UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MEDIATEK, INC.,

Petitioner,

v.

PARKERVISION, INC.
Patent Owner

Inter Partes Review No. IPR2025-00030
U.S. Patent No. 8,498,593

PATENT OWNER'S SUR-REPLY

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PATENT OWNER'S EXHIBIT LIST

Exhibit No.	Description
2001	Declaration of Dr. David Ricketts
2002	Declaration of Anderson To
2003	Deposition Transcript of Dr. Lawrence E. Larson, dated December 9, 2025

For reasons discussed below, Petitioner MediaTek, Inc.'s Reply arguments are misplaced.

I. CLAIM CONSTRUCTION

The sole claim construction dispute in this IPR relates to the term "power efficiency" and the broader phrase "in response to the power efficiency of the power supply exceeding a predetermined threshold." Reply, 2; POR, 12-19; Pet., 12-13. As explained in the POR, Petitioner proposed construction to this well-understood phrase, not to clarify its meaning, but to improperly alter the scope of the claims to encompass so-called "indirect measurements of power efficiency such as output current and voltage." POR, 12-19. Petitioner's veiled attempt to improperly broaden the scope of the claims is internally inconsistent, paradoxical, and divorced from even Petitioner's own erroneous construction of "power efficiency," let alone the term's plain and ordinary meaning.

Petitioner set the stage for unduly broadening claim scope by construing the term "power efficiency" to mean "the output power of the power supply compared to its input power." Pet., 12. However, even Petitioner's own expert, Dr. Larson, admitted during deposition that this construction is "vague" or at least subject to "multiple definitions." Ex. 2003, 12:22-13:11. As PO's expert Dr. Ricketts explained, "power efficiency" is well understood by a POSITA to be "a ratio of output power to input power, which could be expressed in percentage by

multiplying the ratio by 100." Ex-2001, ¶67; POR, 13; Ex. 1001, 4:35-56. This understanding is consistent with the specification's description of the same. *Id.* Indeed, Dr. Larson admitted that "percentages are a typical way of quantifying efficiency," and that the specification's "numerical quantification of efficiency is always done in terms of percentages." Ex. 2003, 33:3-34:11. Nevertheless, Petitioner proposed deviating from the plain and ordinarily meaning of the term to make room for the object of its claim construction position—to broaden the scope of the claims to encompass more than just "a power efficiency of the power supply exceeding a predetermined threshold," as plainly recited, but also "indirect measurements of power efficiency such as current or voltage." Pet., 12-13; Reply, 2-3.

As explained in the POR, Petitioner's construction of this broader phrase does not even meet Petitioner's own definition of "power efficiency"—a measurement of voltage or current alone is not sufficient to calculate power, let alone to compare output power to input power, as required by Petitioner's construction of "power efficiency." POR, 14-15. Tellingly, Petitioner has no response to this argument. Reply, 2-8. Indeed, Dr. Larson admitted that power cannot be determined based solely on voltage. Ex. 2003, 19:8-18. Dr. Larson further acknowledged that a measurement of output power (which a measurement of voltage alone is not) "by itself is[not] a comparison [between output power and

input power]." *Id.*, 15:14-16:19. According to Dr. Larson, in order to compare output power to input power based on a measurement of output power, one must "infer the input power" from the measured output power, then "make a comparison between those two and that will tell you something about the efficiency." *Id.*, 15:14-16:19 ("So the measurement [of output power] by itself isn't a comparison, but … if you take that next step and infer the input power, then you can measure the efficiency, or construe the efficiency, or calculate the efficiency, or estimate the efficiency.").

Thus, by Dr. Larson's own admissions, a voltage or current measurement is not, "by itself," a measurement of "power efficiency" under Petitioner's construction (i.e., "the output power of the power supply compared to its input power"). *Id.*, 15:14-16:19, 19:8-18. Further "step[s]" must be taken to "infer," "calculate," or "estimate" ***both*** output power ***and*** input power before they can be compared against one another to indicate power efficiency. *Id.* This is fatal to Petitioner's construction of "a power efficiency of the power supply exceeding a predetermined threshold," which, as Dr. Larson admitted (*id.*), cannot be met by current or voltage measurement without further determination of power efficiency characteristics. POR, 15-19.

Unable to square its paradoxical claim construction positions, Petitioner resorted to strawman arguments. Contrary to Petitioner's misrepresentation, PO

never alleged that the claims require power supply "circuitry [for] calculating power efficiency." Reply, 2-4. Rather, it has always been PO's position that the claims "require determining the power efficiency characteristics of the power supply and setting a threshold based on that determination." POR, 15. Petitioner's baseless assertion that this interpretation is unsupported by the specification does not make it so. Reply, 4.

As explained in the POR, Figure 1 of the '593 patent shows that the power efficiency characteristics of an exemplary power supply was known and calculated. POR, 16.

