

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

ELM 3DS INNOVATIONS, LLC,
Patent Owner.

Case IPR2017-01305
Patent 8,791,581 B2

Before BARBARA A. BENOIT, FRANCES L. IPPOLITO, and
TERRENCE W. McMILLIN, *Administrative Patent Judges*.

BENOIT, *Administrative Patent Judge*.

DECISION

Denying Institution of *Inter Partes* Review
35 U.S.C. § 314(a) and 37 C.F.R. § 42.108

I. INTRODUCTION

This is a preliminary proceeding to decide whether *inter partes* review of U.S. Patent No. 8,791,581 B2 (Ex. 1001, “the ’581 patent” or “the challenged patent”) should be instituted under 35 U.S.C. § 314(a), which provides that *inter partes* review may not be instituted “unless . . . the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” Samsung Electronics Co., Ltd. (“Petitioner” or “Samsung”) filed a Petition (Paper 2, “Pet.” or “1305 Pet.”) seeking *inter partes* review of claims 1, 5, 12, 36, 54, 78, 113, 116, 133, and 136 of the ’581 patent. Patent Owner, Elm 3DS Innovations, LLC, filed a Preliminary Response to the Petition (Paper 8, “Prelim. Resp.”). After receiving authorization (Paper 9), Petitioner filed a Reply (Paper 10, “Reply”) to Patent Owner’s Preliminary Response.

After Petitioner filed the Petition, Patent Owner filed a statutory disclaimer of claims 1, 5, 113, and 133 of the challenged patent under 35 U.S.C. § 253(a). Prelim. Resp. 1; Ex. 2002. “The patent owner may file a statutory disclaimer under 35 U.S.C. § 253(a) in compliance with § 1.321(a) of this chapter, disclaiming one or more claims in the patent. No *inter partes* review will be instituted based on disclaimed claims.” 37 C.F.R. § 42.107(e). Accordingly, we do not institute *inter partes* review of disclaimed claims 1, 5, 113, and 133.

After considering Samsung’s Petition, Patent Owner’s Preliminary Response, Petitioner’s Reply to Patent Owner’s Preliminary Response, and

exhibits discussed therein, we exercise our discretion under 35 U.S.C. § 314(a) not to institute *inter partes* review of claims 12, 36, 54, 78, 116, and 136 of the '581 patent for the reasons explained below.

A. Related Proceedings

As required by 37 C.F.R. § 42.8(b)(2), each party identifies various judicial or administrative matters that would affect or be affected by a decision in this proceeding. Pet. 1–2; Paper 5 (Patent Owner’s Mandatory Notices). Petitioner and Patent Owner indicate that the challenged patent is involved in the following United States District Court proceedings brought by *Elm 3DS Innovations, LLC*: No. 1:14-cv-01430 (D. Del.), No. 1:14-cv-01431 (D. Del.) and No. 1:14-cv-01432 (D. Del.). Pet. 1; Paper 5, 2.

Both parties also identify two petitions for *inter partes* reviews challenging the same claims of the '581 patent challenged here: *Micron Technology, Inc., et al. v. Elm 3DS Innovations, LLC*, Case IPR2016-00703 (“the 703 proceeding”) and *Micron Technology, Inc., et al. v. Elm 3DS Innovations*, Case IPR2016-00706 (“the 706 proceeding”). Pet. 2; Paper 5, 2. Those petitions were filed by other petitioners— Micron Technology, Inc. (“Micron”) and SK Hynix Inc. (“Hynix”). See IPR2016-00703, Paper 3 (Petition); IPR2016-00706, Paper 3 (Petition). *Inter partes* reviews, however, were not instituted based on those petitions. Pet. 2.

