

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

BESANG, INC.,

Plaintiff

v.

MICRON TECHNOLOGY, INC.,
MICRON SEMICONDUCTOR
PRODUCTS, INC., and
MICRON TECHNOLOGY TEXAS, LLC,

Defendants.

Case No. 2:23-cv-00028

Jury Trial Demanded

**DEFENDANTS' PATENT LOCAL RULE 3-3 DISCLOSURE
OF INVALIDITY CONTENTIONS**

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I. Introduction

Defendants Micron Technology, Inc., Micron Semiconductor Products, Inc., and Micron Technology Texas, LLC (collectively, “Defendants” or “Micron”) make the following Patent Local Rule 3-3 Disclosure of Invalidity Contentions to Plaintiff BeSang, Inc. (“Plaintiff” or “BeSang”).

In Plaintiff’s Preliminary Infringement Contentions (“Infringement Contentions”), served on May 16, 2023, Plaintiff asserted Claims 13–16 of U.S. Patent No. 7,378,702 (“the ’702 Patent” or “Asserted Patent”) against Defendants. Defendants’ Invalidity Contentions address only those claims asserted in Plaintiff’s Infringement Contentions. Defendants provide these Invalidity Contentions without waiving any argument about the sufficiency or substance of Plaintiff’s Infringement Contentions.

Based on its investigation to date, Defendants hereby: (a) identify each item of prior art that anticipates each asserted claim or renders it obvious; (b) specify whether each such item of prior art anticipates each asserted claim and/or renders it obvious and, if a combination of items of prior art makes a claim obvious, identify each such combination and the motivation to combine such items; (c) provide a chart identifying where specifically in each item of prior art each element of each asserted claim is found, including for each element that is governed by 35 U.S.C. § 112 ¶ 6, the identity of the structure(s), act(s), or material(s) in each item of prior art that performs the claimed function; and (d) identify any grounds of invalidity of the asserted claims based on indefiniteness under 35 U.S.C. § 112 ¶ 2 or enablement or written description under 35 U.S.C. § 112 ¶ 1.

In addition, pursuant to Patent Local Rule 3-4, and based on its investigation to date, Defendants have produced or are producing documents concurrently with these Invalidity Contentions.

II. Reservations

Defendants reserve the right to amend these Invalidity Contentions. The information and documents that Defendants produce are based on information available to date and are subject to further revision.

The information and documents that Defendants produce are based on Defendants' present understanding of Plaintiff's infringement theories as advanced by Plaintiff in its Infringement Contentions. Plaintiff's Infringement Contentions are deficient in numerous respects. For example, although Plaintiff lists hundreds of product models as accused products in its Infringement Contentions, the accompanying claim chart includes analysis for only a few models. Thus, Plaintiff has failed to identify specifically where each element of each asserted claim is found within each accused instrumentality. If Plaintiff attempts or is permitted to cure such deficiencies, amends its contentions, or provides additional information regarding its infringement theories, doing so may lead to further grounds for invalidity, and thus Defendants specifically reserve the right to amend or supplement its Invalidity Contentions.

Further, because discovery (including third-party discovery) is at an early stage, Defendants reserve the right to amend or supplement these Invalidity Contentions. For example, Plaintiff has not produced prior art known to it, including information regarding any known prior art products. As discovery proceeds, Defendants may serve subpoenas on third parties believed to have knowledge, documentation, and/or corroborating evidence relating to invalidity and/or prior art. It is therefore likely that Defendants will discover additional prior art or additional information relating to known prior art, and Defendants reserve the right to supplement these contentions after becoming aware of additional prior art or information. Defendants further reserve the right to introduce and use such supplemental materials at trial.

Defendants' claim charts attached to these Invalidity Contentions cite particular teachings and disclosures of the prior art as applied to limitations of the asserted claims. However, persons having ordinary skill in the art may view an item of prior art generally in the context of other publications, literature, products, and understanding. Accordingly, the cited portions are only exemplary, and Defendants reserve the right to rely on uncited portions of the prior art references and on other publications and expert testimony as aids in understanding and interpreting the cited portions, as providing context thereto, and as additional evidence that a claim limitation is known or disclosed. Defendants reserve the right to establish what was known to a person having ordinary skill in the art through other publications, products, and/or testimony. Defendants also reserve the right to rely on uncited portions of the prior art references, other publications, and testimony to establish that a person of skill in the art would have been motivated to combine certain of the cited references so as to render the claims obvious. Citations to figures are inclusive of all discussions of those figures.

Defendants further reserve the right to argue that the asserted claims are invalid under 35 U.S.C. § 102(f) if discovery reveals that the named inventor of the Asserted Patent did not invent the subject matter recited in the asserted claims. If Defendants assert invalidity under Section 102(f), Defendants will provide the name of the person(s) from whom, and the circumstances under which, the invention or any part of it was derived.

Defendants further intend to rely on inventor admissions concerning the scope of the asserted claims or of the prior art relevant to the asserted claims found in, *inter alia*, the patent prosecution history and/or reexamination history for the Asserted Patent and related patents and/or patent applications; any deposition testimony of a named inventor of the Asserted Patent; and the papers filed and any evidence submitted by Plaintiff in conjunction with this litigation.

Defendants reserve the right to contend that the asserted claims are invalid for failure to name the correct inventor(s), and/or to contend that Plaintiff lacks standing to bring this litigation with respect to such patents.

Furthermore, nothing stated herein shall be treated as an admission or suggestion that Defendants agree with Plaintiff regarding the scope of any asserted claim or the claim constructions in its Infringement Contentions. To the extent that Defendants' Invalidity Contentions reflect claim constructions consistent with or suggested by Plaintiff's Infringement Contentions, no inference is intended nor should any be drawn that Defendants agree with Plaintiff's claim constructions. By applying any of Plaintiff's apparent claim constructions and interpretations, Defendants do not concede in any way that those constructions and interpretations are correct, but rather assert the fundamental principle that whatever infringes a claim if later in time anticipates if earlier in time. Defendants expressly reserve the right to propose alternative constructions to those that have been or may be advocated by Plaintiff.

Nor shall anything in these Invalidity Contentions be treated as an admission that Defendants' accused products meet any limitation of any asserted claim. Defendants deny that they infringe any claim of the Asserted Patent. To the extent that any prior art contains a claim element that is the same as or similar to an accused product, inclusion of that prior art in Defendants' Invalidity Contentions shall not be deemed a waiver by Defendants of any claim construction or non-infringement position. Defendants expressly reserve the right to contest any claim construction asserted by Plaintiff and expressly reserve all non-infringement arguments.

In its Infringement Contentions, Plaintiff contends that the asserted claims of the Asserted Patent are entitled to the priority date of September 3, 2004. Defendants reserve the right to challenge Plaintiff's alleged priority date. Defendants further reserve the right to seek discovery

regarding conception and reduction to practice, as appropriate, and to demonstrate earlier invention by other parties under 35 U.S.C. § 102(g), public use and/or the on-sale bar under 35 U.S.C. § 102(b), and/or applicants' failure to comply with 35 U.S.C. § 112. In addition, Defendants rely on Plaintiff's alleged priority date in forming these Invalidity Contentions, and to the extent Plaintiff later argues, or it is determined that, any different priority date applies, Defendants reserve the right to amend these Contentions accordingly.

III. Invalidity Contentions Under 35 U.S.C. §§ 102 And 103

A. Identification of Prior Art

In addition to the prior art cited on the face of the '702 Patent and related patents, the admitted prior art in the specifications of the '702 Patent and related patents, the prior art cited in any file histories, reexaminations, *inter partes* review proceedings, reissue proceedings, or other examination or post-grant proceedings of the '702 Patent and related patents, and the prior art cited in any invalidity contentions or expert reports submitted in any action or proceedings involving the '702 Patent or related patents, Defendants identify the following prior art that anticipates each asserted claim or renders it obvious.

1. Prior Art Patents

The following patents and patent publications are prior art to the asserted claims under at least pre-AIA 35 U.S.C. §§ 102(a), (b), (e), and/or (g) and/or pre-AIA 35 U.S.C. § 103. The identification of any patent or patent publication shall be deemed to include any counterpart patent or application filed, published, or issued anywhere in the world.