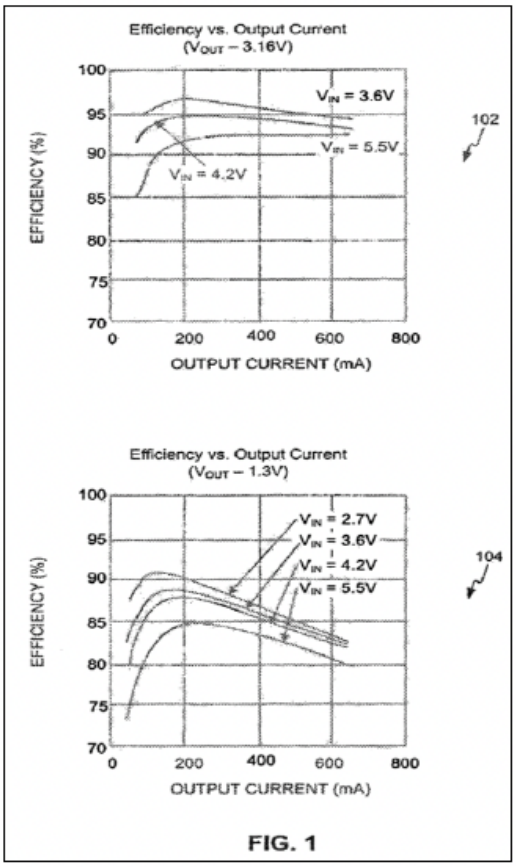
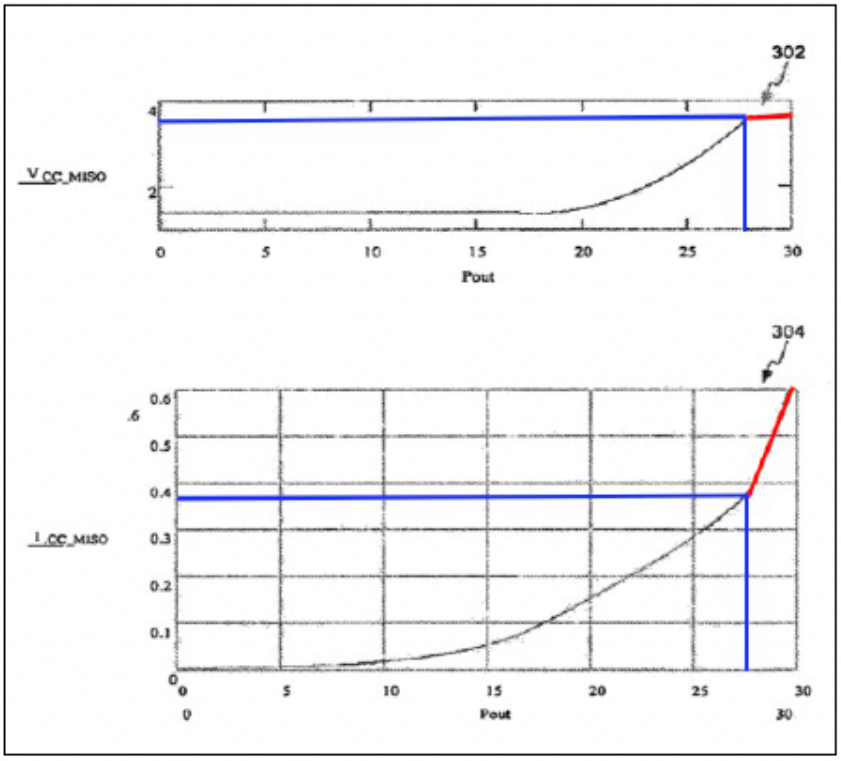


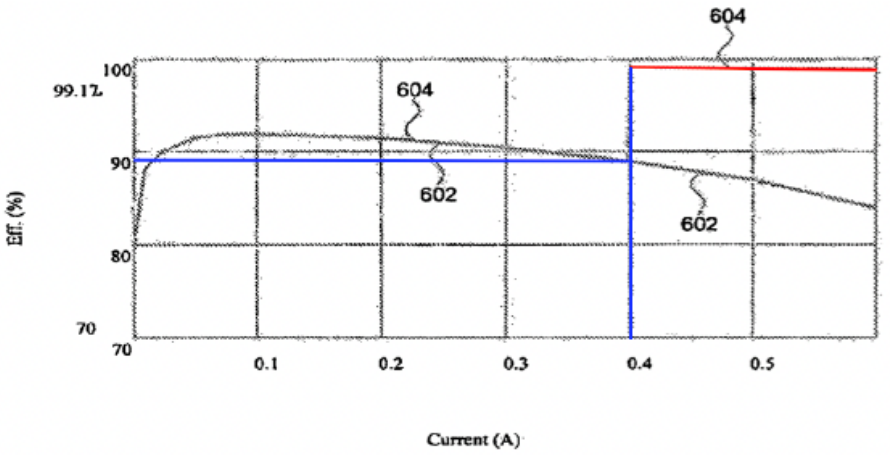
FIG. 1

EX-1001, Fig. 1. Then, based on the network characteristic of CDMA shown in Figure 2, it is determined that the power supply and amplifier system should be configured for a power control range of 0 to +30dBm, with optimal performance at +17 dBm. POR, 16; EX-1001, 5:10-24, 5:38-44. With reference to the exemplary MISO amplifier's output power plot shown in Figure 3, it is determined that an amplifier output power of +17 dBm corresponds to a bias voltage (i.e., power supply output voltage) of 1.39V and a bias current (i.e., power supply output current) of 100mA. POR, 16-17; EX-1001, 5:25-50.