Both parties also identify fourteen other *inter partes* reviews that challenge patents related to the patent challenged here: IPR2016-00386 (U.S. Patent No. 8,653,672); IPR2016-00387 (U.S. Patent No. 8,841,778); IPR2016-00388 and IPR2016-00393 (U.S. Patent No. 7,193,239); IPR2016-

IPR2017-01305
Patent 8,791,581 B2

00389 (U.S. Patent No. 8,035,233); IPR2016-00390 (U.S. Patent No. 8,629,542); IPR2016-00391 (U.S. Patent No. 8,796,862); IPR2016-00394 (U.S. Patent No. 8,410,617); IPR2016-00395 (US Patent No. 7,504,732); IPR2016-00687 (U.S. Patent No. 8,928,119); IPR2016-00691 (U.S. Patent No. 7,474,004); IPR2016-00708 and IPR2016-00770 (U.S. Patent No. 8,907,499); and IPR2016-00786 (U.S. Patent No. 8,933,570). Pet. 1–2, Paper 5, 1–3.

After a consolidated oral hearing was conducted on April 6, 2017, final written decisions were issued in each of the fourteen *inter partes* reviews and have been appealed to the United States Court of Appeals for the Federal Circuit. *See, e.g.*, IPR2016-00386, Paper 68 (Final Written Decision), Paper 69 (Petitioner’s Notice of Appeal). Notably, Samsung was one of the petitioners in each of those fourteen *inter partes* reviews. *See, e.g.*, IPR2016-00386, Paper 4 (identifying Samsung, Micron, and Hynix); Reply 4 (acknowledging Samsung was one of the petitioners in other proceedings); Prelim. Resp. 8 (indicating Samsung was a petitioner).

B. The Challenged Patent

The challenged patent relates generally to a three-dimensional structure (3DS) for integrated circuits that allows for physical separation of memory circuits and control logic circuits on different layers. Ex. 1001, Abstract. Figure 1a is reproduced below.

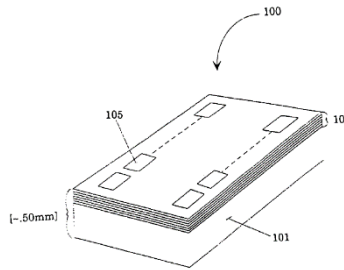


Figure 1a

Figure 1a shows three-dimensional memory device 100 having a stack of integrated circuit layers with a “fine-grain inter-layer vertical interconnect” between all circuit layers. *Id.* at 3:65–4:4. Layers shown include controller circuit layer 101 and memory array circuit layers 103. *Id.* at 4:19–21. The challenged patent discloses that “each memory array circuit layer is a thinned and substantially flexible circuit with net low stress, less than 50 μm and typically less than 10 μm in thickness.” *Id.* at 4:24–27. The challenged patent further discloses that the “thinned (substantially flexible) substrate circuit layers are preferably made with dielectrics in low stress (less than 5×10^8 dynes/cm²) such as low stress silicon dioxide and silicon nitride dielectrics as opposed to the more commonly used higher stress dielectrics of silicon oxide and silicon nitride used in conventional memory circuit fabrication.” *Id.* at 8:47–52.

C. Illustrative Claims

Of the challenged claims that were not disclaimed, only claim 12 is independent. Claims 12 and 78 are illustrative of the claimed subject matter:

12. A stacked memory integrated circuit comprising:
a first integrated circuit controller layer;
at least one *low stress dielectric layer* formed over the first integrated circuit controller layer and *having a tensile stress of less than 5×10^8 dynes/cm²*; and
a plurality of memory layers overlaying the first integrated circuit controller layer;
wherein: the first integrated circuit controller layer and the plurality of memory layers of the stacked memory integrated circuit are partitioned into a plurality of vertically interconnected circuit block stacks; and,
at least one vertical interconnection passes through at least one of the memory layers, a majority of the at least one vertical interconnection being insulated by *a dielectric material having a tensile stress of less than 5×10^8 dynes/cm²*.

78. The stacked memory integrated circuit of claim 12, further comprising at least one additional memory layer, the at least one additional memory layer comprising *a thinned, substantially flexible monocrystalline semiconductor substrate*,

wherein said semiconductor substrate comprising a plurality of etched through-holes each surrounding a vertical interconnect, each vertical interconnect comprising a conductor and an insulator comprising *low-stress silicon-based dielectric material having a tensile stress of less than 5×10^8 dynes/cm²* surrounding the conductor and isolating the conductor from the *thinned, substantially flexible monocrystalline semiconductor substrate*;

wherein at least one of the plurality of block stacks comprises a plurality of the vertical interconnects.

