, or POSA knowledge).

Oh-539 describes moving the "electrode tab...to a center non-coated portion" to "reduc[e] the distance the electric current moves," improving battery discharge rate. EX1007, ¶¶[0009]-[0010], [0100]-[0105], FIGS. 8-11; EX1003,

¶35. Implementing Oh-539's lead placement with Takemura would therefore improve battery discharge rate, motivating a POSA to combine Oh-539's lead placement teachings with Takemura, regardless of lithium plating concerns. EX1003, ¶¶352-356; EX1033, ¶81.

2. Takemura does not teach away from using insulating tape with first and second recesses.

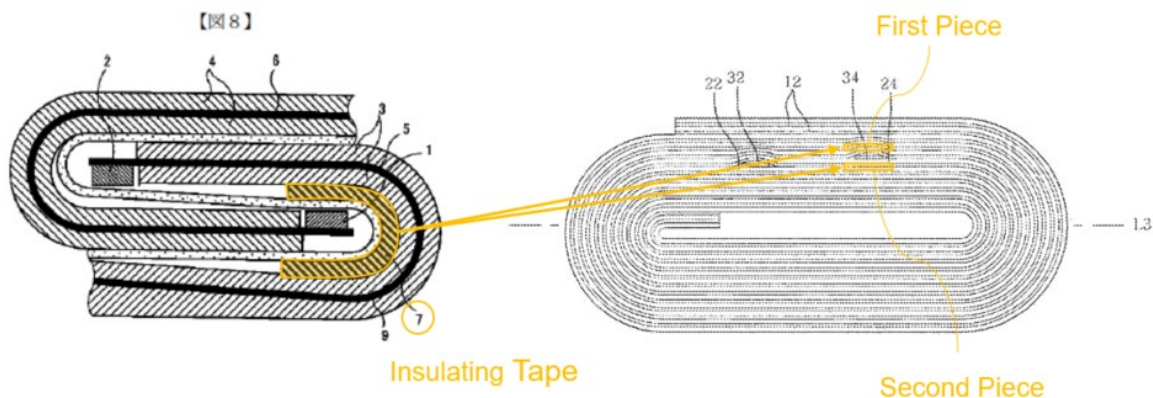
PO rehashes its argument that Takemura teaches away from tape. POR, 49-51. PO's arguments similarly fail here. EX1033, ¶82.

As explained above (Section II.A) and supported by Dr. von Sacken's declaration (EX1033, ¶¶20-27), Takemura's ultimate approach of removing active material does not undermine its express teaching that insulating tape is another suitable option for preventing lithium plating. *Intel*, 21 F.4th at 799-800. A POSA would not be discouraged from applying tape wider and longer than the negative-lead recess—even if Takemura's lead placement were shifted toward the electrode center, as Oh-539 teaches—because this was a common technique to prevent lithium plating. EX1003 ¶¶393-398 (citing EX1022, 51); EX1033 ¶¶83-84; EX1034, 30:13-24.

B. Takemura-Oh-539-Kobayashi renders obvious a “second insulating glue layer” located on “a surface of the positive electrode active material layer opposite to the second recess.”

1. Takemura’s teachings tie tape placement to lead location, not to electrode ends.

Relocating Takemura’s negative lead from the electrode’s end to a central portion, as Oh-539 teaches, would make the positive active material opposite the new lead position susceptible to lithium plating. Pet., 98-100; EX1003, ¶¶393-395. A POSA would have therefore understood the tape must likewise shift to the section of positive active material opposite the recess. EX1003, ¶¶394-395; EX1033, ¶85. Nothing in Takemura discourages that straightforward adjustment. EX1033, ¶¶86-89.



EX1006, FIG. 8 (annotations from Pet., 100); EX1007, FIG. 4 (annotations from Pet. 100).

PO alleges when combining Oh-539’s centrally-located leads with Takemura, a POSA would apply tape only at the electrode ends—mirroring

Takemura's Figure 4. POR, 55-58.⁴ Treating a POSA as automaton, PO's rigid approach for combining the references is legally flawed.

Indeed, obviousness cannot be determined through "a rigid approach" divorced from a POSA's "knowledge, creativity, and common sense." *Randall Mfg. v. Rea*, 733 F. 3d 1355, 1362 (Fed. Cir. 2013). In combining teachings, a POSA is not "compelled to adopt every single aspect of its teaching without the exercise of independent judgment." *Lear Siegler, Inc. v. Aeroquip Corp.*, 733 F.2d 881, 889 (Fed. Cir. 1984).

Takemura's teachings for addressing lithium plating are not solely tied to the approach in Figure 4. EX1033, ¶88. Rather, Takemura's teaching is broader: remove or cover positive active material opposite the exposed plate surface/lead. EX1003, ¶394. That guidance ties tape placement to where the recess/lead is located, not to a fixed location on the electrode. EX1033, ¶88.

