

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICRON TECHNOLOGY, INC.,
Petitioner,

v.

SONRAI MEMORY LIMITED,
Patent Owner.

IPR2023-00909
Patent 6,724,241 B1

Before GREGG I. ANDERSON, GARTH D. BAER, and
JOHN D. HAMANN, *Administrative Patent Judges*.

BAER, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Micron Technology, Inc. (“Petitioner”) filed a Petition (Paper 2, “Pet.”), requesting an *inter partes* review of claims 1–25 of U.S. Patent No. 6,724,241 B1 (Ex. 1001, “the ’241 patent”). Sonrai Memory Limited (“Patent Owner”) filed a Preliminary Response to the Petition (Paper 6, “Prelim. Resp.”).

We have authority under 35 U.S.C. § 314 (2018) to determine whether to institute *inter partes* review. For the reasons discussed below, we institute *inter partes* review of the challenged claims.

II. BACKGROUND

A. RELATED MATTERS

The ’241 patent is at issue in *Sonrai Memory Ltd. v. Micron Technology Inc.*, 6:22-CV-00855-FB (W.D. Tex.), as well as in multiple other district court cases against different defendants. Pet. 90–92, Paper 3, 2. The ’241 patent was challenged in IPR2021-01561, which was terminated after institution due to settlement.

B. THE ’241 PATENT

The ’241 patent is directed to charge pumps, which are devices that generate voltages higher than the voltage of the available power source. Ex. 1001, 1:5–18. In particular, the ’241 patent teaches a technique for minimizing the voltage ripple. *Id.* at code (57). The ’241 patent’s Figure 7 is reproduced below.

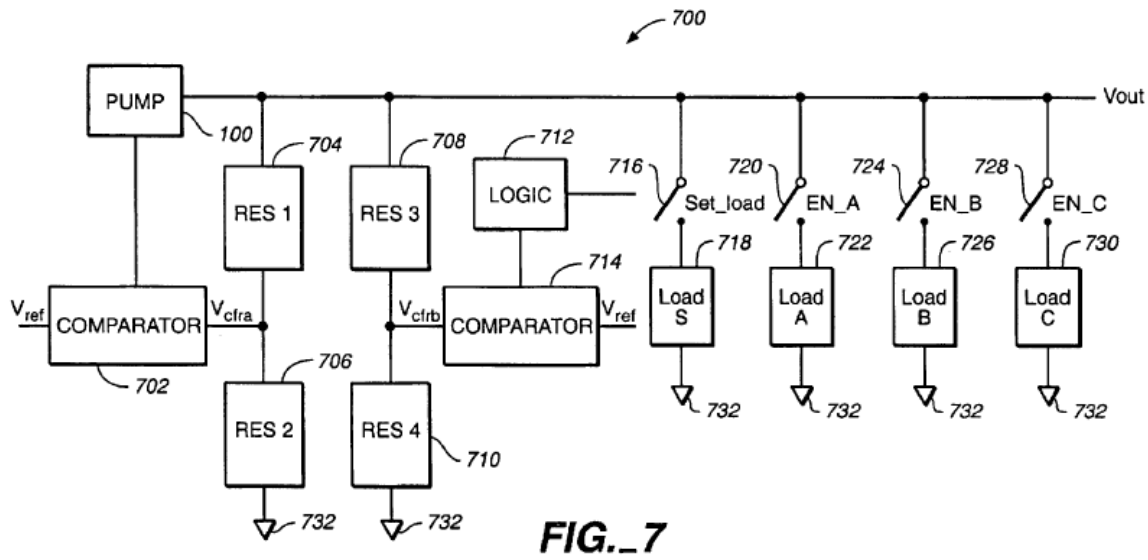


Figure 7 is a block diagram of a charge pump circuit. *Id.* at 3:34–35, 40–41.
According to the '241 patent,

[T]he first comparator 702 disables the pump 100 whenever the pump output voltage (V_{cfra}) sampled by means of the first resistive network is greater than the reference voltage (V_{ref}). Otherwise, the first comparator 702 leaves the pump circuit 100 to continue to operate. When the voltage V_{cfra} is greater than the reference voltage (V_{ref}) the charge pump circuit 700 performs the second test to further minimize the voltage ripple at the pump output (V_{out}). The second comparator 714 instructs the logic circuit 712 to add the load S 718 whenever the maximum acceptable ripple on target output sampled at node V_{clrb} is greater than the reference voltage (V_{ref}); otherwise, the second comparator 714 leaves the pump circuit 700 to operate without adding any load.

Id. at 6:4–17.

