

ROBINS, KAPLAN, MILLER & CIRESI L.L.P.
ATTORNEYS AT LAW
MINNEAPOLIS

1 William H. Manning (*pro hac vice*)
E-mail: WHManning@rkmc.com
2 Brad P. Engdahl (*pro hac vice*)
E-mail: BPEngdahl@rkmc.com
3 Jacob S. Zimmerman (*pro hac vice*)
E-mail: JSZimmerman@rkmc.com
4 Logan J. Drew (*pro hac vice*)
E-mail: LJDrew@rkmc.com
5 **Robins, Kaplan, Miller & Ciresi L.L.P.**
2800 LaSalle Plaza
6 800 LaSalle Avenue
Minneapolis, MN 55402
7 Telephone: 612-349-8500
Facsimile: 612-339-4181

8 David E. Marder (*pro hac vice*)
E-mail: DEMarder@rkmc.com
9 **Robins, Kaplan, Miller & Ciresi L.L.P.**
800 Boylston Street, 25th Floor
10 Boston, MA 02199
11 Telephone: 617-267-2300
Facsimile: 617-267-8288

12 John P. Bovich (SBN 150688)
E-mail: JBovich@reedsmith.com
13 **Reed Smith LLP**
14 Two Embarcadero Center, Suite 2000
San Francisco, CA 94111
15 Telephone: 415-543-8700

16 Attorneys for Plaintiffs Advanced Micro
17 Devices, Inc. and ATI Technologies, ULC

18 UNITED STATES DISTRICT COURT
19 NORTHERN DISTRICT OF CALIFORNIA
20 SAN FRANCISCO DIVISION

21 ADVANCED MICRO DEVICES, INC.,
22 et al.,
23 Plaintiffs,
24 v.
25 SAMSUNG ELECTRONICS CO., LTD.,
26 et al.,
27 Defendants.

Case No. CV-08-0986-SI
**PLAINTIFFS' SURREPLY TO
SAMSUNG'S MOTION FOR SUMMARY
JUDGMENT OF INVALIDITY OF U.S.
PATENT NO. 5,545,592**
Date: May 20, 2009
Time: 4:00 p.m.
Courtroom: 10, 19th Floor
Judge: The Honorable Susan Illston

ROBINS, KAPLAN, MILLER & CIRESI L.L.P.
ATTORNEYS AT LAW
MINNEAPOLIS

TABLE OF CONTENTS

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

	Page
I. INTRODUCTION	1
II. SAMSUNG BADLY MISCONSTRUES AMD’S ARGUMENTS AND THE APPLICABLE LAW.	2
III. SAMSUNG’S ATTACKS ON DR. GLEW’S CONCLUSIONS MISSTATE THE FACTS AND REST UPON TORTURED CONSTRUCTIONS AND OUTRIGHT MISREPRESENTATIONS.	4
A. Samsung’s interpretation of the Abstract is wrong.....	4
B. Samsung misconstrues the phrase “Nitrided Silicide Titanium.”	5
C. Samsung’s use of the phrase “that silicide” is misleading and incorrect.....	7
IV. SAMSUNG’S RELIANCE UPON EXTRANEIOUS PATENTS DOES NOTHING TO SUPPORT ITS CASE.....	7
A. The ’665 Patent Does Not Bolster Samsung’s Arguments.....	7
B. The ’640 Patent Does Not Bolster Samsung’s Argument.....	8
V. SAMSUNG’S RELIANCE UPON COLUMN 3 IS UNAVAILABLE.....	9
VI. THE CASES CITED BY SAMSUNG REGARDING ANTICIPATION ARE INAPPOSITE.....	10
VII. SAMSUNG’S SUGGESTION THAT TiSi DEPOSITION BE SUBSTITUTED FOR DEPOSITING Ti MAKES NO SENSE.....	11
A. Samsung Cannot Use the Discussion of TiSi Deposition to Prove Anticipation.....	12
B. Samsung Cannot Use the TiSi Deposition Disclosure to Prove Obviousness.	12

ROBINS, KAPLAN, MILLER & CIRESI L.L.P.
 ATTORNEYS AT LAW
 MINNEAPOLIS

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

TABLE OF AUTHORITIES

Page

Cases

Alza Corp. v. Mylan Laboratories, Inc.,
 388 F. Supp. 2d 717 (N.D.W.V. 2005) 11

ArthroCare Corp. v. Smith & Nephew,
 406 F.3d 1365 (Fed. Cir. 2005)..... 11

Ecolochem, Inc. v. S. Cal. Edison Co.,
 227 F.3d 1361 (Fed. Cir. 2000)..... 9

Hewlett-Packard Co. v. Mustek Systems, Inc.,
 340 F.3d 1314 (Fed. Cir. 2003)..... 11

Net MoneyIN, Inc. v. VeriSign, Inc.,
 545 F.3d 1359 (Fed. Cir. 2008)..... 7, 10, 12

Scripps Clinic & Res. Found. v. Genentech, Inc.,
 927 F.2d 1565 (Fed. Cir. 1991)..... 2

Upsher-Smith Laboratories, Inc. v. PamLab, LLC,
 412 F.3d 1319 (Fed. Cir. 2005)..... 10

1 Plaintiffs (collectively, “AMD”) hereby respond to the Reply filed by the defendants
2 (collectively, “Samsung”) in support of their Motion for Summary Judgment that U.S. Patent No.
3 5,545,592 (“’592”) is invalid.