Patent or Publication Number	Country of Origin	Filing Date	Date of Issue or Publication
U.S. Patent No. 5,091,762 ("Watanabe")	U.S.	12/14/1990	2/25/1992
U.S. Patent App. Pub. No. 2002/0154556 ("Endoh Patent")	U.S.	3/28/2002	10/24/2002

Patent or Publication Number	Country of Origin	Filing Date	Date of Issue or Publication
U.S. Patent No. 6,881,994 (“Lee”)	U.S.	8/13/2001	3/7/2002
WO 2004/015764 (“Leedy”)	U.S.	8/8/2003	2/19/2004
U.S. Patent No. 6,888,750 (“Walker”)	U.S.	8/13/2001	12/27/2001
U.S. Patent No. 6,670,642 (“Takaura”)	U.S.	1/22/2002	7/24/2003
Japanese Patent Application No. H10-93083 (“Hemink”)	JP	9/18/1996	4/10/1998
U.S. Patent App. Pub. No. 2003/0157748 (“Kim”)	U.S.	2/20/2002	7/13/2004
U.S. Patent No. 6,034,882 (“Johnson”)	U.S.	11/16/1998	3/7/2000
U.S. Patent No. 5,571,730 (“Park”)	U.S.	5/22/1995	11/5/1996
U.S. Patent No. 5,973,352 (“Noble”)	U.S.	8/20/1997	10/26/1999
U.S. Patent No. 5,973,356 (“Noble-2”)	U.S.	7/8/1997	10/26/1999
U.S. Patent No. 6,424,001 (“Forbes”)	U.S.	2/9/2001	7/23/2002
U.S. Patent No. 7,075,146 (“Forbes-2”)	U.S.	2/24/2004	8/25/2005
U.S. Patent No. 7,220,634 (“Forbes-3”)	U.S.	2/24/2004	8/25/2005
U.S. Patent No. 6,400,008 (“Farnworth”)	U.S.	8/25/2000	6/4/2002
U.S. Patent No. 6,538,330 (“Forbes-4”)	U.S.	3/23/2000	3/25/2003

2. Prior Art Non-Patent Publications

The following non-patent publications are prior art to the asserted claims under at least pre-AIA 35 U.S.C. §§ 102(a), (b), and/or (g) and/or pre-AIA 35 U.S.C. § 103.

Title	Author/Publisher	Date of Publication
Novel Ultrahigh-Density Flash Memory w/ a S-SGT Structured Cell (“Endoh Article”)	Tetsuo Endoh et al., IEEE Transactions on Electron Devices, Vol. 50, No. 4	Apr. 2003
New Three-Dimensional High-Density Stacked-Surrounding Gate Transistor (S-SGT) Flash Memory Architecture Using Self-Aligned Interconnection Fabrication Technology Without Photolithography Process for Tera-Bits and Beyond (“Sakuraba”)	Hiroshi Sakuraba et al., 43 Japanese J. Applied Physics 2217	Apr. 2004
The Generic Nature of the Smart-Cut® Process for Thin Film Transfer (“Aspar”)	B. Aspar et al., 30 J. Elec. Materials 834	July 2001
Intel StrataFlash™ Memory Technology Overview	Greg Atwood et al., Intel Tech. J. Q4	1997
Advancements in Stacked Chip Scale Packaging (S-CSP), Provides System-in-a-Package Functionality for Wireless and Handheld Applications, Sharp Corporation (“Kada”)	Morihiro Kada, Pan Pacific Microelectronics Symposium Conference	Jan. 2000
Intel Introduces New Intel StrataFlash® Memory to Enhance Performance Wireless Devices,	Intel	Sept. 2001
Intel Unveils Advances In Technology For Cell Phones (“Intel Developer Forum”)	Intel Developer Forum	Oct. 2002
Stacked-CSP Delivers Flexibility, Reliability and Space-Saving Capabilities, (“Schoeman”)	Steve Schoeman, Dataweek	Aug. 2003
Intel StrataFlash® Wireless Memory System (LV18/LV30 SCSP): 768-Mbit LVQ Family with Asynchronous Static RAM (“768-Mbit LVQ”)	Intel	Dec. 2003
Intel StrataFlash® Wireless Memory System (LV18 SCSP): 1024-Mbit LVX Family with LPSPDRAM (“1024-Mbit LVX”)	Intel	Feb. 2004

3. Prior Art Systems

The following systems are prior art under at least 35 U.S.C. §§ 102(a), (b) and/or (g):

1. Products, components, systems, and methods invented, designed, developed,

reduced to practice, and/or in public use or on sale related to Irvine Sensors Corporation's Wide Word SRAM ("WWSRAM"), as exemplified in the claim chart in Exhibit A10. As part of these Invalidity Contentions, Defendants have produced documents relating to WWSRAM. Based on information available to Defendants, Defendants believes that WWSRAM was conceived and/or reduced to practice by engineers at Irvine Sensors Corp. and Micron Technology, Inc., including those identified in the claim chart and its cited publications, at least before December 1996, without being abandoned, suppressed, or concealed, and it was in public use or on sale by the dates identified in the claim chart, which are no later than December 1996.

2. Products, components, systems, and methods invented, designed, developed, reduced to practice, and/or in public use or on sale related to the Intel Corporation's StrataFlash® Wireless Memory System products, including, for example, LV18 SCSP and LV30 SCSP ("StrataFlash"), as exemplified in claim charts in Exhibit A11. As part of these Invalidity Contentions, Defendants have produced documents relating to the StrataFlash. Defendants believe that StrataFlash was conceived and/or reduced to practice by engineers at Intel Corporation, including those identified in the claim chart and its cited publications, at least in 1997, without being abandoned, suppressed, or concealed, and it was in public use or on sale by the dates identified in the claim chart, which are no later than 1997.

Defendants' investigation into publicly-available prior art systems that teach and/or render obvious each element of any asserted claims is ongoing. Fact discovery is at an early stage, and Defendants may require discovery from third parties regarding publicly-available prior art systems. Defendants reserve the right to amend its identification of prior art systems as Defendants become aware of the existence, functionality, and/or characteristics of prior art systems as a result of their investigation and forthcoming discovery.

B. Primary References

Defendants contend that the primary prior art references identified below and described in the charts attached as Exhibits A1 to A22, by themselves, anticipate the asserted claims of the '702 Patent. To the extent that a primary reference is deemed not to anticipate a claim for failing to teach one or more limitations of that claim, Defendants contend that the claim would nonetheless have been obvious to a person of ordinary skill in the art at the time of the invention

in view of the prior art reference itself and the knowledge of a person of ordinary skill in the art, as described in the attached charts. Defendants’ prior art charts (attached as Exhibits A1 to A22) set forth the particular claims that are anticipated under 35 U.S.C. § 102 and/or rendered obvious under 35 U.S.C. § 103 by each item of prior art and identify where specifically in each item of prior art each element of each asserted claim is found.

Exhibit	Primary References
A1	U.S. Patent No. 5,091,762 (“Watanabe”)
A2	U.S. Patent App. Pub. No. 2002/0154556 (“Endoh Patent”)
A3	U.S. Patent No. 6,881,994 (“Lee”)
A4	Tetsuo Endoh et al., <i>Novel Ultrahigh-Density Flash Memory w/ a S-SGT Structured Cell</i> , IEEE Transactions on Electron Devices, Vol. 50, No. 4 (Apr. 2003) (“Endoh Article”)
A5	Hiroshi Sakuraba et al., <i>New Three-Dimensional High-Density Stacked-Surrounding Gate Transistor (S-SGT) Flash Memory Architecture Using Self-Aligned Interconnection Fabrication Technology Without Photolithography Process for Tera-Bits and Beyond</i> , 43 Japanese J. Applied Physics 2217 (Apr. 2004) (“Sakuraba”)
A6	WO 2004/015764 (“Leedy”)
A7	U.S. Patent No. 6,888,750 (“Walker”)
A8	U.S. Patent No. 6,670,642 (“Takaura”)
A9	Japanese Patent Application No. H10-93083 (“Hemink”)
A10	Irvine Sensors Corp.’s Wide Word SRAM (“WWSRAM”)
A11	Intel Corporation’s StrataFlash Wireless Memory System (“StrataFlash”)
A12	U.S. Patent No. 5,973,352 (“Noble”)
A13	U.S. Patent No. 5,973,356 (“Noble-2”)
A14	U.S. Patent No. 6,424,001 (“Forbes”)
A15	U.S. Patent No. 7,075,146 (“Forbes-2”)

Exhibit	Primary References
A16	U.S. Patent No. 7,220,634 (“Prall”)
A17	U.S. Patent No. 6,400,008 (“Farnworth”)
A18	U.S. Patent No. 6,538,330 (“Forbes-3”)
A19	U.S. Patent Appl. Publ. No. 2003/0157748 (“Kim”)
A20	B. Aspar et al., <i>The Generic Nature of the Smart-Cut® Process for Thin Film Transfer</i> , 30 J. Elec. Materials 834 (2001) (“Aspar”)
A21	U.S. Patent No. 6,034,882 (“Johnson”)
A22	U.S. Patent No. 5,571,730 (“Park”)

C. Obvious Combinations

To the extent that a primary reference is deemed, by itself, not to anticipate or render obvious a claim for failing to teach one or more limitations, the claim would nonetheless have been obvious to a person of ordinary skill in the art at the time of the invention by the combination of the primary reference with one or more other primary references and/or the knowledge of someone skilled in the art. For example, a person of ordinary skill in the art would have been motivated to combine any reference in Exhibits A1 to A22 with any other reference(s) in Exhibits A1 to A22. Such combinations would be achieved, for example, by merely combining the disclosures described in the respective claim charts for each reference.

