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2010-1270

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

QIMONDA AG,
Appellant,

v.

INTERNATIONAL TRADE COMMISSION,
Appellee,

and

LSI CORPORATION,
Intervenor,

and

SEAGATE TECHNOLOGY, SEAGATE TECHNOLOGY (US) HOLDINGS INC.,
SEAGATE TECHNOLOGY LLC, AND SEAGATE (US) LLC,
Intervenors.

FILED
U.S. COURT OF APPEALS FOR THE FEDERAL CIRCUIT
SEP 10 2010
JAN HORBALY
CLERK

On appeal from the United States International Trade Commission
in Investigation No. 337–TA–665.

BRIEF OF INTERVENORS LSI CORPORATION, SEAGATE TECHNOLOGY, SEAGATE TECHNOLOGY (US) HOLDINGS, INC., SEAGATE TECHNOLOGY LLC, AND SEAGATE (US) LLC

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CERTIFICATE OF INTEREST

(1) The full name of every party or amicus represented in the case by the attorney.

LSI Corporation, Seagate Technology, Seagate Technology (US) Holdings, Inc., Seagate Technology LLC, and Seagate (US) LLC

(2) The name of the real party in interest if the party named in the caption is not the real party in interest.

N/A

(3) All parent corporations and any publicly held companies that own 10% or more of the stock of the party or amicus curiae.

N/A

(4) The names of all law firms and the partners or associates that appeared for the party or the amicus now represented by me in the trial court or agency or are expected to appear in this Court are:

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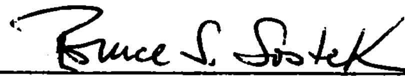

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STATEMENT OF RELATED CASES

The patent at issue in this appeal is being asserted in *Qimonda AG v. LSI Corp.*, C.A. No. 3:08-cv-00735–JRS (E.D. Va.). That case is stayed until this case has been resolved. *See* 28 U.S.C. § 1659.

STATEMENT OF THE ISSUE

Qimonda's statement of the issues misstates the ITC's claim construction. The ITC did not construe the term at issue — "removing the exposed portion of the insulating material over the active regions" — to require that all insulating material over the active regions be removed. Rather, following the claim language, the specification, and the prosecution history, the ITC's construction requires removing only "the insulating material from those areas not covered by the photoresist layer."

The issue, therefore, is: Whether the ITC properly construed the term "removing the exposed portion of the insulating material over the active regions" to mean "removing the insulating material from those areas not covered by the photoresist layer to expose the surface of the semiconductor substrate."

STATEMENT OF FACTS

A. Qimonda no longer has a domestic industry related to the '899 Patent.

1. Qimonda's only business in the United States is the divestiture of its property.

Qimonda wrongly asserts that it (1) designs and manufactures semiconductor technologies and (2) invests significant money each year on research and development and the protection of its intellectual property rights. Appellant's Br. at 4–5. While this may have been true at some time in the past, it is no longer. As Qimonda acknowledges, Qimonda AG filed for bankruptcy on January 23, 2009 under German law, and the German bankruptcy court opened insolvency proceedings on April 1, 2009. *Id.* at 5 n.1 (citing A2390). Separately, on February 20, 2009, Qimonda AG's wholly-owned U.S. subsidiaries filed for creditor protection in Delaware under Chapter 11 of the U.S. Bankruptcy Code. *Id.* (citing A2353–420.) Those subsidiaries include Qimonda North America and its wholly-owned subsidiary, Qimonda Richmond. *Id.* at 5 (citing A2384; A2799.) Qimonda Richmond managed and operated Qimonda's United States fabrication facilities, located in Richmond, Virginia. *Id.* at 5 (citing A2711; A2718.)

The ITC determined (and Qimonda has not challenged) that by March 2009, all of Qimonda's manufacturing activities in the United States had ceased. (A250.) On June 19, 2009 — the close of evidence of the action on appeal — Qimonda Richmond employed between 30 and 40 employees to maintain its Virginia

facilities in "warm idle status." (A250–53.)

Since that time, Qimonda's activities have become even more limited, contradicting the assertion that it continues to be active in the semiconductor business in the United States. On March 16, 2010, for example, the bankruptcy court approved the sale of its fabrication facilities in Virginia to Richmond Semiconductor LLC. (A18113–35.[1]) Under the terms of the sale transaction that followed, Qimonda Richmond conveyed title to Richmond Semiconductor and now leases the facilities from Richmond Semiconductor. (A18259; A18136–257.) Further, Qimonda Richmond may use the leased property "solely for the purpose of allowing third parties to dismantle and remove [their] equipment . . . and for such activities that are reasonably related to removing, administering and maintaining Tenant's Property." (A18234.) Likewise, the lease agreement requires that Qimonda Richmond "shall use commercially reasonable efforts to cause all of [its] Property and Third Party Equipment to be removed . . . as

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[1] Intervenors request that the Court take judicial notice of the continued decline of Qimonda's U.S. activities since the close of the administrative record. *See Opoka v. Immigration & Naturalization Serv.*, 94 F.3d 392, 394–95 (7th Cir. 1996) ("[I]t is a well-settled principle that the decision of another court or agency . . . is a proper subject of judicial notice. . . . Further . . . judicial notice may be taken at any stage of a proceeding."); *Vikase Corp. v. Am. Nat'l Can Co.*, 261 F.3d 1316, 1328 (Fed. Cir. 2001) (taking judicial notice during appeal in patent-infringement suit that patentability of one of the patents in question had recently been confirmed by the Patent and Trademark Office); *Biomedical Patent Mgmt. Corp. v. Cal., Dep't of Health Servs.*, 505 F.3d 1328, 1331 (Fed. Cir. 2007) (finding it proper to take judicial notice of court filings in another matter).

expeditiously as possible." (A18234.) If Qimonda fails to turn the property over to Richmond Semiconductor by September 30, 2010, it will be liable for monthly holdover payments of $500,000. (A18259–60; A18231.)