C. THE CHALLENGED CLAIMS

Of the challenged claims, claims 1, 13, and 24 are independent.

Claim 1 is representative and reproduced below:

1. A charge pump circuit for generating a charge pump voltage having minimal voltage ripples, comprising:

- a) a pumping circuit comprising one or more stages operable to receive a supply voltage and generate a selected one of a plurality of pump voltages;
- b) a plurality of loads selectively coupleable to an output of the pumping circuit, each load associated with a specific pump voltage; and
- c) a load selector means for selectively coupling a load associated with a specific pump voltage to the output of said pumping circuit.

Ex. 1001, 8:16–27.

D. ASSERTED GROUNDS OF UNPATENTABILITY

Petitioner asserts the following grounds of unpatentability. Pet. 2.

Claims Challenged	35 U.S.C. §	References/Basis
1–3, 24, 25	§ 103	Doluca ¹ , Buti ²
4–5, 11–15, 21–23	§ 103	Doluca, Buti, Hosono ³
1, 6–10	§ 103	Le ⁴ , Ujiie ⁵
2, 3, 11, 24, 25	§ 103	Le, Ujiie, Kuriyama ⁶
4, 5	§ 102	Le, Ujiie, Hosono
13–17, 19, 21–23	§ 103	Asano, Le, Ujiie, Kuriyama
18, 20	§ 103	Asano, Le, Ujiie, Kuriyama, Yang ⁷

¹ US 4,769,784, Sept. 6, 1988 (Ex. 1006, “Doluca”).

² US 5,872,733, Feb. 16, 1999 (Ex. 1005, “Buti”).

³ US 6,404,274 B1, June 11, 2002 (Ex. 1007, “Hosono”).

⁴ US 6,424,570 B1, July 23, 2002 (Ex. 1008, “Le”).

⁵ JP S61-24094, Pub. Feb. 1, 1986 (Ex. 1004, “Ujie”).

⁶ US 6,373,325 B1, Apr. 16, 2002 (Ex. 1011, “Kuriyama”).

⁷ US 6,091,613, July 18, 2000, (Ex. 1010, “Yang”).

Petitioner also relies on a declaration from Dr. James C. Dickens (Ex. 1003).

III. DISCUSSION

A. DISCRETIONARY DENIAL IN VIEW OF PARALLEL LITIGATION

Patent Owner argues that we should exercise our discretion under § 314(a) to deny institution in view of the related district court case. Prelim. Resp. 20–30. For the reasons explained below, we decline to exercise our discretion to deny institution based on the related district court case.

The Director’s Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation (June 21, 2022)⁸ (“Interim Procedure”) states that “the PTAB will not discretionarily deny institution in view of parallel district court litigation where a petitioner presents a stipulation not to pursue in a parallel proceeding the same grounds or any grounds that could have reasonably been raised before the PTAB.” Interim Procedure at 3 (citing *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020) (precedential as to § II.A)); *see id.* at 7, 9. As the Interim Procedure explains, such a stipulation (a *Sotera* stipulation) “mitigates concerns of potentially conflicting decisions and duplicative efforts between the district court and the PTAB.” *Id.* at 7.

Here, Petitioner provides a *Sotera* stipulation. Ex. 1022. Specifically, Petitioner stipulates that if we institute review, “Micron will not seek resolution in the district court of the same grounds as set forth in the petitions or any grounds that Micron could have reasonably raised in the

⁸ Available at https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf.

petition[.]” *Id.* (citing *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020)).

Patent Owner asserts we should deny the Petition despite Petitioner’s *Sotera* stipulation because Petitioner has not identified “which references cited in its invalidity contentions Petitioner will contend could not have been raised in the Petition and could therefore be asserted in the district court.” PO Prelim. Resp. 27–28. We disagree with Patent Owner because nothing in the Interim Procedure or *Sotera Wireless* requires Petitioner to identify what prior art from its district court invalidity contentions falls outside of its stipulation. *See Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12, 18–19; Interim Procedure at 7–8. In addition, Patent Owner notes that Petitioner’s stipulation “does not resolve the question of overlap” because it does not apply to a different defendant—Apple—in another district court case involving the ’241 patent. Prelim. Resp. 28. Absent aggravating circumstances, however, we decline to penalize Petitioner for Patent Owner’s litigation conduct against Apple. By offering its stipulation, Petitioner has done what it can to ensure “that there is minimal potential overlap of the two proceedings” between these two parties. *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12, 20.

Because Petitioner provides a *Sotera* stipulation, we decline to exercise our discretion under § 314(a) to deny institution in view of the related district court litigation. *See* Interim Procedure at 3, 7, 9.