The obviousness combinations are provided in the alternative to Defendants’ anticipation contentions and are not to be construed to suggest that any reference included in the combinations is not itself anticipatory.

1. Exemplary Combinations

Below are examples of prior art references that would have been combined by one of ordinary skill in the art at the time of the alleged invention. These combinations are merely examples. The asserted claims of the '702 Patent are rendered obvious by:

- Watanabe alone or in combination with one or more of Endoh Patent, Lee, Endoh Article, Sakuraba, Leedy, Walker, Takaura, Hemink, WWSRAM, StrataFlash, Noble, Noble-2, Forbes, Forbes-2, Prall, Farnworth, Forbes-3, Kim, Aspar, Johnson, and Park. For example:
 - Independent claim 13 is obvious over Watanabe; Watanabe in view of Endoh Patent; Watanabe in view of Lee; Watanabe in view of Endoh Article; Watanabe in view of Hemink; Watanabe in view of WWSRAM; Watanabe in view of StrataFlash; and/or Watanabe in view of Johnson.
 - Dependent claims 14 and 15 are obvious over Watanabe; Watanabe in view of Endoh Patent; Watanabe in view of Lee; Watanabe in view of Sakuraba; Watanabe in view of Walker; Watanabe in view of Takaura; Watanabe in view of Hemink; Watanabe in view of Noble; Watanabe in view of Noble-2; Watanabe in view of Forbes-2; and/or Watanabe in view of Prall.
 - Dependent claim 16 is obvious over Watanabe; Watanabe in view of Endoh Patent; Watanabe in view of Endoh Patent and Endoh Article; Watanabe in view of Lee; Watanabe in view of Sakuraba; Watanabe in view of Walker; Watanabe in view of Hemink; Watanabe in view of

Hemink and Endoh Patent; Watanabe in view of Hemink and Kim or Aspar; and/or Watanabe in view of Lee and Kim or Aspar.

- Endoh Patent alone or in combination with one or more of Watanabe, Lee, Endoh Article, Sakuraba, Leedy, Walker, Takaura, Hemink, WWSRAM, StrataFlash, Noble, Noble-2, Forbes, Forbes-2, Prall, Farnworth, Forbes-3, Kim, Aspar, Johnson, and Park. For example:
 - Independent claim 13 is obvious over Endoh Patent; Endoh Patent in view of Watanabe; Endoh Patent in view of Lee; Endoh Patent in view of Endoh Article; Endoh Patent in view of Hemink; Endoh Patent in view of WWSRAM; Endoh Patent in view of StrataFlash; and/or Endoh Patent in view of Johnson.
 - Dependent claims 14 and 15 are obvious over Endoh Patent; Endoh Patent in view of Watanabe; Endoh Patent in view of Lee; Endoh Patent in view of Sakuraba; Endoh Patent in view of Walker; Endoh Patent in view of Takaura; Endoh Patent in view of Hemink; Endoh Patent in view of Noble; Endoh Patent in view of Noble-2; Endoh Patent in view of Forbes-2; and/or Endoh Patent in view of Prall.
 - Dependent claim 16 is obvious over Endoh Patent; Endoh Patent in view of Watanabe; Endoh Patent in view of Lee; Endoh Patent in view of Endoh Article; Endoh Patent in view of Sakuraba; Endoh Patent in view of Walker; Endoh Patent in view of Hemink; Endoh Patent in view of Hemink and Kim or Aspar; and/or Endoh Patent in view of Lee and Kim or Aspar.

- Lee alone or in combination with one or more of Watanabe, Endoh Patent, Endoh Article, Sakuraba, Leedy, Walker, Takaura, Hemink, WWSRAM, StrataFlash, Noble, Noble-2, Forbes, Forbes-2, Prall, Farnworth, Forbes-3, Kim, Aspar, Johnson, and Park. For example:
 - Independent claim 13 is obvious over Lee; Lee in view of Watanabe; Lee in view of Endoh Patent; Lee in view of Endoh Article; Lee in view of Hemink; Lee in view of WWSRAM; Lee in view of StrataFlash; and/or Lee in view of Johnson.
 - Dependent claims 14 and 15 are obvious over Lee; Lee in view of Watanabe; Lee in view of Endoh Patent; Lee in view of Sakuraba; Lee in view of Walker; Lee in view of Takaura; Lee in view of Hemink; Lee in view of Noble; Lee in view of Noble-2; Lee in view of Forbes-2; and/or Lee in view of Prall.
 - Dependent claim 16 is obvious over Lee; Lee in view of Endoh Patent; Lee in view of Endoh Patent and Endoh Article; Lee in view of Sakuraba; Lee in view of Walker; Lee in view of Hemink; Lee in view of Hemink and Endoh Patent; and/or Lee in view of Hemink and Kim or Aspar.
- Endoh Article alone or in combination with one or more of Watanabe, Endoh Patent, Lee, Sakuraba, Leedy, Walker, Takaura, Hemink, WWSRAM, StrataFlash, Noble, Noble-2, Forbes, Forbes-2, Prall, Farnworth, Forbes-3, Kim, Aspar, Johnson, and Park. For example:
 - Independent claim 13 is obvious over Endoh Article; Endoh Article in view of Watanabe; Endoh Article in view of Endoh Patent; Endoh Article

in view of Lee; Endoh Article in view of Hemink; Endoh Article in view of WWSRAM; Endoh Article in view of StrataFlash; and/or Endoh Article in view of Johnson.

- Dependent claims 14 and 15 are obvious over Endoh Article; Endoh Article in view of Watanabe; Endoh Article in view of Endoh Patent; Endoh Article in view of Lee; Endoh Article in view of Sakuraba; Endoh Article in view of Walker; Endoh Article in view of Takaura; Endoh Article in view of Hemink; Endoh Article in view of Noble; Endoh Article in view of Noble-2; Endoh Article in view of Forbes-2; and/or Endoh Article in view of Prall.
- Dependent claim 16 is obvious over Endoh Article; Endoh Article in view of Watanabe; Endoh Article in view of Lee; Endoh Article in view of Endoh Patent; Endoh Article in view of Sakuraba; Endoh Article in view of Walker; Endoh Article in view of Hemink; Endoh Article in view of Hemink and Kim or Aspar; and/or Endoh Article in view of Lee and Kim or Aspar.
- Sakuraba Article alone or in combination with one or more of Watanabe, Endoh Patent, Lee, Endoh Article, Leedy, Walker, Takaura, Hemink, WWSRAM, StrataFlash, Noble, Noble-2, Forbes, Forbes-2, Prall, Farnworth, Forbes-3, Kim, Aspar, Johnson, and Park. For example:
 - Independent claim 13 is obvious over Sakuraba; Sakuraba in view of Watanabe; Sakuraba in view of Endoh Patent; Sakuraba in view of Lee; Sakuraba in view of Endoh Article; Sakuraba in view of Hemink;

Sakuraba in view of WWSRAM; Sakuraba in view of StrataFlash; and/or Sakuraba in view of Johnson.

