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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INNOSCIENCE AMERICA, INC.,
Petitioner,

v.

INFINEON TECHNOLOGIES AUSTRIA AG,
Patent Owner.

Case No. IPR2025-00010

Patent No. 9,070,755

PATENT OWNER'S PRELIMINARY RESPONSE

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REGULATIONS

37 C.F.R § 42.22	31, 52
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LISTING OF EXHIBITS

Exhibit	Description
2001	Excerpts of Merriam-Webster’s Collegiate Dictionary, 11th Ed. (2012)
2002	Excerpts of The American Heritage College Dictionary, 4th Ed. (2007)
2003	U.S. Patent No. 6,534,829 (“Sogo”)
2004	In the Matter of Certain Semiconductor Devices and Products Containing the Same, Inv. No. 337-TA-1414, Joint Proposed Claim Construction Chart (Jan. 17, 2025)

I. INTRODUCTION

Every challenged claim is directed to a transistor comprising drain finger electrodes *interdigitated* with source finger electrodes (the “interdigitated limitation”), where at least one of the drain finger electrodes has an end that is *non-coplanar* with the drain finger electrode’s main body (the “non-coplanar limitation”). Figs. 6A and 6C of the ’755 Patent (annotated below) illustrate drain finger electrodes 620 interdigitated with source finger electrodes 610 (Fig. 6A), and a drain finger electrode end 626b that is non-coplanar with drain finger electrode main body 624b (Fig. 6C).

FIG. 6A

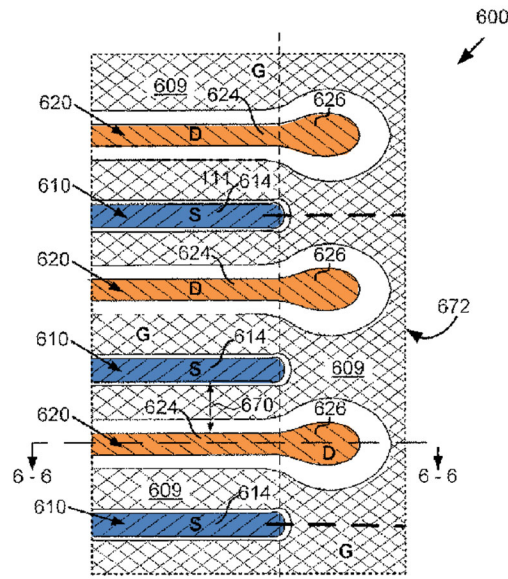
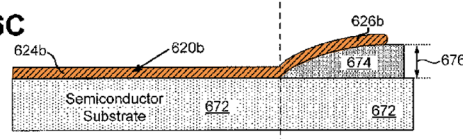


FIG. 6C



’755 Patent, Figs. 6A, 6C (annotated)

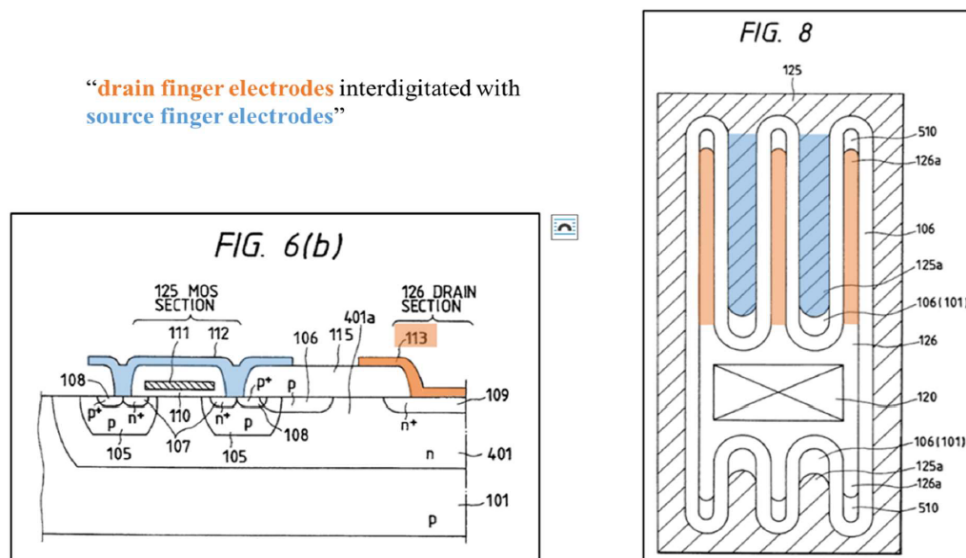
The Petition presents two sets of grounds. Grounds 1A-1E (the “Fujishima-based grounds”) rely on Fujishima (EX-1005) to meet both the interdigitated and non-coplanar limitations. Grounds 2A-2B (the “Asano grounds”) rely on Asano (EX-1009) to meet both the interdigitated and non-coplanar limitations.

A. The Fujishima-Based Grounds Fail

The Petition annotates Figs. 6(b) and 8 of Fujishima as shown below.

Petition, 18. Petitioner alleges that:

- Fig. 8 discloses drain finger electrodes (orange) interdigitated with source finger electrodes (blue);
- Fig. 6(b)’s drain electrode 113 meets the non-coplanar limitation; and
- Fujishima teaches that Figs. 6(b) and 8 show the same transistor.



Petitioner’s Annotations to Fujishima, Figs. 6(b) and 8 (Petition, 18)

Petitioner fails to establish that *any* of its three assertions is true. Thus, the Fujishima Grounds fail for at least three independent reasons.