Ex. 1001, 15:18–32 (claim 12) (paragraphing and italics added), 25:26–39 (claim 78) (paragraphing and italics added).

D. The Asserted Grounds of Unpatentability

Petitioner contends that challenged claims are unpatentable under 35 U.S.C. § 103 based on the following specific grounds (Pet. 13–66):

References	Claims Challenged
Hsu ¹ and Cohen ²	1 and 5 (now disclaimed)
Hsu, Cohen, and Leedy '695 ³	12, 36, 54, and 78
Hsu, Cohen, and Bertin '333 ⁴	113 and 133 (now disclaimed)
Hsu, Cohen, Leedy '695, and Bertin '333	116 and 136

II. DISCUSSION

As a threshold matter, we consider whether we should exercise the Board's discretion and deny institution of an *inter partes* review under 35 U.S.C. § 314(a) in the particular circumstances of this proceeding. *See Harmonic Inc. v. Avid Tech, Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (“the PTO is permitted, but never compelled, to institute an IPR proceeding”); *see also* 37 C.F.R. § 42.108(a) (“When instituting inter partes review, the Board may authorize the review to proceed on all or some of the challenged claims and on all or some of the grounds of unpatentability asserted for each claim.”).

¹ U.S. Patent No. 5,627,106, issued May 6, 1997 (Ex. 1008, “Hsu”).

² U.S. Patent No. 4,701,843, issued Oct. 20, 1987 (Ex. 1092, “Cohen”).

³ U.S. Patent No. 5,354,695, issued Oct. 11, 1994 (Ex. 1006, “Leedy '695”).

⁴ U.S. Patent No. 5,502,333, issued Mar. 26, 1996 (Ex. 1010, “Bertin '333”).

A. Petitions Challenging the '581 Patent

The instant Petition is the third petition that has been filed challenging claims 1, 5, 12, 36, 54, 78, 113, 116, 133, and 136 of the '581 patent. *See* IPR2016-00703, Paper 3; IPR2016-00706, Paper 3. On April 20, 2017, Samsung filed the instant Petition, more than a year after Micron and Hynix filed the prior two petitions (March 3, 2016). On September 6, 2016, we denied institution of those prior petitions because the information presented did not show there was a reasonable likelihood that the petitioners would prevail in establishing the unpatentability of at least one of the challenged claims. IPR2016-00703, Paper 12; IPR2016-00706, Paper 12.

Petitioner is correct that the grounds presented in this proceeding are different from the grounds presented in the earlier petitions because Cohen is asserted here. Pet. 2. Patent Owner, however, also is correct that both the 703 proceeding and this proceeding assert three of the same prior art references: Hsu, Leedy '695, and Bertin '333. Prelim. Resp. 1. As shown in the table below, the grounds asserted in the 703 proceeding and this proceeding apply Hsu, Leedy '695, and Bertin '333 against similar claims, with Cohen being substituted for Sakuta.

Case	Claims Challenged	References
IPR2016-00703	12, 36, 54, 78, and 116	Hsu, Sakuta , ⁵ and Leedy '695
IPR2016-00703	136	Hsu, Sakuta , Leedy '695, and Bertin '333
IPR2017-01305	12, 36, 54, and 78	Hsu, Cohen , and Leedy '695
IPR2017-01305	116 and 136	Hsu, Cohen , Leedy '695, and Bertin '333