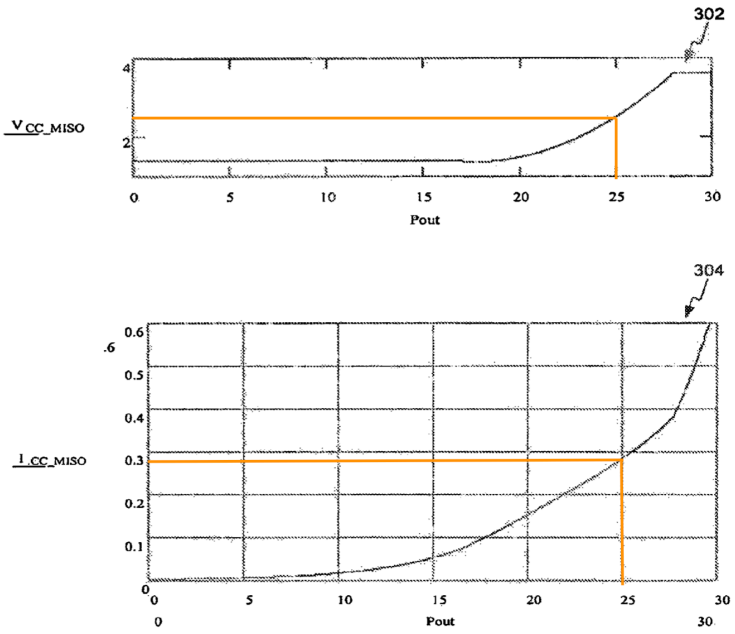
EX-1001, Fig. 3 (annotated); EX-2001, ¶77. On this basis, the power supply is configured to provide voltage up to 3.6V, with optimal power efficiency at 1.39V

and 100mA. As shown in Figure 6, the resulting power supply design activates the bypass switch at a threshold of 3.6V and 400mA, which corresponds to a power efficiency of approximately 89%.



EX-1001, Fig. 6 (annotated); EX-2001, ¶78.

Contrary to Petitioner's argument, the above process of designing and configuring the power supply, including setting the threshold for activating the bypass switch, depends on Figure 1's efficiency curves, Figure 2's probability distribution, and Figure 3's output power curves. For example, in the case where Figure 2's probability distribution shows a power control range of 0 to +25 dBm (as opposed to 0 to +30 dBm), it may be determined, with reference to Figure 3, that the power supply is only required to provide bias voltage of up to 2.7V.



EX-1001, Fig. 3 (annotated). Because it is unnecessary for power supply output voltage to reach the exemplary MISO amplifier's maximum bias voltage of 3.6V, Figure 1 shows that, for optimal performance at +17 dBm, the power supply should be configured to have an input voltage of 2.7V, which is more efficient than an input voltage of 3.6V at providing output voltage of 1.39V and output current of 100mA.

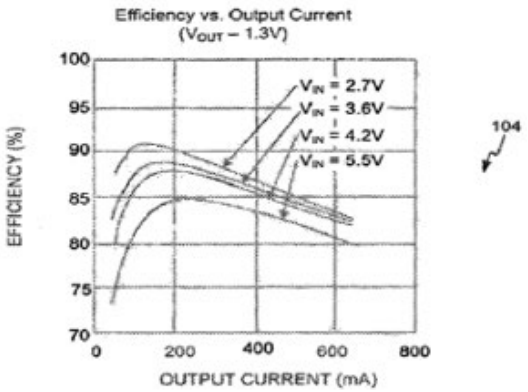


FIG. 1

EX-1001, Fig. 1 (excerpted). In this case, the power efficiency curve, threshold for activating bypass switch, and corresponding power efficiency would be different than as shown in Figure 6, even though the same power supply and MISO amplifier (with the same 3.6V maximum bias voltage) is used. Thus, Petitioner is wrong that "nothing in the '593 Patent relates Figure 1's efficiency curves or Figure 2's probability distribution to the threshold where the bypass switch activates." Read as a whole, the specification discloses setting a "predetermined threshold" for activating the bypass switch based on "power efficiency of the power supply."

Petitioner's reliance on *Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1353 (Fed. Cir. 2001) is misplaced. PO's understanding of the claims does not depend on "the state of mind of the accused infringer." *Id.* Rather, it depends on the affirmative act of determining "power efficiency" and setting a threshold based on that determination.

Finally, Petitioner's argument regarding dependent claims 2 and 6 defies logic. Reply, 7-8. Independent claim 1 and dependent claims 2 and 6 recite different requirements for deactivating the claimed switching device. Nothing in independent claim 1 precludes additional requirements for deactivating the claimed switching device, as recited in claims 2 and 6. Indeed, Figure 5 shows that load current, as recited in claim 2, is "Optional." EX-1001, Fig. 5. Thus, the claimed

switching device can be deactivated based on "load current" (as recited in claim 2) and/or "a comparison of the down-converted input voltage to a threshold voltage" (as recited in claim 6), in addition to "a power efficiency of the power supply exceeding a predetermined threshold" (as recited in claim 1). Alternatively, a "load current" threshold (as recited in claim 2) or a "threshold voltage" (as recited in claim 6) could be the "predetermined threshold" of claim 1 if they are set based on "power efficiency of the power supply."

II. PETITIONER FAILED TO SHOW THAT THE CHALLENGED CLAIMS ARE UNPANTENTABLE

A. Ground 1A: Hau in View of Yoshida

1. Hau does not disclose or suggest controlling the switching device "in response to a power efficiency of the power supply exceeding a predetermined threshold," as required by all challenged claims

As explained in the POR, Hau's Pdet does not disclose or suggest de-activating the switching device and passing the input voltage to the output voltage node "in response to a power efficiency of the power supply exceeding a predetermined threshold," as required by claim 1 (from which claims 2-8 depend), claim 9 (from which claims 10-14 depend), and claim 15 (from which claims 16-20 depend). POR, 28-33. Petitioner's Reply arguments failed to show otherwise.