Qimonda Richmond has also sold the majority of its assets in a series of transactions with Texas Instruments and Global Alliance Technologies, among others. (A18259; A18287–88; A18276–86; A18304–84.) As of May 4, 2010, those transactions had resulted in the sale of more than 90% of Qimonda Richmond's remaining assets. (A18259; A18287–89.) Plainly put, Qimonda's only "business" in the United States is the divestiture of its property.

2. **The ALJ's sole basis for finding a domestic industry related to the '899 Patent was a finding that Qimonda Richmond owned and operated the Virginia facilities in warm-idle status at the close of evidence.**

The ALJ determined that Qimonda met the economic prong of the domestic industry requirement of 19 U.S.C. § 1337 based solely on a finding that Qimonda Richmond still owned the facilities in Virginia, which it continued to operate in warm idle status, as of the close of evidence on June 19, 2009. (A250–53.) Qimonda failed to prove that it maintains substantial investment in exploiting or licensing the asserted patents. (A253–57.) Qimonda has not appealed this determination.

As explained, Qimonda Richmond sold its manufacturing facility to Richmond Semiconductor after the close of evidence, and it has sold over 90% of

it remaining assets. Thus, there is no longer any basis for finding a domestic industry related to the '899 Patent. Under these facts, even if this Court were to determine that the ITC erred in construing the claim at issue (though it did not), remanding the case would be an exercise in futility. *See, e.g., Certain Variable Speed Wind Turbines and Components Thereof*, Inv. No. 337-TA-376, USITC Pub. No. 3003, 1996 ITC LEXIS 556, Comm'n Op. at 22–26 (Nov. 1996) (cessation of domestic activities after the close of evidence renders the continuation of any remedy inappropriate); *Certain Neodymium-Iron-Boron Magnets, Magnet Alloys, and Articles Containing Same*, Inv. No. 337-TA-372, 1997 ITC LEXIS 422, Comm'n Op. at 73 (Oct. 28, 1997) (same).

B. The '899 Patent claims a method for forming shallow isolation trenches in integrated circuits.

Claim 1 of the '899 Patent recites:

> A method for fabricating devices including the step of forming isolation between device structures fabricated on a substrate comprising:
>
> defining active and non-active regions on a surface of the substrate;
>
> forming isolation trenches of varying widths the active regions comprising active regions of varying width in the non-active regions;
>
> forming a layer of HDP-CVD insulating material of silicon oxide, wherein the HDP-CVD silicon oxide layer is non-planar and protrudes angularly above isolation trench edges forming sloping edges that slope away from the trench on the substrate by high density plasma-enhanced chemical vapor deposition (HDP-CVD), the HDP-CVD

layer substantially filling the trenches and covering the active regions;

removing at least a portion of the insulating material covering the active regions; and

planarizing the surface of said substrate to expose the active regions, the removal of at least a portion of insulating material from the active regions providing a planar topography; wherein removing at least a portion of the insulating material from the active regions includes:

depositing a mask layer over the insulating material;

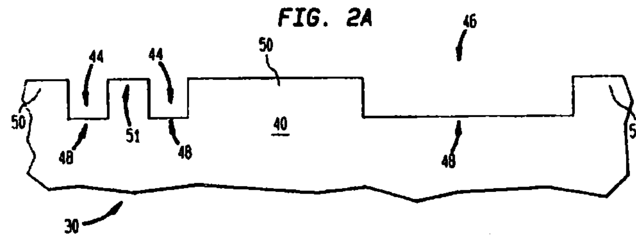
patterning the mask layer to expose at least a portion of the insulating material over the active regions; and

removing the exposed portion of the insulating material over the active regions, leaving unexposed portions of the insulating materials; and wherein the mask layer is deposited using an inverse active area mask that is biased so that the mask layer after patterning covers the non-active regions and at least a portion of the active regions.

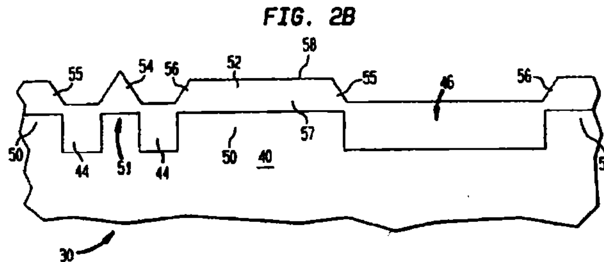
(A682–83, at 8:58–9:24.) (disputed term in bold).[2]

As illustrated in the specification, the claimed method follows a simple sequence. First, trenches (labeled 44 and 46 in Figure 2A) are etched into the substrate. (A18005.)

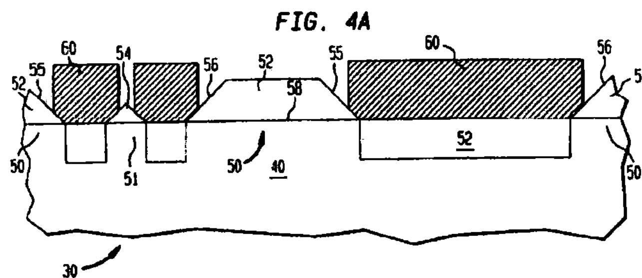
[2] Qimonda ultimately asserted claims 1, 2, 7, 22, and 23 of the '899 Patent. Claims 1 and 22 are independent claims. Claims 2 and 7 depend from claim 1, and claim 23 depends from claim 22. Claims 1 and 22 both describe the etching limitation at issue here. As Qimonda notes, those claims use slightly different language to describe the limitation, but the ALJ, the parties, and the Office of Unfair Import Investigation treated them as identical and construed them as if they were the same. Appellant's Br. at 27 n.3. Similarly, Qimonda's arguments here treat claims 1 and 22 interchangeably. Thus, if this Court finds the ITC properly construed the term at issue in claim 1, there is no basis for finding that it erred in construing the term in claim 22.