B. DISCRETIONARY DENIAL IN VIEW OF MULTIPLE PETITIONS

Relying on framework from *General Plastic Industrial Co., Ltd. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19 (PTAB Sept. 6, 2017) (precedential as to Section II.B.4.i) (“*General Plastic*”), Patent Owner

asserts that we should exercise our discretion under § 314(a) to deny institution because previous petitioners also challenged the '241 patent in IPR2021-01561. Prelim Resp. 30–33. For the reasons that follow, we disagree.

In *General Plastic*, the Board discussed the “potential for abuse” due to multiple, staggered petitions “challenging the same patent and same claims.” *General Plastic* at 17. The Board said, “The absence of any restrictions on follow-on petitions would allow petitioners the opportunity to strategically stage their prior art and arguments in multiple petitions, using our decisions as a roadmap, until a ground is found that results in the grant of review.” *Id.*

In *General Plastic*, the Board identified the following nonexclusive factors to consider when deciding whether to exercise discretion under § 314(a) to deny institution based on a follow-on petition:

- 1) whether the same petitioner previously filed a petition directed to the same claims of the same patent;
- 2) whether at the time of filing of the first petition the petitioner knew of the prior art asserted in the second petition or should have known of it;
- 3) whether at the time of filing of the second petition the petitioner already received the patent owner’s preliminary response to the first petition or received the Board’s decision on whether to institute review in the first petition;
- 4) the length of time that elapsed between the time the petitioner learned of the prior art asserted in the second petition and the filing of the second petition;
- 5) whether the petitioner provides adequate explanation for the time elapsed between the filings of multiple petitions

directed to the same claims of the same patent;

6) the finite resources of the Board; and

7) the requirement under 35 U.S.C. § 316(a)(11) to issue a final determination not later than 1 year after the date on which the Director notices institution of review.

General Plastic, 16.

Here, *General Plastic* factors 1–5 weigh against denying institution. This is the first time this petitioner has challenged the ’421 patent. Pet. 85. The only connection Patent Owner alleges between this and the previous petitioners challenging the same patent is that Petitioner’s law firm also represented two of the eight parties involved in the previous IPR. Prelim. Resp. 31. That, however, is not the kind of relationship that might warrant denying a follow-on petition by a different petitioner. *See Valve Corp. v. Elec. Scripting Prods. Inc.*, IPR2019-00062, Paper 11 at 9–10 (Apr. 2, 2019) (precedential) (exercising discretion to deny institution based on a different petitioner’s earlier-filed petition where the different petitioners were co-defendants in a related district-court litigation, and where both petitioners were accused of infringing the challenged patent based on the same product incorporating technology licensed from petitioner Valve). Because this Petitioner has not previously filed a petition and Patent Owner does not assert extenuating circumstances that might justify discretionary denial, *see* Prelim. Resp. 31–32, factors 1–5 weigh against denying institution. *See Alcatel-Lucent USA Inc. v. Oyster Optics, LLC*, Case IPR2017-02146, Paper 12, 12 (Feb. 28, 2018) (“Once resolution of factor 1 indicates that Petitioner had not previously filed a petition against the same patent, factors 2–5 bear

little relevance unless there is evidence in the record of extenuating circumstances.”).

General Plastic factors 6 and 7 also weigh against denying institution. The previous IPR terminated after institution due to settlement. *See* Pet. 87. Because this Petition is now the only IPR before the Board challenging the ’421 patent, we agree with Petitioner that this case provides an efficient means for resolving patentability within one year after institution and does so without unnecessarily straining the Board’s limited resources. *See id.* at 87–88.

For these reasons, the circumstances in this case do not warrant denying the Petition under § 314(a).

C. CLAIM CONSTRUCTION

For an *inter partes* review petition filed after November 13, 2018, we construe claim terms “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” 37 C.F.R. § 42.100(b) (2022).

1. “load selector means”

Claim 1 recites “a load selector means for selectively coupling a load associated with a specific pump voltage to the output of said pumping circuit.” Claim 13 has a similar element requiring “a load selector means coupled to the output pump for selecting a load that satisfies a specific pump voltage.” Petitioner asserts these are means-plus-function limitations, subject to construction under § 112 ¶ 6. Pet. 7, 11. Petitioner asserts the claimed function matches the claim language, and that we should construe that function as “choosing a load based on the target pump voltage, such that the load is coupled to the output of the pumping circuit when the target

pump voltage is selected.” *Id.* at 7–8, 11. Petitioner identifies switches 320, 324, and 328, which may be transistors, and their control signals EN_A, EN_B, and EN_C as the ’241 patent’s disclosed structure corresponding to the claimed load-selector means. *Id.* at 8, 11. According to Petitioner, the corresponding structure may further include switches and controller for generating the control signals. *Id.* at 8–9, 11. For purposes of this decision, we agree with and adopt Petitioner’s construction.