First, the relationship between Pdet and Vin does not establish Pdet as an indicator of "power efficiency of the power supply." POR, 29-31. As explained in

the POR, Vin "is an ***RF signal*** sensed from the ***output of the first power amplifier PA1***." Ex. 1007, 4:16-17; POR, 29. Thus, the relationship between Pdet and Vin only establishes Pdet as an indicator of RF output power of the first power amplifier. POR, 29. It does not show Pdet as an indicator of DC supply power, let alone an indicator of "power efficiency of the power supply." *Id.* Indeed, Dr. Larson recognized the distinction between RF power and DC power. Ex. 2003, 10:17-11:9 ("And you could … look at the input power of a power amplifier. And by input power I think I mean like the ***DC input power, not the RF input power***."). On Reply, Petitioner did not meaningfully address this argument. Reply, 8-10. Instead, Petitioner relied on the linear relationship between Pdet and Vcc2 (not Vin). *Id.* As explained below, this relationship is also unavailing.

Second, the linear relationship between Pdet and Vcc2 also fails to establish Pdet as an indicator of "power efficiency of the power supply." As explained in the POR, under both PO's plain meaning and Petitioner's construction, "power efficiency" is a function of both input power and output power, which depends on input and output voltage and current. POR, 29-31. Because Pdet only determines the DC-DC buck regulator's output voltage Vcc2 (Ex. 1007, 4:19-21) and does not account for variation in input and output current (on which power efficiency depends), Pdet does not correlate to, and thus is not an indicator of, power efficiency. POR, 29-31.

Petitioner argues on Reply that "the '593 [patent's] preferred embodiments do not measure input currents, and at least one embodiment relies solely on a voltage threshold to indicate output power without considering either input or output current." Reply, 10 (citation omitted). Again, the claims do not require calculation of power efficiency by the power supply circuitry. POR, 15-19; *supra* § I. Rather, the claims require determining the power efficiency characteristics of the power supply and setting a threshold based on that determination. *Id.* As explained in the POR and in Section I above, the '593 patent's exemplary voltage threshold is set based on, *inter alia*, the power efficiency characteristics of the power supply shown in Figure 1. *Id.*

Petitioner further argues that "[b]ecause Hau's battery voltage is fixed and Hau's Figure 5 provides output current for every power level, a POSITA would have understood a given power level (including the threshold at which the bypass switch is activated) corresponds to an ascertainable power efficiency." Reply, 10-11. However, Hau's Figure 5 shows the output power of the ***amplifier***, not the output power of the ***power supply***. EX-1007, 4:66-5:8. Thus, contrary to Petitioner's argument, power efficiency of the ***power supply*** is not "ascertainable" from Figure 5 of Hau. Moreover, "an ascertainable power efficiency" is not sufficient to meet the claims, which requires an actual determination of power efficiency, and a threshold set based on that determination. POR, 15-19; *supra* § I.

By Petitioner's logic, any threshold for activating a bypass switch would read onto the claims since any such threshold corresponds to "an ascertainable power efficiency." Reply, 10-11. This renders the claimed phrase "in response to a power efficiency of the power supply" entirely superfluous.

Third, Petitioner's argument that the claims do not require a "power efficiency" determination fails because it depends on Petitioner's erroneous claim construction. Reply, 11-12. Indeed, this argument illustrates the upshot of Petitioner's construction—it reads out "power efficiency" entirely and rewrites the claims to simply require a voltage or current threshold. According to Petitioner, "it is irrelevant whether the bypass function 'involve[s] power efficiency determinations.'" *Id.* It is also irrelevant that Hau's voltage threshold is set based on hardware limitations and not on power efficiency considerations. *Id.* And it "does not matter whether the bypass determination 'involve[s] any calculation of…power efficiency.'" *Id.* "All that matters is that [the bypass] function is activated … by [a] voltage [threshold]." *Id.* In view of Petitioner's assertions above, it is plain that Petitioner's interpretation of the claims gives no meaning to the phrase "power efficiency." Under Petitioner's erroneous construction, the claims' bypass limitation reads as follow:

> … in response to ~~**a power efficiency of**~~ the power supply exceeding a predetermined **voltage or current** threshold, …

> deactivat[es/ing] the switching device and pass[es/ing] the input voltage to the output voltage node.

EX-1001, claims 1, 9, 15. Petitioner's improper attempt to rewrite the claims should be rejected.

2. Hau does not disclose "deactivate the switching device based on a load current at the output voltage node," as required by claim 2

Petitioner does not dispute that Hau teaches away from using measured current to control its bypass switch. Reply, 12; POR, 33-37. Nor does Petitioner dispute that substituting Hau's voltage measurement with current measurement would have fundamentally altered the design and operation of Hau's device. *Id.* Nonetheless, Petitioner argues that this limitation is obvious merely because "devices that monitor[] the output power of the power amplifier through the current in the voltage bias line to the power amplifier" were well-known. Reply, 12 (internal quotations omitted). This is not how obviousness works.

As a threshold matter, Hau merely discloses that it was known to ***optimize the bias voltage*** of power amplifier based on current measured in the in the voltage bias line to the power amplifier. EX-1007, 2:1-11. Neither Hau nor the prior art referenced therein discloses ***controlling a bypass switch*** based on current measured at the output voltage node, as required by the claims.

Nevertheless, even assuming that controlling a bypass switch based on current measurement was known, a POSITA nonetheless would not have had a reasonable likelihood of success in modifying Hau in this manner. As explained in the POR, Hau's bypass switch is controlled by Pdet, which is a voltage measurement generated based on the RF AC signal from the power amplifier. POR, 36-37. Substitution Pdet with the output DC current of the DC-DC converter involves a total and complete overhaul of Hau's circuit configuration. *Id.* More importantly, the self-adaptive nature of Hau's power supply depends on the linear voltage relationships between Vin—the output voltage of the first stage power amplifier, Vcc2—the power supply voltage, and Pdet. *Id.* Substituting Pdet's voltage measurement for current measurement destroys this linear relationship and the current consumption optimization feature of Hau's device. *Id.* Petitioner's conclusory assertion that such a modification "would have been well within the skill of a POSITA" does nothing to refute this argument.