4 **I. INTRODUCTION**

5 Samsung has engaged in prolonged, pervasive and knowing infringement of the ’592
6 patent across its product lines. It is now faced with mounting evidence of infringement gathered
7 through discovery and a pending motion to expand that discovery to include its processors. In an
8 effort to draw attention away from its infringement and avoid further discovery, Samsung began a
9 campaign to invalidate the ’592 patent on March 19, 2009, when it filed a premature Summary
10 Judgment motion. In that motion, it represented that the Court could find, without resolving any
11 disputes of material fact, that the ’592 patent is anticipated by U.S. Patent No. 5,975,912
12 (“Hillman”). Samsung supported its motion with a cursory declaration by its expert, Dr. Thomas,
13 that oversimplified the Hillman patent and failed to address any of the complex technical issues
14 that underlie the motion.

15 AMD replied by submitting its Opposition to Samsung’s Motion for Summary Judgment
16 (“Opposition”) and a thorough declaration from its expert, Dr. Glew. Dr. Glew explained in
17 detail the nature of the relevant technology and how a person of ordinary skill in the art would
18 read the Hillman patent. Dr. Glew also identified why Samsung’s arguments are wrong and why
19 there are genuine disputes of material fact.

20 Samsung has now submitted a Reply in Support of Motion for Summary Judgment of
21 Invalidity (“Reply”), where it includes for the first time a discussion of the complex factual issues
22 that underlie its positions. In an attempt to resuscitate its motion, it raises a host of new
23 arguments and new references not previously submitted to the Court. Instead of establishing that
24 summary judgment should be granted, Samsung’s Reply does little more than establish that
25 Samsung’s expert disagrees with AMD’s expert. Therefore, Samsung’s Reply only highlights
26 that there are genuine factual disputes that preclude summary judgment.

27 Samsung’s Reply suffers from three major deficiencies. First, Samsung badly
28 misconstrues AMD’s arguments and attacks arguments that AMD never made. Second, Samsung

1 ignores AMD's careful recitation of the applicable law and blurs the distinction between express
 2 anticipation, inherent anticipation, and obviousness. Finally, Samsung supports its arguments
 3 with irrelevant, extraneous material, twisted grammatical constructions, and outright
 4 misrepresentations of the record. These deficiencies are catalogued in the Surreply Declaration of
 5 Alexander Glew ("Glew Surreply Decl.") filed herewith.

6 **II. SAMSUNG BADLY MISCONSTRUES AMD'S ARGUMENTS AND THE**
 7 **APPLICABLE LAW.**

8 As the Court is aware, the '592 patent involves a process for contact formation where
 9 titanium silicide is formed in a contact and then exposed to nitrogen ionized in a plasma, thereby
 10 causing a portion of the titanium silicide to become nitrided. Opposition at 2-6. In contrast, the
 11 Hillman patent involves a process whereby titanium is deposited on silicon, which causes a thin
 12 layer of titanium silicide to form at the junction between the titanium and the silicon. The
 13 structure is then nitrided with a plasma. *Id.* at 6-10. Since the titanium silicide layer is covered
 14 with titanium, Hillman's titanium silicide is not exposed to nitrogen ionized in a plasma, thereby
 15 causing nitridation, as required by the claims of the '592 patent. Accordingly, the Hillman patent
 16 does not expressly or inherently anticipate the '592 patent because it does not expressly disclose
 17 such nitridation or inherently require it. A dramatic illustration of the difference between the
 18 '592 patent and the Hillman patent was included in an animation presented to the Court with the
 19 Opposition. A copy of the key slide from that presentation, showing the two side-by-side, is
 20 attached hereto as Exhibit A.

21 Samsung responds by arguing that Dr. Glew "never says that the Hillman process *does not*
 22 result in the complete conversion of titanium to titanium silicide; just that he does not read
 23 Hillman to *say* it does." Reply at 1 (emphasis in original). Moreover, throughout its Reply brief,
 24 Samsung claims that Dr. Glew can only *speculate* that "perhaps" only the lower portion of the
 25 titanium is converted to titanium silicide at the time of the exposure to plasma. Reply at 3.

