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

FORCE MOS TECHNOLOGY, CO., LTD., **Plaintiff,** **v.** **ASUSTEK COMPUTER, INC.,** **Defendant.**	**Civil Action No. 2:22-cv-00460-JRG** **JURY TRIAL DEMAND**

DEFENDANT'S PATENT INITIAL DISCLOSURES

Pursuant to the Court's Docket Control Order (ECF No. 23), Defendant ASUSTek Computer, Inc. ("ASUS" or "Defendant") serves its Patent Initial Disclosures under Local Patent Rules 3-3 (Invalidity Contentions) and 3-4 (Document Production Accompanying Invalidity Contentions) on Plaintiff Force MOS Technology, Co., Ltd. ("Plaintiff" or "Force MOS"). These Patent Initial Disclosures relate to the following U.S. Patent Nos. (collectively, the "Asserted Patents") and claims (collectively, the "Asserted Claims"):

- Claims 1-9 of U.S. Patent No. 7,629,634 ("'634 Patent");
- Claims 1-20 of U.S. Patent No. 7,847,346 ("'346 Patent"); and
- Claim 1 of U.S. Patent No. 7,812,409 ("'409 Patent").[1]

In its Infringement Contentions dated May 16, 2023, Force MOS has alleged that the Asserted Patents are entitled to the following priority dates:

[1]The Asserted Patents and Asserted Claims identified herein are based on the claims and patents included in Force MOS's Infringement Contentions dated May 16, 2023.

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Inergy v. Force MOS, IPR2024-00094

Asserted Patent	Alleged Priority Date[2]
’634 Patent	February 23, 2008
’346 Patent	November 26, 2008
’409 Patent	December 4, 2006

INTRODUCTION

Defendant’s Invalidity Contentions reflect present knowledge and contentions, and ASUS reserves all rights to modify and supplement these contentions inthe event that additional invalidity or unenforceability grounds are identified or for all other reasons permitted by the applicable Local Rules and/or legal precedent of this Court. Defendant has not yet completed its investigation, collection of information, discovery, or analysis relating to this action. Such further investigation and discovery may require ASUS to supplement or modify these contentions. For example:

- ASUS has not yet deposed the named inventors of the Asserted Patents and/or other persons having potentially relevant information, including information regarding the prior art, but intend to engage in this and other such discovery consistent with this Court’s Docket Control Order (ECF No. 23);
- ASUS prepared these Invalidity Contentions before it has had an opportunity to conduct full discovery in this case; and
- Claim terms and/or phrases in the Asserted Patents do not have a clear and unambiguous meaning and have yet to be construed by the Court.

Accordingly, Defendant reserves the right to supplement these contentions based on such discovery or claim constructions. Defendant also reserves the right to identify additional teachings in the same references or in other references that anticipate or would have made the addition of any allegedly missing limitation to the invention obvious. Defendant further reserves the right to introduce and use such supplemental materials at trial. Further, to the extent that Force MOS is

[2]ASUS reserves the right to challenge Force MOS’s alleged priority dates. ASUS has relied on these alleged priority dates in preparing these Invalidity Contentions but in no way concedes that the alleged priority dates are accurate.

granted leave to amend their contentions, Defendant will supplement its invalidity contentions to address any such amendment(s).

Defendant's Invalidity Contentions are not, and should not been seen as, admissions or adoptions as to any particular claim scope or construction, or as any admission that any particular element is met in any particular way. ASUS objects to any attempt to imply claim constructions from any identification or description of potential prior art. In addition, Defendant's Invalidity Contentions may rely upon Force MOS's improper assertions of infringement and improper applications of the claims, but ASUS does not agree with those applications and denies infringement.

ASUS reserves all rights to rely on witness testimony to supplement these Invalidity Contentions, where appropriate. Further, to the extent an accused product or feature comprises or arises from prior art, ASUS contends, without admitting purported infringement, that the claims of the Asserted Patents are anticipated and/or made obvious in light of that prior art.

ASUS further reserves all rights to seek leave to amend their Invalidity Contentions in view of, without limitation: (1) information provided by Plaintiff concerning its infringement allegations, theories, contentions, facts supporting them, prior or concurrent suits involving the Asserted Patents or related patents, and/or positions that Plaintiff or its fact or expert witness(es) may take concerning claim construction, infringement, and/or invalidity issues; (2) information provided by Plaintiff concerning the alleged priority, conception, and reduction to practice dates for any of the asserted claims; (3) any change by Plaintiff in the asserted claims; (4) the claim construction process; (5) additional prior art, including, without limitation, prior art obtained through discovery from Plaintiff or a third party or from prior suits involving the Asserted Patents or related patents; or (6) any other basis in law or in fact.

INVALIDITY CONTENTIONS

I. IDENTIFICATION OF PRIOR ART UNDER 35 U.S.C. §§ 102 AND 103

Defendant provides in the lists below the currently known prior art that anticipates or

renders obvious the Asserted Patents' Asserted Claims under 35 U.S.C. § 102 and/or § 103 (pre-AIA) expressly or inherently, as further discussed below in Section II(A)-(C) and in the charts attached as Exhibits A-1 through A-17; B-1 through B-20; and C-1 through C-11.

For references that qualify as prior art under 35 U.S.C. § 102 (whether used as prior art for anticipation or obviousness), those references were publicly known or used; patented or described in a printed publication; described in an application for patent; in public use or on sale; and/or otherwise publicly available no later than their respective filing / publication / issue / on sale dates, and persons with knowledge of that public availability include without limitation the author(s) of the reference, the inventors, and/or the companies or makers of the product(s). Defendant continues to investigate the prior art identified below and reserves the right to offer additional evidence that may be uncovered after further discovery.

Exhibit No.	**Prior Art Reference**[3]	**Inventor**	**Date of Filing / Issue / Publication**
A-1	US 2007/0093019	Rieger	Filed: September 26, 2006; Published: April 26, 2007
A-2	JP 2005-183547	Hebinuma	Filed: December 17, 2003; Published: July 7, 2005
A-3	US 2006/0209887	Bhalla	Filed: March 10, 2006; Published: September 21, 2006
A-4	US 2004/0169220	Takemori	Filed: November 27, 2002; Published: September 2, 2004
A-5	DE 102004009083	Hirler	Filed: February 25, 2004; Published: September 22, 2005
A-6	US 7,112,843	Takaishi	Filed: March 26, 2004; Published: September 30, 2004 Issued: September 26, 2006
A-7	DE 102005055838	Zundel	Filed: November 23, 2005; Published: May 31, 2007
A-8	JP 2001-284587	Kanamaru	Filed: March 28, 2000; Published: October 12, 2001
A-9	US 6,927,101	Henninger	Filed: March 28, 2003; Published: October 2, 2003; Issued: August 9, 2005
A-10	US 2004/0021174	Kobayashi	Filed: April 24, 2003;

[3] *See also* the prior art references cited within each Exhibit, as further explained in Section II.A.-II.C.

			Published: February 5, 2004
A-11	US 2009/0090966	Thorup	Filed: September 30, 2008; Published: April 9, 2009; Claims priority to Provisional application No. 60/977,635 filed on October 4, 2007
A-12	US 2007/0221952	Thorup	Filed: March 24, 2006; Published: September 27, 2007
A-13	US 2006/0273382	Hshieh	Filed: August 15, 2005; Published: December 7, 2006
A-14	US 2006/0180855	Lui	Filed: February 11, 2005; Published: August 17, 2006
A-15	US 2008/0001220	Lui	Filed: September 11, 2007; Published: January 3, 2008; Claims priority to Provisional application No. 11/056,346 filed on February 11, 2005
A-16	US 2006/0273384	Hshieh	Filed: September 26, 2005; Published: December 7, 2006
A-17	US 2005/0029584	Shiraishi	Filed: July 8, 2004; Published: February 10, 2005
A-17	US 2004/0026753	Matsuki	Filed: May 16, 2003; Published: February 12, 2004
A-17	US 2003/0011027	Zeng	Filed: July 16, 2002; Published: January 16, 2003
A-17	KR 10-0630437	Byeong-Ok Cho	Filed August 31, 2005; Published October 2, 2006
B-1	US 6,888,196	Kobayashi	Filed: April 24, 2003; Published: February 5, 2004; Issued: May 3, 2005
B-2	US 7,102,182	Takemori	Filed: November 27, 2002; Published: September 2, 2004; Issued: September 5, 2006
B-3	US 4,853,345	Himelick	Filed: August 22, 1988; Issued and Published: August 1, 1989
B-4	US 2004/0012050	Uno	Filed: June 18, 2003; Published: January 22, 2004
B-5	US 7,521,773	Yilmaz	Filed: March 31, 2006; Issued: April 21, 2009; Published: October 4, 2007
B-6	US 7,075,147	Cao	Filed: June 8, 2004; Published: January 13, 2005; Issued: July 11, 2006;

			Claimed benefit to provisional application No. 60/478,004 filed June 11, 2003
B-7	US 2009/0090966	Thorup	Filed: September 30, 2008; Published: April 9, 2009; Claims priority to Provisional application No. 60/977,635 filed on October 4, 2007
B-8	US 2007/0221952	Thorup	Filed: March 24, 2006; Published: September 27, 2007
B-9	US 2006/0209887	Bhalla	Filed: March 10, 2006; Published: September 21, 2006
B-10	US 2006/0267090	Saap	Filed: April 4, 2006; Published: November 30, 2006; Claimed benefit to U.S. Provisional Application No. 60/669,063 filed April 6, 2005
B-11	US 2008/0150018	Tanabe	Filed: December 20, 2007; Published: June 26, 2008
B-12	Publication, Silicon Carbide MOSFETs	Myeong-Seob So	May, 1999
B-13	US 7,615,849	Nakamura	Filed: September 11, 2006; Published: March 15, 2007; Issued: November 10, 2009
B-14	US 2006/0273382	Hshieh	Filed: August 15, 2005; Published: December 7, 2006
B-15	US 8,067,798	Hino	Filed in Japan: March 31, 2008; Filed in the US: March 30, 2009; Published: October 1, 2009; Issued: November 29, 2011
B-16	US 7,807,536	Sreekantham	Filed: August 29, 2006; Published: August 16, 2007; Issued: October 5, 2010
B-17	US 2005/0167742	Challa	Filed: December 29, 2004; Published: August 4, 2005
B-18	US 6,137,135	Kubo	Filed: August 7, 1998; Issued: October 24, 2000
B-19	US 7,800,169	Bhalla	Filed: September 11, 2007; Issued: September 21, 2010
B-20	Publication, *Copper Wirebonding*		EESEMI (Published 2005)
B-20	Publication, *Current Distribution in High RF Power Transistors*	Jihad Mohamad El-Rashid;	September 2007