- Dependent claims 14 and 15 are obvious over Sakuraba; Sakuraba in view of Watanabe; Sakuraba in view of Endoh Patent; Sakuraba in view of Lee; Sakuraba in view of Walker; Sakuraba in view of Takaura; Sakuraba in view of Hemink; Sakuraba in view of Noble; Sakuraba in view of Noble-2; Sakuraba in view of Forbes-2; and/or Sakuraba in view of Prall.
- Dependent claim 16 is obvious over Sakuraba; Sakuraba in view of Endoh Patent; Sakuraba in view of Endoh Patent and Endoh Article; Sakuraba in view of Lee; Sakuraba in view of Walker; Sakuraba in view of Hemink; Sakuraba in view of Hemink and Endoh Patent; Sakuraba in view of Lee and Kim or Aspar; and/or Sakuraba in view of Hemink and Kim or Aspar.
- Leedy Article alone or in combination with one or more of Watanabe, Endoh Patent, Lee, Endoh Article, Sakuraba, Walker, Takaura, Hemink, WWSRAM, StrataFlash, Noble, Noble-2, Forbes, Forbes-2, Prall, Farnworth, Forbes-3, Kim, Aspar, Johnson, and Park. For example:
 - Independent claim 13 is obvious over Leedy; Leedy in view of Watanabe; Leedy in view of Endoh Patent; Leedy in view of Lee; Sakuraba in view of Endoh Article; Leedy in view of Hemink; Leedy in view of WWSRAM; Leedy in view of StrataFlash; and/or Leedy in view of Johnson.
 - Dependent claims 14 and 15 are obvious over Leedy; Leedy in view of Watanabe; Leedy in view of Endoh Patent; Leedy in view of Lee; Leedy in view of Walker; Leedy in view of Takaura; Leedy in view of Hemink;

Leedy in view of Noble; Leedy in view of Noble-2; Leedy in view of Forbes-2; and/or Leedy in view of Prall.

- Dependent claim 16 is obvious over Leedy in view of Endoh Patent; Leedy in view of Endoh Patent and Endoh Article; Leedy in view of Lee; Leedy in view of Sakuraba; Leedy in view of Walker; Leedy in view of Hemink; Leedy in view of Hemink and Endoh Patent; Leedy in view of Lee and Kim or Aspar; and/or Leedy in view of Hemink and Kim or Aspar.
- Walker Article alone or in combination with one or more of Watanabe, Endoh Patent, Lee, Endoh Article, Sakuraba, Leedy, Takaura, Hemink, WWSRAM, StrataFlash, Noble, Noble-2, Forbes, Forbes-2, Prall, Farnworth, Forbes-3, Kim, Aspar, Johnson, and Park. For example:
 - Independent claim 13 is obvious over Walker; Walker in view of Watanabe; Walker in view of Endoh Patent; Walker in view of Lee; Walker in view of Endoh Article; Walker in view of Hemink; Walker in view of WWSRAM; Walker in view of StrataFlash; and/or Walker in view of Johnson.
 - Dependent claims 14 and 15 are obvious over Walker; Walker in view of Watanabe; Walker in view of Endoh Patent; Walker in view of Lee; Walker in view of Sakuraba; Walker in view of Takaura; Walker in view of Hemink; Walker in view of Noble; Walker in view of Noble-2; Walker in view of Forbes-2; and/or Walker in view of Prall.
 - Dependent claim 16 is obvious over Walker; Walker in view of Endoh Patent; Walker in view of Endoh Patent and Endoh Article; Walker in

view of Lee; Walker in view of Sakuraba; Walker in view of Hemink; Walker in view of Hemink and Endoh Patent; Walker in view of Lee and Kim or Aspar; and/or Walker in view of Hemink and Kim or Aspar.

- Takaura Article alone or in combination with one or more of Watanabe, Endoh Patent, Lee, Endoh Article, Sakuraba, Leedy, Walker, Hemink, WWSRAM, StrataFlash, Noble, Noble-2, Forbes, Forbes-2, Prall, Farnworth, Forbes-3, Kim, Aspar, Johnson, and Park. For example:
 - Independent claim 13 is obvious over Takaura; Takaura in view of Watanabe; Takaura in view of Endoh Patent; Takaura in view of Lee; Takaura in view of Endoh Article; Takaura in view of Hemink; Takaura in view of WWSRAM; Takaura in view of StrataFlash; and/or Walker in view of Johnson.
 - Dependent claims 14 and 15 are obvious over Takaura; Takaura in view of Watanabe; Takaura in view of Endoh Patent; Takaura in view of Lee; Takaura in view of Sakuraba; Takaura in view of Walker; Takaura in view of Hemink; Takaura in view of Noble; Takaura in view of Noble-2; Takaura in view of Forbes-2; and/or Takaura in view of Prall.
 - Dependent claim 16 is obvious over Takaura in view of Endoh Patent; Takaura in view of Endoh Patent and Endoh Article; Takaura in view of Lee; Takaura in view of Sakuraba; Takaura in view of Walker; Takaura in view of Hemink; Takaura in view of Hemink and Endoh Patent; Takaura in view of Lee and Kim or Aspar; and/or Takaura in view of Hemink and Kim or Aspar.

- Hemink Article alone or in combination with one or more of Watanabe, Endoh Patent, Lee, Endoh Article, Sakuraba, Leedy, Walker, Takaura, WWSRAM, StrataFlash, Noble, Noble-2, Forbes, Forbes-2, Prall, Farnworth, Forbes-3, Kim, Aspar, Johnson, and Park. For example:
 - Independent claim 13 is obvious over Hemink; Hemink in view of Watanabe; Hemink in view of Endoh Patent; Hemink in view of Lee; Hemink in view of Endoh Article; Hemink in view of WWSRAM; Hemink in view of StrataFlash; and/or Hemink in view of Johnson.
 - Dependent claims 14 and 15 are obvious over Hemink; Hemink in view of Watanabe; Hemink in view of Endoh Patent; Hemink in view of Lee; Hemink in view of Walker; Hemink in view of Sakuraba; Hemink in view of Walker; Hemink in view of Takaura; Hemink in view of Noble; Hemink in view of Noble-2; Hemink in view of Forbes-2; and/or Hemink in view of Prall.
 - Dependent claim 16 is obvious over Hemink in view of Endoh Patent; Hemink in view of Endoh Patent and Endoh Article; Hemink in view of Lee; Hemink in view of Sakuraba; Hemink in view of Walker; and/or Hemink in view of Lee and Kim or Aspar.
- WWSRAM alone or in combination with one or more of Watanabe, Endoh Patent, Lee, Endoh Article, Sakuraba, Leedy, Walker, Takaura, Hemink, StrataFlash, Noble, Noble-2, Forbes, Forbes-2, Prall, Farnworth, Forbes-3, Kim, Aspar, Johnson, and Park. For example:

- Independent claim 13 is obvious over WWSRAM; WWSRAM in view of Watanabe; WWSRAM in view of Endoh Patent; WWSRAM in view of Lee; WWSRAM in view of Endoh Article; WWSRAM in view of Hemink; and/or WWSRAM in view of Johnson.
- Dependent claims 14 and 15 are obvious over WWSRAM; WWSRAM in view of Watanabe; WWSRAM in view of Endoh Patent; WWSRAM in view of Lee; WWSRAM in view of Sakuraba; WWSRAM in view of Walker; WWSRAM in view of Takaura; WWSRAM in view of Hemink; WWSRAM in view of Noble; WWSRAM in view of Noble-2; WWSRAM in view of Forbes-2; and/or WWSRAM in view of Prall.
- Dependent claim 16 is obvious over WWSRAM in view of Endoh Patent; WWSRAM in view of Endoh Patent and Endoh Article; WWSRAM in view of Lee; WWSRAM in view of Sakuraba; WWSRAM in view of Walker; WWSRAM in view of Hemink; WWSRAM in view of Hemink and Endoh Patent; WWSRAM in view of Lee and Kim or Aspar; and/or WWSRAM in view of Hemink and Kim or Aspar.
- StrataFlash alone or in combination with one or more of Watanabe, Endoh Patent, Lee, Endoh Article, Sakuraba, Leedy, Walker, Takaura, Hemink, WWSRAM, Noble, Noble-2, Forbes, Forbes-2, Prall, Farnworth, Forbes-3, Kim, Aspar, Johnson, and Park. For example:
 - Independent claim 13 is obvious over StrataFlash; StrataFlash in view of Watanabe; StrataFlash in view of Endoh Patent; StrataFlash in view of