3. Hau does not disclose "an output current at a maximum power efficiency associated with the down-converted input voltage," as required by claims 5 and 11

As explained in the POR, Petitioner's argument that Hau discloses this limitation conflates the disparate and distinct concepts of current consumption and power efficiency. POR, 37-40. On Reply, Petitioner argues that there is a direct relationship between these terms in that efficiency can be expressed as

$\frac{P_{OUT}}{V_{BATT} \times I_{BATT}}$. Reply, 13. On this basis, Petitioner argues that "maximum efficiency for a given P_{OUT} is achieved when I_{BATT} is minimized." *Id.* This argument further conflates power efficiency of the amplifier with power efficiency of the power supply. As described in connection with Figure 5, the object of Hau is to minimize input current I_{BATT} at each output power level of the ***power amplifier*** P_{OUT}. The DC input efficiency of the ***power amplifier*** μ_{PA} can be expressed as $\frac{P_{OUT}}{V_{cc2} \times I_{cc2}}$. As shown in Figures 4 and 5 of Hau, the relationship between Vcc2 and P_{OUT} is non-linear:

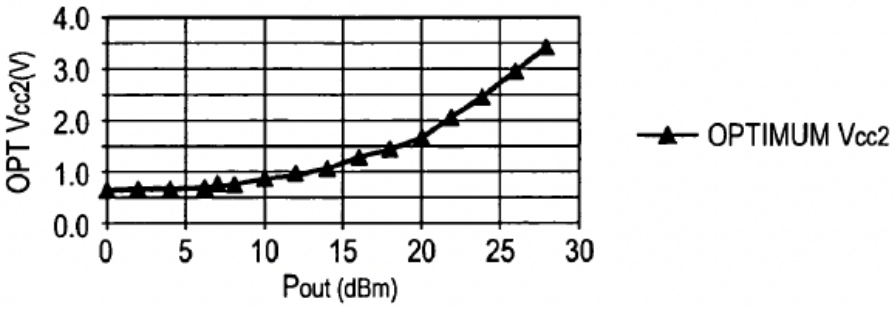
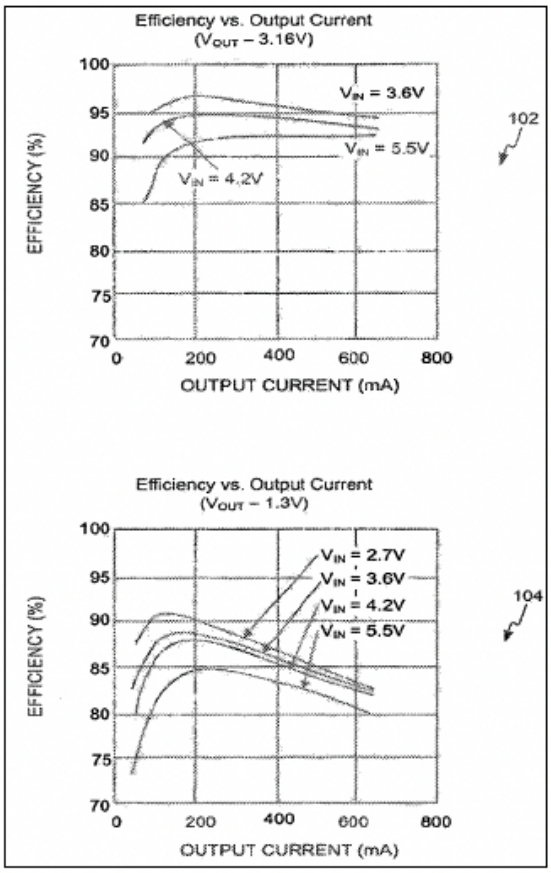


FIG. 4

EX-1007, Fig. 4. Thus, The DC input efficiency of the power amplifier μ_{PA} is also non-linear. Further, the power efficiency of the power supply μ_{PS} can be expressed as $\frac{V_{cc2} \times I_{cc2}}{V_{BATT} \times I_{BATT}}$. As shown in Figure 1 of the '539 patent, the relationship between current and power supply efficiency is also non-linear:



EX-1001, Fig. 1. Thus, P_{OUT} relates to I_{BATT} via two non-linear variables μ_{PA} and μ_{PS}. They do not have the direct linear relationship as alleged by Petitioner. Reply, 13. Accordingly, maximum amplifier efficiency μ_{PA} for a given P_{OUT} is not necessarily achieved when I_{BATT} is minimized (even when V_{BATT} is fixed)—it depends on the non-linear variable μ_{PS}. Petitioner's Reply argument, based on faulty assumptions, is flawed.

4. Hau does not disclose "deactivat[e/ing] the switching device and pass[ing] the input voltage to the output voltage node [based on a/comprises] compar[ison of/ing] the down-converted [input] voltage to a threshold voltage," as required by claims 6-8 and 12-14.