		Youssef Tawk	
B-20	Publication, *Formation of Low Temperature Silicon Dioxide Films Using Chemical Vapor Deposition*	Hsiao-Hui Chen	Wallace Memorial Library of Rochester Institute of Technology (Published September 10, 1991)
B-20	US 2006/0180855	Bhalla	Filed: February 11, 2005; Published: August 17, 2006
B-20	US 2008/0080112	Lin	Filed September 29, 2007; Published April 3, 2008
B-20	US 2010/0052174	Bachman	Filed: August 27, 2008; Published: March 4, 2010
B-20	US 6,815,836	Ano	Filed March 24, 2003; Issued November 9, 2004
B-20	US 7,408,251	Hata	Filed: December 21, 2005; Published: May 11, 2006
B-20	US 7,511,361	Zhang	Filed: June 10, 2005; Published: July 6, 2006; Issued: March 31, 2009
B-20	US 7,514,353	Weidman	Filed: March 20, 2006; Published: November 9, 2006; Issued: April 7, 2009
B-20	AO4496 Product manufactured by Alpha and Omega Semiconductor		In use and on sale / offered for sale at least by September 2008
B-20	FDS8880 Product manufactured by Fairchild Semiconductor		In use and on sale / offered for sale at least by April 2007
C-1	US 5,216,275	Chen	Filed: September 17, 1991; Issued: June 1, 1993
C-2	US 6,630,698	Deboy	Filed on April 22, 1999; Issued: October 7, 2003
C-3	US 5,406,104	Hirota	Filed: January 14, 1994; Issued: April 11, 1995
C-4	US 5,763,914	Hshieh	Filed: July 16, 1997; Issued on June 9, 1998
C-5	US 6,320,223	Hueting	Filed on March 17, 2000; Issued on November 20, 2001
C-6	US 5,852,315	Ker	Filed on February 25, 1997; Issued on December 22, 1998
C-7	US 6,888,196	Kobayashi	Filed: April 24, 2003; Published: February 5, 2004; Issued: May 3, 2005
C-8	US 7,052,954	Nakamura	Filed on August 29, 2003; Published on May 20, 2004; Issued on May 30, 2006

C-9	US 6,140,687	Shimomura	Filed on November 26, 1997; Issued on October 31, 2000
C-10	US 6,133,587	Takeuchi	Filed on February 13, 1998; Issued: October 17, 2000
C-11	US 2004/0012050	Uno	Filed: June 18, 2003; Published: January 22, 2004
C-11	KR 10-0630437	Byeong-Ok Cho	Filed August 31, 2005; Published October 2, 2006

Below are listings of the currently known prior art that anticipates or renders obvious the Asserted Patents' Asserted Claims under 35 U.S.C. § 102 and/or § 103 (pre-AIA) expressly or inherently, including United States Patents and Patent Publication References (Section I.A.); Foreign Patents and Patent Publication References (Section I.B.); Printed Publication References (Section I.C.); Product-Related References, including On-Sale, Offers for Sale, Uses, or other Public Availability (Section I.D.). Additional information and references are provided identified in Section I.E. Copies of the references identified below are being produced along with these Invalidity Contentions, bearing the following Bates ranges: ASUS_00000001–ASUS_00003629.[4]

A. United States Patent/Patent Publication References

Patent or patent publication number	Date of Filing / Issue / Publication
US 2003/0011027	Filed on July 16, 2002; Published on January 16, 2003
US 2003/0060013 A1	Filed on September 24, 1999; Published on March 27, 2003
US 2004/0012050	Filed: June 18, 2003; Published: January 22, 2004
US 2004/0021174	Filed on April 24, 2003; Published on February 5, 2004
US 2004/0026753	Filed on May 16, 2003; Published on February 12, 2004
US 2004/0169220	Filed on November 27, 2002; Published on September 2, 2004
US 2004/0164304 A1	Filed on November 14, 2003; Published on August 26, 2004
US 2005/0029584	Filed on July 8, 2004; Published on February 10, 2005

[4]As a courtesy, Defendant has also provided AOS_0003031, AOS_0003046-AOS_0003047, AOS_0003050, and AOS_0003051 contemporaneously with its Invalidity Contentions and disclosures, for reference.

Patent or patent publication number	Date of Filing / Issue / Publication
US 2005/0199918 A1	Filed on March 15, 2004; Published on September 15, 2005
US 2006/0145318	Filed on June 10, 2005; Published on July 7, 2006
US 2006/0180855	Filed on February 11, 2005; Published on August 17, 2006
US 2006/0209887	Filed on March 10, 2006; Published on September 21, 2006
US 2006/0273382	Filed on August 15, 2005; Published on December 7, 2006
US 2006/0273384	Filed on September 26, 2005; Published on December 7, 2006
US 2006/0102953	Filed on November 15, 2005; Published on May 18, 2006
US 2006/0128100	Filed on February 2, 2006; Published on June 15, 2006
US 2006/0226474	Filed on April 12, 2005; Published on October 12, 2006
US 2006/0252192	Filed on July 11, 2006; Published on November 9, 2006
US 2006/0258105 A1	Filed on March, 31, 2006; Published on November 16, 2006
US 2006/060916 A1	Filed on August 25, 2005; Published on March 23, 2006
US 2007/0093019	Filed on September 26, 2006; Published on April 26, 2007
US 2007/0221952	Filed on March 24, 2006; Published on September 27, 2007
US 2007/0018274	Filed on June 30, 2006; Published on January 25, 2007
US 2007/093019 A1	Filed on September 26, 2006; Published on April 26, 2007
US 2007/218615 A1	Filed on May 17, 2007; Published on April 6, 2010
US 2008/0150018	Filed on December 20, 2007; Published on June 26, 2008
US 2008/0150018 A1	Filed on December 20, 2007; Published on June 26, 2008
US 2008/197361 A1	Filed on January 29, 2008; Published on August 21, 2008
US 2009/0090966	Filed on September 30, 2008; Published on April 9, 2009; Claims priority to Provisional application No. 60/977,635 filed on October 4, 2007
US 2008/0080112	Filed September 29, 2007; Published on April 3, 2008

Patent or patent publication number	Date of Filing / Issue / Publication
US 2009/0166722	Filed on December 28, 2007; Published on July 2, 2009
US 2010/0052174	Filed on August 27, 2008; Published on March 4, 2010
US 4,853,345	Filed on August 22, 1988; Issued and Published on August 1, 1989
US 5,216,275	Filed on September 17, 1991; Issued on June 1, 1993
US 5,406,104	Filed on January 14, 1994; Issued on April 11, 1995
US 5,763,914	Filed on July 16, 1997; Issued on June 9, 1998
US 5,852,315	Filed on February 25, 1997; Issued on December 22, 1998
US 5,260,227	Filed November 24, 1992; Published and Issued November 9, 1993
US 5,831,288	Filed on September 29, 1997; Published and Issued on November 3, 1998
US 6,096,608	Filed on November 3, 1998; Published on August 1, 2000
US 6,133,587	Filed on February 13, 1998; Issued on October 17, 2000
US 6,137,135	Filed on August 7, 1998; Issued on October 24, 2000
US 6,140,687	Filed on November 26, 1997; Issued on October 31, 2000
US 6,204,533	Filed on June 2, 1998; Published and Issued on March 20, 2001
US 6,222,753	Filed on June 5, 1998; April 24, 2001
US 6,320,223	Filed on March 17, 2000; Issued on November 20, 2001
US 6,630,698	Filed on April 22, 1999; Issued on October 7, 2003
US 6,815,836	Filed March 24, 2003; Issued November 9, 2004
US 6,888,196	Filed on April 24, 2003; Published on February 5, 2004; Issued on May 3, 2005
US 6,927,101	Filed on March 28, 2003; Published on October 2, 2003; Issued on August 9, 2005
US 6,972,464	Filed on June 19, 2003; Published on January 27, 2005; Issued on December 6, 2005
US 6,984,864	Filed on June 18, 2003; Published on January 22, 2004
US 6,586,800	Filed on May 11, 2001; Published on November 15, 2001; Issued on

Patent or patent publication number	Date of Filing / Issue / Publication
	July 1, 2003
US 6,621,107	Filed on August 23, 2001; Published on February 27, 2003; Issued on September 16, 2003
US 6,638,826	Filed on July 16, 2002; Published on January 16, 2003; Issued on October 28, 2003
US 6,713,352	Filed on September 13, 2002; Published on January 16, 2003; Issued on March 30, 2004
US 6,720,616	Filed on December 26, 2001; Published on July 18, 2002; Issued on April 13, 2004
US 6,737,323	Filed on June 11, 2001; Published on February 28, 2002; Issued on May 18, 2004
US 6,770,539	Filed on April 24, 2003; Published on October 30, 2003; Issued on August 3, 2004
US 6,774,434	Filed on November 12, 2002; Published on May 22, 2003; Issued on August 10, 2004
US 6,921,939	Filed on April 27, 2001; Published on January 24, 2002; Issued on July 26, 2005.
US 6,927,101	Filed on March 28, 2003; Published on October 2, 2003; Issued on August 9, 2005
US 2004/0012050	Filed: June 18, 2003; Published: January 22, 2004
US 6,974,750	Filed on February 24, 2004; Published on December 16, 2004; Issued on December 13, 2005
US 7,052,954	Filed on August 29, 2003; Published on May 20, 2004; Issued on May 30, 2006
US 7,075,147	Filed on June 8, 2004; Published on January 13, 2005; Issued on July 11, 2006; Claimed benefit to provisional application No. 60/478,004 filed June 11, 2003
US 7,102,182	Filed on November 27, 2002; Published on September 2, 2004; Issued on September 5, 2006
US 7,112,843	Filed on March 26, 2004; Published on September 30, 2004 Issued on September 26, 2006
US 7,282,765	Filed on July 13, 2005; Published on January 18, 2007; Issued on October 16, 2007
US 2006/0180855	Filed on February 11, 2005; Published on August 17, 2006
US 7,345,342	Filed on December 29, 2004; Published on August 4, 2005
US 2005/0167742	Filed on December 29, 2004; Published on August 4, 2005
US 7,408,251	Filed on December 21, 2005; Published on May 11, 2006

Patent or patent publication number	Date of Filing / Issue / Publication
US 7,446,374	Filed on March 24, 2006; Published on September 27, 2007
US 7,446,375	Filed on March 14, 2006; Published on September 20, 1007; Issued on November 4, 2008
US 7,453,119	Filed on March 10, 2006; Published on September 21, 2006
US 7,504,306	Filed on April 4, 2006; Published on November 30, 2006; Claimed benefit to U.S. Provisional Application No. 60/669,063 filed April 6, 2005
US 2006/0267090	Filed on April 4, 2006; Published on November 30, 2006; Claimed benefit to U.S. Provisional Application No. 60/669,063 filed April 6, 2005
US 7,511,361	Filed on June 10, 2005; Published on July 6, 2006; Issued on March 31, 2009
US 7,514,353	Filed on March 20, 2006; Published on November 9, 2006; Issued on April 7, 2009
US 7,521,773	Filed on March 31, 2006; Issued on April 21, 2009; Published on October 4, 2007
US 2008/0001220	Filed on September 11, 2007; Published on January 3, 2008; Claims priority to Provisional application No. 11/056,346 filed on February 11, 2005
US 7,615,849	Filed on September 11, 2006; Published on March 15, 2007; Issued on November 10, 2009
US 7,800,169	Filed on September 11, 2007; Issued on September 21, 2010
US 7,807,536	Filed on August 29, 2006; Published on August 16, 2007; Issued on October 5, 2010
US 7,112,843	Filed on March 26, 2004; Published on September 30, 2004; Issued on September 26, 2006
US 7,118,953	Filed on June 1, 2005; Published on October 6, 2005; Issued on October 10, 2006
US 7,211,862	Filed on October 14, 2005; Published on February 9, 2006; Issued on May 1, 2007
US 7,217,976	Filed on February 8, 2005; Published on August 11, 2005; Issued on May 15, 2007
US 7,345,342	Filed on December 29, 2004; Published on August 4, 2005; Issued on March 18, 2008
US 7,365,392	Filed on December 14, 2004; Published on April 28, 2005; Issued on April 29, 2008.
US 7,473,604	Filed on January 12, 2007; Published on May 17, 2007; Issued on January 6, 2009
US 7,645,690	Filed on February 15, 2007; Published on February 21, 2008; Issued on January 12, 2010