26 These arguments completely misconstrue AMD's position and ignore the applicable law.
 27 The manner in which a person of ordinary skill in the art reads the Hillman patent is the key issue
 28 underlying this motion. *See Scripps Clinic & Res. Found. v. Genentech, Inc.*, 927 F.2d 1565,

1 1576 (Fed. Cir. 1991). Such a person would understand that the degree of conversion to titanium
 2 silicide in Hillman's process would depend upon the deposition parameters. Declaration of
 3 Alexander Glew in Support of AMD's Opposition ("First Glew Decl.") at ¶¶ 50-51. Dr. Glew
 4 has explained that column 15 of the Hillman patent does not disclose whether Hillman's
 5 parameters would result in complete conversion. *Id.* at ¶ 52. However, a person of ordinary skill
 6 in the art would understand that Hillman contemplated leaving a layer of titanium above the
 7 titanium silicide. *Id.* at ¶¶ 37, 55. This is not speculation because it is well-supported by the
 8 evidence, as summarized below:

- 9 • The Abstract of the Hillman patent establishes that titanium silicide only forms at the
 10 juncture between the silicon substrate and the deposited titanium. Opposition at 8.
- 11 • The Hillman patent describes the layers in the contact after nitridation as "nitrided silicide
 12 titanium." *Id.* Hillman used that same term in another patent, U.S. Patent No. 6,274,496
 13 ("the '496 patent") to describe a contact with a silicon substrate, a film of nitrided
 14 titanium above it, and a layer of titanium silicide between the two. Opposition at 17-19.
- 15 • In Tables 10-12 of the Hillman patent, the author describes the layer that is deposited over
 16 the silicon as "Ti" (*i.e.*, titanium), not "TiSi" (*i.e.*, titanium silicide). Glew Surreply Decl.
 17 at ¶ 5.
- 18 • As Samsung's expert admits, one would expect a layer of titanium to have a different
 19 resistivity than a layer of titanium silicide of the same thickness deposited in the same
 20 manner. Thomas Dep.¹ at 21:2-8; Glew Surreply Decl. at ¶ 6. In Tables 12 and 13 of the
 21 Hillman patent, Hillman discusses two different experiments where titanium films of the
 22 same thickness were deposited by the same method on silicon and thermal oxide (where
 23 titanium silicide does not grow). Glew Surreply Decl. at ¶ 7. The tables show that the
 24
 25
 26

27
 28 ¹ "Thomas Dep." refers to the Deposition of Dr. Thomas, excerpts of which are attached as Exhibit 1 to the Declaration of Logan Drew.

1 films have the same or nearly identical resistivities, clearly establishing that the titanium
2 deposited over the silicon remains mostly titanium. *Id.*

- 3 • None of Hillman’s claims discuss a titanium layer fully converted to titanium silicide.

4 Opposition at 16.

5
6 **III. SAMSUNG’S ATTACKS ON DR. GLEW’S CONCLUSIONS MISSTATE THE**
7 **FACTS AND REST UPON TORTURED CONSTRUCTIONS AND OUTRIGHT**
8 **MISREPRESENTATIONS.**

9 **A. Samsung’s interpretation of the Abstract is wrong.**

10 The Abstract to the Hillman patent states, “[w]hen titanium is so deposited over a silicon
11 surface, titanium silicide will form at the juncture” Hillman at Abstract, attached as Ex. 2 to
12 the Declaration of Jacob Zimmerman (Dkt. #198). Plain English dictates that AMD reads this
13 sentence correctly. The word “junction” is a clear reference to the earlier part of the sentence that
14 discusses the two elements being joined (titanium and silicon). Accordingly, a person of ordinary
15 skill would understand that titanium silicide would form at the junction between the two. Glew
16 Surreply Decl. at ¶ 8. This interpretation is bolstered by Dr. Thomas’ admission at his deposition
17 that it is a common contact fabrication technique to only form titanium silicide at the junction and
18 to leave a layer of pure titanium over the titanium silicide before the anneal step. Thomas Dep. at
19 23:24-24:23.

20 Samsung’s claim that Hillman’s use of the term “junction” in the Abstract of the Hillman
21 patent “is merely intended to distinguish the contact, where titanium and silicon meet, from the
22 dielectric, where they do not” (Reply at n. 2) is little more than wishful thinking. There is no
23 indication that “junction” is being used in this narrow sense. The Abstract does not mention
24 dielectric layers or contact holes at all. Instead, the Abstract explains that titanium silicide forms
25 at the junction—where the titanium and silicon meet. Glew Surreply Decl. at ¶ 8.