2. “target output pump selector”

Claim 2 recites “a target output pump selector for shutting down the variable charge pump circuit when the target output pump voltage (V_{cfra}) is greater than or equal to a reference voltage (V_{ref}).” Claim 13 has a similar element requiring “a target output pump selector sampling the output of the pump circuit for shutting down the variable charge pump circuit whenever the sampled output voltage ($vcfra$) is greater than or equal to a reference voltage (V_{ref}).” Petitioner asserts these limitations are means-plus-function limitations, “as evidenced by claims 12 and 13 referring to these limitations as the ‘target output pump selector means.’” *Id.* at 10 (quoting Ex. 1001). According to Petitioner, the claimed function matches the claim language, and the disclosed structure for both functions is comparator 702. *Id.* at 10–11. For purposes of this decision, we agree with and adopt Petitioner’s construction.

3. “load”

Petitioner asserts two alternative constructions for the “load” recited in claims 1 and 13. *Id.* at 6–7. According to Petitioner, however, “[t]he claims are unpatentable under either construction.” *Id.* at 7. Because we “construe ‘only those terms . . . that are in controversy, and only to the

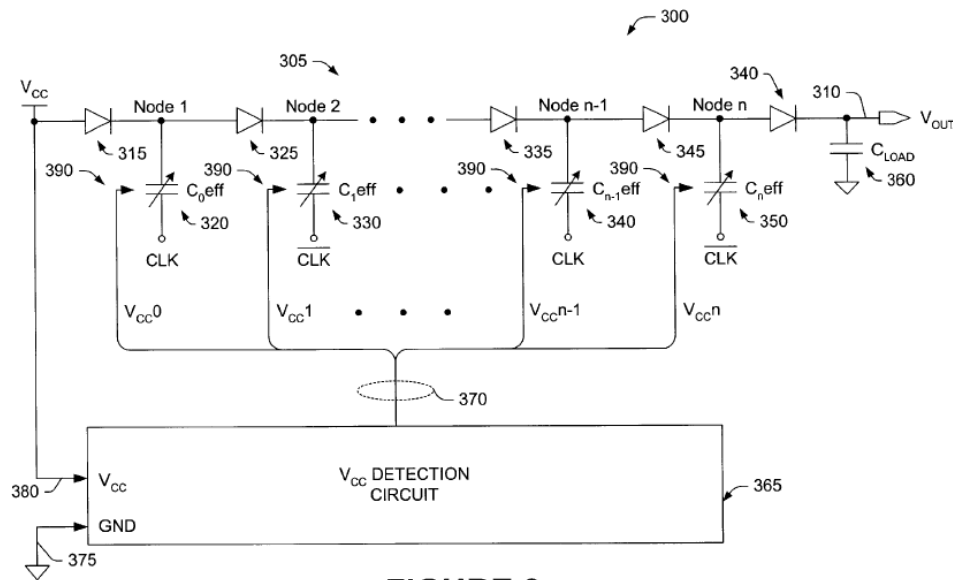


FIGURE 3

Figure 3 is a “schematic illustration of an exemplary charge pump circuit.” *Id.* at 5:50–51. Le teaches “a shunt regulator circuit which may operate in conjunction with such a charge pump circuit will consume less power and regulate the charge pump output with less ripple than with conventional charge pump circuits.” *Id.* at 6:21–25.

E. OBVIOUSNESS ANALYSIS

In its first two obviousness grounds, Petitioner challenges claims 1–5, 11–15, and 21–25 over Doluca in combination with other references. Pet. 11–48. In its additional obviousness grounds, Petitioner challenges claims 1–11 and 13–25 over Le in combination with other references. *Id.* at 48–83. For the reasons outlined below, we find Petitioner has shown a reasonable likelihood of succeeding in its asserted grounds.