After the trenches have been etched into the wafer, insulating material is deposited over the wafer. (A18005.) In the figure below (Figure 2B from the patent), the insulating material is seen in the trenches and in the raised areas between the trenches.

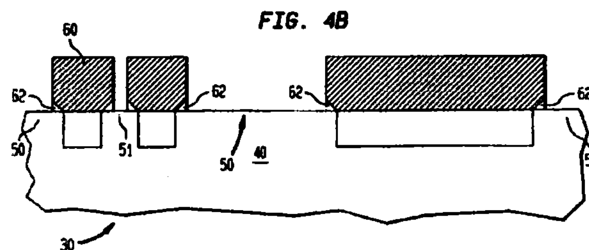


Next, a layer of photoresist is deposited over the wafer and exposed using a mask that allows photoresist to remain over the trenches and at least a portion of the active areas (50 and 51) on either side of the trenches. (A18005.) The result of this step is illustrated in Figure 4A, reproduced below, where photoresist (60) alternates with the raised areas of insulating material on the substrate. (A18005.)

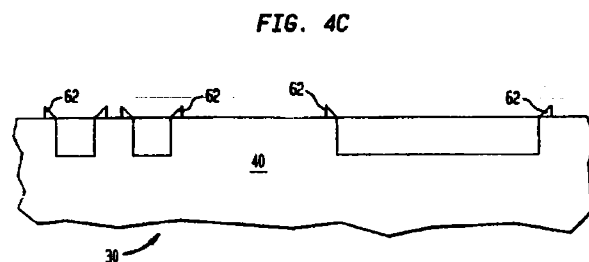


In the next step, which is the subject of this dispute, "the exposed portion of

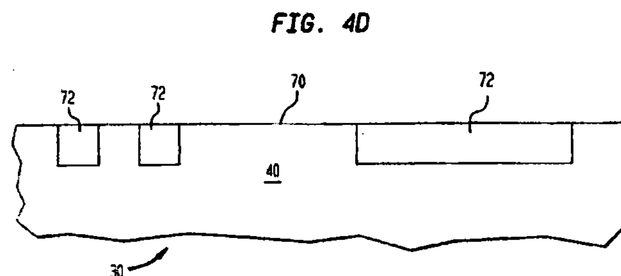
the insulating material" — insulating material that is not covered by photoresist — is removed in an etching step. (A18005.) Unexposed insulating material — insulating material covered by the photoresist — remains. (A18005.) The remaining insulation can be seen in the trenches (unlabeled in Figure 4B, below) and as the wedges (62) above the active area. (A18005.)



The photoresist mask is then removed, leaving the wafer profile shown below in Figure 4C. (A18005.)



Finally, the wafer is planarized to remove the wedges, resulting in the profile below. (A18005–06.)



SUMMARY OF THE ARGUMENTS

The etching step of the fabrication process claimed by the '899 Patent requires "removing the exposed portion of the insulating material over the active regions." Qimonda contends this does not require removing insulating material all the way to the substrate because the claim also states that "at least a portion of the insulating material covering the active regions" must be removed. Qimonda focuses on the phrase "at least a portion" and says this means the patent does not require removing all of the insulating material. Qimonda misrepresents the effect of the ITC's construction, which does not require removal of all the insulating material. Rather, consistent with the rest of the claim, it requires removal of all the *exposed* insulating material. Claim 1 defines the portion of insulating material to be removed as the material left exposed when the mask layer is deposited: "removing *at least a portion* of the insulating layer from the active regions includes . . . patterning the mask layer *to expose at least a portion* of the insulating material over the active regions and removing *the exposed portion* . . . ." (emphasis added). Thus, the exposed insulating material is the portion that must be removed. The ITC's construction provides the only reasonable interpretation of the claim language, and it is also consistent with the specification and the prosecution history.

STANDARD OF REVIEW

This Court's standard of review for section 337 investigations is governed by 19 U.S.C. § 1337(c) and 5 U.S.C. § 706(2)(E). Under the applicable standard of review, this Court reviews the Commission's legal determinations *de novo*. *Honeywell Int'l, Inc. v. U.S. Int'l Trade Comm'n*, 341 F.3d 1332, 1338 (Fed. Cir. 2003); *SSIH Equip. S.A. v. U.S. Int'l Trade Comm'n*, 718 F.2d 365, 372 (Fed. Cir. 1983). However, where an agency construes a statute it administers and Congress has not directly spoken to the issue, a reviewing court "does not simply impose its own construction"; rather, it must "respect legitimate policy choices" by the agency. *Chevron U.S.A., Inc. v. Natural Resources Defense Counsel, Inc.*, 467 U.S. 837, 843, 866 (1984). Accordingly, this Court will "uphold the ITC's determination of section 337 if it is reasonable in light of the language, policies and legislative history of the statute." *Enercon GmbH v. U.S. Int'l Trade Comm'n*, 151 F.3d 1376, 1381 (Fed. Cir. 1998).