26 Samsung’s bizarre contention that “Dr. Glew confirmed this distinction in his deposition”
27 (Reply at n. 2) is wholly unsupported by the deposition itself. Dr. Glew said *nothing* to confirm
28 Samsung’s unsupported position. In the portion of the Glew deposition cited by Samsung, Dr.
Glew does not refer to the Hillman Abstract at all. He merely responds to a hypothetical by

1 confirming the unremarkable notion that when a titanium layer is deposited over both the silicon
 2 and the dielectric, the titanium overlying the dielectric remains unreacted. *See* Haskett Reply
 3 Declaration, Ex. 1 at 21:2-24. Samsung's characterization of Dr. Glew's testimony is inaccurate
 4 and should be disregarded. In any event, the impact of this disagreement is clear: Samsung
 5 cannot establish the absence of genuine issues of material fact, and for that reason, summary
 6 judgment must be denied.

7 **B. Samsung misconstrues the phrase "Nitrated Silicide Titanium."**

8 Samsung also attempts to undermine AMD's reliance on the '496 patent, which was
 9 attached as Exhibit 3 to the Zimmerman Declaration. As set forth above, that patent's use of the
 10 term "nitrated silicide titanium" shows that the term means exactly what AMD says it means.
 11 The '496 patent identifies three layers after deposition: the silicon substrate on the bottom, the
 12 titanium layer on the top, and the "layer of titanium silicide formed *between*." '496 at 7:61-65
 13 (emphasis added). The surface of this structure is then exposed to ammonia plasma anneal to
 14 form a layer of "nitrated silicide titanium." *Id.* at 7:65-8:1. The '496 patent therefore confirms
 15 that the process in the Hillman patent subjects titanium, and not a silicide, to plasma. Because the
 16 '912 patent does not disclose each and every process step, Hillman '912 cannot anticipate.

17 Dr. Thomas has provided an imaginative interpretation of the passage at lines 61-65 of
 18 column 7. Specifically, he argues that "between" refers to some kind of "reaction" between the
 19 titanium and silicon layers. Thomas Dep. at 82:10-23. This is simply incorrect. The word
 20 "between" in this section is used to explain the orientation of the titanium silicide layer in relation
 21 to the silicon and titanium layers. There is no indication that "between" refers to any chemical
 22 reaction between the two. Glew Surreply Decl. at ¶ 11.

23 Samsung also points out that the '496 patent uses the terms "nitrated titanium film" and
 24 "nitrated titanium silicide film" in the paragraph following the description of "nitrated silicide
 25 titanium." Reply at 6. Samsung then launches into a confusing discussion about the significance
 26 of these two terms. The meaning of these two terms is beside the point. The issue before the
 27 Court is the meaning of the term "nitrated silicide titanium." The fact that Dr. Glew's
 28 interpretation is perfectly aligned with the use of the term in another patent by the same inventor

1 is dispositive that Dr. Glew’s interpretation is reasonable. Indeed, Dr. Thomas admitted at his
2 deposition that Dr. Glew’s interpretation is one way to read “nitrided silicide titanium” (although
3 Dr. Thomas prefers another interpretation that helps Samsung’s argument). Thomas Dep. at
4 68:10-23. The dispute between Dr. Glew and Dr. Thomas over this term represents precisely the
5 kind of fact question that renders summary judgment inappropriate.

6 Samsung also argues that the Hillman patent uses different terms for when *titanium* is
7 exposed to nitrogen plasma and when *titanium silicide* is exposed to nitrogen plasma, pointing to
8 the “nitrided titanium film” language in the Hillman patent at 15:63-16:4. Reply at 4. This
9 proves nothing. In this section of the specification, Hillman describes the deposition of titanium
10 without specifying the nature of the substrate upon which it was deposited. *See* Hillman at 15:63-
11 65 (“The titanium film can be deposited over *any substrate* according to the PECVD method
12 previously described.”) (emphasis added). Accordingly, Hillman simply refers to the film by the
13 generic term “titanium” because it may or may not have reacted with the substrate, depending
14 upon the substrate’s composition. Samsung reads far too much into this passage—especially at
15 the summary judgment stage where AMD is entitled to all reasonable inferences.

16 In an attempt to undermine AMD’s argument as to the meaning of “nitrided silicide
17 titanium,” Dr. Thomas states in his Reply Declaration that another patent, U.S. Patent No.
18 5,665,640 (“’640”), uses the term “nitrided silicide titanium” in a different way than the ’496
19 patent. Dr. Thomas states, “as discussed above, the term nitrided silicide titanium, which is a
20 term used in the ’496 patent, is the same term used in the ’640 patent.” Thomas Reply Decl. at ¶
21 19. Dr. Thomas admitted in his deposition that one would read this sentence to understand that
22 the term “nitrided silicide titanium” is used in the ’640 patent. Thomas Dep. at 12:14-18. In fact,
23 the representation in Dr. Thomas’ Reply Declaration is an outright falsehood; the term “nitrided
24 silicide titanium” never appears in the ’640 patent. Glew Surreply Decl. at ¶ 17. Faced with his
25 misrepresentation, Dr. Thomas could only claim that he “thought” he “had seen something that
26 would allow” him to make that statement, and ultimately pointed to a portion of the patent that
27 does not use the term at all. Thomas Dep. at 10:15-11:7. This misstatement is indicative of Dr.
28 Thomas’ sloppy approach to his analysis, which is replete with error.