Patent or patent publication number	Date of Filing / Issue / Publication
US 7,750,398	Filed on September 26, 2007; Published on March 5, 2009; Issued on July 6, 2010.
US 7,791,135	Filed on January 29, 2008; Published on August 21, 2008; Issued on September 7, 2010
US 7,943,990	Filed on August 14, 2006; Published on February 22, 2007; Issued on May 17, 2011
US 8,067,798	Filed in Japan on March 31, 2008; Filed in the US on March 30, 2009; Published on October 1, 2009; Issued on November 29, 2011
US 8,686,493	Filed on September 30, 2008; Published on April 9, 2009; Claims priority to Provisional application No. 60/977,635 filed on October 4, 2007

B. Foreign Patent/Patent Publication References

Patent or patent publication number	Date of Filing / Issue / Publication
KR 10-0630437	Filed August 31, 2005; Published October 2, 2006
TW 200612497A	Filed October 4, 2004; Published April 16, 2006
JP H11-330469A	Filed May 21, 1998; Published November 30, 1999
JP 2003168799A	Filed December 3, 2001; Published June 13, 2003
DE 102004009083	Filed on February 25, 2004; Published on September 22, 2005
DE 102005055838	Filed on November 23, 2005; Published on May 31, 2007
JP 2001-284587	Filed on March 28, 2000; Published on October 12, 2001
WO1997036329	Filed March 26, 1997; Published October 2, 1997
KR 20030076804A	Filed March 21, 2002; Published September 29, 2003
JP 5017823	Filed September 12, 2005; Published March 29, 2007
JP 2009246225	Filed March 31, 2008; Published October 22, 2009
JP 2006203131A	Filed January 24, 2005; Published August 3, 2006
JP 2006140239A	Filed November 11, 2004; Published June 1, 2006
JP 2006093186A	Filed September 21, 2004; Published April 6, 2006
JP 2005174996A	Filed December 8, 2003; Published June 30, 2005

Patent or patent publication number	Date of Filing / Issue / Publication
JP 2005174996	Filed December 8, 2003; Published June 30, 2005
JP 2004303964	Filed March 31, 2003; Published October 28, 2004
JP 2005183547A	Filed December 17, 2003; Published July 7, 2005
JP 2001284587	Filed March 28, 2000; Published October 12, 2001
DE 102006049043	Filed October 18, 2006; Published April 24, 2008
DE 102006011283	Filed March 10, 2006; Published and Issued September 27, 2007
CN 1941417A	Filed September 19, 2006; Claimed benefit to U.S. Patent App. No. 11/236,007 filed September 26, 2005; Published April 4, 2007

C. Printed Publication References

Printed publication title, author, etc.	Date of Publication
"A high-performance self aligned UMOSFET with a vertical trench contact structure"; Satoshi Matsumoto et al.	May 1994
"A New Trenched Source Power MOSFET Improving Avalanche Energy"; Soo-Seong Kim et al	April 2003
"High Voltage Silicon Carbide UMOSFETS"; Imran A. Khan	August 2002
"High-Density Trench DMOSFETs Employing Two Step Trench Technique and Trench Contact Structure"; Jongdae Kim et al.	April 14-17, 2003
"Copper Wirebonding"; EE Semi	2005
"Current Distribution in High RF Power Transistors"; Jihad Mohamad, El-Rashid, Youssef Tawk	September 2007
"Formation of Low Temperature Silicon Dioxide Films Using Chemical Vapor Deposition"; Hsiao-Hui Chen	September 10, 1991
"Silicon Carbide MOSFETs"; Myeong-Seob So	May 1, 1999
"Synchronous Rectifiers Using New Structure MOSFET"; Y. Fukumochi, I. Suga, T. Ono	1995

D. Product On Sale/Offered for Sale, Product Use, or Otherwise Publicly Available Product References

Product	Date Publicly Available
FDS8880 Product Line	September, 2008

Product	Date Publicly Available
AO4496 Product Line	April, 2007

In addition, the following Panjit product(s) qualify as prior art and were publicly available at least by the below dates:

Product	Date Publicly Available
2N7002	December 17, 2004
2N7002W	February 27, 2006
2N7002DW	February 27, 2006

See ASUS_00000013-ASUS_00000096. On information and belief, there were relevant sales or offers for sales associated with these products around the same time frame. ASUS's investigation is ongoing, and ASUS reserves the right to further supplement its Invalidity Contentions to include any uncovered product prior art sales, offers for sale, uses, or other public availability of these products.

E. Identification of Other References

Each of the references and systems listed in the Sections above qualifies as prior art under one or more sections of 35 U.S.C. §§ 102 and/or 103. The invalidating disclosure in each of the listed references and materials is express, implicit, and/or inherent. The references provided herein may also be relied upon to show the state of the art in the relevant time frame. Also, to the extent that any of the references listed above are deemed not to be prior art, they may nevertheless provide evidence of prior or simultaneous invention, thereby supporting the obviousness of the asserted claims.

To the extent they constitute prior art, Defendant reserves the right to rely upon any of the following art related to the prior art identified herein: (i) foreign counterparts of the U.S. patents identified; (ii) U.S. counterparts of any foreign patents and foreign patent applications identified; (iii) U.S. and foreign patents and patent applications corresponding to any articles and publications

identified; (iv) any products, prior inventions, or publications that relate to any references identified; (v) any patents, patent applications, or publications that relate to any identified system or method; (vi) admitted prior art or background art in the Asserted Patents or their foreign counterparts; (vii) any Force MOS products or publications that relate to any of the Asserted Patents or their foreign counterparts, including those identified in Force MOS's Local Patent Rule 3-1 and 3-2 Patent Disclosures dated May 16, 2023; (viii) any references, publications, patents, patent publications, articles, prior inventions, or publications that are discovered during this litigation; (viv) any prior art known to or discovered by Force MOS that relates to any of the Asserted Patents; (x) any prior art disclosed by third parties or non-parties, including but not limited to during this litigation and during parallel proceedings (in the US or abroad) involving one or more of the Asserted Patents or their foreign counterparts.[5]

In addition, the specifications and prosecution histories of the Asserted Patents and related patents and/or applications contain descriptions of, and admissions concerning, the scope of the claims. Defendant intends to rely upon these descriptions and admissions. Defendant also identifies all prior art references cited to, included in, or incorporated by reference in the Asserted Patents and their prosecution histories, as well as any statements regarding the prior art in the Asserted Patents and their prosecution histories. Defendant also identifies all prior art references cited to, included in, or incorporated by reference in any of the above-identified prior art references. Defendant reserves the right to amend their contentions to include additional prior art references.

II. INVALIDITY CONTENTIONS REGARDING THE ASSERTED PATENTS

These Invalidity Contentions disclose the current basis for Defendant's contentions regarding invalidity—i.e., prior art references under Pre-AIA 35 U.S.C. §§ 102 and 103, indefiniteness under Pre-AIA 35 U.S.C. § 112 ¶ 2, and enablement and written description defects

[5]To date, Plaintiff has not produced any invalidity contentions, disclosures, or prior art discovered, received, or otherwise identified in *Alpha and Omega Semiconductor, Ltd. et al v. Force MOS Technology Co., Ltd.*, Civ. No. 4-22-cv-05488 (NDCA). Defendant reserves all rights to amend these contentions based on any information or prior art provided in such invalidity contentions or disclosures.

under 35 U.S.C. § 112 ¶ 1. These contentions do not address bases for unenforceability, including improper inventorship or inequitable conduct, pursuant to the Local Rules.

A. Anticipation and Obviousness References and Combinations

Pursuant to P.R. 3-3(a)-(b) and the Court's Docket Control Order (ECF No. 23), and in light of Force MOS's Infringement Contentions and accompanying claim charts, Defendant lists below the prior art now known to Defendant that anticipates or renders obvious the asserted claims under 35 U.S.C. §§ 102 and/or 103. Defendant's contentions do not imply any admission or suggestion that a specific prior art reference does not independently anticipate the Asserted Claims. Each individual prior art reference identified in Section I, above, that anticipates and/or each combination that renders obvious the Asserted Patents' Asserted Claims is described below, and in Exhibits A-1 through A-17; B-1 through B-20; and C-1 through C-11.

Although Defendant has identified at least one disclosure of a limitation for each prior art reference, each and every disclosure of the same limitation in the same reference is not necessarily identified. To focus the issues, Defendant cites in Exhibits A-1 through A-17; B-1 through B-20; and C-1 through C-11 only representative portions of an identified reference, even where a reference may contain additional support for a particular claim limitation. Persons of ordinary skill in the art generally read an item of prior art as a whole and in the context of other publications and literature. Thus, to understand and interpret any specific statement or disclosure within a prior art reference, such persons would rely on other information within the reference, along with other publications and their general scientific knowledge. Defendant may rely upon uncited portions of the prior art references and on other publications and expert testimony to provide context, and as aids to understanding and interpreting the portions that are cited.

Where ASUS cites to a particular drawing or figure in the claim charts, the citation encompasses not only the drawing or figure, but also any corresponding text within the specification of the prior art reference associated with the drawing or figure. Similarly, where ASUS cites to particular text of the specification that relates to or references a drawing or figure

in a prior art reference, the citation should be understood to encompass not only the text, but also the drawing or figure associated with that reference.

ASUS does not take any position at this time as to whether the subject matter recited in the preambles limits the claims and will address this issue at the appropriate juncture.

Further, some or all of the systems and methods identified below or identified in the prior art publications and patents may be the subject of continuing investigation and discovery, including third party discovery. Defendant reserves the right to supplement its contentions consistent with the Federal Rules and the Local Patent Rules, in the event that additional information is discovered relating to these systems and methods.

Defendant identifies the below reference(s) as anticipating one or more of the Asserted Claims of each of the Asserted Patents under 35 U.S.C. § 102, as further discussed below. To the extent any item of prior art cited above is deemed not to disclose, explicitly or inherently, any limitation of the Asserted Patents' Asserted Claim[s], Defendant reserves the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent to the art, or obvious to one of ordinary skill in the art, even if they have not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art. Each prior art reference above describing or relating to a prior art system and/or method should be understood to discuss the system and/or method's capabilities generally and also to discuss specific examples of specific installations of the particular system and/or method. To the extent the prior art references describe various implementations of the same underlying system and/or method, that underlying system and/or method is a single reference under 35 U.S.C. §§ 102(a), 102(b), and/or 102(e). The prior art references are evidence of the capabilities of the prior art system and/or method, and each chart provided for a prior art system and/or method should be understood to incorporate by reference all printed publications describing or relating to that prior art system and/or method and all charts provided for those printed publications. In addition, each reference itself may also qualify as prior art on separate grounds as a publication under §§ 102(a), 102(b), and/or 102(e). Even if the prior art references are not treated as a single prior art reference, at the

very least, it would have been obvious to combine the features described in those references.