⁴ PO mischaracterizes Dr. von Sacken's deposition testimony, alleging he used impermissible hindsight to show tape placement in Takemura-Oh-539's battery. POR, 57-58. But his rationale is rooted in the prior art—Takemura's teaching to mask active material from exposed conducting surfaces. EX1003, ¶¶393-395; EX1033, ¶89.

2. PO attacks Kobayashi individually, ignoring the combination's teachings as a whole.

Petitioner relied on Kobayashi to show a POSA would insulate Takemura's relocated positive lead with a first tape to prevent short-circuiting from pressure or burrs. Pet., 86-88, 96-98; EX1003, ¶¶358-359, 389-391. PO does not dispute this rationale, instead arguing Petitioner ignores Kobayashi's teaching to directly cover the negative lead with insulating tape. POR, 59-60. PO claims this somehow "undercuts" Petitioner's rationale to shift Takemura's second tape to oppose the relocated negative lead. *Id.*

PO's argument fails because Takemura—the primary reference—*already* teaches placing insulating tape on positive active material opposite the negative lead. Pet., 98; EX1003, ¶¶393, 424-427, 456-459; EX1006, ¶[0008]; EX1033, ¶¶90-91. Kobayashi does not discourage this, acknowledging the negative electrode does not need the "same configuration" as the positive electrode. EX1008, ¶[0015]; EX1033, ¶91. A POSA would have therefore recognized Kobayashi's tape placement for the negative lead can follow other prior art examples, including Takemura's teaching to locate tape on the positive active material opposite to the negative lead. EX1033, ¶¶91-92. Thus, Petitioner's rationale for locating the second tape on the opposing positive active material surface stems directly from the applied references, not the '498 patent. EX1033, ¶93.

C. Takemura-Oh-539-Kobayashi renders obvious a “second insulating glue layer” having “a length larger than a length of the second recess.”

PO repeats its argument that Petitioner relies solely on unsupported expert testimony for this limitation. POR, 50. As explained in the Petition and above (Section II.C), a POSA would have understood to size tape wider and longer than the second recess in view of Takemura. Pet., 102-103; EX1003, ¶¶398, 433, 461; EX1033, ¶94. Thus, PO’s arguments against Takemura-Oh-539-Kobayashi fail.

IV. CLAIM CONSTRUCTION

PO’s assertion regarding inconsistent claim construction of “positive plate” and “negative plate” is inaccurate and moot. POR, 6.

Petitioner initially raised an antecedent-basis indefiniteness argument in district court, but the parties agreed to judicially correct the terms to “positive electrode” and “negative electrode.” EX1035, 9; EX1036; EX1037, 9. Petitioner withdrew its indefiniteness challenge. EX1036; EX1037, 9; EX1038, 7-8.

Petitioner’s applied art for the “positive plate” and “negative plate” is consistent with the agreed-upon construction. Pet., 24-26, 27-29, 33-36, 88-89, 91-93, 98-101. Thus, there is no inconsistency.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX PLLC

/Jason A. Fitzsimmons/

Jason A. Fitzsimmons (Reg. No. 65,367)

Jason D. Eisenberg (Reg. No. 43,447)

Chase Hammond (Reg. No. 73,827)

John Higgins (Reg. No. 74,992)

James D. Stein (Reg. No. 63,782)

Kevin Yao (Limited Recognition No. L0790)

Counsel for Petitioner

Date: March 5, 2026

1101 K Street, NW, 10th Floor
Washington, DC 20005
(202) 371-2600

CERTIFICATE OF WORD COUNT (37 C.F.R. § 42.24(d))

1. This Petitioner's Reply complies with the type-volume limitation of 5,600 words, comprising 5,552 words, excluding the parts exempted by 37 C.F.R. § 42.24(c).

2. This Petitioner's Reply complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word in 14-point Times New Roman font.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX PLLC

/Jason A. Fitzsimmons/

Jason A. Fitzsimmons
Registration No. 65,367
Counsel for Petitioner

Date: March 5, 2026

1101 K Street, NW, 10th Floor
Washington, DC 20005
(202) 371-2600

CERTIFICATE OF SERVICE (37 C.F.R. § 42.6(e))

I certify that the above-captioned **PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE** and associated **Exhibits 1033-1043** were served in their entireties on March 5, 2026, upon the following parties via electronic mail:

Christopher TL Douglas (Lead Counsel) christopher.douglas@alston.com
Madeline Byrd (Back-Up Counsel) maddy.byrd@alston.com
Miranda Sooter (Back-Up Counsel) miranda.sooter@alston.com
Casey Hickey (Back-Up Counsel) casey.hickey@alston.com
Brady Cox (Back-Up Counsel) brady.cox@alston.com
ATL-CosMX-IPRs@alston.com
ALSTON & BIRD LLP

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX PLLC

/Jason A. Fitzsimmons/

Jason A. Fitzsimmons
Registration No. 65,367
Counsel for Petitioner

Date: March 5, 2026

1101 K Street, NW, 10th Floor
Washington, DC 20005
(202) 371-2600