1 **C. Samsung’s use of the phrase “that silicide” is misleading and incorrect.**

2 Samsung also appears to rely upon the phrase in column 15 of the Hillman patent that
3 describes a layer of titanium silicide being formed. Hillman at 15:31-33. As explained in AMD’s
4 Opposition at page 8, this passage merely refers to the layer between the silicon substrate and the
5 deposited titanium. In an effort to bolster its position, Samsung makes it appear as if column 15
6 provides that the titanium silicide layer is nitrated (even though this would be impossible because
7 plasma nitridation is a surface process that would only affect the titanium overlying the titanium
8 silicide layer (Glew Surreply Decl. at ¶ 26)). Samsung characterizes column 15 as follows:
9 “Hillman could not be more clear: depositing titanium onto a silicon surface forms titanium
10 silicide; the next step exposes *that silicide* to nitrogen ionized in a plasma.” Reply at 3 (emphasis
11 added). However, nothing in the column states “that silicide” is exposed to nitrogen ionized in a
12 plasma. Column 15 merely states that the ammonia plasma anneal is performed *after* the titanium
13 is deposited. Because Hillman does not disclose each and every limitation of Iaconi claims 1
14 or 4, Hillman cannot anticipate.

15 **IV. SAMSUNG’S RELIANCE UPON EXTRANEIOUS PATENTS DOES NOTHING**
16 **TO SUPPORT ITS CASE**

17 **A. The ’665 Patent Does Not Bolster Samsung’s Arguments.**

18 Samsung attempts to buttress its argument by pointing to U.S. Patent No. 4,526,665
19 (“’665”), an unrelated patent issued in 1985. Samsung uses the ’665 patent in an effort to
20 establish that the deposition parameters described in the Hillman patent would result in complete
21 conversion of titanium silicide. Samsung fails to explain how the ’665 patent could be relevant to
22 the anticipation analysis, which is limited to the four corners of the allegedly anticipating
23 reference. *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008). The only
24 possible relevance is to disclosure by inherency, which is not the basis for anticipation Samsung’s
25 motion purports to rely on. *See* Reply at 9 (“Samsung is not arguing that Hillman anticipates the
26 claims of the ’592 patent under principles of inherency.”) Thus, Samsung’s reliance on the ’665
27 patent cannot support Samsung’s motion of anticipation by express disclosure.

28 Even if Samsung were arguing inherency, Samsung’s discussion of the ’665 patent leaves

1 out material details. The '665 patent involves deposition of titanium onto a silicon substrate by
 2 “sputtering” ('665 at Abstract), which is a type of physical vapor deposition (“PVD”). Glew
 3 Surreply Decl. at ¶ 12. Sputtering uses high energy to bombard a substrate with particles. *Id.*
 4 Therefore, in addition to the temperature of the substrate, formation of titanium silicide by
 5 sputtering is dependent upon the “sputtering energy.” *Id.* The sputtering energy reduces the
 6 temperature needed to form the silicide. *Id.*

7 In contrast, the process described in the Hillman patent involves the deposition of titanium
 8 on silicon by plasma-enhanced chemical vapor deposition (“PECVD”). *Id.* at ¶ 13. PECVD
 9 techniques involve using an ionized source gas to deposit film on a substrate. *Id.* In PECVD, the
 10 energy with which the ions strike the surface is a factor in determining the degree of silicide
 11 conversion, but the energy of the particles striking the surface is generally lower than in
 12 sputtering. *Id.* Because of the significant differences in the processes, the temperature needed to
 13 form a given amount of silicide in sputtering can be lower than that needed in PECVD. *Id.* at ¶
 14 14. Accordingly, one cannot extrapolate from a patent on sputtering technology that a PECVD
 15 process using a similar temperature would result in the same degree of titanium silicide
 16 formation. *Id.* Of course, Dr. Thomas does not even mention in his declaration that the '665
 17 patent uses sputtering instead of PECVD. Thus, Samsung’s reliance on the '665 patent cannot
 18 help Samsung prove anticipation or obviousness.

19 **B. The '640 Patent Does Not Bolster Samsung’s Argument.**

20 Samsung also argues that another patent, the '640 patent, uses parameters similar to those
 21 in the Hillman patent with the result of converting titanium to silicide all the way to the surface.
 22 Reply at 5-6. Unfortunately for Samsung, the '640 patent says nothing of the sort. It does state
 23 that the titanium is “fully converted” to TiSi_2 , but Samsung misconstrues this statement.