In addition to the anticipatory references described in these Invalidity Contentions, each prior art reference identified above and described in the charts attached as Exhibits A-1 through A-17; B-1 through B-20; and C-1 through C-11, either alone or in combination with other prior art, also renders the Asserted Claims invalid as obvious under 35 U.S.C. § 103 as described in those Exhibits. Each identified prior art reference may be combined with: (i) information known to persons skilled in the art at the time of the alleged inventions of the Asserted Patents; (ii) any of the other anticipatory or other prior art references identified in these contentions or the accompanying charts.

In addition, Defendant incorporates by reference each and every prior art reference of record in the prosecution histories of the Asserted Patents, counterpart patents, and related patent applications, as well as all statements made by the applicant in the prosecution histories of the Asserted Patents, counterpart patents, and related patent applications, including any discussion of prior art or conventional features in any of the specifications of the Asserted Patents, counterpart patents, and related patent applications.

Defendant incorporates by reference the statements and reasoning by the U.S. Patent and Trademark Office during prosecution of the Asserted Patents and any counterpart patents or applications, and any parent or child patents or applications, as to why it would have been obvious to modify or combine prior art references to achieve the limitations of the Asserted Claims or similar claims in any counterparts.

1. Anticipation and/or Obviousness of the ’634 Patent

Attached hereto as Exhibits A-1 through A-17 are charts that set forth where in the prior art references to each element of the Asserted Claims of the ’634 Patent can be found.

Exhibit A-1 provides examples of where Rieger discloses, either expressly or inherently, each limitation of the Asserted Claims of the ’634 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Rieger does not anticipate and/or

render obvious the Asserted Claims of the ’634 Patent, it would have been obvious for a person of ordinary skill in the art (POSITA) to combine or modify Rieger with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits A-2 through A-17. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Rieger based on at least one of Hebinuma (Ex. A-2), Takemori (Ex. A-4), Hirler (Ex. A-5), Takaishi (Ex. A-6), Kanamaru (Ex. A-8), Kobayashi (Ex. A-10), Thorup 966 (Ex. A-11), and/or 103 chart (Ex. A-17), to form “a bottom metal layer [] on the lower surface of said semiconductor region.”

Exhibit A-2 provides examples of where Hebinuma discloses, either expressly or inherently, each limitation of the Asserted Claims of the ’634 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Hebinuma does not anticipate and/or render obvious the Asserted Claims of the ’634 Patent, it would have been obvious for a POSITA to combine or modify Hebinuma with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits A-1 and A-3 through A-17. For example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Hebinuma based on at least one of Rieger (Ex. A-1), Bhalla (Ex. A-3), Hirler (Ex. A-5), Takaishi (Ex. A-6), Henninger (Ex. A-9), Kobayashi (Ex. A-10), Thorup 966 (Ex. A-11), Thorup 952 (Ex. A-12), Hshieh 382 (Ex. A-13), Lui 855 (Ex. A-14), Lui 220 (Ex. A-15), Hshieh 384 (Ex. A-16), and/or 103 chart (Ex. A-17), to have “the sidewalls of said trenches in said base layer [] covered by the lateral contact layer.”

Exhibit A-3 provides examples of where Bhalla discloses, either expressly or inherently, each limitation of the Asserted Claims of the ’634 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Bhalla does not anticipate and/or render obvious the Asserted Claims of the ’634 Patent, it would have been obvious for a POSITA to combine or modify Bhalla with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits A-1, A-2, and A-4 through A-17. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Bhalla based on at

least one of Rieger (Ex. A-1), Hebinuma (Ex. A-2), Takemori (Ex. A-4), Hirler (Ex. A-5), Takaishi (Ex. A-6), Kanamaru (Ex. A-8), Henninger (Ex. A-9), Kobayashi (Ex. A-10), Thorup 966 (Ex. A-11), Thorup 952 (Ex. A-12), Lui 855 (Ex. A-14), Lui 220 (Ex. A-15), Hshieh 384 (Ex. A-16), and/or 103 chart (Ex. A-17), to have "the bottom base of said trenches in said base layer [] covered by the base contact layer."

Exhibit A-4 provides examples of where Takemori discloses, either expressly or inherently, each limitation of the Asserted Claims of the '634 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Takemori does not anticipate and/or render obvious the Asserted Claims of the '634 Patent, it would have been obvious for a POSITA to combine or modify Takemori with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits A-1 through A-3 and A-5 through A-17. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Takemori based on at least one of Rieger (Ex. A-1), Bhalla (Ex. A-3), Hirler (Ex. A-5), Takaishi (Ex. A-6), Henninger (Ex. A-9), Kobayashi (Ex. A-10), Thorup 966 (Ex. A-11), Thorup 952 (Ex. A-12), Hshieh 382 (Ex. A-13), Lui 855 (Ex. A-14), Lui 220 (Ex. A-15), Hshieh 384 (Ex. A-16), and/or 103 chart (Ex. A-17), to have "the sidewalls of said trenches in said base layer [] covered by the lateral contact layer."

Exhibit A-5 provides examples of where Hirler discloses, either expressly or inherently, each limitation of the Asserted Claims of the '634 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Hirler does not anticipate and/or render obvious the Asserted Claims of the '634 Patent, it would have been obvious for a POSITA to combine or modify Hirler with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits A-1 through A-4 and A-6 through A-17. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Hirler based on at least one of Rieger (Ex. A-1), Bhalla (Ex. A-3), Kanamaru (Ex. A-8), Kobayashi (Ex. A-10), Thorup 966 (Ex. A-11), Hshieh 382 (Ex. A-13), Lui 855 (Ex. A-14), to form a "barrier metal layer."

Exhibit A-6 provides examples of where Takaishi discloses, either expressly or inherently, each limitation of the Asserted Claims of the ’634 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Takaishi does not anticipate and/or render obvious the Asserted Claims of the ’634 Patent, it would have been obvious for a POSITA to combine or modify Takaishi with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits A-1 through A-5 and A-7 through A-17. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Takaishi based on Hirler (Ex. A-5) such that “the lateral contact layer has less doping concentration than the base contact layer.”

Exhibit A-7 provides examples of where Zundel discloses, either expressly or inherently, each limitation of the Asserted Claims of the ’634 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Zundel does not anticipate and/or render obvious the Asserted Claims of the ’634 Patent, it would have been obvious for a POSITA to combine or modify Zundel with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits A-1 through A-6 and A-8 through A-17. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Zundel based on at least one of Rieger (Ex. A-1), Bhalla (Ex. A-3), Hirler (Ex. A-5), Takaishi (Ex. A-6), Henninger (Ex. A-9), Kobayashi (Ex. A-10), Thorup 966 (Ex. A-11), Thorup 952 (Ex. A-12), Hshieh 382 (Ex. A-13), Lui 855 (Ex. A-14), Lui 220 (Ex. A-15), Hshieh 384 (Ex. A-16), and/or 103 chart (Ex. A-17), to have “the sidewalls of said trenches in said base layer [] covered by the lateral contact layer.”

Exhibit A-8 provides examples of where Kanamaru discloses, either expressly or inherently, each limitation of the Asserted Claims of the ’634 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Kanamaru does not anticipate and/or render obvious the Asserted Claims of the ’634 Patent, it would have been obvious for a POSITA to combine or modify Kanamaru with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits A-1 through A-7 and A-9 through

A-17. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Kanamaru based on at least one of Rieger (Ex. A-1), Hebinuma (Ex. A-2), Takemori (Ex. A-4), Hirler (Ex. A-5), Takaishi (Ex. A-6), Henninger (Ex. A-9), Kobayashi (Ex. A-10), Thorup 966 (Ex. A-11), Thorup 952 (Ex. A-12), Lui 855 (Ex. A-14), Lui 220 (Ex. A-15), Hshieh 384 (Ex. A-16), and/or 103 chart (Ex. A-17), to have "the bottom base of said trenches in said base layer [] covered by the base contact layer."

Exhibit A-9 provides examples of where Henninger discloses, either expressly or inherently, each limitation of the Asserted Claims of the '634 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Henninger does not anticipate and/or render obvious the Asserted Claims of the '634 Patent, it would have been obvious for a POSITA to combine or modify Henninger with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits A-1 through A-8 and A-10 through A-17. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Henninger based on at least one of Hebinuma (Ex. A-2), Takemori (Ex. A-4), Hirler (Ex. A-5), Takaishi (Ex. A-6), Kanamaru (Ex. A-8), Kobayashi (Ex. A-10), and/or Thorup 966 (Ex. A-11) to form "a bottom metal layer [] on the lower surface of said semiconductor region."

Exhibit A-10 provides examples of where Kobayashi discloses, either expressly or inherently, each limitation of the Asserted Claims of the '634 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Kobayashi does not anticipate and/or render obvious the Asserted Claims of the '634 Patent, it would have been obvious for a POSITA to combine or modify Kobayashi with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits A-1 through A-9 and A-11 through A-17. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Kobayashi based on at least one of Bhalla (Ex. A-3), Hirler (Ex. A-5), Takaishi (Ex. A-6), Zundel (Ex. A-7), Thorup 966 (Ex. A-11), Thorup 952 (Ex. A-12), such that "the base layer and the lateral contact layer are P-type."

Exhibit A-11 provides examples of where Thorup 966 discloses, either expressly or

inherently, each limitation of the Asserted Claims of the ’634 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Thorup 966 does not anticipate and/or render obvious the Asserted Claims of the ’634 Patent, it would have been obvious for a POSITA to combine or modify Thorup 966 with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits A-1 through A-10 and A-12 through A-17. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Thorup 966 based on Hirler (Ex. A-5) such that “the lateral contact layer has less doping concentration than the base contact layer at bottom.”

Exhibit A-12 provides examples of where Thorup 952 discloses, either expressly or inherently, each limitation of the Asserted Claims of the ’634 Patent, thereby anticipating and/or rendering obvious those claims . To the extent Force MOS asserts that Thorup 952 does not anticipate and/or render obvious the Asserted Claims of the ’634 Patent, it would have been obvious for a POSITA to combine or modify Thorup 952 with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits A-1 through A-11 and A-13 through A-17. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Thorup 952 based on at least one of Hebinuma (Ex. A-2), Takemori (Ex. A-4), Hirler (Ex. A-5), Takaishi (Ex. A-6), Kanamaru (Ex. A-8), Kobayashi (Ex. A-10), and/or Thorup 966 (Ex. A-11) to form “a bottom metal layer [] on the lower surface of said semiconductor region.”

Exhibit A-13 provides examples of where Hshieh 382 discloses, either expressly or inherently, each limitation of the Asserted Claims of the ’634 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Hshieh 382 does not anticipate and/or render obvious the Asserted Claims of the ’634 Patent, it would have been obvious for a POSITA to combine or modify Hshieh 382 with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits A-1 through A-12 and A-14 through A-17. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Hshieh 382 based on at least one of Rieger (Ex. A-1), Hirler (Ex. A-5),

Takaishi (Ex. A-6), Henninger (Ex. A-9), Kobayashi (Ex. A-10), Thorup 966 (Ex. A-11), Thorup 952 (Ex. A-12), Hshieh 384 (Ex. A-16), and/or 103 chart (Ex. A-17), to have "the sidewalls of said trenches in said base layer [] covered by the lateral contact layer" and to have "the bottom base of said trenches in said base layer [] covered by the base contact layer."