- Lee; StrataFlash in view of Endoh Article; StrataFlash in view of Hemink; and/or StrataFlash in view of Johnson.
- Dependent claims 14 and 15 are obvious over StrataFlash; StrataFlash in view of Watanabe; StrataFlash in view of Endoh Patent; StrataFlash in view of Lee; StrataFlash in view of Sakuraba; StrataFlash in view of Walker; StrataFlash in view of Takaura; StrataFlash in view of Hemink; StrataFlash in view of Noble; StrataFlash in view of Noble-2; StrataFlash in view of Forbes-2; and/or StrataFlash in view of Prall.
 - Dependent claim 16 is obvious over StrataFlash in view of Endoh Patent; StrataFlash in view of Endoh Patent and Endoh Article; StrataFlash in view of Lee; StrataFlash in view of Sakuraba; StrataFlash in view of Walker; StrataFlash in view of Hemink; StrataFlash in view of Hemink and Endoh Patent; StrataFlash in view of Lee and Kim or Aspar; and/or StrataFlash in view of Hemink and Kim or Aspar.
 - Noble alone or in combination with Farnworth or Forbes-3 and one or more of Watanabe, Endoh Patent, Lee, Endoh Article, Sakuraba, Leedy, Walker, Takaura, Hemink, WWSRAM, StrataFlash, Noble-2, Forbes, Forbes-2, Prall, Farnworth, Forbes-3, Kim, Aspar, Johnson, and Park. For example:
 - Independent claim 13 is obvious over Noble and Farnworth or Forbes-3; Noble and Farnworth or Forbes-3 in view of Watanabe; Noble and Farnworth or Forbes-3 in view of Endoh Patent; Noble and Farnworth or Forbes-3 in view of Lee; Noble and Farnworth or Forbes-3 in view of Endoh Article; Noble and Farnworth or Forbes-3 in view of Hemink;

Noble and Farnworth or Forbes-3 in view of WWSRAM; Noble and Farnworth or Forbes-3 in view of StrataFlash; and/or Noble and Farnworth or Forbes-3 in view of Johnson.

- Dependent claims 14 and 15 are obvious over Noble and Farnworth or Forbes-3; Noble and Farnworth or Forbes-3 in view of Watanabe; Noble and Farnworth or Forbes-3 in view of Endoh Patent; Noble and Farnworth or Forbes-3 in view of Lee; Noble and Farnworth or Forbes-3 in view of Sakuraba; Noble and Farnworth or Forbes-3 in view of Walker; Noble and Farnworth or Forbes-3 in view of Takaura; Noble and Farnworth or Forbes-3 in view of Hemink; Noble and Farnworth or Forbes-3 in view of Noble-2; Noble and Farnworth or Forbes-3 in view of Forbes-2; and/or Noble and Farnworth or Forbes-3 in view of Prall.
- Dependent claim 16 is obvious over Noble and Forbes-3 in view of Endoh Patent; Noble and Forbes-3 in view of Lee; Noble and Forbes-3 in view of Endoh Article; Noble and Forbes-3 in view of Sakuraba; Noble and Forbes-3 in view of Walker; and/or Noble and Forbes-3 in view of Hemink.
- Noble-2 alone or in combination with Farnworth or Forbes-3 and one or more of Watanabe, Endoh Patent, Lee, Endoh Article, Sakuraba, Leedy, Walker, Takaura, Hemink, WWSRAM, StrataFlash, Noble, Forbes, Forbes-2, Prall, Farnworth, Forbes-3, Kim, Aspar, Johnson, and Park. For example:
 - Independent claim 13 is obvious over Noble-2 and Farnworth or Forbes-3; Noble-2 and Farnworth or Forbes-3 in view of Watanabe; Noble-2 and

Farnworth or Forbes-3 in view of Endoh Patent; Noble-2 and Farnworth or Forbes-3 in view of Lee; Noble-2 and Farnworth or Forbes-3 in view of Endoh Article; Noble-2 and Farnworth or Forbes-3 in view of Hemink; Noble-2 and Farnworth or Forbes-3 in view of WWSRAM; Noble-2 and Farnworth or Forbes-3 in view of StrataFlash; and/or Noble-2 and Farnworth or Forbes-3 in view of Johnson.

- Dependent claims 14 and 15 are obvious over Noble-2 and Farnworth or Forbes-3; Noble-2 and Farnworth or Forbes-3 in view of Watanabe; Noble-2 and Farnworth or Forbes-3 in view of Endoh Patent; Noble-2 and Farnworth or Forbes-3 in view of Lee; Noble-2 and Farnworth or Forbes-3 in view of Sakuraba; Noble-2 and Farnworth or Forbes-3 in view of Walker; Noble-2 and Farnworth or Forbes-3 in view of Takaura; Noble-2 and Farnworth or Forbes-3 in view of Hemink; Noble-2 and Farnworth or Forbes-3 in view of Noble; Noble-2 and Farnworth or Forbes-3 in view of Noble-2; Noble-2 and Farnworth or Forbes-3 in view of Forbes-2; and/or Noble-2 and Farnworth or Forbes-3 in view of Prall.
- Dependent claim 16 is obvious over Noble-2 and Forbes-3 in view of Endoh Patent; Noble-2 and Forbes-3 in view of Lee; Noble-2 and Forbes-3 in view of Endoh Article; Noble-2 and Forbes-3 in view of Sakuraba; Noble-2 and Forbes-3 in view of Walker; and/or Noble-2 and Forbes-3 in view of Hemink.
- Forbes alone or in combination with Farnworth or Forbes-3 and one or more of Watanabe, Endoh Patent, Lee, Endoh Article, Sakuraba, Leedy, Walker, Takaura,

Hemink, WWSRAM, StrataFlash, Noble, Noble-2, Forbes-2, Prall, Farnworth, Forbes-3, Kim, Aspar, Johnson, and Park. For example:

- Independent claim 13 is obvious over Forbes and Farnworth or Forbes-3; Forbes and Farnworth or Forbes-3 in view of Watanabe; Forbes and Farnworth or Forbes-3 in view of Endoh Patent; Forbes and Farnworth or Forbes-3 in view of Lee; Forbes and Farnworth or Forbes-3 in view of Endoh Article; Forbes and Farnworth or Forbes-3 in view of Hemink; Forbes and Farnworth or Forbes-3 in view of WWSRAM; Forbes and Farnworth or Forbes-3 in view of StrataFlash; and/or Forbes and Farnworth or Forbes-3 in view of Johnson.
- Dependent claims 14 and 15 are obvious over Forbes and Farnworth or Forbes-3; Forbes and Farnworth or Forbes-3 in view of Watanabe; Forbes and Farnworth or Forbes-3 in view of Endoh Patent; Forbes and Farnworth or Forbes-3 in view of Lee; Forbes and Farnworth or Forbes-3 in view of Sakuraba; Forbes and Farnworth or Forbes-3 in view of Walker; Forbes and Farnworth or Forbes-3 in view of Takaura; Forbes and Farnworth or Forbes-3 in view of Hemink; Forbes and Farnworth or Forbes-3 in view of Noble; Forbes and Farnworth or Forbes-3 in view of Noble-2; Forbes and Farnworth or Forbes-3 in view of Forbes-2; and/or Forbes and Farnworth or Forbes-3 in view of Prall.
- Dependent claim 16 is obvious over Forbes and Forbes-3 in view of Endoh Patent; Forbes and Forbes-3 in view of Lee; Forbes and Forbes-3 in view of Endoh Article; Forbes and Forbes-3 in view of Sakuraba; Forbes and

Forbes-3 in view of Walker; and/or Forbes and Forbes-3 in view of Hemink.