As explained in the POR, Hau does not teach this limitation because Hau's bypass switch is activated based on a comparison of the DC voltage set point to Pdet, which does not equal Vcc2 (i.e., the down-converted input voltage by Hau's DC to DC convertor). POR, 40-42. Petitioner's Reply argument that this claim limitation "does not exclude any indirect comparison" boils down to: its close enough. Reply, 14-16 But the plain language of the claim is unambiguous and precise—it requires "a comparison of the down-converted input voltage to a threshold voltage." Petitioner does not dispute that Pdet is not the down-converted input voltage by Hau's DC to DC convertor. *Id.* Rather, Petitioner again tried to broaden the scope of the claims beyond what they expressly recite by pointing to the '593 patent's exemplary embodiments. *Id.* In doing so, Petitioner ignores the specification's description that the Bypass Switch Control module 402 determines whether to switch to bypass mode by comparing Threshold Voltage 414 to "the value of the power supply output voltage to determine whether power supply 400 should switch to bypass mode." Ex. 1001, 7:50-8:3; POR, 40-42. Contrary to Petitioner's argument, the express language of the claims is clearly supported by the specification. There is no wiggle room.

Moreover, Petitioner did not and could not explain why, under Petitioner's "indirect comparison," the claims would not impermissibly reach beyond what is described in the specification to include, for example, Hau's Vin, which is an RF output signal far removed from the claimed "down-converted input voltage." POR, 42.

B. Ground 1B: Hau in View of Yoshida and Further in View of Sahu

1. No motivation to combine Sahu with Hau and Yoshida

Petitioner's Reply arguments for combining Sahu with Hau and Yoshida are nothing but hindsight. Reply, 16-18. As explained in the POR, while Sahu teaches evaluating the efficiency of power amplifier design using "weighted average efficiency," it does not teach how to optimize a system's weighted efficiency other than using a dynamic-supply system (like those already described in Hau and Yoshida). POR, 42-45. On Reply, Petitioner alleged two improvements taught by Sahu, but neither is availing.

First, Petitioner argues that Sahu suggests to a POSITA that the design of a power supply for a wireless system should be optimized for greatest efficiency at the power levels at which it is most likely to operate. Reply, 17. But as explained in the POR, Sahu teaches no such optimization other than to use a dynamic-supply system. POR, 43-45. And because the Hau/Yoshida device already utilizes a dynamic power supply, a POSITA would not have been motivated to apply Sahu's

teachings to Hau/Yoshida. Petitioner's argument that the claims do not require performance optimization is a red herring. PO's argument is directed towards Petitioner's proffered reason to combine, not at specific claim language.

Second, Petitioner argues that a POSITA would have been motivated by Sahu's teaching that "a fixed-supply power supply becomes more efficient than a "dynamic-supply" power supply at a point that can be calculated for a particular system" to "set[] the threshold for bypass operation to correspond to the point where a fixed supply becomes more efficient." Reply, 16-17. But as explained in the POR, a POSITA would not have equated Sahu's fixed-supply system with Hau's bypass pathway without the benefit of hindsight. POR, 51. Sahu compared the weighted efficiency of its proposed dynamic-supply system with that of a fixed-supply system to demonstrate the merit of its own system, which does not include a bypass switch like that described in Hau. *Id.*; Ex. 2003, 49:3-11 (Dr. Larson admitting that Sahu nowhere mentions a bypass switch). Hau teaches a bypass switch that is closed based on hardware limitations of the DC-DC convertor, not on power efficiency considerations. POR, 51. Petitioner improperly used the disclosures in the '593 patent as a road map for reasons to combine Sahu and Hau/Yoshida. *Id.*

2. Hau in view of Yoshida and Sahu does not render obvious controlling the switching device "based on a probable output power point of operation for a selected modulation scheme based on one or more power efficiency characteristics of an electronic device coupled to the power supply," as required by claims 3-4, 10, and 19

Petitioner argues that Sahu teaches that "the PA configuration should be based on the expected average efficiency for a selected modulation scheme," and that this is all that the claims require. Reply, 18. Even if that's true, Petitioner failed to demonstrate how Sahu's alleged teaching can be applied to the Hau/Yoshida device, which is fatal to Petitioner's assertion of obviousness.

Moreover, as explained in the POR, Sahu does not teach control or configuration that is "based on a probable output power point of operation for a selected modulation scheme"—it teaches a one-size-fits-all solution—the use of a dynamic power supply (already employed by Hua/Yoshida) for all modulation schemes that operate more often in back off power. POR, 48-49.

3. Hau-Yoshida-Sahu does not render obvious "programming the threshold voltage based on a communication waveform efficiency" (claims 8, 13)

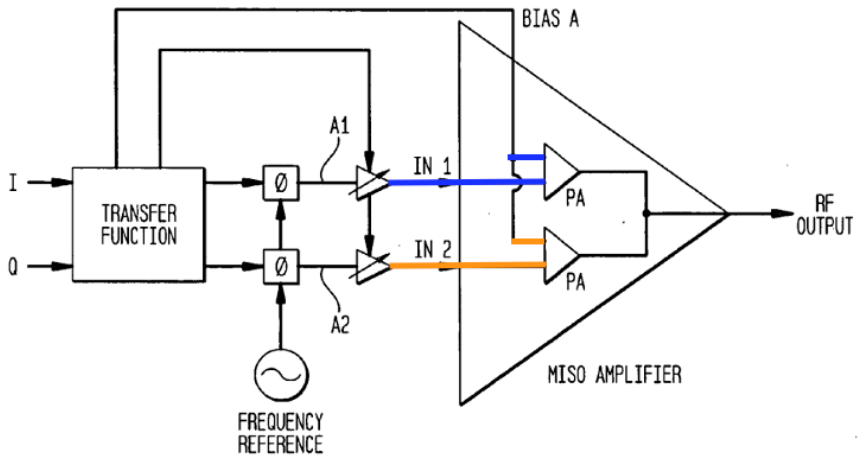
Contrary to Petitioner's baseless assertion, Sahu nowhere discloses a bypass switch, let alone "setting the threshold for a bypass … at the point where the fixed power supply becomes more efficient would improve the efficiency of the system." Reply, 19-20; *see* Ex. 2003, 49:3-11 (Dr. Larson admitting that Sahu nowhere

mentions a bypass switch). For reasons discussed in the POR and Section II.B.1 above, Petitioner's arguments fail. POR, 50-52; supra § II.B.1.