Both the Petition in the 703 proceeding and the instant Petition rely on Hsu for many of the claim limitations. IPR2017-01305 (“1305”) Pet. 21 (“Hsu explicitly discloses all but a few of the features recited in the challenged claims.”); IPR2017-00703 (“703”) Pet. 21 (“Hsu expressly discloses all but a few of the features recited in the [challenged] claims.”). Similarly, the Petition in the 703 proceeding and the instant Petition rely on Leedy '695 for the particular low tensile stress dielectric required by the claims— a dielectric material having a tensile stress of less than 5×10^8 dynes/cm², as recited for example by independent claim 12. *Compare* 1305 Pet. 17 (Leedy '695's “dielectric may be ‘silicon dioxide’ or ‘silicon nitride’ deposited with a stress of ‘less than 8×10^8 dynes/cm² (preferably 1×10^7 dynes/cm²) in tension.’ [Ex. 1006] at 11:33–37; *see also id.*, 1:53–58, 2:40–45, 3:9–11, 7:1–9:63, 9:28–31, 11:25–65, 47:46–51, 48:45–50.”), *with* 703 Pet. 13–14 (Leedy '695's “dielectric may be ‘silicon dioxide’ or ‘silicon nitride’ deposited with a stress of ‘less than 8×10^8 dynes/cm² (preferably $1 \times$

⁵ U.S. Patent No. 5,208,782, issued May 4, 1993 (703 Ex. 1067, “Sakuta”).

10^7 dynes/cm²) in tension.’ [Ex. 1006] at 11:33–37; *see also id.*, 1:53–58, 2:40–45, 3:9–11, 7:1–9:63, 9:28–31, 11:25–65, 47:46–51, 48:45–50.”).

Furthermore, both the Petition in the 703 proceeding and the instant Petition rely on Bertin ’333 for a three-dimensional integrated circuit with specific types of control functions arranged on a logic chip. 1305 Pet. 20 (“*Bertin* ’333 discloses a 3D IC in which control functions are arranged on a logic chip, wherein the control functions include ECC, array built-in self-testing, and other memory logic/control functions.”); 703 Pet. 20 (“*Bertin* ’333 discloses that in a 3D IC in which control functions are arranged on a single logic chip, some of the functions that can be included on the single logic chip include error correction code, array built-in self-testing, and other memory logic/control functions based on the given application.”).

Accordingly, we conclude that Petitioner Samsung here uses Hsu, Leedy ’695, and Bertin ’333 in substantially similar ways to the ways the prior art was used in the prior proceeding. In addition, both Petitioner Samsung here and Petitioners Micron and Hynix in the 703 and 706 proceedings rely on declarations by Paul D. Franzon, Ph.D. concerning the challenged claims in the ’581 patent. *See* Ex. 1002; IPR2016-00703, Ex. 1002; IPR2016-00706, Ex. 1002.

In the instant Petition, however, Petitioner Samsung relies on the combination of Hsu and Cohen (rather than the combination of Hsu and Sakuta) as disclosing “the first integrated circuit controller layer and the plurality of memory layers of the stacked memory integrated circuit are

partitioned into a plurality of vertically interconnected circuit block stacks.”
Pet. 50.

In addition, Petitioner Samsung here advances the same claim construction for “substantially flexible monocrystalline semiconductor substrate” (recited in claims 36, 54, 78, 116, and 136) as advanced by Micron and Hynix in the prior petitions. 1305 Pet. 8 (indicating “substantially flexible monocrystalline semiconductor substrate” should be construed as “a monocrystalline semiconductor substrate that has been thinned to a thickness of less than 50 μm and subsequently polished or smoothed”); 703 Pet. 8 (“substantially flexible semiconductor substrate”⁶ as “a semiconductor substrate that has been thinned to a thickness of less than 50 μm and subsequently polished or smoothed”); 706 Pet. 7–8 (““substantially flexible semiconductor substrate” as “a semiconductor substrate that has been thinned to a thickness of less than 50 μm and subsequently polished or smoothed”).

Although Petitioner contends correctly that arguments regarding Cohen are arguments not previously considered by the Board (Reply 3), Petitioner does not otherwise address the similarity of the grounds asserted in the 703 proceeding and this proceeding.

The similarity between the Petition in the 703 proceeding and the instant Petition—similar uses of Hsu, Leedy ’695, and Bertin ’333, using Cohen in a similar way as Sakuta, using the same declarant (Dr. Franzone), and proposing the same claim constructions for “substantially flexible”—is

⁶ In both IPR2016-00703 and IPR2016-00706, Petitioner omitted the modifier “monocrystalline.”

remarkable. The similarity supports a conclusion that the subsequently filed instant Petition benefitted from the information available in the 703 proceeding at the time the instant Petition was filed.