As to factual findings, this Court must affirm the agency's determination if supported by substantial evidence. 5 U.S.C. § 706(2)(E); *see also* 19 U.S.C. § 1337(c); *Honeywell*, 341 F.3d at 1338. Substantial evidence "means such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." *Universal Camera Corp. v. NLRB*, 340 U.S. 474, 477 (1951) (citing *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938)); *see Alloc, Inc. v. U.S.*

Int'l Trade Comm'n, 342 F.3d 1361, 1368 (Fed. Cir. 2003). In this regard, this Court has recognized that agencies are "equipped or informed by experience to deal with a specialized field of knowledge, whose findings within that field carry the authority of an expertness which courts do not possess and therefore must respect." *SSIH Equip. S.A.*, 718 F.2d at 382.

ARGUMENTS

The ITC construed the term "removing the exposed portion of the insulating material over the active regions" as "removing the insulating material from those areas not covered by the photoresist layer to expose the surface of the semiconductor substrate." (A150.) Qimonda disputes this construction. The question is whether "the exposed portion of the insulating material" means all of the exposed insulating material, as required by the ITC's construction, or just some undefined "portion" of the exposed material, as Qimonda contends.

As explained below, the straightforward language of the claim, supported by the specification and the prosecution history, show the ITC got it right — the exposed portion of the insulating material must be removed completely.

Further, Qimonda agrees that, under the ITC's construction, none of the parties practice claims 1 or 22 of the '899 Patent. Accordingly, there is no question that Respondents do not infringe and that Qimonda failed to meet the technical prong of the domestic-industry requirement.

A. The claim language requires removal of all the exposed oxide.

Claim 1 describes a process in which the surface of the semiconductor wafer is first etched and then planarized. In each of these steps, "a portion" of the insulating material covering the substrate is removed. The etching step first "remov[es] at least a portion of the insulating material covering the active regions"; then "at least a portion of insulating material from the active regions" is removed by planarization. (A683, at 9:7–12.) The term at issue — "removing the exposed portion of the insulating material over the active regions" — describes the portion removed during the etching step. Qimonda contends that only some, not all, of the exposed portion must be removed.

The language of the claim refutes Qimonda's argument. It clearly defines the portion of the insulating material that must be removed as "***the** exposed portion* of the insulating material":

> *removing at least a portion of the insulating material* from the active regions includes:
>
> depositing a mask layer over the insulating material;
>
> patterning the mask layer *to expose at least a portion of the insulating materia*l over the active regions; and
>
> removing *the exposed portion* of the insulating material over the active regions, leaving unexposed portions of the insulating materials . . . .

(A683, at 9:12–24 (emphasis added). The patent therefore claims a process in which (1) a mask layer is patterned to expose some portions of the insulating

material but not others, and (2) only the exposed portions are removed. The claim is clear and direct — "removing at least a portion of the insulating material" means removing the exposed portions while leaving unexposed portions. The question is whether a claim that clearly requires removal of "*the* exposed portion" requires removal of all of that exposed portion.

As the ITC properly determined, it does: "[T]he claim language that requires removing 'the exposed portion' by using the definite article 'the' designates all of the item being described, which is in this case the words 'exposed portion.'" (A151.)[3] Qimonda attempts to refute this by stating that "the plain and ordinary meaning of the article 'the' is not 'all': rather, in the context of the claim language '*the* exposed portion' refers to *where* the etching of the insulating material is to occur." Appellant's Br. at 28–29 (emphasis in original). But this leads to the same result. If what has been previously specified is a complete unit — such as the exposed portion of the insulating material — then the word "the" indicates the entire unit, wherever it might be, not just some undefined portion of it. *See, e.g.*, *Kaufman v. Allstate N.J. Ins. Co.*, 561 F.3d 144, 155 (3d Cir. 2009) (in construing the Class Action Fairness Act, holding that "the definite article preceding the term 'claims' indicates that 'the claims asserted' means all the claims asserted");

[3] The meaning of "the exposed portion" is further clarified by the requirement that unexposed portions of the insulating material remain. The patent, therefore, teaches leaving unexposed portions behind. It does not describe a process that leaves behind any of the exposed portions.

Frazier v. Pioneer Ams. LLC, 455 F.3d 542, 546 (5th Cir. 2006) ("The plain text of [28 U.S.C.] § 1332(d)(5)(A), using the definite article before the plural nouns, requires that all primary defendants be states.").

Only if there is a modifier, such as "some of" or "a portion of," can the word "the" refer to part of whatever was previously specified. In this case, there is no such modifier. "The" indicates insulating material that was exposed during the previous step of the process. That insulating material is what must be removed — not unexposed insulating material, and not exposed insulating material over only a portion of the active region.

Put plainly, Qimonda wants to add language to the claim that would broaden its scope to cover processes that remove only *some of* the exposed portion of the insulating material. But the claim recites "removing *the exposed portion* of the insulating material over the active regions," not "removing *some of* the exposed portion of the insulating material over the active regions." The ITC therefore properly rejected Qimonda's construction. *E.g.*, *Laitram Corp. v. NEC Corp.*, 163 F.3d 1342, 1347 (Fed. Cir. 1998) ("Claims may not be construed by reading in extraneous words not actually contained in the claim.").

B. The specification is consistent with the claim language.

Qimonda further contends the ITC erred by limiting the claims to the preferred embodiment. But as the Initial Determination clearly states, the

construction is based on the claim language. While the specification supports that construction, it does not define it: "The construction given to this term is also *supported by* the specification of the '899 patent." (A152 (emphasis added).) In particular, the ALJ found that in the preferred embodiment — the only embodiment described by the patent — all of the exposed insulating material is removed, thus exposing the substrate. (A152–54.) This simply shows that the claim corresponds to the preferred embodiment. It does not read limitations into the claim from the embodiment. *See Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1248 (Fed. Cir. 1998) (recognizing "a familiar pair of claim construction canons": "(a) one may not read a limitation into a claim from the written description, but (b) one may look to the written description to define a term already in a claim limitation, for a claim must be read in view of the specification of which it is a part").