24 By way of background, titanium mixed with silicon can convert to titanium monosilicide
 25 (TiSi_1), titanium disilicide (TiSi_2), or other compounds. Glew Surreply Decl. at ¶ 20. TiSi_2 is
 26 preferable because it has lower contact resistance. *Id.* Accordingly, by using the term “fully
 27 converted,” the patent merely states the inventors’ conclusion that titanium had been fully
 28 converted to titanium disilicide (as opposed to titanium monosilicide). *Id.* One of skill would not

1 understand that term to mean that all the titanium had been silicided. *Id.* The inventors of the
 2 '640 patent knew it was critical to draw this distinction because those of skill in the art know that
 3 $TiSi_1$ is not an acceptable contact material due to its high degree of resistance. *Id.*

4 Furthermore, Dr. Thomas admitted that the conclusion about titanium being fully
 5 converted relies upon the experiments described in column 29 of the '640 patent, and that those
 6 experiments do not match up with any of the experiments summarized in the patent tables.

7 Thomas Dep. at 43:25-46:1; 46:13-21; Glew Surreply Decl. at ¶ 23. Accordingly, the deposition
 8 parameters are missing that would allow a person of ordinary skill in the art to determine if the
 9 results described in the '640 patent shed light on the processes described in the Hillman patent.
 10 Glew Surreply Decl. at ¶ 24. Samsung's reliance on the '640 patent is misplaced. That patent
 11 does not supply any of the missing information that Samsung must show to establish invalidity.

12 **V. SAMSUNG'S RELIANCE UPON COLUMN 3 IS UNAVAILING.**

13 As AMD made clear in its Opposition, Samsung is not entitled to pick and choose from
 14 different parts of the Hillman patent to establish anticipation. Opposition at 20. Samsung's
 15 purported evidence linking the disclosure in column 3 with column 15 is insufficient. All
 16 Samsung has done is come forward with evidence that the two disclosures are similar and ignored
 17 the legal standard that requires "evidence that specifically links the disclosures." Opposition at
 18 20 (citing *Ecolochem, Inc. v. S. Cal. Edison Co.*, 227 F.3d 1361, 1369 (Fed. Cir. 2000)).

19 Even if the disparate disclosures are combined, column 3 describes nothing more than a
 20 portion of the process described in column 15. Samsung relies heavily on the language in column
 21 3 that states, "This will permit PECVD deposition of titanium onto a silicon surface to form
 22 titanium silicide [*sic*, "silicide"] which can be annealed with an ammonia plasma." Reply at 4
 23 (citing Hillman at 49:52). Samsung apparently assumes that the "which" clause modifies the
 24 "titanium silicide" (so it is the titanium silicide being annealed and exposed to ammonia plasma).
 25 However, one of ordinary skill in the art would understand that the "which" modifies not
 26 "titanium silicide," but rather the entire deposited titanium film (only a portion of which becomes
 27 titanium silicide). Glew Surreply Decl. at ¶ 26. Moreover, the sentence only states that the
 28 titanium silicide is subjected to an anneal, not a plasma. The plasma is only described as

1 occurring “with” (*i.e.*, at the same time as) the anneal. A person of ordinary skill in the art would
2 understand that the plasma is only a surface treatment and it would not extend down to a layer of
3 titanium silicide covered by titanium. *Id.* The plasma does not cause the anneal or vice versa—
4 they are merely two different processes that occur at the same time. *Id.* Thus, Samsung has
5 failed to establish the absence of a genuine issue of material fact that would allow Samsung to
6 combine disparate disclosures within the Hillman ’912 patent.

7 **VI. THE CASES CITED BY SAMSUNG REGARDING ANTICIPATION ARE**
8 **INAPPOSITE.**

9 An anticipating reference “must not only disclose all elements of the claim within the four
10 corners of the document, but must also disclose those elements ‘arranged as in the claim.’” *Net*
11 *MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008). Because Samsung is
12 unable to establish anticipation under this standard, it turns to cases decided under unique factual
13 circumstances that cannot apply to this case. At bottom, Samsung seeks to perform an end-run
14 around the law of anticipation by supplying missing elements under some amorphous “knowledge
15 of the art” standard. It ignores the case law cited in AMD’s Opposition, which requires that an
16 element be expressly or inherently disclosed, and essentially eliminates the legal distinction
17 between obviousness and anticipation.

18 For example, Samsung relies upon *Upsher-Smith Laboratories, Inc. v. PamLab, LLC*,
19 where the claims of the relevant vitamin supplement patent expressly excluded antioxidants. 412
20 F.3d 1319, 1321 (Fed. Cir. 2005). The prior art reference provided for optional inclusion of the
21 antioxidants (in other words, both vitamins with antioxidants and vitamins without antioxidants
22 were disclosed). *Id.* at 1322. This bears no resemblance to the present factual scenario. The
23 Hillman patent does not lay out two simple options regarding conversion to silicide; there is an
24 infinite number of degrees of such conversion. Further, the Hillman patent describes a titanium
25 deposition step that only results in titanium silicide formation at the juncture with the silicon, and
26 not a complete conversion of the titanium to titanium silicide. There is no disclosure of an
27 optional complete conversion.