C. Ground 1C: Hau in view of Yoshida and Lejon does not teach a MISO amplifier, as required by claim 16

Petitioner is wrong that Figures 9 and 10 of Lejon "show amplifiers with multiple inputs." Reply, 20. Lejon expressly discloses, in connection with Figure 9, that "***an input (RF) signal (phasor fragment)*** present at the input ports 210, 220. EX-1013, 21:26-28. Similarly, Lejon discloses, in connection with Figure 10, that "***the phasor signal is*** **[singular]** applied" over "the input terminals 310, 320. *Id.*, 23:22-24. Thus, the input ports (210, 220 in Figure 9; 310, 320 in Figure 10) collectively receive a single differential input RF signal. *Id.*, 21:26-28, 23:22-24. Indeed, the MISO amplifier incorporated by the '593 patent illustrates this point:

FIG. 71



EX-1033, Fig. 71. As shown in Figure 71, the MISO amplifier has ***two inputs IN1***

and IN2. *Id.* The MISO amplifier comprises two smaller PAs each with two input ports. However, like the amplifier in Figures 9 and 10 of Lejon, the two smaller PAs are not themselves MISO amplifiers because each of the two PA receives a single differential input signal (blue lines and orange lines).

D. Ground 2A: Canyon in view of Ranjan

1. No motivation to combine Canyon with Ranjan

Petitioner's Reply arguments regarding motivation to combine Canyon and Ranjan are unavailing.

First, the fundamental differences between Ranjan and Canyon's circuit structures are highly relevant. As explained in the POR, Ranjan discloses amplifier architectures that control the power supply output voltage based on the RF input signal. POR, 53-54; EX-1012, 493, Figs. 1a, 1b. Notably, Ranjan does not disclose any bypass circuitry. EX-2003, 46:19-47:10 (Dr. Larson admitting that Ranjan contains no reference to a bypass switch). In contrast, Canyon discloses controlling the power supply output voltage and bypass switch based on power supply current output or amplifier power output. POR, 54-56. Because Ranjan and Canyon employ fundamentally distinct control schemes for controlling their respective power supply, a POSITA would not have expected Canyon's system to perform similarly to Ranjan's system. *Id.* Thus, a POSITA would not have found the measured efficiency of Ranjan's system shown in Figure 3 to be indicative of the

efficiency of Canyon's system, nor would such a skilled person been motivated by Ranjan's Figure 3 to plot the efficiency of Canyon's device to identify a power level at which Canyon's bypass pathway becomes more efficient than the dynamic voltage output by a DC-DC converter. *Id.*

Second, contrary to Petitioner's misrepresentation, Ranjan does not teach a "bypass pathway," much less "a 'crossover' point can be ascertained for a transmitter where the bypass pathway becomes more efficient." Replay 21; EX-2003, 46:19-47:10. The so-called "crossover" point came not from Ranjan's teaching, but from Petitioner expert's hindsight-fueled annotation:

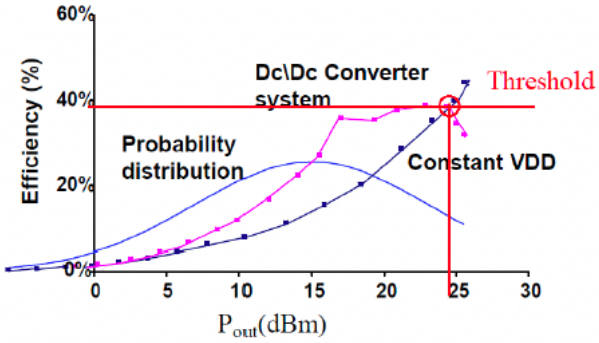


Fig.3: Measured efficiency of amplifier with constant VDD and with dc/dc converter , at different output power levels. Also shown is a representative distribution of output power for wireless application.

EX-1012, Fig. 3 (annotated). Moreover, as discussed above, a POSITA would not have found the measured efficiency of Ranjan's system shown in Figure 3 to be indicative of the efficiency of Canyon's system. A POSITA certainly would not have applied Canyon's power level of greater than 22-24 dBm wholesale to

Ranjan's Figure 3 (depicting efficiency of circuits wholly different from those in Canyon) to determine whether Canyon's system could be improved. *See* Reply, 22.

Third, the mere fact that Figures 1 and 2 of Canyon depicts some identical elements does not mean that the disclosures relating to one is applicable to the other. *See* Reply, 23. This is especially true where the disclosure at issue (i.e., closing the bypass switch when power meter measures an output power level of greater than 22-24 dBm) concerns the very elements (i.e., current meter in Figure 1 and power meter in Figure 2) that are different between the Figures. Petitioner is wrong that the "two embodiments differ only in the placement of power meter 180/181." *Id.* As Dr. Larson admitted during deposition, notwithstanding Figure 1's labeling of element 180 as a "power meter," the specification describes, and a POSITA would have understood, that element 180 in Figure 1 is a current meter. EX-2003, 42:1-22. It measures current Ibb, not "power input to the PA," as Petitioner wrongly alleged. *Id.*; Reply, 23. As explained in the POR, a POSITA would have recognized that the output power level of the power amplifier unit 120 is a function of: (1) the power level of the input RF signal 151; and (2) the gain of the power amplifier at a given bias voltage Vbb. POR, 59; EX-2001, ¶192. Thus, with respect to Figure 1, even if power input of the power amplifier unit 120 can be determined based on current Ibb, a POSITA nonetheless would not have known how to determine output power level of the power amplifier for purpose of

controlling the bypass switch as described for the Figure 2 embodiment. *Id.* Petitioner's argument to the contrary, based on misrepresentation of Canyon's teaching, is unconvincing.