1. The only embodiment described in the specification removes all the exposed insulating material.

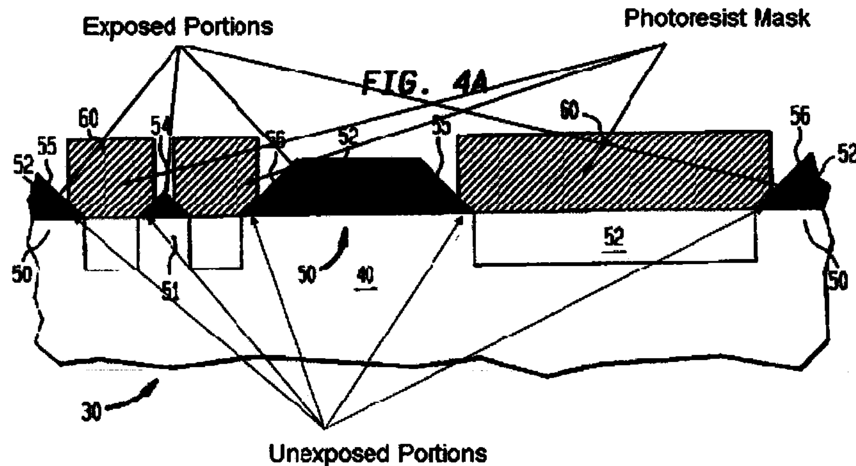
The only embodiment described in the specification — which includes the only discussion of how to remove the "exposed portions" — unquestionably describes removing all the exposed oxide above the active areas *so as to expose the substrate*:

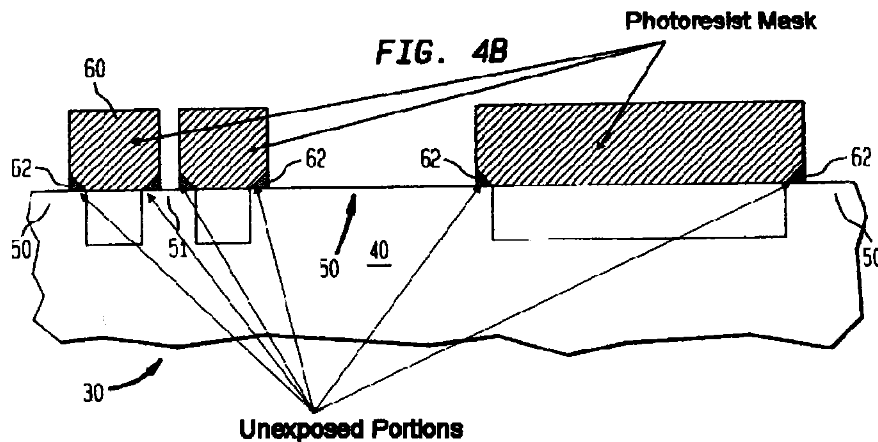
> The regions of the oxide layer 52 unprotected by photoresist are then etched using a suitable etching technique (such as RIE). The RIE etching step is oxide selective. By employing an

> oxide selective RIE, the silicon substrate and resist act as etch stops. ***Thus, the RIE removes only the HDP-CVD oxide layer 52, exposing the semiconductor substrate surface above those areas not covered by the photoresist layer 60.***

(A682, at 7:45–52 (emphasis added).)

The figures that illustrate the etching process likewise demonstrate that "removing the exposed portion of the insulating material over the active regions" means removing the entire exposed portion. Figures 4A and 4B are shown below with the exposed and unexposed portions of the insulating material highlighted.





As the specification states in describing Figure 4B, all of the exposed insulating

material has been removed:

> As shown in FIG. 4B, the RIE etching process results in the removal of portions of the HDP-CVD oxide layer 52 overlying the active regions. It can also be seen that wedge shaped portions 62 of the HDP-CVD oxide layer 52 are left on the surfaces of the edges of the active areas after the RIE etching step. These wedge shaped portions 62 are removed in a subsequent CMP [planarization] step.

(A682, at 7:53–59.) Accordingly, the specification supports a construction that requires removal of all the exposed insulating material over the active regions, and provides no support for a claim construction in which only some of the exposed material is removed.

2. The '899 patent distinguishes prior art in which some of the exposed insulating material is left over the active regions.

Qimonda's proposed construction is further undermined by the '899 Patent's description of the prior art, in which only part of the exposed material is removed. Figures 1A and 1B illustrate examples of the prior art. Figure 1A shows a cross section of a semiconductor wafer with an insulating oxide layer (18) deposited over the substrate and photoresist (20) patterned over the oxide layer. (A674; A679, at 2:5–35.)