Exhibit A-14/A-15 provides examples of where Lui 855/Lui 220 discloses, either expressly or inherently, each limitation of the Asserted Claims of the '634 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Lui 855/Lui 220 does not anticipate and/or render obvious the Asserted Claims of the '634 Patent, it would have been obvious for a POSITA to combine or modify Lui 855/Lui 220 with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits A-1 through A-13 and A-16 through A-17. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Lui 855/Lui 220 based on at least one of Hebinuma (Ex. A-2), Takemori (Ex. A-4), Hirler (Ex. A-5), Takaishi (Ex. A-6), Kanamaru (Ex. A-8), Kobayashi (Ex. A-10), Thorup 966 (Ex. A-11), and/or 103 chart (Ex. A-17), to form "a bottom metal layer [] on the lower surface of said semiconductor region."

Exhibit A-16 provides examples of where Hshieh 384 discloses, either expressly or inherently, each limitation of the Asserted Claims of the '634 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Hshieh 384 does not anticipate and/or render obvious the Asserted Claims of the '634 Patent, it would have been obvious for a POSITA to combine or modify Hshieh 384 with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits A-1 through A-15, and A-17. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Hshieh 384 based on at least one of Hebinuma (Ex. A-2), Takemori (Ex. A-4), Hirler (Ex. A-5), Takaishi (Ex. A-6), Kanamaru (Ex. A-8), Kobayashi (Ex. A-10), Thorup 966 (Ex. A-11), and/or 103 chart (Ex. A-17), to form "a bottom metal layer [] on the lower surface of said semiconductor region."

2. Anticipation and/or Obviousness of the ’346 Patent

Attached hereto as Exhibits B-1 through B-20 are charts that set forth where in the prior art references to each element of the Asserted Claims of the ’346 Patent can be found.

Exhibit B-1 provides examples of where Kobayashi discloses, either expressly or inherently, each limitation of the Asserted Claims of the ’346 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Kobayashi does not anticipate and/or render obvious the Asserted Claims of the ’346 Patent, it would have been obvious for a person of ordinary skill in the art (POSITA) to combine or modify Kobayashi with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits B-2 through B-20. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Kobayashi based on at least one of Bachman, Lin, Ano, and Zhang (in Exhibit B-20) to include “at least one copper wire electrically bonded to said source metal.”

Exhibit B-2 provides examples of where Takemori discloses, either expressly or inherently, each limitation of the Asserted Claims of the ’346 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Takemori does not anticipate and/or render obvious the Asserted Claims of the ’346 Patent, it would have been obvious for a POSITA to combine or modify Takemori with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits B-1 and B-3 through B-20. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Takemori based on at least one of Uno (Ex. B-4), Sapp (Ex. B-10), Nakamura (Ex. B-13), Hsieh (Ex. B-14), Hino (Ex. B-15), Sreekantham (Ex. B-16), Challa (Ex. B-17), and/or 103 chart (Ex. B-20), to include “a doped polysilicon of said first type conductivity as said trench gates overlying said first insulating layer.”

Exhibit B-3 provides examples of where Himelick discloses, either expressly or inherently, each limitation of the Asserted Claims of the ’346 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Himelick does not anticipate and/or render obvious the Asserted Claims of the ’346 Patent, it would have been obvious for a POSITA

to combine or modify Himelick with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits B-1 through B-2 and B-4 through B-20. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Himelick based on at least one of Kobayashi (Ex. B-1), Takemori (Ex. B-2), Uno (Ex. B-4), Yilmaz (Ex. B-5), Cao (Ex. B-6), Thorup 966 (Ex. B-7), Thorup 952 (Ex. B-8), Bhalla (Ex. B-9), Sapp (Ex. B-10), Tanabe (Ex. B-11), So (Ex. B-12), Hsieh (Ex. B-14), Hino (Ex. B-15), Sreekantham (Ex. B-16), Challa (Ex. B-17), and/or 103 chart (Ex. B-20), to include "a plurality of trenches extending into said epitaxial layer, surrounded by a plurality of said source regions of said first type conductivity above said body regions of said second type conductivity."

Exhibit B-4 provides examples of where Uno discloses, either expressly or inherently, each limitation of the Asserted Claims of the '346 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Uno does not anticipate and/or render obvious the Asserted Claims of the '346 Patent, it would have been obvious for a POSITA to combine or modify Uno with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits B-1 through B-3 and B-5 through B-20. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Uno based on at least one of Kobayashi (Ex. B-1), Takemori (Ex. B-2), Himelick (Ex. B-3), Yilmaz (Ex. B-5), Cao (Ex. B-6), Thorup 966 (Ex. B-7), Thorup 952 (Ex. B-8), Sapp (Ex. B-10), Tanabe (Ex. B-11), So (Ex. B-12), Nakamura (Ex. B-13), Hsieh (Ex. B-14), Hino (Ex. B-15), Sreekantham (Ex. B-16), Challa (Ex. B-17), and/or 103 chart (Ex. B-20), such that its "epitaxial layer of said first type conductivity over said substrate[] ha[s] a lower doping concentration than said substrate."

Exhibit B-5 provides examples of where Yilmaz discloses, either expressly or inherently, each limitation of the Asserted Claims of the '346 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Yilmaz does not anticipate and/or render obvious the Asserted Claims of the '346 Patent, it would have been obvious for a POSITA to combine or modify Yilmaz with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits B-1 through B-4 and B-6 through B-20. As one example, a

POSITA would have found it obvious and been motivated to modify the MOSFET in Yilmaz based on at least one of Uno (Ex. B-4), Sapp (Ex. B-10), Nakamura (Ex. B-13), Hsieh (Ex. B-14), Hino (Ex. B-15), Sreekantham (Ex. B-16), Challa (Ex. B-17), and/or 103 chart (Ex. B-20), to include "a doped polysilicon of said first type conductivity as said trench gates overlying said first insulating layer."

Exhibit B-6 provides examples of where Cao discloses, either expressly or inherently, each limitation of the Asserted Claims of the '346 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Cao does not anticipate and/or render obvious the Asserted Claims of the '346 Patent, it would have been obvious for a POSITA to combine or modify Cao with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits B-1 through B-5 and B-7 through B-20. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Cao based on at least one of Uno (Ex. B-4), Sapp (Ex. B-10), Nakamura (Ex. B-13), Hsieh (Ex. B-14), Hino (Ex. B-15), Sreekantham (Ex. B-16), Challa (Ex. B-17), and/or 103 chart (Ex. B-20), to include "a doped polysilicon of said first type conductivity as said trench gates overlying said first insulating layer."

Exhibit B-7 provides examples of where Thorup 966 discloses, either expressly or inherently, each limitation of the Asserted Claims of the '346 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Thorup 966 does not anticipate and/or render obvious the Asserted Claims of the '346 Patent, it would have been obvious for a POSITA to combine or modify Thorup 966 with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits B-1 through B-6 and B-8 through B-20. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Thorup 966 based on at least one of Uno (Ex. B-4), Sapp (Ex. B-10), Nakamura (Ex. B-13), Hsieh (Ex. B-14), Hino (Ex. B-15), Sreekantham (Ex. B-16), Challa (Ex. B-17), and/or 103 chart (Ex. B-20), to include "a doped polysilicon of said first type conductivity as said trench gates overlying said first insulating layer."

Exhibit B-8 provides examples of where Thorup 952 discloses, either expressly or

inherently, each limitation of the Asserted Claims of the ’346 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Thorup 952 does not anticipate and/or render obvious the Asserted Claims of the ’346 Patent, it would have been obvious for a POSITA to combine or modify Thorup 952 with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits B-1 through B-7 and B-9 through B-20. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Thorup 952 based on at least one of Uno (Ex. B-4), Sapp (Ex. B-10), Nakamura (Ex. B-13), Hsieh (Ex. B-14), Hino (Ex. B-15), Sreekantham (Ex. B-16), Challa (Ex. B-17), and/or 103 chart (Ex. B-20), to include “a doped polysilicon of said first type conductivity as said trench gates overlying said first insulating layer.”

Exhibit B-9 provides examples of where Bhalla discloses, either expressly or inherently, each limitation of the Asserted Claims of the ’346 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Bhalla does not anticipate and/or render obvious the Asserted Claims of the ’346 Patent, it would have been obvious for a POSITA to combine or modify Bhalla with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits B-1 through B-8 and B-10 to B-20. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Bhalla based on at least one of Kobayashi (Ex. B-1), Takemori (Ex. B-2), Himelick (Ex. B-3), Uno (Ex. B-4), Cao (Ex. B-6), Thorup 966 (Ex. B-7), Thorup 952 (Ex. B-8), Sapp (Ex. B-10), Tanabe (Ex. B-11), Nakamura (Ex. B-13), Challa (Ex. B-17), and/or 103 chart (Ex. B-20), to form “a plurality of source contact trenches penetrating through said second insulating layer and said source regions with vertical sidewalls substantially perpendicular to a top epitaxial surface within said source regions, and further extending into said body regions with tapered sidewalls with respect to said top surface of said epitaxial layer.”

Exhibit B-10 provides examples of where Sapp discloses, either expressly or inherently, each limitation of the Asserted Claims of the ’346 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Sapp does not anticipate and/or render

obvious the Asserted Claims of the ’346 Patent, it would have been obvious for a POSITA to combine or modify Sapp with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits B-1 through B-9 and B-11 through B-20. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Sapp based on at least one of Takemori (Ex. B-2), Himelick (Ex. B-3), and/or 103 chart (Ex. B-20), such that “said second insulating layer is a combination of SRO and PSG or BPSG to further reduce source contact resistance, and each of said source contact trenches has a wider contact width in said PSG or said BPSG than in said SRO.”

Exhibit B-11 provides examples of where Tanabe discloses, either expressly or inherently, each limitation of the Asserted Claims of the ’346 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Tanabe does not anticipate and/or render obvious the Asserted Claims of the ’346 Patent, it would have been obvious for a POSITA to combine or modify Tanabe with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits B-1 through B-10 and B-12 through B-20. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Tanabe based on at least one of Kobayashi (Ex. B-1), Takemori (Ex. B-2), Himelick (Ex. B-3), Uno (Ex. B-4), Cao (Ex. B-6), Thorup 966 (Ex. B-7), Thorup 952 (Ex. B-8), Sapp (Ex. B-10), Tanabe (Ex. B-11), Nakamura (Ex. B-13), Challa (Ex. B-17), and/or 103 chart (Ex. B-20), to form “a plurality of source contact trenches penetrating through said second insulating layer and said source regions with vertical sidewalls substantially perpendicular to a top epitaxial surface within said source regions, and further extending into said body regions with tapered sidewalls with respect to said top surface of said epitaxial layer.”