1. Generating/Selecting Pump Voltages

a. Claim 1

Claim 1 recites “a pumping circuit . . . operable to . . . generate a selected one of a plurality of pump voltages.” Ex. 1001, 8:18–20. Petitioner

relies alternatively on Doluca and Le for teaching this feature. Specifically, in its Doluca grounds, Petitioner asserts that Doluca teaches generating a selected one of a plurality of pump voltages because “Dolucas discloses that charge pump 37 is operated to provide [pump output voltage] within a range depending on the value of K, which can be ‘chosen’ to be within a specified range.” Pet. 19 (citing Ex. 1006, 3:31–54). According to Petitioner, “by choosing the value of K and accordingly that of VCP, Doluca’s charge pump can ‘generate a selected one of a plurality of pump voltages.’” *Id.* at 19–20. For its grounds involving Le, Petitioner asserts that Le teaches generating a selected one of a plurality of pump voltages because “Le teaches that the charge pump voltage generated by its disclosed embodiment can be applied to program/erase operations of memory cells, and notes that such operations in semiconductor memory devices use different voltage levels, which are generated by the charge pump circuits.” *Id.* at 53 (citing Ex. 1:51–2:34).

Patent Owner argues that neither Doluca nor Le teaches generating a selected one of a plurality of pump voltages. Prelim. Resp. 14–16, 17–19. Addressing Doluca, Patent Owner contends that “*Dolucas*’ circuitry generates only a single output voltage” rather than a plurality of pump voltages, as claimed. Prelim. Resp. 14. Although Doluca’s output voltage depends on the variable K, according to Patent Owner, “K is a design criteria,” that, once selected, maintains “a constant having a value” that “cannot be modified in the charge pump circuitry.” *Id.* (quoting Ex. 1006, 3:42–43). Patent Owner makes a similar argument in contesting Petitioner’s Le-based challenges. Le is deficient, according to Patent Owner, because “*Le* does not disclose a charge pump to generate multiple output voltages.” Prelim. Resp. 19, *see id.* at 18 (arguing that “[n]owhere in *Le*’s disclosure of

the charge pump circuitry is a description or disclosure that the charge pump can generate multiple output voltages”).

We disagree with Patent Owner’s arguments. The claim term at issue requires a pumping circuit operable to generate “a selected one of a plurality of pump voltages.” Ex. 1001, 8:18–20. Although the output voltage must be selected, nothing in the term’s plain meaning precludes making the selection only once during design, or otherwise requires that the output voltage must be dynamically selectable, as Patent Owner suggests. *See* Prelim. Resp. 14, 17–18. On the current record, we agree with Petitioner that Doluca teaches generating a selected one of a plurality of pump voltages because it teaches the circuit’s output voltage varies based on a parameter that is “chosen.” Ex. 1006, 3:49–50.⁹ We further agree with Petitioner that Le teaches this feature because “Le teaches that the charge pump voltage generated by its disclosed embodiment can be applied to program/erase operations of memory cells, and notes that such operations in semiconductor memory devices use different voltage levels, which are generated by the charge pump circuits.” Ex. 1003 ¶ 146.

b. Claims 13 and 24

Patent Owner raises the same single-output-voltage argument to contest Petitioner’s Doluca-based and Le-based challenges to independent claims 13 and 24. *See* Prelim. Resp. 16–17, 19–20. We disagree with this argument because it is not commensurate with claim 13’s or claim 24’s scope. Claim 13 requires only “a pumping circuit . . . operable to . . .

⁹ Because we agree with Petitioner that Doluca teaches “a pumping circuit . . . operable to . . . generate a selected one of a plurality of pump voltages,” we need not address Petitioner’s assertion that Buti also teaches this feature. *See* Pet. 20.

generate one or more pump voltages,” while claim 24 requires only “selecting a[n] output pump voltage.” Ex. 1001, 10:26–28, 12:36. Thus, neither claim requires generating a plurality of pump voltages, as Patent Owner asserts. *See* Prelim. Resp. 16–17, 19–20. We agree with Petitioner that both Doluca and Le teach generating/selecting an output voltage, as claims 13 and 24 require. *See* Pet. 28, 46, 53, 67, 71.

2. Uncontested Limitations

Petitioner provides a detailed analysis demonstrating that the asserted prior art teaches the remaining elements of claims 1–25. *See* Pet. 11–83. Other than the arguments outlined above, Patent Owner does not additionally challenge Petitioner’s analysis at this stage. We have reviewed Petitioner’s arguments and the underlying evidence cited in support and are persuaded that, at this stage, Petitioner sufficiently demonstrates a reasonable likelihood of succeeding in its obviousness challenges to claims 1–25.

IV. CONCLUSION

For the foregoing reasons, we have determined that there is a reasonable likelihood that the Petitioner would prevail with respect to at least one of the claims challenged in the Petition. We therefore institute trial as to all challenged claims on all grounds stated in the Petition.

V. ORDER

Accordingly, it is:

ORDERED that *inter partes* review of claims 1–25 of the ’241 patent is instituted on all grounds in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial will commence on the entry date of this decision.

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