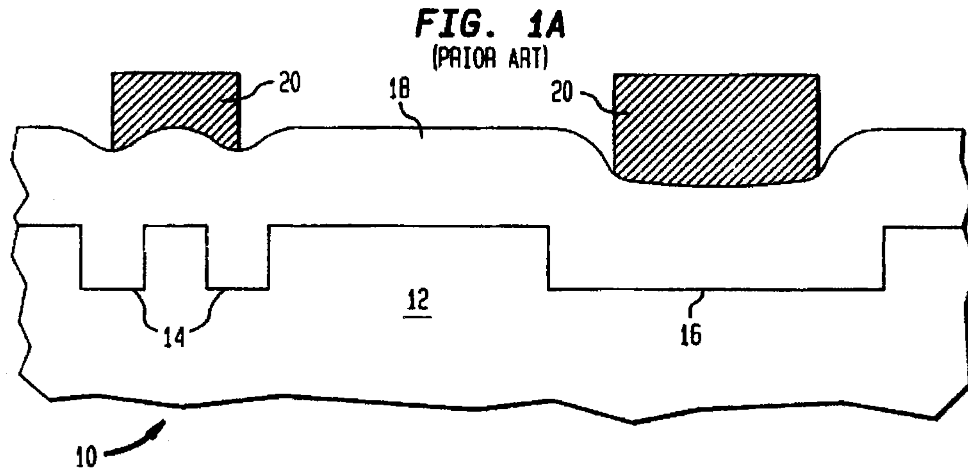
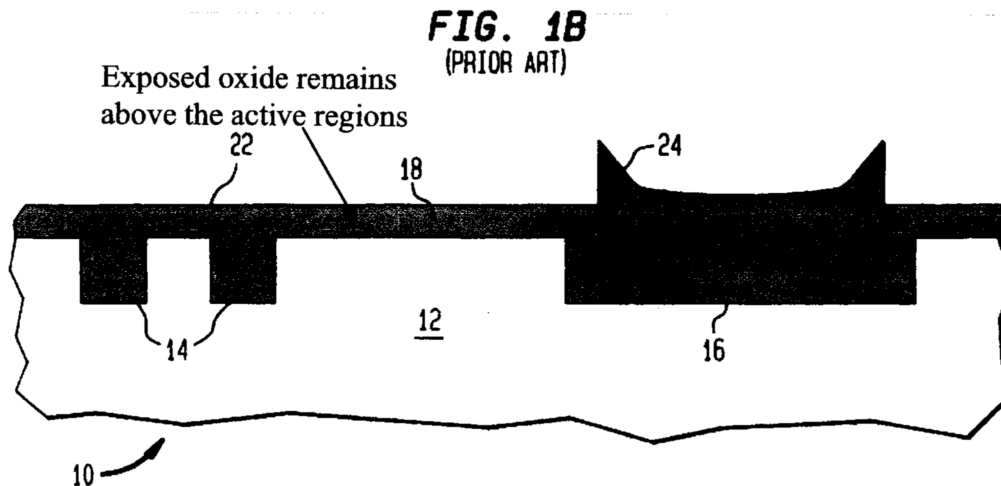


Figure 1B, reproduced below with annotations, illustrates the next step in the fabrication process. It shows the same cross section following a "conventional etchback process." (A679, at 2:36–38.) The specification explains that "[t]he etchback process removes parts of the oxide layer 18," and the figure shows that some of the oxide remains above the active regions. (A679, at 2:39–40.)



The '899 Patent's description of the prior art contrasts with the claims and the specification's description of the invention, which demonstrate that the applicant's improvement includes removal of all exposed insulating material to expose the

substrate. Thus, the specification again supports the ITC's construction, which distinguishes the claimed invention over the prior art by requiring that all the exposed oxide be removed.

3. The specification explains that the amount of insulating material to be removed is defined by the size of the bias in the inverse area mask.

According to Qimonda, the specification describes a process in which a horizontal layer of indeterminate size is removed from the insulating material during the etching step. To support this contention, Qimonda cites a passage from the specification out of context as evidence that the patent "only requires that enough of the insulating material, rather than all of that material, be removed prior to the planarizing step so that the excess erosion problem is avoided." Appellant's Br. at 32–33 (citing A681, at 6:48–59).

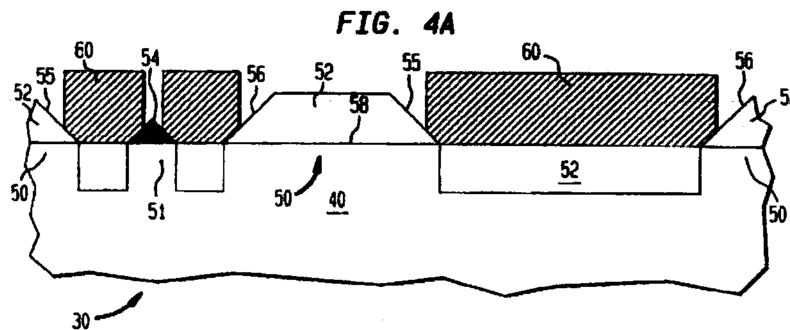
The passage Qimonda relies on states: "Typically, the amount of oxide that is removed from the active regions is sufficient to effectively shorten the CMP step . . . ." (A681, at 6:55–57.) Based on this, Qimonda concludes the claim loosely requires that only some undefined amount of oxide must be removed — as long as the CMP step is shortened, the limitation is met. The patent, however, is not so vague.

The next paragraph in the specification, which Qimonda ignores, explains how the etching process shortens the CMP step, and it precisely defines the

amount of oxide that must be removed:

> Typically, ***the time needed to remove the amount of oxide in triangles 54*** above the narrow active areas 51 is sufficiently short to result in a substantially planar surface in the STIs. ***As such, the amount of oxide remaining above the wide active regions 50 should not exceed the amount in the triangles 54.*** If a portion of center of the oxide region 52 is removed, ***then each of the remaining side portions should not exceed about the amount of oxide in the triangle 54.***