Exhibit B-12 provides examples of where So discloses, either expressly or inherently, each limitation of the Asserted Claims of the ’346 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that So does not anticipate and/or render obvious the Asserted Claims of the ’346 Patent, it would have been obvious for a POSITA to combine or modify So with concepts from other prior art such as, for example, the prior art references as

disclosed in Exhibits B-1 through B-11 and B-13 through B-20. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in So based on at least one of Kobayashi (Ex. B-1), Takemori (Ex. B-2), Himelick (Ex. B-3), Uno (Ex. B-4), Cao (Ex. B-6), Thorup 966 (Ex. B-7), Thorup 952 (Ex. B-8), Sapp (Ex. B-10), Tanabe (Ex. B-11), Nakamura (Ex. B-13), Challa (Ex. B-17), and/or 103 chart (Ex. B-20), to form "a plurality of source contact trenches penetrating through said second insulating layer and said source regions with vertical sidewalls substantially perpendicular to a top epitaxial surface within said source regions, and further extending into said body regions with tapered sidewalls with respect to said top surface of said epitaxial layer."

Exhibit B-13 provides examples of where Nakamura discloses, either expressly or inherently, each limitation of the Asserted Claims of the '346 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Nakamura does not anticipate and/or render obvious the Asserted Claims of the '346 Patent, it would have been obvious for a POSITA to combine or modify Nakamura with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits B-1 through B-12 and B-14 through B-20. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Nakamura based on at least one of Kobayashi (Ex. B-1), Takemori (Ex. B-2), Uno (Ex. B-4), Yilmaz (Ex. B-5), Cao (Ex. B-6), Thorup 966 (Ex. B-7), Thorup 952 (Ex. B-8), Bhalla (Ex. B-9), Sapp (Ex. B-10), Tanabe (Ex. B-11), So (Ex. B-12), Hsieh (Ex. B-14), Hino (Ex. B-15), Sreekantham (Ex. B-16), Challa (Ex. B-17), and/or 103 chart (Ex. B-20), to include "a plurality of trenches extending into said epitaxial layer, surrounded by a plurality of said source regions of said first type conductivity above said body regions of said second type conductivity."

Exhibit B-14 provides examples of where Hsieh discloses, either expressly or inherently, each limitation of the Asserted Claims of the '346 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Hsieh does not anticipate and/or render obvious the Asserted Claims of the '346 Patent, it would have been obvious for a POSITA to combine or modify Hsieh with concepts from other prior art such as, for example, the prior art

references as disclosed in Exhibits B-1 through B-13 and B-15 through B-20. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Hsieh based on at least one of Kobayashi (Ex. B-1), Takemori (Ex. B-2), Himelick (Ex. B-3), Uno (Ex. B-4), Cao (Ex. B-6), Thorup 966 (Ex. B-7), Thorup 952 (Ex. B-8), Sapp (Ex. B-10), Tanabe (Ex. B-11), Nakamura (Ex. B-13), Challa (Ex. B-17), and/or 103 chart (Ex. B-20), to form "a plurality of source contact trenches penetrating through said second insulating layer and said source regions with vertical sidewalls substantially perpendicular to a top epitaxial surface within said source regions, and further extending into said body regions with tapered sidewalls with respect to said top surface of said epitaxial layer."

Exhibit B-15 provides examples of where Hino discloses, either expressly or inherently, each limitation of the Asserted Claims of the '346 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Hino does not anticipate and/or render obvious the Asserted Claims of the '346 Patent, it would have been obvious for a POSITA to combine or modify Hino with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits B-1 through B-14 and B-16 through B-20. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Hino based on at least one of Kobayashi (Ex. B-1), Takemori (Ex. B-2), Himelick (Ex. B-3), Uno (Ex. B-4), Cao (Ex. B-6), Thorup 966 (Ex. B-7), Thorup 952 (Ex. B-8), Sapp (Ex. B-10), Tanabe (Ex. B-11), Nakamura (Ex. B-13), Challa (Ex. B-17), and/or 103 chart (Ex. B-20), to form "a plurality of source contact trenches penetrating through said second insulating layer and said source regions with vertical sidewalls substantially perpendicular to a top epitaxial surface within said source regions, and further extending into said body regions with tapered sidewalls with respect to said top surface of said epitaxial layer."

Exhibit B-16 provides examples of where Sreekantham discloses, either expressly or inherently, each limitation of the Asserted Claims of the '346 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Sreekantham does not anticipate and/or render obvious the Asserted Claims of the '346 Patent, it would have been

obvious for a POSITA to combine or modify Sreekantham with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits B-1 through B-15 and B-17 through B-20. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Sreekantham based on at least one of Kobayashi (Ex. B-1), Takemori (Ex. B-2), Himelick (Ex. B-3), Uno (Ex. B-4), Cao (Ex. B-6), Thorup 966 (Ex. B-7), Thorup 952 (Ex. B-8), Sapp (Ex. B-10), Tanabe (Ex. B-11), Nakamura (Ex. B-13), Challa (Ex. B-17) and/or 103 chart (Ex. B-20), to form "a plurality of source contact trenches penetrating through said second insulating layer and said source regions with vertical sidewalls substantially perpendicular to a top epitaxial surface within said source regions, and further extending into said body regions with tapered sidewalls with respect to said top surface of said epitaxial layer."

Exhibit B-17 provides examples of where Challa discloses, either expressly or inherently, each limitation of the Asserted Claims of the '346 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Challa does not anticipate and/or render obvious the Asserted Claims of the '346 Patent, it would have been obvious for a POSITA to combine or modify Challa with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits B-1 through B-16 and B-18 through B-20. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Challa based on at least one of Takemori (Ex. B-2), Himelick (Ex. B-3), and/or 103 chart (Ex. B-20), such that "said second insulating layer is a combination of SRO and PSG or BPSG to further reduce source contact resistance, and each of said source contact trenches has a wider contact width in said PSG or said BPSG than in said SRO."

Exhibit B-18 provides examples of where Kubo discloses, either expressly or inherently, each limitation of the Asserted Claims of the '346 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Kubo does not anticipate and/or render obvious the Asserted Claims of the '346 Patent, it would have been obvious for a POSITA to combine or modify Kubo with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits B-1 through B-17 and B-19 through B-20. As one example, a

POSITA would have found it obvious and been motivated to modify the MOSFET in Kubo based on at least one of Takemori (Ex. B-2), Himelick (Ex. B-3), and/or 103 chart (Ex. B-20), such that "said second insulating layer is a combination of SRO and PSG or BPSG to further reduce source contact resistance, and each of said source contact trenches has a wider contact width in said PSG or said BPSG than in said SRO."

Exhibit B-19 provides examples of where Bhalla 169 discloses, either expressly or inherently, each limitation of the Asserted Claims of the '346 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Bhalla 169 does not anticipate and/or render obvious the Asserted Claims of the '346 Patent, it would have been obvious for a POSITA to combine or modify Bhalla 169 with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits B-1 through B-18, and B-20. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Bhalla 169 based on at least one of Takemori (Ex. B-2), Himelick (Ex. B-3), and/or 103 chart (Ex. B-20), such that "said second insulating layer is a combination of SRO and PSG or BPSG to further reduce source contact resistance, and each of said source contact trenches has a wider contact width in said PSG or said BPSG than in said SRO."

In addition, claim 8 of the ’346 Patent (and the claims dependent thereon), as issued, are invalid at least because they do not include all of the limitations considered by the Examiner during prosecution. Specifically, in the Reasons for Allowance, the Examiner provided the following reasons for allowance with respect to *product* claims 1-7 and 16-20:

> ***Reasons for Allowance***
>
> 2. Claims 1-7 and 16-20 are allowed.
>
> 3. The following is an examiner's statement of reasons for allowance:
>
> The prior art of record neither anticipates nor renders obvious all the limitations in the base claims 1 and 6. Specifically, the combination of a trench MOSFET comprising: a plurality of insulating layers formed on said N+ source regions; a source metal formed on said insulating layers; trench gates extending through said N+ source regions, said P-body regions and said N-epitaxial layer; a plurality of trench source contacts comprising a plurality of sidewalls, two of said sidewalls substantially perpendicular to a top surface of the source regions and two other sidewalls tapered with respect to said source regions, wherein said trench source contacts extend through said insulating layers, said N+ source regions, said P-body regions and said N-epitaxial layer; and copper wire electrically bonded to said source metal.

See File History of ’346 Patent, Notice of Allowance and Fees Due mailed September 1, 2010, Notice of Allowability, p. 2. The Examiner then rejoined claims 8-15, directed to the *process* of making or using an allegedly allowable *product*, which were previously withdrawn from consideration as a result of a restriction requirement. *See* File History of ’346 Patent, Supplemental Action Notice of Allowability mailed October 1, 2010, Detailed Action, p. 2. The Examiner’s decision was based on the version of claim 8 provided in the applicant’s Reply to Office Action of April 6, 2010, Amendment to the Claims (hereinafter “Examined Claim 8”), which included multiple limitations that are *not* present in claim 8 of the issued patent (hereinafter “Issued Claim 8”). Specifically, the Examined Claim 8 includes the following claim limitations that are *not* present in the Issued Claim 8:

- etching back or Chemical Mechanical Polishing (CMP) said doped poly from the surface of said gate oxide above the epitaxial layer and leaving said doped poly into

said gate trenches as trench gate material;

- implanting said epitaxial layer with a second type conductivity dopant to from body regions;
- implanting with said first type conductivity dopant to form source regions into said body regions;
- forming a second insulating layer onto the entire trench MOSFET;
- forming a contact mask on the surface of said second insulating layer and removing insulating material and semiconductor material to form source contact trenches:
- implanting BF2 ions to form P+ areas wrapping sidewalls and bottoms of said source contact trenches within body regions;
- widening the top surface of said source contact trenches with dilute HF as pre-Ti/TiN cleaning;
- depositing Ti/TiN/W or Co/TiN/W sequentially into said source contact trenches and on the front surface of said trench MOSFET;
- etching back W and Ti/TiN or Co/TiN to form source contact metal plugs and depositing a layer of Ti or Ti/TiN as an interconnection metal layer.

Compare File History of '346 Patent, Reply to Office Action dated April 6, 2010, Amendment to the Claims, p. 4-6; *with* '346 Patent Claim 8. Accordingly, to the extent claim 8 of the '346 Patent is interpreted not to include these limitations, claim 8 and the claims dependent thereon are invalid at least for the reasons provided by the Examiner in the File History of the '346 Patent and based on the prior art cited therein.

3. Anticipation and/or Obviousness of the '409 Patent

Attached hereto as Exhibits C-1 through C-11 are charts that set forth where in the prior art references to each element of the Asserted Claims of the '409 Patent can be found.

Exhibit C-1 provides examples of where Chen discloses, either expressly or inherently, each limitation of the Asserted Claims of the '409 Patent, thereby anticipating and/or rendering

obvious those claims. To the extent Force MOS asserts that Chen does not anticipate and/or render obvious the Asserted Claims of the ’409 Patent, it would have been obvious for a person of ordinary skill in the art (POSITA) to combine or modify Chen with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits C-2 through C-11. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Chen based on at least one of Deboy (Ex. C-2), Hueting (Ex. C-5), Kobayashi (Ex. C-7), Nakamura (Ex. C-8), Takeuchi (Ex. C-10), and/or 103 Chart (Ex. C-11) to form “sidewalls of said hole [] surrounded by and in contact [with] said source and body regions.”