- Forbes-2 alone or in combination with Farnworth or Forbes-3 and one or more of Watanabe, Endoh Patent, Lee, Endoh Article, Sakuraba, Leedy, Walker, Takaura, Hemink, WWSRAM, StrataFlash, Noble, Noble-2, Forbes, Prall, Farnworth, Forbes-3, Kim, Aspar, Johnson, and Park. For example:
 - Independent claim 13 is obvious over Forbes-2 and Farnworth or Forbes-3; Forbes-2 and Farnworth or Forbes-3 in view of Watanabe; Forbes-2 and Farnworth or Forbes-3 in view of Endoh Patent; Forbes-2 and Farnworth or Forbes-3 in view of Lee; Forbes-2 and Farnworth or Forbes-3 in view of Endoh Article; Forbes-2 and Farnworth or Forbes-3 in view of Hemink; Forbes-2 and Farnworth or Forbes-3 in view of WWSRAM; Forbes-2 and Farnworth or Forbes-3 in view of StrataFlash; and/or Forbes-2 in view of Johnson.
 - Dependent claims 14 and 15 are obvious over Forbes-2 and Farnworth or Forbes-3; Forbes-2 and Farnworth or Forbes-3 in view of Watanabe; Forbes-2 and Farnworth or Forbes-3 in view of Endoh Patent; Forbes-2 and Farnworth or Forbes-3 in view of Lee; Forbes-2 and Farnworth or Forbes-3 in view of Sakuraba; Forbes-2 and Farnworth or Forbes-3 in view of Walker; Forbes-2 and Farnworth or Forbes-3 in view of Takaura; Forbes-2 and Farnworth or Forbes-3 in view of Hemink; Forbes-2 and Farnworth or Forbes-3 in view of Noble; Forbes-2 and Farnworth or

- Forbes-3 in view of Noble-2; Forbes-2 and Farnworth or Forbes-3 in view of Forbes-2; and/or Forbes-2 and Farnworth or Forbes-3 in view of Prall.
- Dependent claim 16 is obvious over Forbes-2 and Forbes-3 in view of Endoh Patent; Forbes-2 and Forbes-3 in view of Lee; Forbes-2 and Forbes-3 in view of Endoh Article; Forbes-2 and Forbes-3 in view of Sakuraba; Forbes-2 and Forbes-3 in view of Walker; and/or Forbes-2 and Forbes-3 in view of Hemink.
 - Prall alone or in combination with Farnworth or Forbes-3 and one or more of Watanabe, Endoh Patent, Lee, Endoh Article, Sakuraba, Leedy, Walker, Takaura, Hemink, WWSRAM, StrataFlash, Noble, Noble-2, Forbes, Forbes-2, Farnworth, Forbes-3, Kim, Aspar, Johnson, and Park. For example:
 - Independent claim 13 is obvious over Prall and Farnworth or Forbes-3; Prall and Farnworth or Forbes-3 in view of Watanabe; Prall and Farnworth or Forbes-3 in view of Endoh Patent; Prall and Farnworth or Forbes-3 in view of Lee; Prall and Farnworth or Forbes-3 in view of Endoh Article; Prall and Farnworth or Forbes-3 in view of Hemink; Prall and Farnworth or Forbes-3 in view of WWSRAM; Prall in view of StrataFlash; and/or Prall in view of Johnson.
 - Dependent claims 14 and 15 are obvious over Prall and Farnworth or Forbes-3; Prall and Farnworth or Forbes-3 in view of Watanabe; Prall and Farnworth or Forbes-3 in view of Endoh Patent; Prall and Farnworth or Forbes-3 in view of Lee; Prall and Farnworth or Forbes-3 in view of Sakuraba; Prall and Farnworth or Forbes-3 in view of Walker; Prall and

Farnworth or Forbes-3 in view of Takaura; Prall and Farnworth or Forbes-3 in view of Hemink; Prall and Farnworth or Forbes-3 in view of Noble; Prall and Farnworth or Forbes-3 in view of Noble-2; Prall and Farnworth or Forbes-3 in view of Forbes-2; and/or Prall and Farnworth or Forbes-3 in view of Prall.

- Dependent claim 16 is obvious over Prall and Forbes-3 in view of Endoh Patent; Prall and Forbes-3 in view of Lee; Prall and Forbes-3 in view of Endoh Article; Prall and Forbes-3 in view of Sakuraba; Prall and Forbes-3 in view of Walker; and/or Prall and Forbes-3 in view of Hemink.
- Johnson alone or in combination with one or more of Watanabe, Endoh Patent, Lee, Endoh Article, Sakuraba, Leedy, Walker, Takaura, Hemink, WWSRAM, StrataFlash, Noble, Noble-2, Forbes, Forbes-2, Prall, Farnworth, Forbes-3, Kim, Aspar, and Park. For example:
 - Independent claim 13 is obvious over Johnson; Johnson in view of Watanabe; Johnson in view of Endoh Patent; Johnson in view of Lee; Johnson in view of Endoh Article; Johnson in view of Hemink; Johnson in view of WWSRAM; and/or Johnson in view of StrataFlash.
 - Dependent claims 14 and 15 are obvious over Johnson; Johnson in view of Watanabe; Johnson in view of Endoh Patent; Johnson in view of Lee; Johnson in view of Sakuraba; Johnson in view of Walker; Johnson in view of Takaura; Johnson in view of Hemink; Johnson in view of Noble; Johnson in view of Noble-2; Johnson in view of Forbes-2; and/or Johnson in view of Prall.

- Dependent claim 16 is obvious over Johnson in view of Endoh Patent; Johnson in view of Endoh Patent and Endoh Article; Johnson in view of Lee; Johnson in view of Sakuraba; Johnson in view of Walker; Johnson in view of Hemink; Johnson in view of Hemink and Endoh Patent; Johnson in view of Lee and Kim or Aspar; and/or Johnson in view of Hemink and Kim or Aspar.

2. Motivations to Combine and Expectation of Success

To the extent a finder of fact finds that a primary prior art reference does not disclose one or more limitations of an asserted claim, the asserted claim is nevertheless obvious because the alleged missing limitations contain nothing beyond ordinary improvements. In other words, the asserted claim combines known elements to achieve predictable results or chooses between clear alternatives known to those of skill in the art, particularly in view of the state of the art as reflected in the relevant prior art.

Moreover, as explained above, it would have been obvious to a person of skill in the art at the time of the alleged invention of the asserted claims to combine any primary reference with any combination of other primary references so as to practice the asserted claims. To the extent that Plaintiff argues that any concept claimed in the asserted claims is not disclosed in a primary reference, it would, at a minimum, have been obvious to adapt the primary reference to include the concept or combine it with other primary references that disclose the concept. Each concept described and claimed in the Asserted Patent was known to those of skill in the art as available design choices for semiconductor memory design and fabrication.

The Supreme Court has held that “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007). “When a work is available in one field of

endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one.” *Id.* at 417. As the Supreme Court made clear, “[f]or the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.” *Id.*

To determine whether there is an apparent reason to combine the known elements in the fashion claimed by the patent at issue, a court can “look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art.” *Id.* at 418. For example, obviousness can be demonstrated by showing “there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent’s claims.” *Id.* at 420. “[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.” *Id.* Common sense also teaches that “familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle.” *Id.*

However, the Supreme Court in *KSR* held that a claimed invention can be obvious even if there is no explicit teaching, suggestion, or motivation for combining the prior art to produce that invention. In summary, *KSR* holds that patents that are based on new combinations of elements or components already known in a technical field may be found to be obvious. *See, generally, KSR*, 550 U.S. 398. Specifically, the Court in *KSR* rejected a rigid application of the “teaching, suggestion, or motivation [to combine]” test. *Id.* at 418. “In determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed

purpose of the patentee controls. What matters is the objective reach of the claim.” *Id.* at 419. “Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.” *Id.* at 420. A key inquiry is whether the “improvement is more than the predictable use of prior art elements according to their established functions.” *Id.* at 417.

The rationale to combine or modify prior art references is significantly stronger when, as here, the references seek to solve the same problem, come from the same field, and correspond well to each other. *In re Inland Steel Co.*, 265 F.3d 1354, 1362 (Fed. Cir. 2001). The Federal Circuit has held that two references may be combined as invalidating art under similar circumstances, namely “[the prior art] focus[es] on the same problem that the . . . patent addresses: enhancing the magnetic properties of . . . steel. Moreover, both [prior art references] come from the same field Finally, the solutions to the identified problems found in the two references correspond well.” *Id.* at 1364 (concerning patents and prior art relating to improving the magnetic and electrical properties of steel).

In view of the Supreme Court’s *KSR* decision, the PTO issued a set of Examination Guidelines. Examination Guidelines for Determining Obviousness Under 35 U.S.C. §103 in view of the Supreme Court Decision in *KSR International Co. v. Teleflex, Inc.*, 72 Fed. Reg. 57526 (October 10, 2007). Those Guidelines summarized the *KSR* decision and identified various rationales for finding a claim obvious, including those based on other precedents. Those rationales include:

- (A) Combining prior art elements according to known methods to yield predictable results;
- (B) Simple substitution of one known element for another to obtain predictable results;
- (C) Use of known technique to improve similar devices (methods, or products) in the same way;

(D) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;

(E) “Obvious to try” – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;

(F) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art;

(G) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

Id. at 57529. The above rationales likewise apply in rendering obvious the asserted claims of the Asserted Patent.

The references disclosed herein, alone or in combination, contain an explicit and/or implicit teaching or motivation to combine them due to the following: (1) the knowledge generally available to a person of ordinary skill in the art; (2) the prior art references as understood by a person of ordinary skill in the art; (3) the nature of the problem to be solved; (4) the fact that each prior art reference addresses similar problems; and (5) the knowledge of those skilled in the art that the disclosed elements had been or could be used together.