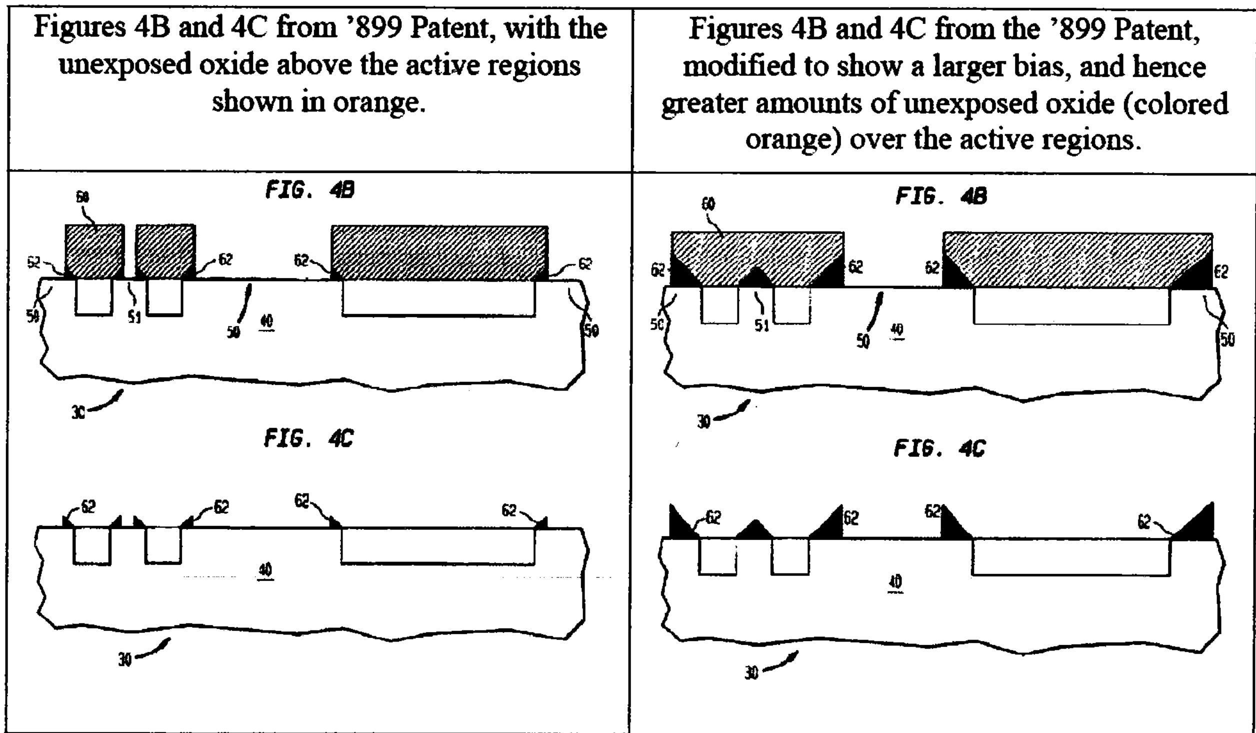
(A681, at 6:60–67 (emphasis added).) Thus, the "amount of oxide that is removed" is determined by the size of the openings in the mask layer. Figure 4A of the patent illustrates and clarifies this concept. As described in the text, triangles 54 are the triangles of oxide over the narrow active regions as shown in orange below:



(A677 (emphasis added to show triangle 54 in orange)). The amount of insulating material remaining over the wide active region (50) after etching is limited to what is left in the "remaining side portions" — the triangles 62 shown in Figure 4B, below. (A677.) And again, those side portions must be no larger than the triangles (54) over the narrow active regions in Figure 4A, shown above.

This requirement relates to the amount of "bias" in the mask layer. Bias

refers to the overlap of the photoresist layer over the edges of the active regions. The larger the bias, the more oxide is left over the active regions after the etch step. This concept is illustrated below, where Figures 4B and 4C of the '899 Patent are shown next to a version of these same figures modified to show a larger bias:



Figures 4B and 4C from '899 Patent, with the unexposed oxide above the active regions shown in orange.	Figures 4B and 4C from the '899 Patent, modified to show a larger bias, and hence greater amounts of unexposed oxide (colored orange) over the active regions.

(A677–78.)

As the figures show, when the bias is increased, the openings in the mask layer 60 get smaller. Smaller openings in the mask layer result in less exposure and thus leave more of the oxide covered. This is why the triangles 62 in Figures 4B and 4C on the right are larger than the triangles 62 in Figures 4B and 4C on the left.

Thus, when the specification states that "[b]y reducing the amount of oxide needed to be removed in order to expose the active areas, the corresponding CMP step is shortened," it does not mean, as Qimonda suggests, that a layer of exposed oxide is left. Rather, as the following paragraph explains, it refers to the width of the opening in the mask, and hence the size of the triangles remaining after the etch step. This was an important concept to the inventor, as 9 claims (claims 3–5, 10–12, and 17–19) are directed to the amount of bias.

Likewise, the patent claims a specific type of mask, an inverse active area mask, to ensure the precision of the biasing. As explained in the specification:

> [A]n inverse active area mask . . . is used to form and pattern the . . . oxide layer. Such a mask is the negative mask of the mask used to form the active areas. Techniques for biasing the inverse mask are well known in the art. *Typically, there are overlay inaccuracies associated with the lithographic process. To compensate for the overlay inaccuracies, the inverse mask is biased.* The amount of bias is sufficient to effectively shift the edges of the photoresist onto the sloping edges 55 and 56 of the . . . oxide layer.

(A682, at 7:7–16 (emphasis added).) The need for such accurate biasing further demonstrates the patent's goal of limiting the amount of oxide remaining over the active regions to the wedge-shaped portions that were covered by the mask. In fact, use of an inverse active area mask to define those portions is the innovative feature of the invention that led the examiner to allow the patent to issue. (A880.)