28 Samsung also cites *Hewlett-Packard Co. v. Mustek Systems, Inc.*, 340 F.3d 1314 (Fed. Cir.

1 2003). That case involved an *obviousness* defense where a prior art device could function in two
 2 ways, where one way practiced a claim element and the other did not. *Id.* at 1326. The court held
 3 that the prior art product taught both ways because it would sometimes operate one way and
 4 sometimes the other (similar to a light switch that is sometimes “on” and sometimes “off”). *Id.*
 5 This is dramatically different from the present situation. Hillman does not teach that complete
 6 conversion to titanium silicide is sometimes appropriate. It teaches only partial conversion.²

7 Finally, relying upon *ArthroCare Corp. v. Smith & Nephew*, 406 F.3d 1365 (Fed. Cir.
 8 2005), Samsung argues that it does not rely upon inherent anticipation. Reply at 9. It cites that
 9 case for the proposition that the knowledge of one skilled in the art can act as a substitute for a
 10 claimed element in a prior art reference. There are two problems with Samsung’s analysis. First,
 11 by explaining that it was not relying upon *express* disclosure, the court in *ArthroCare* confirmed
 12 that it was, in fact, relying upon inherent disclosure. *See id.* at 1373-74 (“[E]ven if a piece of
 13 prior art does not *expressly* disclose a limitation, it anticipates if a person of ordinary skill in the
 14 art would understand that prior art to disclose the limitation . . .”). Moreover, this is not a case
 15 where a person of ordinary skill would understand that the limitation is present. For all the
 16 reasons set forth in AMD’s Opposition and the additional reasons described above, such a person
 17 would understand that the limitation is *not* present. At a bare minimum, there is a dispute of fact
 18 over this issue, which precludes summary judgment.

19 **VII. SAMSUNG’S SUGGESTION THAT TiSi DEPOSITION BE SUBSTITUTED FOR**
 20 **DEPOSITING Ti MAKES NO SENSE.**

21 Samsung’s suggestion that one can combine the disclosure in paragraph 15 (in which one
 22 deposits titanium on silicon to form titanium silicide) with other disclosures in the patent (where
 23 titanium silicide is deposited directly) ignores the applicable case law, the language of the
 24 Hillman patent, and the underlying technology.

25
 26
 27 ² *Alza Corp. v. Mylan Laboratories, Inc.*, 388 F. Supp. 2d 717, 735 (N.D.W.V. 2005), also
 28 involves a product that would sometimes operate in an anticipatory manner and sometimes not.
 This case is distinguishable for the same reason as *Hewlett-Packard*.

A. Samsung Cannot Use the Discussion of TiSi Deposition to Prove Anticipation.

Column 15, lines 29-33 of the Hillman patent specifically provides that the plasma process is performed on a layer formed by depositing *titanium* on silicon, not by depositing *titanium silicide*. An earlier paragraph in the patent does mention deposition of titanium silicide, but not in the context of a plasma process. This earlier paragraph is irrelevant to the anticipation analysis. An anticipating reference “must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements arranged as in the claim.” *Net MoneyIn*, 545 F.3d at 1369 (quotation omitted). Accordingly, Samsung cannot simply substitute one of the process steps discussed in the Hillman patent with a process discussed elsewhere in the patent in a different context. Samsung can supply a *missing* process step only if the reference links the two processes. *See* AMD’s Opposition at 20. Samsung has failed to do so. It is unable to do so because column 15 specifically contemplates applying plasma to a layer formed by titanium deposition, and there is no suggestion anywhere linking titanium silicide deposition to the plasma nitridation process. Glew Surreply Decl. at ¶ 28. The earlier paragraph relied upon by Samsung (found at column 15, lines 20-28), merely discusses a very general process whereby various layers can be deposited onto an unspecified substrate material. Because Samsung has failed to establish the necessary linkage, Samsung’s anticipation defense cannot combine these disparate disclosures.

B. Samsung Cannot Use the TiSi Deposition Disclosure to Prove Obviousness.

In its Opposition, AMD established that Samsung’s obviousness argument lacked evidence in support of the basic facts underlying obviousness. Samsung now attempts to supply such evidence through new arguments in its Reply. This suggested combination of references was never disclosed in Samsung’s Preliminary Invalidity Contentions or Amended Preliminary Invalidity Contentions. Even if Samsung is allowed to make these new arguments, Samsung falls well short of a legally sufficient argument that can be decided in summary judgment.