Moreover, the substitution of Cohen for Sakuta further supports a conclusion that the subsequently filed Petition in this proceeding benefitted from the decision denying institution in the 703 and 706 proceedings that found fault with the Petitions in those cases. As explained in our decision denying institution in the 703 proceeding, we were “not persuaded that Sakuta would have conveyed to one of ordinary skill in the art a partitioned control circuit, much less that the combination of Sakuta and Hsu would have conveyed to one of ordinary skill in the art a partitioned control layer,” as required by the challenged claims. 703 Paper 12, 19. We found a similar shortcoming in the petition filed in the 706 proceeding. 706 Paper 12, 16 (“Thus, we are not persuaded that Petitioner has shown sufficiently that Petitioner’s proposed combination of Bertin ’945 and Sakuta would have conveyed to one of ordinary skill in the art the required partitioned circuit control layer of a stacked memory integrated circuit.”).

B. Inter Partes Reviews of Related Patents

Samsung filed the Petition in the instant proceeding on April 20, 2017, which was about two weeks after the consolidated oral hearing held on April 6, 2017 for the fourteen *inter partes* reviews of related patents. Notably, Samsung (along with Micron and Hynix) was a petitioner in each of those cases. Each of the patents in these reviews shares a common core of written description but have different claims (continuations and divisional

applications of a common parent). Although there are differences among these related *inter partes* reviews (different claims and different combinations of prior art references, different reasons to combine, and different arguments regarding reasonable expectation of success), there is a significant overlap of evidentiary records among the reviews. *See, e.g.*, IPR2016-00708, Paper 48 (Final Written Decision), 3; IPR2016-00687, Paper 42 (Final Written Decision), 3.

1. Claim Construction Issue

A central issue to thirteen of the reviews⁷ was the claim construction of “substantially flexible semiconductor [] substrate” that the Petitioners (including Samsung) proposed as “a semiconductor substrate that has been thinned to a thickness of less than 50 μm and subsequently polished or smoothed.” *See, e.g.*, IPR2016-00386, Paper 68, 23–39 (Final Written Decision discussing the claim construction of “substantially flexible” and “substantially flexible semiconductor substrate”). In all thirteen final decisions, the panel determined that Petitioner had failed to demonstrate by a preponderance of the evidence that the prior art combinations on which the claim challenges were made provided a substantially flexible substrate. *Id.*

⁷ The term “substantially flexible” is at issue in thirteen of the Elm 3DS *inter partes* reviews: IPR2016-00386 (’672 patent), IPR2016-00387 (’778 patent), IPR2016-00388 (’239 patent), IPR2016-00390 (’542 patent), IPR2016-00391 (’862 patent), IPR2016-00393 (’239 patent), IPR2016-00394 (’617 patent), IPR2016-00395 (’732 patent), IPR2016-00687 (’119 patent), IPR2016-00691 (’004 patent), IPR2016-00708 (’499 patent), IPR2016-00770 (’499 patent), and IPR2016-00786 (’570 patent).

Moreover, Final Written Decisions in IPR2016-00687, IPR2016-00708, IPR2016-00770, and IPR2016-00786 addressed the claim construction of “substantially flexible *monocrystalline* semiconductor substrate.” *See, e.g.*, IPR2016-00687, Paper 42, 8–11; IPR2016-00708, Paper 48, 12–14.

Here, claims 36, 54, 78, 116, and 136 recite a “substantially flexible monocrystalline semiconductor substrate” and, as noted previously, Petitioner Samsung here advocates the same claim construction as in the prior cases. In addition, as Patent Owner notes, Samsung’s arguments in the instant Petition that the prior art allegedly teaches the “substantially flexible” substrate of challenged claims 36, 54, 78, 116, and 136 rely on Samsung’s proposed claim construction “thinned to a thickness of 50 μm and subsequently polished or smoothed.” Prelim. Resp. 6 (citing Pet. 7–13). Also as Patent Owner notes, final written decisions in the other proceedings reviewed and rejected Petitioner’s proposed claim construction. *Id.* (citing IPR2016–00387, Paper 63, 23–27, 87–89; IPR2016-00708, Paper 48, 37).