In short, the specification does not suggest that the claims contemplate

removing a horizontal portion from the top of the exposed insulating layer and leaving another portion over the substrate.[4] Rather, it teaches that the exposed portion must be removed entirely, from top to bottom. The only insulating material that remains over the active regions after etching are the "wedge-shaped portions 62 [that] are removed in a subsequent CMP [planarizing] step." (A682, at 7:58–59.) This is made quite clear by the figures, which all show vertical cross sections of the semiconductor wafer with the exposed oxide removed all the way to the substrate.

4. In any event, the specification cannot expand the scope of the claim.

Even if the specification did describe an etching method that leaves some of the exposed insulating material over the substrate (and it does not), the claim, not the specification, defines the scope of the invention. When an applicant files narrow claims, those claims cannot be broadened based on a broader disclosure in the specification. *See, e.g., Schoenhaus v. Genesco, Inc.*, 440 F.3d 1354, 1359 (Fed. Cir. 2006) ("Where a patent specification includes a description lacking a feature, but the claim recites that feature, the language of the claim controls."); *Oak Tech., Inc. v. Int'l Trade Comm'n*, 248 F.3d 1316, 1329 (Fed. Cir. 2001) (holding that specification's disclosure of embodiment not covered by claim

[4] The only place such a layer is mentioned is in the description of the prior-art method (Figure 1B) that resulted in the very oxide erosion problems (Figure 1C) the '899 Patent was trying to solve. (A674; A679, at 2:5–60.)

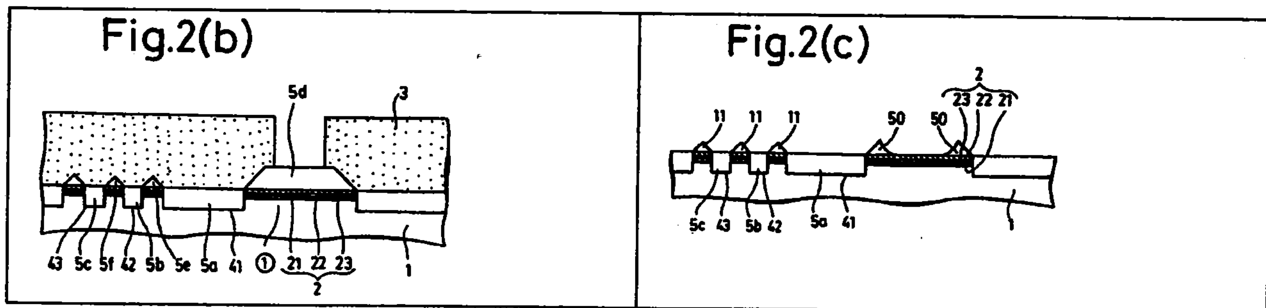
language does not broaden claim). As explained, the claim clearly requires removal of *the* exposed portion of the insulating material, which necessarily means the entire exposed portion of the insulating material. Qimonda cannot expand the scope of the claim based on a strained reading of the specification. More importantly, the ITC did not err by construing the term at issue based on the straightforward language of the claim.

C. The prosecution history supports the ITC's construction.

Qimonda argues the prosecution history supports its claim construction. It does not; in fact, it supports the ITC's construction. Qimonda cites a response to the examiner's first rejection of claim 1 as evidence the applicant understood the phrase "at least a portion of" to mean the etching step would remove only enough insulating material to shorten the planarization step. Appellant's Br. at 35–36. That response, however, tells only part of the story. As originally drafted, claim 1 broadly claimed a process without an etching step, in which the surface of the substrate was simply planarized "to expose the active regions while effectively reducing the erosion of the insulating material." (A704.) The examiner rejected this claim as anticipated by the prior art. (A779–80.)

In response, the applicant amended the claim to state that "at least a portion of the insulating material" must be removed before the planarizing step "to provide a planar topography." (A800–01.) The examiner rejected this, as well, finding that

U.S. Patent No. 5,498,565 ("Gocho") "teaches every positive step of the claimed invention." (A816.) Indeed, Gocho clearly shows the removal of "at least a portion of" the insulating material, as demonstrated in Gocho Figures 2(b) and 2(c), which show portions of insulating material 5d being removed so as to leave triangles 50 (A823–24)[5]:



To overcome this rejection, the applicant further amended the claim to include the limitations that describe in greater detail how the etching step must be performed. (A874–75.) Those limitations require: (1) using an inverse active area mask to deposit a mask layer over the insulating material; (2) exposing "at least a portion of the insulating material over the active regions"; and (3) "removing the exposed portion of the insulating material over the active regions." (A875; A683, at 9:12–24.) These limitations added two innovations over the prior art — use of an inverse active area mask and removal of *the exposed* portion of insulating material. As explained, removing "*the* exposed portion of insulating material" requires removing the entire exposed portion, and the inverse area mask

[5] Further, as noted above, Figure 1B of the '899 Patent, itself, illustrates prior art in which the etching process removes a portion of the exposed oxide.

was necessary to ensure the remaining unexposed insulating material was small enough to shorten the polishing step.

The examiner ultimately allowed the claim based on this amendment, stating that "[the p]rior art of record does not teach or suggest the claimed invention in which an inverse active area mask is used to remove at least a portion of the insulating layer from the active regions as claimed." (A880.) Simply stated, the patent issued because the applicant amended the claim to include an etching step that removes all of the exposed insulating material over the active regions.

CONCLUSION

As fully set forth above, the ITC properly construed the phrase "removing the exposed portion of the insulating material over the active regions" to mean "removing the insulating material from those areas not covered by the photoresist layer to expose the surface of the semiconductor substrate." This construction is the only possible meaning consistent with the plain language of the claim as read in view of the teachings of the specification and the prosecution history.

Because the ITC properly construed the only term at issue, the final determination made the basis of this appeal must be affirmed.

Respectfully submitted,

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