Exhibit C-2 provides examples of where Deboy discloses, either expressly or inherently, each limitation of the Asserted Claims of the ’409 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Deboy does not anticipate and/or render obvious the Asserted Claims of the ’409 Patent, it would have been obvious for a POSITA to combine or modify Deboy with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits C-1 and C-3 through C-11. For example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Deboy based on at least one of Chen (Ex. C-1), Hirota (Ex. C-3), Hshieh (Ex. C-4), Hueting (Ex. C-5), Kobayashi (Ex. C-7), Nakamura (Ex. C-8), Takeuchi (Ex. C-10), and/or 103 Chart (Ex. C-11) to have “a plurality of transistor cells formed in a semiconductor substrate.”

Exhibit C-3 provides examples of where Hirota discloses, either expressly or inherently, each limitation of the Asserted Claims of the ’409 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Hirota does not anticipate and/or render obvious the Asserted Claims of the ’409 Patent, it would have been obvious for a POSITA to combine or modify Hirota with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits C-1, C-2, and C-4 through C-11. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Hirota based on at least one of Chen (Ex. C-1), Deboy (Ex. C-2), Hueting (Ex. C-5), Ker (Ex. C-6), Kobayashi (Ex. C-7), Nakamura (Ex. C-8), Shimomura (Ex. C-9), and/or 103 Chart (Ex. C-11) to have “said

contact metal plug connected to a source metal disposed on top of said circular trench contact."

Exhibit C-4 provides examples of where Hshieh discloses, either expressly or inherently, each limitation of the Asserted Claims of the '409 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Hshieh does not anticipate and/or render obvious the Asserted Claims of the '409 Patent, it would have been obvious for a POSITA to combine or modify Hshieh with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits C-1 through C-3 and C-5 through C-11. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Hshieh based on at least one of Chen (Ex. C-1), Deboy (Ex. C-2), Hueting (Ex. C-5), Ker (Ex. C-6), Kobayashi (Ex. C-7), Nakamura (Ex. C-8), Shimomura (Ex. C-9), and/or 103 Chart (Ex. C-11) to have "said contact metal plug connected to a source metal disposed on top of said circular trench contact."

Exhibit C-5 provides examples of where Hueting discloses, either expressly or inherently, each limitation of the Asserted Claims of the '409 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Hueting does not anticipate and/or render obvious the Asserted Claims of the '409 Patent, it would have been obvious for a POSITA to combine or modify Hueting with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits C-1 through C-4 and C-6 through C-11. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Hueting based on at least one of Deboy (Ex. C-2), Hirota (Ex. C-3), Kobayashi (Ex. C-7), Shimomura (Ex. C-9), and/or 103 Chart (Ex. C-11) to form a "circular trench contact [comprising] a hole opened from a top surface of said semiconductor substrate and is filled with the contact metal plug."

Exhibit C-6 provides examples of where Ker discloses, either expressly or inherently, each limitation of the Asserted Claims of the '409 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Ker does not anticipate and/or render obvious the Asserted Claims of the '409 Patent, it would have been obvious for a POSITA to combine or modify Ker with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits C-1 through C-5 and C-7 through C-11. As one example, a POSITA would

have found it obvious and been motivated to modify the MOSFET in Ker based on at least one of Deboy (Ex. C-2), Hueting (Ex. C-5), Kobayashi (Ex. C-7), Nakamura (Ex. C-8), Takeuchi (Ex. C-10), and/or 103 Chart (Ex. C-11) such that "sidewalls of said hole [] surrounded by and in contact [with] said source and body regions."

Exhibit C-7 provides examples of where Kobayashi discloses, either expressly or inherently, each limitation of the Asserted Claims of the '409 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Kobayashi does not anticipate and/or render obvious the Asserted Claims of the '409 Patent, it would have been obvious for a POSITA to combine or modify Kobayashi with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits C-1 through C-6 and C-8 through C-11. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Kobayashi based on at least one of Hshieh (Ex. C-4), Takeuchi (Ex. C-10), and/or 103 Chart (Ex. C-11) to have "said trenched gates surrounding said transistor cells as closed cells constituting substantially square-shaped cells with rounded corners."

Exhibit C-8 provides examples of where Nakamura discloses, either expressly or inherently, each limitation of the Asserted Claims of the '409 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Nakamura does not anticipate and/or render obvious the Asserted Claims of the '409 Patent, it would have been obvious for a POSITA to combine or modify Nakamura with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits C-1 through C-7 and C-9 through C-11. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Nakamura based on at least one of Deboy (Ex. C-2), Hirota (Ex. C-3), Kobayashi (Ex. C-7), Shimomura (Ex. C-9), and/or 103 Chart (Ex. C-11) to form a "circular trench contact [comprising] a hole opened from a top surface of said semiconductor substrate and is filled with the contact metal plug."

Exhibit C-9 provides examples of where Shimomura discloses, either expressly or inherently, each limitation of the Asserted Claims of the '409 Patent, thereby anticipating and/or

rendering obvious those claims. To the extent Force MOS asserts that Shimomura does not anticipate and/or render obvious the Asserted Claims of the ’409 Patent, it would have been obvious for a POSITA to combine or modify Shimomura with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits C-1 through C-8, and C-11. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Shimomura based on at least one of Deboy (Ex. C-2), Hueting (Ex. C-5), Kobayashi (Ex. C-7), Nakamura (Ex. C-8), Takeuchi (Ex. C-10), and/or 103 Chart (Ex. C-11) such that “sidewalls of said hole [] surrounded by and in contact [with] said source and body regions.”

Exhibit C-10 provides examples of where Takeuchi discloses, either expressly or inherently, each limitation of the Asserted Claims of the ’409 Patent, thereby anticipating and/or rendering obvious those claims. To the extent Force MOS asserts that Takeuchi does not anticipate and/or render obvious the Asserted Claims of the ’409 Patent, it would have been obvious for a POSITA to combine or modify Takeuchi with concepts from other prior art such as, for example, the prior art references as disclosed in Exhibits C-1 through C-9, and C-11. As one example, a POSITA would have found it obvious and been motivated to modify the MOSFET in Takeuchi based on at least one of Deboy (Ex. C-2), Hirota (Ex. C-3), Kobayashi (Ex. C-7), Shimomura (Ex. C-9), and/or 103 Chart (Ex. C-11) to form a “circular trench contact [comprising] a hole opened from a top surface of said semiconductor substrate and is filled with a contact metal plug.”

B. Claim Charts

Defendant attaches claim charts as Exhibits A-1 through A-17; B-1 through B-20; and C-1 through C-11, to Defendant’s Invalidity Contentions, and identify where, in each alleged item of prior art, each element of each Asserted Claim is found either expressly or inherently. In these claim charts, Defendant has attempted to identify the most relevant portions of the references. The references may, however, contain additional support for claim limitations. Persons of ordinary skill in the art generally read a prior art reference as a whole and in the context of other publications and literature. Defendant may rely upon uncited portions of the references, other documents, and expert

testimony to provide context or to aid in understanding the disclosures of the references. Where Defendant cites to a particular figure in a reference, the citation should be understood to encompass the caption and any corresponding description of the figure in the specification. Conversely, where Defendant cites to particular text referring to a figure, the citation should be understood to include the corresponding figure as well. Defendant may also rely upon uncited portions of the prior art produced at ASUS_00000001 – ASUS_00003629.

C. Motivations to Combine

The suggested obviousness combinations discussed herein are not to be construed to suggest that any reference included in the combinations is not anticipatory. Further, to the extent that Plaintiff contends that any of the anticipatory prior art fails to disclose one or more limitations of the Asserted Patents, Defendant reserve the right to identify other prior art references that, when combined with the anticipatory prior art, would render the claims obvious despite an allegedly missing limitation. In addition to those discussed above and in Exhibits A-1 through A-17; B-1 through B-20; and C-1 through C-11, Defendant will further specify the motivations to combine the prior art, including through reliance on expert testimony, at the appropriate later stage of this lawsuit.

The decision in *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007), held that patents that are based on new combinations of elements or components already known in a technical field may be found to have been obvious. The Supreme Court rejected a rigid application of the "teaching, suggestion, or motivation [to combine]" test. *Id.* at 415, 419. "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. The Supreme Court emphasized the principle 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." *Id.* at 416. A key inquiry is whether the "improvement is more than the predictable use of prior art elements according to their established function." *Id.* at 417.

The Court further held that "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.* at 420. It is sufficient that a combination of elements was "obvious to try" – "When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense." *Id.* at 421. "In that instance the fact that a combination was obvious to try might show that it was obvious under § 103." *Id.* Finally, the Supreme Court recognized that "[g]ranting patent protection to advances that would occur in the ordinary course without real innovation retards progress and may, in the case of patents combining previously known elements, deprive prior inventions of their value or utility." *Id.* at 419.

The rationale to combine or modify prior art references is significantly stronger when the references seek to solve the same problem, come from the same field, and correspond well together. *See In re Inland Steel Co.*, 265 F.3d 1354, 1362 (Fed. Cir. 2001) (allowing two references to be combined as invalidating art under similar circumstances where the art "focus[ed] on the same problem . . . c[a]me from the same field of art [and] . . . the identified problem found in the two references correspond[ed] well").

All of the following rationales recognized in *KSR* support a finding of obviousness with respect to each of the obviousness combinations disclosed herein: (1) combining prior art elements according to known methods to yield predictable results; (2) simple substitution of one known element for another to obtain predictable results; (3) use of a known technique to improve similar devices, methods, or products in the same way; (4) applying a known technique to a known device, method, or product ready for improvement to yield predictable results; (5) "obvious to try," that is, choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; (6) 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; and (7) 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. Certain of these rationales are discussed more specifically below. The fact that other rationales are not discussed more specifically should not be interpreted as an admission or concession that the other rationales do not apply.

Motivation to combine any of the prior art references discussed or identified herein is found, explicitly or implicitly, in one or more of the following: (1) a person of ordinary skill in the art's own knowledge or common sense; (2) a prior art reference(s) itself/themselves; (3) the subject matter acknowledged as prior art in the Asserted Patent(s); (4) the interrelated teachings of one or more of the prior art references identified herein; (5) the nature of the problem to be purportedly solved by the Asserted Patent(s) and the existence of similar improvements in similar applications; (6) design incentives and other market forces, including advantages of creating a superior and more desirable product and the effects of demands known to the design community or present in the marketplace; (7) the ability to implement the alleged invention as a predictable variation of the prior art; (8) improvements in similar devices; (9) any needs or problems known in the field and purportedly addressed by the Asserted Patent(s); and (10) the number of identified, predictable solutions to the problem(s) purportedly addressed by the Asserted Patent(s).

Defendant further contends that the prior art identified in these Invalidity Contentions is evidence of simultaneous or near-simultaneous independent invention by others of the alleged invention as recited in one or more of the Asserted Patents. Defendant reserves their rights to rely on the simultaneous or near-simultaneous independent invention by others as further evidence of the obviousness of the Asserted Patents.