As an example of those reasons and motivations to combine the references, Watanabe, Endoh Patent, Lee, Endoh Article, Sakuraba, Leedy, Walker, Takaura, Hemink, WWSRAM, StrataFlash, Noble, Noble-2, Forbes, Forbes-2, Prall, Farnworth, Forbes-3, Kim, Aspar, Johnson, and Park all generally relate to semiconductor memory design and, in particular, structures and manufacturing methods for increasing the density of semiconductor memory devices including flash/non-volatile memory and other types of memories (e.g., DRAM and SRAM). *See, e.g.*, Ex. A1, 1:49–52, 2:51–55; *see also* Ex. A4 at 945. The references disclose using similar components and techniques, such as the use of semiconductor substrates; memory transistors each having a

gate, source, and drain electrode; dielectric layers to insulate conductive elements; deposition and doping steps to form semiconductor devices; organizing memory cells in rows and columns using word and bit lines. *Id.* Thus, combining one or more such references merely involves combining prior art elements according to known methods to yield predictable results, the substitution of one known element for another to obtain predictable results, the use of a known technique to improve similar devices in the same way, or applying a known technique to a known device ready for improvement to yield predictable results.

In addition, below are additional motivations to combine prior art for particular claim limitations. The following discussion of specific claim limitations merely provides examples which are not limiting.

For example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach limitation 13[a] (“a substrate having electrical devices formed therein, and further having a dielectric layer disposed above the electrical devices”), it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the primary reference with any of the prior art that discloses limitation 13[a] in Exhibits A1 to A22. For example, the charted prior art references explicitly describe or implicitly suggest a semiconductor device including a substrate having electrical devices formed therein, and further having a dielectric layer disposed above the electrical devices. *See, e.g.*, Ex. A1, 3:53–54, 5:1–6:14, Figs. 2A, 5A–5E, 6A–6D; *see also* Ex. A3, 12:13–27, Fig. 35. It would have been obvious to combine any primary reference with any of Watanabe, Endoh Patent, Lee, Endoh Article, Sakuraba, Leedy, Walker, Takaura, Hemink, WWSRAM, StrataFlash, Noble, Noble-2, Forbes, Forbes-2, Prall, Farnworth, Forbes-3, Kim, Aspar, Johnson, and Park to satisfy limitation 13[a].

A person skilled in the art would have recognized that having “a substrate having electrical devices formed therein, and further having a dielectric layer disposed above the electrical devices” was a common, predictable approach to form semiconductor devices in a substrate. For example, forming electrical devices (such as transistors, resistors, or inductors) in a substrate (such as a silicon wafer) dates back to at least the 1950s and was the industry norm as of the alleged priority date of the ’702 Patent. Similarly, using a dielectric layer to insulate electrical devices in a semiconductor substrate was also common practice. A person of ordinary skill in the art would have recognized that having a dielectric layer disposed above the electrical devices is necessary to insulate the electrical devices from other circuit components. Thus, a person of ordinary skill in the art would have been motivated to modify any of the primary references to include the claimed features, to the extent it is not disclosed. A person of ordinary skill in the art would also have had a reasonable expectation of success given that, by the alleged priority date of the ’702 Patent, millions of semiconductor devices were manufactured each year using silicon wafers as substrates and dielectric layers for insulation. A person of ordinary skill in the art would have understood that these references disclose interrelated teachings based on routine technologies and would have been amendable to various well-understood and predictable combinations.

In addition, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach limitation 13[b] (“a stackable add-on layer having a plurality of vertically oriented semiconductor memory cells”), it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the primary reference with any of the prior art that discloses this limitation in Exhibits A1 to A22. For example, the charted prior art references disclose “a stackable add-on layer having a plurality of vertically oriented semiconductor

memory cells.” *See, e.g.*, Ex. A1, 1:49–52, 1:65–2:2, 5:1–6:14, Figs. 1, 2A, 5A–5E, 6A–6D; *see also* Ex. A3, 5:46–56, 12:17–27, 13:32–36, 14:10–31, Figs. 1A, 35. A person skilled in the art would have recognized that arranging a plurality of vertically oriented memory cells in a stackable add-on layer would lead to stacked memory layers with the shortest distance between them and low resistance interconnections. A person of ordinary skill in the art would also have recognized that stacking memory cells vertically achieves a greater integration density per unit of cell area, which leads to increased memory density and lower cost. *See, e.g.*, Ex. A4 at 945–47; *see also* Ex. A1, 1:49–52, 1:65–2:5. Thus, a person of ordinary skill in the art would have been motivated to modify any of the primary references to include this feature, if it is not disclosed by the primary references. A person of ordinary skill in the art would also have had a reasonable expectation of success given that several semiconductor companies, such as Intel, Micron, and Sharp, had successfully demonstrated the use of stacking technology for memory products. A person of ordinary skill in the art would have understood that these references disclose interrelated teachings based on routine technologies and would have been amendable to various well-understood and predictable combinations.

In addition, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach limitation 13[c] (“the stackable add-on layer being bonded to the dielectric layer”), it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the primary reference with any of the prior art that discloses this limitation in Exhibits A1 to A22. For example, the charted prior art references disclose “the stackable add-on layer being bonded to the dielectric layer.” *See, e.g.*, Ex. A1, 3:9–15, 5:1–6:14, Figs. 2A, 5C–5D, 6B–6C; *see also* Ex. A3, 11:24–31, 12:17–25, 55:30–36, Figs. 35, 83A. A person skilled in the art would have recognized that for a memory device to function properly, a stackable add-on

layer would need to be bonded to a dielectric above a substrate. A person skilled in the art would have also recognized that using a dielectric for bonding stackable add-on layers allows for stronger bonding at a lower temperature as compared to other forms of bonding, such as silicon-to-silicon bonding. Thus, a person of ordinary skill in the art would have been motivated to modify any of the primary references to include this feature. A person of ordinary skill in the art would also have had a reasonable expectation of success given the well-known uses of dielectric bonding in semiconductor processing and 3D integration. A person of ordinary skill in the art would have understood that these references disclose interrelated teachings based on routine technologies and would have been amendable to various well-understood and predictable combinations.

In addition, to the extent that any primary reference is deemed not to anticipate dependent claim 14 for failing to teach, “wherein the vertically oriented semiconductor nonvolatile memory cell comprises a vertical transistor having a floating gate and a control gate,” it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the primary reference with any of the prior art that discloses this limitation in Exhibits A1 to A22. For example, the charted prior art references disclose “a vertical transistor having a floating gate and a control gate.” *See, e.g.*, Ex. A1, 6:15–19, Fig. 7; *see also* Ex. A3, 14:10–31, 15:41–54, 18:19–30, Figs. 1A, 2. A person skilled in the art would have recognized that a non-volatile memory transistor requires a structure to store charges when the transistor is powered off. A person skilled in the art would have also known that there were two common ways to store charges for non-volatile memory—either a floating gate or a charge-trapping insulator—because both methods have been well known since the 1960s. In addition, a person skilled in the art would have known that floating gate devices offer several advantages, including improved data retention, reliability,

and low power consumption. Thus, a person of ordinary skill in the art would have been motivated to modify any of the primary references to include this feature, if it is not expressly disclosed. A person of ordinary skill in the art would also have had a reasonable expectation of success because, by the alleged priority date of the '702 Patent, the use of floating-gate transistors for non-volatile memory products was taught in common semiconductor textbooks, and many commercially-available non-volatile memory products used floating-gate transistors. A person of ordinary skill in the art would have understood that these references disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

In addition, to the extent that any primary reference is deemed not to anticipate dependent claim 15 for failing to teach, “wherein the vertically oriented semiconductor nonvolatile memory cell comprises a vertical transistor having a charge-trapping gate insulator and a gate on a SOI pillar,” it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the primary reference with any of the prior art that discloses this limitation in Exhibits A1 to A22. For example, the charted prior art references disclose “a vertical transistor having a charge-trapping gate insulator and a gate.” *See, e.g.*, Ex. A2 ¶¶ 40, 1139, 1161, Figs. 1, 1171–72; *see also* Ex. A3, 8:40–42, 15:37–40, 18:61–19:5, Fig. 7. A person skilled in the art would have recognized that a non-volatile memory transistor requires a structure to store charges when the transistor is powered off. A person skilled in the art would have also known that there were two common ways to store charges for non-volatile memory—either a floating gate or a charge-trapping insulator—because both methods have been well known since the 1960s. In addition, a person skilled in the art would have known that charge-trapping devices offer several advantages, including scalability for NAND devices without significant changes in architecture

and periphery circuits. Thus, a person of ordinary skill in the art would have been motivated to modify any of the primary references to include this feature. A person of ordinary skill in the art would also have had a reasonable expectation of success because, by the alleged priority date of the '702 Patent, the use of charge-trapping transistors for non-volatile memory products was taught in common semiconductor textbooks, and many commercially-available non-volatile memory products used charge-trapping transistors. A person of ordinary skill in the art would have understood that these references disclose interrelated teachings based on routine technologies and would have been amendable to various well-understood and predictable combinations.