1. Samsung still has not made a sufficient obviousness argument.

The sum total of Samsung’s obviousness argument consists of a few lines at the end of its brief. *See* Reply at 10-11. As with its first attempt to establish obviousness, Samsung fails to

1 define the level of ordinary skill in the art. More importantly, Samsung provides no motivation to
 2 combine the disclosures identified in the brief. Dr. Thomas opines that one of ordinary skill
 3 “could” combine the two disclosures (Thomas Reply Decl. at ¶ 29), but he provides no reason as
 4 to why one would be motivated to do so. As such, Samsung’s obviousness argument is deficient,
 5 and summary judgment would be improper.

6 **2. Samsung cannot show a sufficient motivation to combine the two**
 7 **Hillman disclosures.**

8 Even if Samsung’s obviousness argument contained all of the requisite parts, there are
 9 several reasons why one of ordinary skill in the art would not think to combine the direct titanium
 10 silicide deposition disclosure with the rest of the Hillman patent.

11 **a. Direct TiSi deposition does not allow for selective deposition of**
 12 **TiSi.**

13 Contact holes are surrounded by a dielectric layer (*i.e.*, insulation). Glew Surreply Decl.
 14 at ¶ 30. Silicon is found at the bottom of these contact holes. *Id.* When titanium is deposited
 15 over the chip and the chip is subsequently annealed, titanium silicide will form only where the
 16 titanium comes into contact with silicon (*i.e.*, at the bottom of the hole, where it is desired to
 17 reduce resistance). *Id.* The undesired titanium on the dielectric layer and any unreacted titanium
 18 in the contact hole can then be etched away with a chemical that selectively removes titanium but
 19 not titanium silicide. *Id.*

20 When titanium silicide is deposited in lieu of titanium, it covers the silicon at the bottom
 21 of the contact hole, as well as the sidewalls of the contact hole and the surface dielectric layer. *Id.*
 22 at ¶ 31. It is then highly difficult to remove the titanium silicide from the dielectric layer (as must
 23 be done for most applications) because there is no ability to selectively etch. *Id.* For this reason,
 24 those of ordinary skill in the art tend to avoid using direct titanium silicide deposition. *Id.*

25 **b. Superior phases of TiSi₂ cannot be achieved when titanium**
 26 **silicide is directly deposited.**

27 There are two phases, or crystal structures, of titanium silicide: C49 and C54. Glew
 28 Surreply Decl. at ¶ 32. C54 is a superior phase with lower resistivity, but it is more difficult to

1 form than C49. *Id.* One of ordinary skill in the art would recognize that it is easier to control the
 2 amount of C54 by depositing titanium and then annealing it rather than depositing titanium
 3 silicide directly. *Id.* Therefore, one of ordinary skill in the art would avoid combining direct
 4 titanium silicide deposition with the process described in column 15, lines 29-37. *Id.*

5 **c. Hillman does not teach using plasma nitridation on directly**
 6 **deposited titanium silicide.**

7 Combining a titanium silicide deposition with the plasma process described in column 15
 8 of the Hillman patent would be inconsistent with the teaching of that patent. Glew Surreply Decl.
 9 at ¶ 33. Column 2 of the Hillman patent explains that titanium nitride is commonly deposited in a
 10 contact before a top layer such as tungsten. *Id.* Hydrogen chloride, which is a byproduct of CVD
 11 deposition of titanium nitride, etches away titanium. *Id.* Accordingly, any elemental titanium
 12 (*i.e.*, titanium not combined with silicide) underneath the deposited titanium nitride must be
 13 nitrided to prevent such etching. *Id.* This is why column 15 of the Hillman patent provides a
 14 plasma process after the titanium deposition. *Id.* Hillman does not teach that depositing titanium
 15 nitride on titanium silicide presents a similar problem. *Id.*

16 **CONCLUSION**


17 As set forth above, Samsung's motion implicates numerous disputes of material fact that
 18 preclude summary judgment. The evidence proffered by AMD establishes that the Hillman
 19 patent does not anticipate the '592 patent. Accordingly, Samsung's Motion should be denied.
 20 Moreover, there is no reason to further delay discovery concerning Samsung's processor chips in
 21 light of the deposition testimony concerning such chips, which was set forth in AMD's
 22 Opposition to Samsung's Motion for a Protective Order (Dkt. #209). Accordingly, the Court
 23 should compel Samsung's production of documents concerning such chips.

ROBINS, KAPLAN, MILLER & CIRESI L.L.P.
ATTORNEYS AT LAW
MINNEAPOLIS

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

DATED: May 8, 2009

ROBINS, KAPLAN, MILLER & CIRESI L.L.P.

By: 
William H. Manning (*pro hac vice*)
Jacob S. Zimmerman (*pro hac vice*)

**ATTORNEYS FOR PLAINTIFFS
ADVANCED MICRO DEVICES, INC. AND
ATI TECHNOLOGIES, ULC**