In addition to the specific combinations of prior art identified herein, ASUS reserves the right to rely on other combinations of the prior art references disclosed herein. ASUS further reserves the right to rely upon combinations disclosed within the prosecution history of the

references cited herein. ASUS further reserves the right to rely upon evidence that there would have been a motivation to combine the prior art references identified above includes the interrelated teachings of multiple prior art references; the effects of demands known to the design community or present in the marketplace; the existence of a known problem for which there was an obvious solution encompassed by the Asserted Claims of the Asserted Patents; the existence of a known need or problem in the field of the endeavor at the time of the invention(s); and the background knowledge that would have been possessed by a person having ordinary skill in the art.

In addition, the motivation to combine the teachings of the prior art references disclosed herein is found in the references themselves and: (1) the nature of the problem being solved, (2) the express, implied, and inherent teachings of the prior art, (3) the knowledge of persons of ordinary skill in the art, (4) the fact that the prior art is generally directed to the same fields of art, and/or (5) the predictable results obtained in combining different elements of the prior art.

Multiple teachings, suggestions, motivations, and/or reasons to modify any of the references and/or to combine any two or more of the references disclosed herein come from many sources, including the prior art (specific and as a whole), common knowledge, common sense, predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, obviousness to try, the nature of the problem faced, and/or knowledge possessed by a person of ordinary skill and is inherent in the nature of the problem to be solved.

In sum, each limitation of each claim of the Asserted Patents was well-known to those of ordinary skill in the art at the time. At best, the elements recited in the Asserted Patents are mere combinations and modifications of these well-known elements. A person of ordinary skill in the art would be able, and motivated, to improve the existing technology in the same or similar manner by combining or modifying the individual elements that were already known in the art to yield predictable results.

D. Invalidity of the Claims Under 35 U.S.C. § 112

Defendant further asserts that the Asserted Patents are invalid under 35 U.S.C. § 112. The following are the grounds upon which Defendant contends the asserted claims of the Asserted Patents are invalid for failure to meet the requirements of 35 U.S.C. §§ 112, ¶ 1 and/or 112, ¶ 2, based on Defendant's investigation to date and currently-available information. For each claim identified as invalid, any dependent claims of those invalid claims are also invalid under 35 U.S.C. §§ 112, ¶ 1 and/or 112, ¶ 2. Defendant reserves the right to supplement and amend these contentions based on further discovery and investigation including the deposition of any of the named parties, inventors of the Asserted Patents, or prior artists.

1. Enablement and Written Description

35 U.S.C. § 112, ¶ 1 requires that the specification contain a written description of the invention. "[T]he hallmark of written description is disclosure." *Bos. Sci. Corp. v. Johnson & Johnson*, 647 F.3d 1353, 1361-62 (Fed. Cir. 2011) (citation omitted). The test for whether a specification adequately describes an invention is "whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date. . . . [T]he test requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art. . . . [It] is a question of fact." *Ariad Pharms., Inc. v. Eli Lilly and Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (*en banc*); *Bos. Sci.*, 647 F.3d at 1362.

The enablement requirement of Section 112 demands that the patent specification enable "those skilled in the art to make and use the full scope of the claimed invention without 'undue experimentation.'" *Genentech, Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1365 (Fed. Cir. 1997) (quoting *In re Wright*, 999 F.2d 1557, 1561 (Fed. Cir. 1993)). "[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).

Defendant contends that the following Asserted Claims are invalid under 35 U.S.C. § 112, ¶ 1. Each Asserted Claim (and the claims dependent thereon) identified below are invalid under ¶

1 because the specification of the Asserted Patents fail to provide a sufficient written description and/or enabling disclosure.

Claim 6 (and the claims dependent thereon) of the ’634 Patent lack adequate written description and/or enablement at least because nothing from the figures or description provides embodiments where the doping polarities are reversed. The ’634 Patent merely states at Col. 2, lines 16-20 and Col. 4, lines 46-49 that “by inverting the conductive type, this invention is also applicable to a P-channel MOSFET structure.” But this statement does not sufficiently disclose the features at claims 6-9 of the ’634 patent. In particular, there is no disclosure or explanation as to how, why, or whether inverting the doping polarities would lead to the desired outcome of achieving avalanche improvement (*see, e.g.*, ’634 Patent at Field of Invention; Col. 2, lines 23-34). Moreover, a person having ordinary skill in the art would aware that reversing the doping polarity impacts mobility of holes and electrons. Accordingly, the disclosure of the ’634 Patent does not reasonably convey to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date. And the disclosure of the ’634 Patent does not enable those skilled in the art to make and use the full scope of the claimed invention without undue experimentation.

Claim 1 (and the claims dependent thereon) of the ’346 Patent lack adequate written description and/or enablement at least at least for the following reasons. Claim 1 requires “a plurality of source contact trenches . . . extending into said body regions with tapered sidewalls with respect to said top surface of said epitaxial layer.” And claim 16 requires “two other sidewalls tapered with respect to said source regions.” However, the ’346 Patent does not contain sufficient disclosure to teach those skilled in the art how to make and use the “tapered sidewalls” / “sidewalls tapered” without undue experimentation. And the disclosure of the ’346 Patent does not reasonably convey to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.

ASUS’s investigation is ongoing. ASUS reserves the right to supplement its grounds of invalidity based on § 112, ¶ 1, to the extent permitted by the Court or under applicable rules.

2. Indefiniteness

Claims are indefinite under 35 U.S.C. § 112, ¶ 2 when they "fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 989, 901 (2014).

In addition to Defendant's reservation of rights stated above, Defendant notes that Patent Rules 4-1, 4-2, and 4-3 contemplate that indefiniteness issues be brought to the Court's attention through the *Markman* briefing process. Defendant's detailed arguments as to indefiniteness will be presented at that time, *i.e.*, through the *Markman* meet and confer and briefing process.

Defendant contends that the Asserted Patents are invalid under 35 U.S.C. § 112, ¶ 2. The Asserted Claims identified below are invalid under § 112, ¶ 2 because they fail to inform, with reasonable certainty, those skilled in the art about the scope of the claimed invention:

Asserted Patent	Asserted Claim(s)[6]	Term(s) and/or Phrase(s) that render the Asserted Claim(s) Indefinite
'634 Patent	1	"wherein the sidewalls of said trenches in said base layer are covered by the lateral contact layer"
'634 Patent	1	"wherein the bottom base of said trenches in said base layer are covered by the base contact layer"
'634 Patent	1	"the top of [said silicon substrate / said epitaxial layer / said base layer]"
'634 Patent	1	"the upper surface of [said semiconductor region]"
'634 Patent	1	"the lower surface of [said semiconductor region]"
'634 Patent	1	"on top of [said source layer] extending downwardly through [said base layer]"

[6]Asserted Claims dependent on any claim identified in this table are also indefinite at least for being dependent on an indefinite base claim.

Asserted Patent	Asserted Claim(s)[6]	Term(s) and/or Phrase(s) that render the Asserted Claim(s) Indefinite
’634 Patent	1	“on top of [said interlayer oxide film] extending downwardly through [said source layer]”
’634 Patent	1	“the sidewalls”
’634 Patent	1	“said trenches”
’634 Patent	1	“the lateral contact layer”
’634 Patent	1	“the bottom base”
’634 Patent	1	“the base contact layer”
’634 Patent	2	“the base contact layer at bottom”
’634 Patent	5	“the source contact trench”
’634 Patent	9	“the source contact trench”
’346 Patent	1, 8	“above [a drain region / a plurality of body regions / said body regions]”
’346 Patent	1	“over / overlying [said substrate / said epitaxial layer / said first insulating layer”
’346 Patent	1, 2, 11, 16, 17	“said source regions”
’346 Patent	1, 2,	“said body regions”
’346 Patent	1	“said trenches”

Asserted Patent	Asserted Claim(s)[6]	Term(s) and/or Phrase(s) that render the Asserted Claim(s) Indefinite
’346 Patent	1	“said trench gates”
’346 Patent	1, 16	“vertical sidewalls substantially perpendicular to a top epitaxial surface” / “sidewalls substantially perpendicular to a top surface”
’346 Patent	1, 16	“tapered sidewalls with respect to said top surface of said epitaxial layer” / “sidewalls tapered with respect to said source regions”
’346 Patent	1, 2	“said top surface of said epitaxial layer”
’346 Patent	1	“front surface [of said trench MOSFET]”
’346 Patent	1	“the backside [of said substrate]”
’346 Patent	3	“to further reduce source contact resistance”
’346 Patent	8	“on the front” / “backside” / “rear side” / “inner”
’346 Patent	10	“said P-body regions”
’346 Patent	19	“vertically connects”
’409 Patent	1	“the top [of said silicon substrate / of said epitaxial layer / of said base layer / of said interlayer oxide film]”
’409 Patent	1	“the upper surface”
’409 Patent	1	“the lower surface”

Asserted Patent	Asserted Claim(s)[6]	Term(s) and/or Phrase(s) that render the Asserted Claim(s) Indefinite
’409 Patent	1	“downwardly”
’409 Patent	1	“the sidewalls”
’409 Patent	1	“said trenches”
’409 Patent	1	“the lateral contact layer”
’409 Patent	1	“the bottom base”
’409 Patent	1	“the base contact layer”

These terms and/or phrases render the respective claims indefinite at least because the terms lack antecedent basis and/or use positioning or orientation terminology without having a reasonable frame of reference, and therefore do not inform, with reasonable certainty, those skilled in the art about the scope of the invention.

Exhibits A-1 through A-17; B-1 through B-20; and C-1 through C-11 identify disclosures in prior art references that correspond to limitations in the Asserted Claims, some of which limitations have been identified as indefinite in the table above. ASUS’s identification of prior art disclosures should not be construed as an admission that such corresponding limitations of the Asserted Claims are definite under § 112, ¶ 2. ASUS’s prior art disclosures for these limitations are based on its best understanding as informed by Force MOS’s infringement contentions.

ASUS’s investigation is ongoing. ASUS reserves the right to supplement its grounds of invalidity based on § 112, ¶ 2, to the extent permitted by the Court or under applicable rules.

III. ACCOMPANYING DOCUMENT PRODUCTION

Pursuant to P.R. 3-4(a), Defendant will produce documents sufficient to show the operation of any aspects or elements of each Accused Instrumentality identified by Plaintiff in its P.R. 3-1(c) charts, based on a reasonable search of documents in Defendant's possession, custody, or control, or available on the Internet. *See* ASUS_00003630 – ASUS_00004069.

Additionally, Pursuant to P.R. 3-4(b), Defendant will produce a copy of each prior art reference identified above pursuant to P.R. 3-3(a) which does not appear in the file histories of the Asserted Patents as well as additional prior art references. To the extent any such prior art reference is not in English, Defendant has produced to Plaintiff or will produce to Plaintiff an English translation of the portion(s) of the non-English prior art reference (s) relied upon by Defendant. Defendant reserves the right to provide an updated formal or certified translation of all non-English prior art references. *See* ASUS_00000001 – ASUS_00003629.[7]

[7]As a courtesy, Defendant has also provided AOS_0003031, AOS_0003046-AOS_0003047, AOS_0003050, and AOS_0003051 contemporaneously with its Invalidity Contentions and disclosures, for reference.

Dated: July 18, 2023

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned certifies that on this 18th day of July 2023, all counsel of record in the relevant member case (Civil Action No. 2:22-cv-00460-JRG) are receiving this document via email.

/s/ Mackenzie M. Martin
Mackenzie M. Martin