For example, to the extent that any primary reference is deemed not to anticipate dependent claims 14, 15, or 16 for failing to teach “SOI pillar,” it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the primary reference with any of the prior art that discloses this limitation in Exhibits A1 to A22. For example, several prior art references disclose “SOI pillar.” *See, e.g.*, Ex. A2 ¶¶ 329, 662, 1206, Figs. 1, 1171–72; *see also* Ex. A3, 31:41–45, 69:14–20, 69:44–50. A person skilled in the art would have recognized that forming a semiconductor structure on a silicon-on-insulator substrate was common and offered several benefits, including better wafer utilization, improved power consumption, and reduced temperature dependency. Thus, a person of ordinary skill in the art would have been motivated to modify any of the primary references to include this feature. A person of ordinary skill in the art would also have had a reasonable expectation of success because, by the alleged priority date of the '702 Patent, many semiconductor companies used SOI technology for their semiconductor devices. A person of ordinary skill in the art would have

understood that these references disclose interrelated teachings based on routine technologies and would have been amendable to various well-understood and predictable combinations.

In addition, to the extent that any primary reference is deemed not to anticipate dependent claim 16 for failing to teach, “wherein at least two nonvolatile memory cells are vertically oriented and serially connected together and formed with a first SOI pillar,” it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the primary reference with any of the prior art that discloses this limitation in Exhibits A1 to A22. For example, several prior art references disclose “at least two nonvolatile memory cells are vertically oriented and serially connected together and formed with a first SOI pillar.” *See, e.g.*, Ex. A2 ¶¶ 257–58, 1074, 1205–07, Figs. 1, 65, 1171–72; *see also* Ex. A4 at 946–947, Fig. 3(e). A person skilled in the art would have recognized that connecting multiple memory cells vertically in series would further increase the integration density of the memory design and lead to faster write and erase operations as well as decreased power consumption. In addition, a person of ordinary skill in the art would also have known that the most suitable technology in fabricating these stackable add-on layers was silicon-on-insulator (SOI). Thus, a person of ordinary skill in the art would have been motivated to modify any of the primary references to include this feature. A person of ordinary skill in the art would also have had a reasonable expectation of success because, by the alleged priority date of the ’702 Patent, many commercially-available non-volatile memory products included serially-connected memory transistors (e.g., all NAND flash memory). A person of ordinary skill in the art would have understood that these references disclose interrelated teachings based on routine technologies and would have been amendable to various well-understood and predictable combinations.

IV. Invalidity Contentions Under 35 U.S.C. § 112

Defendants include below the grounds on which Defendants contend the asserted claims are invalid for failure to meet the requirements of the first two paragraphs of 35 U.S.C. § 112.

Plaintiff has not yet provided a claim construction for many of the terms and phrases that Defendants anticipate will be in dispute. Defendants, therefore, cannot provide a complete list of its § 112 defenses because Defendants do not know whether Plaintiff will proffer a construction for certain terms and phrases that is broader than, or inconsistent with, the construction that would be supportable by the disclosure set forth in the specification.

To the extent the following contentions reflect constructions of claim limitations consistent with or implicit in Plaintiff's Infringement Contentions, no inference is intended nor should any be drawn that Defendants agree with Plaintiff's claim constructions, and Defendants expressly reserve the right to contest such claim constructions. Defendants offer these contentions in response to Plaintiff's Infringement Contentions and without prejudice to any position it may ultimately take as to any claim construction issues.

Accordingly, Defendants reserve the right to amend or supplement these § 112 Invalidity Contentions as discovery progresses.

A. Indefiniteness Under 35 U.S.C. § 112, ¶ 2

35 U.S.C. § 112, ¶ 2 requires that a patent claim "particularly point[] out and distinctly claim[] the subject matter which the applicant regards as his invention." 35 U.S.C. § 112, ¶ 2. Claim terms that fail to inform those skilled in the art "with reasonable certainty . . . about the scope of the invention" fail the definiteness requirement of 35 U.S.C. § 112, ¶ 2. *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014).

Each of the asserted claims are invalid as indefinite under 35 U.S.C. § 112 because they fail to particularly point out and distinctly claim the subject matter which the applicant regards

as his invention. In particular, the following limitations, read in light of the intrinsic evidence, fail to inform those skilled in the art with reasonable certainty about the scope of the claimed inventions:

- Claim 13: “having a dielectric layer disposed above the electrical devices”
- Claim 13: “a stackable add-on layer . . . the stackable add-on layer being bonded to the dielectric layer”
- Claims 14 and 15: “on a SOI pillar”
- Claim 16: “at least two nonvolatile memory cells are vertically oriented and serially connected together and formed with a first SOI pillar.”

B. Lack of Enablement/Lack of Written Description Under 35 U.S.C. § 112, ¶ 1

The asserted claims of the '702 Patent are further invalid under 35 U.S.C. § 112, ¶ 1 because the specifications do not contain an adequate written description of the subject matter of these claims and would not enable one of skill in the relevant art to make and use the alleged invention.

For a claim to be valid, the specification must contain a written description of the invention. 35 U.S.C. § 112, ¶ 1. To fulfill the written description requirement, it “must clearly allow persons of ordinary skill in the art to recognize that the inventor invented what is claimed.” *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (citation and internal quotation marks omitted). “[T]he applicant must ‘convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention,’ and demonstrate that by disclosure in the specification of the patent.” *Carnegie Mellon Univ. v. Hoffmann-La Roche Inc.*, 541 F.3d 1115, 1122 (Fed. Cir. 2008) (quoting *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1563–64 (Fed. Cir. 1991)).

The specification must also describe “the manner and process of making and using [the invention], in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains . . . to make and use the” invention. *Ariad*, 598 F.3d at 1343; *see also* 35 U.S.C. § 112 ¶ 1. “The enablement requirement is satisfied when one skilled in the art, after reading the specification, could practice the claimed invention without undue experimentation.” *AK Steel Corp. v. Sollac & Ugine*, 344 F.3d 1234, 1244 (Fed. Cir. 2003) (citation omitted). “[T]he scope of the claims must be less than or equal to the scope of the enablement.” *Nat’l Recovery Tech., Inc. v. Magnetic Separation Sys., Inc.*, 166 F.3d 1190, 1196 (Fed. Cir. 1999).

Each of the asserted claims below are invalid because the specifications fail to provide written description and/or an enabling disclosure of at least the following limitations:

- Claim 13: “a stackable add-on layer having a plurality of vertically oriented semiconductor memory cells”
- Claim 13: “the stackable add-on layer being bonded to the dielectric layer”
- Claims 14 and 15: “on a SOI pillar”
- Claim 16: “at least two nonvolatile memory cells are vertically oriented and serially connected together and formed with a first SOI pillar.”

V. Document Production

Pursuant to Patent Local Rule 3-4, Defendants are concurrently producing the prior art identified in these Invalidity Contentions, but Defendants are not required to produce the prior art in the file history of the Asserted Patent.

In addition, based on its investigations to date, Defendants are concurrently producing source code, specifications, schematics, flow charts, artwork, formulas, or other documentation

sufficient to show the operation of any aspects or elements of the Accused Instrumentalities identified by Plaintiff in its P. R. 3-1(c) chart.

Defendants reserve the right to supplement these productions with additional documentation, in accordance with the Federal Rules of Civil Procedure, the Local Rules, the Court's Orders and other applicable rules and statutes.

Dated: July 11, 2023

Respectfully submitted,

/s/ John Kappos

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CERTIFICATE OF SERVICE

Pursuant to the Federal Rules of Civil Procedure, I hereby certify that, on July 11, 2023, all counsel of record who have appeared in this case are being served with a copy of the foregoing via the electronic mail.

/s/ John Kappos

John Kappos

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