2. Canyon alone or in view of Ranjan does not disclose controlling the switching device "in response to a power efficiency of the power supply exceeding a predetermined threshold," as required by all challenged claims

Petitioner's Reply argument for this limitation is based on the same misrepresentation of Figure 1 of Canyon. Reply, 26. Again, Canyon Figure 1's current meter does not measure power input to the PA, and the output power of the PA depends on: (1) the power level of the input RF signal 151; and (2) the gain of the power amplifier at a given bias voltage Vbb. POR, 59; EX-2001, ¶192. Canyon does not disclose, and a POSITA would not have known, how output power of the PA can be determined based on the measured current Ibb. *Id.* Regardless, having failed to allege that it would have been obvious to modify Canyon's Figure 1 embodiment in view of the Figure 2 embodiment in the Petition, Petitioner cannot do so on Reply. And for reasons discussed in the POR and in Section II.D.1 above, a POSITA would not have found anything in Ranjan that fills the gap between Canyon's Figure 1 and Figure 2 embodiments. POR, 62-64.

3. Ranjan does not disclose controlling the switching device "based on a probable output power point of operation for a selected modulation scheme based on one or more power efficiency characteristics of an electronic device coupled to the power supply," as required by claims 3-4, 10, and 19

As explained in the POR, Ranjan does not disclose this limitation because Petitioner's alleged control of the switching device (i.e., threshold in red) is not determined based on the probable output power point of operation (light blue), and is instead based on a comparison of the measured efficiency between amplifier with constant VDD and DC-DC convertor:

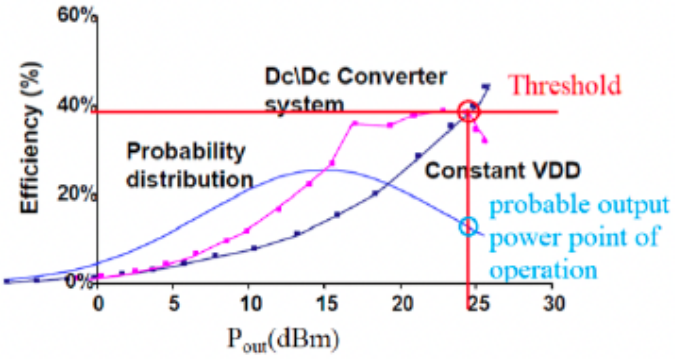


Fig.3: Measured efficiency of amplifier with constant VDD and with dc/dc converter , at different output power levels. Also shown is a representative distribution of output power for wireless application.

EX-1012, Fig. 3 (annotated by Petitioner).

On Reply, Petitioner alleged, for the first time, that "a POSITA would have understood Ranjan suggests optimizing system performance by using (controlling) the DC-DC converter system for maximum efficiency at the most likely point of operation, e.g., ***at the peak of the curve***." Reply, 28. Petitioner cannot change

theory at this stage of the proceeding. Nevertheless, Petitioner utterly failed to demonstrate how a POSITA would have modified Canyon such that Canyon's circuit would operate at "maximum efficiency at the most likely point of operation, e.g., at the peak of the curve," which is fatal to Petitioner's obviousness case. *Id.*

E. Ground 2B: Canyon in view of Ranjan and Hau

1. Hau does not disclose "deactivat[e/ing] the switching device and pass[ing] the input voltage to the output voltage node [based on a/comprises] compar[ison of/ing] the down-converted [input] voltage to a threshold voltage," as required by claims 6-8 and 12-14.

Petitioner's Reply arguments for this limitation fail for the same reasons discussed in Section II.A.4. *Supra* Section II.A.4.

2. Canyon in view of Ranjan and Hau does not render obvious "programming the threshold voltage based on a communication waveform efficiency, battery life associated with an electronic device coupled to the power supply, or a combination thereof," as required by claims 8 and 13

Petitioner's Reply arguments for this limitation do not substantively address the POR's arguments. Reply, 29-30; POR, 67-68. To the extent Petitioner's mapping for this claim can be understood, Petitioner appears to have changed theory on Reply—it no longer relies on spectral efficiency. Petitioner's new theory, submitted for the first time on Reply, should be rejected.

F. Ground 2C: Canyon in view of Ranjan and Lejon

Petitioner's Reply arguments for this limitation fail for the same reasons discussed in Section II.C. *Supra* Section II.C.

III. CONCLUSION

For the foregoing reasons, and those set forth in the POR, the Petition fails to demonstrate that Claims 1-20 of the '593 patent are unpatentable.

Dated: December 11, 2025

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that this Patent Owner's Response complies with the type-volume limitation of 37 C.F.R. § 42.24(b) because it contains 5,291 words, as determined by the word-processing program used to prepare the brief, excluding the parts of the brief exempted by 37 C.F.R. § 42.24(a)(1).

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that the foregoing PATENT OWNER'S SUR-REPLY and Exhibits were served electronically via email on December 11, 2025, on the following counsel of record for Petitioners:

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