2. *Low Tensile Stress Dielectric Substitution*

Another central issue in the other *inter partes* reviews was whether one of ordinary skill in the art would have had reason to combine a prior art reference with the low tensile stress dielectric in Leedy ’695 in the manner proposed by Petitioner to arrive at the claimed invention—having a low-stress silicon-based dielectric material having a stress of 5×10^8 dynes/cm² tensile or less. Of particular note, prior *inter partes* reviews considered Samsung’s contention that one of ordinary skill in the art would have substituted Leedy ’695’s low tensile stress dielectric for a dielectric disclosed

in Hsu. *See* IPR2016-00387, Paper 68, 97–102; IPR2016-00687, Paper 42, 30–56; IPR2016-00708, Paper 48, 34–36; IPR2016-00786, Paper 37, 25–33; *see also* Prelim. Resp. 7–9 (discussing the Board’s prior consideration of this issue).

3. Summary

Petitioner correctly notes that “although the Board found that Samsung (and others) did not establish that certain claims in related patents are unpatentable in other proceedings, those other proceedings are subject to appeal.” Reply 4. We further agree with Petitioner that the record in this proceeding is different than the records for the other proceedings. *Id.* We note, however, that Petitioner has made the deposition transcript of Patent Owner’s expert from the other *inter partes* reviews of record in this proceeding. Ex. 1082 (Transcript of Deposition of Alexander D. Glew, Ph.D. on January 20, 2017); *see id.* at 6:1–14 (indicating the parties (including Samsung) had agreed that the deposition transcript for Petitioner’s expert and Patent Owner’s expert would be usable in all IPRs); *id.* at 3:19–22 (identifying Samsung’s counsel as being present).

Furthermore, we note that at the time of filing the instant Petition, Samsung had available information from (i) the prior petitions in IPR2016-00703 and IPR2016-00706, (ii) Patent Owner’s Preliminary Responses in IPR2016-00703 and IPR2016-00706, (iii) our decisions denying institution in IPR2016-00703 and IPR2016-00706 that explained, among other things, the shortcomings of those petitions relative to Sakuta, (iv) the Patent Owner’s Responses in the fourteen related *inter partes* reviews that have significant

overlap in claim construction issues and motivation to combine, among other issues, and (v) deposition testimony of Petitioner's declarant Dr. Franzon and Patent Owner's declarant. Furthermore, Petitioner Samsung had the opportunity to develop and present its arguments in the fourteen *inter partes* reviews.

Finally, we recognize that, should we institute an *inter partes* review in the instant proceeding, Petitioner also would have available to it our final written decisions in those fourteen *inter partes* reviews. Notably, the Hsu and Leedy '695 combination is in five of the cases: IPR2016-00387, IPR2016-00687, IPR2016-00708, IPR2016-00770, and IPR2016-00786.

C. Evaluating the Equities

On September 6, 2017, the Board issued a decision explaining that applying the factors set forth in *NVIDIA Corp. v. Samsung Electronics Co., Ltd.*, Case IPR2016-00134 (PTAB May 4, 2016) (Paper 9) to deny institution is a proper exercise of the Board's discretion under 35 U.S.C. § 314(a). *Gen. Plastic Indus. Co., Ltd. v. Canon Kabushiki Kaisha*, Case IPR2016-01357, (PTAB September 6, 2017) (Paper 19) (informative⁸) (hereinafter "*General Plastic*"). In its Petition filed on April 20, 2017, Petitioner does not address expressly the *General Plastic* factors or explain Petitioner's role in any of the fourteen other *inter partes* reviews. Pet. 1–2 (identifying as "Related Matters" fourteen *inter partes* reviews without acknowledging its own role as a petitioner in them). Petitioner has been afforded the opportunity to address

⁸ *General Plastic* was designated informative on September 18, 2017.

the *General Plastic* factors and arguments in Patent Owner's Preliminary Response regarding the other proceedings. *See generally* Paper 9 (Order authorizing Petitioner's Reply); Reply.

As the panel in *General Plastic* explains, the factors are “a non-exhaustive list of factors [that] informs practitioners and the public of the Board's considerations in evaluating follow-on petitions.” *General Plastic*, slip op. at 16. The factors are

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, slip op. at 9–10, 16 (citations omitted).

A central issue addressed by the *General Plastic* factors is balancing the equities between a petitioner and a patent owner when information is

available from prior Board proceedings for a subsequent proceeding.

General Plastic, slip op. at 15–19. Accordingly, we use the non-exhaustive *General Plastic* factors as a framework for balancing the equities between the parties here.

1. First Factor: Same Petitioner

The first *General Plastic* factor is “whether the same petitioner previously filed a petition directed to the same claims of the same patent.” *General Plastic*, slip op. at 9, 16. Petitioner Samsung correctly notes that “Samsung was not a petitioner (or a real party-in-interest) in the two IPR proceedings challenging the ’581 patent.” Reply 3 (identifying IPR2016-00703 and IPR2016-00706).

Yet, as discussed above, the instant Petition presents many issues and arguments, including the dispositive issues of claim construction of “substantially flexible” and whether one of ordinary skill in the art would have had reason to substitute a low tensile stress dielectric, that also are present in fourteen other *inter partes* reviews for which Samsung is a petitioner. Petitioner Samsung agreed with Patent Owner in those prior proceedings to have consolidated depositions and a consolidated oral hearing due to the similarity of the issues and evidence. *See* Ex. 1082 (Transcript of Deposition of Alexander D. Glew, Ph.D. on January 20, 2017); *see id.* at 6:1–14 (indicating the parties (including Samsung) had agreed that the deposition transcript for Petitioner’s expert and Patent Owner’s expert would be usable in all IPRs); *id.* at 3:19–22 (identifying Samsung’s counsel as being present); IPR2016-00386, Paper 67 (Transcript of consolidated hearing), 4:2–10.

Moreover, the high degree of similarity of Samsung's instant Petition with the prior petitions by Petitioners Micron and Hynix in the 703 and 706 proceedings, as discussed above, reduces the weight we accord this factor. Petitioner's use of the same expert (Dr. Franzon) in this Petition as used to support the reasoning in prior petitions further reduces the weight we accord this factor.

For these reasons, we do not agree with Petitioner's view that this first factor "strongly counsels against the Board exercising its discretion to deny institution." Reply 3. Rather, in the particular circumstances of this case, we conclude this factor weighs minimally against exercising our discretion.

2. Second Factor: Knowledge of Prior Art

The second *General Plastic* factor is "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." *General Plastic*, slip op. at 9, 16. Petitioner did not address this factor directly in its Petition or Reply. Rather, Petitioner Samsung further contends that, "because Samsung was not a petitioner in the previously filed IPR proceedings involving the '581 patent, the remaining *General Plastic* factors are not relevant and should not be considered." Reply 3. As noted previously, we consider the *General Plastic* factors to be a helpful framework in the circumstances of this case.

Without question, Petitioner Samsung knew about three of the four prior art references asserted in this proceeding—Hsu, Leedy '695, and Bertin '333—because Petitioner asserted these references in some of the other fourteen *inter partes* reviews. *See, e.g.*, IPR2016-00387, 687, 708, 770,

786 (final written decisions addressing the Hsu and Leedy '695 combination). Because Petitioner Samsung was not a petitioner in the prior cases challenging the '581 patent, however, we conclude that whether Samsung knew about the asserted references at the time the prior petitions were filed has little, if any, probative value here.

We conclude that this factor neither weighs significantly for or against exercising our discretion.

3. Third Factor: Availability of Information from Prior Proceedings

The third *General Plastic* factor considers “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.” *General Plastic*, slip op. at 9, 16. This *General Plastic* factor weighs strongly in favor of exercising our discretion. At the time the instant Petition was filed (April 20, 2017), the Patent Owner’s Preliminary Response and our decisions denying institution in the 703 and 706 proceedings had been filed. Moreover, the decisions denying institution were entered on September 6, 2016, over seven months before Samsung filed the instant Petition. As noted above, the substitution of Cohen in the instant Petition for Sakuta asserted in the prior 703 and 706 proceedings and otherwise asserting substantially the same prior art in a substantially similar manner evinces benefit Petitioner Samsung derived from those prior proceedings.

In the circumstances of this case, we also look to additional considerations regarding what information was available to Petitioner. *See*,

e.g., *General Plastic*, slip op. at 16 (noting the seven factors are “a non-exhaustive list of factors”). At the time of filing the instant Petition, Samsung also had the Patent Owner’s Response and Patent Owner’s expert testimony in the other related proceedings. Not only did the Petitioner have such information, but Petitioner used such information in its Petition. For example, Petitioner relies on Patent Owner’s expert testimony in the prior proceedings as support for its reason to substitute the low tensile stress dielectric in the instant Petition. Pet. 26 (citing Ex. 1082 (154:8-13)). Petitioner entered that testimony as Exhibit 1082 in the instant proceeding. Notably, counsel for Samsung was present at the deposition of Patent Owner’s expert. *See* Ex. 1082, 3:19–22 (identifying Samsung’s counsel as being present). In other examples, Petitioner in the instant Petition addresses Patent Owner’s arguments in Patent Owner’s Response in “related IPR Proceedings.” *See* Pet. 29–30 (citing IPR2016-00387 Paper 50, 46–49); Pet. 31 (citing IPR2016-00387 Paper 50, 38).

The availability of the Patent Owner’s Response and Patent Owner’s expert testimony from other proceedings also weighs strongly in favor of exercising our discretion, as does Petitioner’s use of such information in its Petition.

Furthermore, if we were to institute a review here, Petitioner would be able to use the final written decisions from fourteen *inter partes* reviews, which address many of the same issues, to improve its position. This also strongly weighs in favor of exercising our discretion.

4. Fourth Factor: Prior Art Asserted in Instant Petition

The fourth *General Plastic* factor is “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.” *General Plastic*, slip op. at 9, 16.

Without question, Petitioner Samsung knew about three of the four prior art references asserted in this proceeding—Hsu, Leedy ’695, and Bertin ’333—months before the instant Petition was filed because Petitioner asserted these references in some of the other fourteen *inter partes* reviews. *See, e.g.*, IPR2016-00387, IPR2016-00687, IPR2016-00708, IPR2016-00770, IPR2016-00786 (final written decisions addressing the Hsu and Leedy ’695 combination).

Because Petitioner Samsung was not a petitioner in the prior cases challenging the ’581 patent, however, this factor has little, if any, probative value here. We conclude that this factor neither weighs significantly for or against exercising our discretion.

5. Fifth Factor: Petitioner’s Explanation

The fifth *General Plastic* factor is “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.” *General Plastic*, slip op. at 9, 16. Here, Petitioner provides an important and reasonable explanation for waiting until April 2017 to file the instant Petition—Samsung

was not accused of infringing the '581 patent until April 2017, long after Micron and Hynix had filed the earlier petitions in March 2016. Reply 2 n.1.

This factor weighs against exercising our discretion.

6. Sixth and Seventh Factors: Board Considerations

The sixth and seventh *General Plastic* factors consider “the finite resources of the Board” and “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*, slip op. at 9–10, 16.

We conclude that these factors do not weigh significantly for or against exercising our discretion.

7. Conclusion

We do not take lightly denying a petition on grounds unrelated to its substantive patentability challenges. Rather, in determining whether to exercise our discretion to deny institution under 35 U.S.C. § 314(a), we seek to balance the equities between the parties.

After weighing the respective factors here, and in the particular circumstances of this proceeding, we exercise our discretion under § 314(a) and decline to institute *inter partes* review.

III. CONCLUSION

After due consideration of the record before us and for the foregoing reasons, we conclude that the circumstances of this case justify exercising our discretion under 35 U.S.C. § 314(a) and 37 C.F.R. § 42.108(a) to deny institution of an *inter partes* review.

IV. ORDER

It is hereby:

ORDERED that the Petition is denied as to all challenged claims of the '581 patent and no trial is instituted.

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