First, Petitioner fails to establish that Fujishima Fig. 8 discloses drain finger electrodes interdigitated with source finger electrodes. The interdigitated structures 125 and 126 that Petitioner colors blue and orange in Fujishima Fig. 8 *are not electrodes*—they are a MOS (also called MIS) section 125 and a drain section 126. Fujishima, 8:37-40 (“MOS section 125” and “drain section 126”), 15:16-17 (“MIS section 125”). Fujishima explains that these are doped sections of the semiconductor material that form the source, gate, and drain regions of the transistor in the semiconductor. *Id.*, 8:37-63. The electrodes are connected to these semiconductor regions. To the extent Petitioner suggests Fujishima teaches that the source electrode is coextensive with MOS/MIS section 125 and the drain electrode is coextensive with drain section 126, that is unsupported by anything in Fujishima and plainly wrong. The Fujishima Grounds fail because Petitioner fails to establish that Fujishima teaches *interdigitated* source and drain *electrodes*.

Second, consistent with its position in parallel litigation, Petitioner alleges that the proper construction of the non-coplanar limitation requires that the drain finger electrode end be “on a horizontal plane that is not on the same horizontal plane as *any part*¹ of [the drain finger electrode’s] main body.” Petition, 25.

¹ Other than bolded colored (non-black) text in quotations from the Petition, all emphasis herein is added unless otherwise indicated.

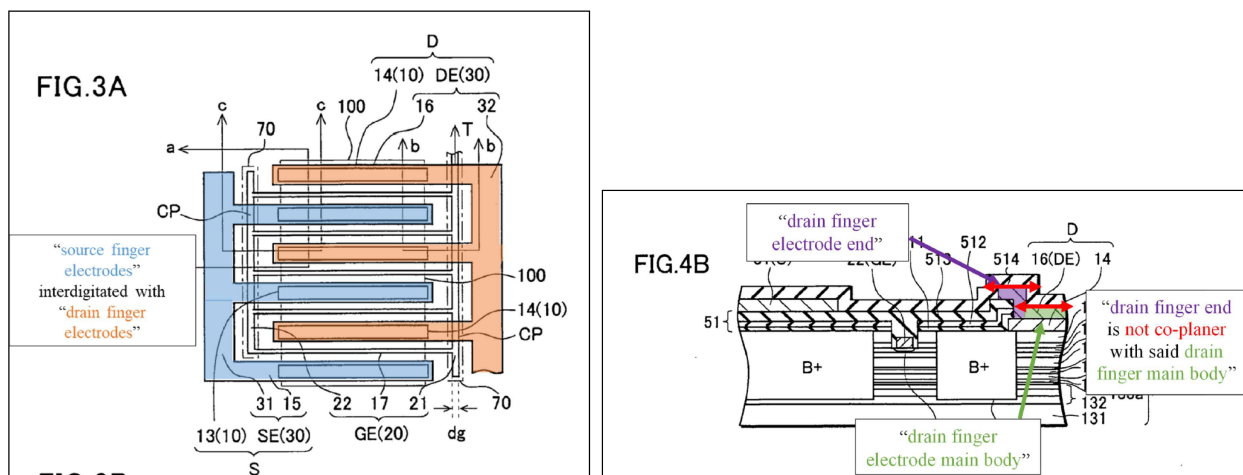
Petitioner fails to demonstrate that Fujishima meets Petitioner's own construction. Petitioner relies entirely on Fujishima Fig. 6(b) to allegedly meet the non-coplanar limitation. But as seen from Petitioner's annotated figures above, Fig. 6(b) illustrates only a tiny fraction of the drain finger electrode's main body. Fig. 6(b) provides no information whatsoever about the planar (or not) structure of the majority of the alleged main body that Petitioner highlights orange in Fig. 8 to denote where the drain finger electrode allegedly extends. The Fujishima Grounds fail because Petitioner fails to establish that Fujishima meets Petitioner's own construction of the non-coplanar limitation.

Third, Petitioner alleges anticipation by Fujishima but mixes embodiments and fails to establish that Fujishima teaches a transistor that meets *both* the interdigitated and non-coplanar limitations as required by every challenged claim. Petitioner's assertion that Fujishima teaches a transistor meeting both limitations is based on the conclusory assertion that Figs. 6(b) and 8 disclose "the same MISFET [Metal-Insulator-Semiconductor Field-Effect Transistor]." Petition, 15. But Fig. 6(b) shows Fujishima's "Fifth Embodiment" (Fujishima, 13:35-14:25) whereas Fig. 8 illustrates Fujishima's "Seventh Embodiment" (*id.*, 15:1-60). And Fig. 8's Seventh Embodiment has an n-type well layer 510 that is not shown in Figs. 6(a)-(b) or described as part of the Fifth Embodiment. Petitioner's assertion that Figs. 6(b) and 8 show the same transistor is plainly wrong. The Fujishima Grounds fail

for this additional independent reason because Petitioner fails to establish that Fujishima teaches a transistor that meets **both** the interdigitated and non-coplanar limitations as required by every challenged claim.

B. The Asano-Based Grounds Fail

For Ground 2A, the Petition annotates Figs. 3A and 4B of Asano as shown below. *See* Petition, 79, 86-87. Petitioner alleges that Asano Fig. 3A discloses drain finger electrodes (orange) interdigitated with source finger electrodes (blue). Petitioner further alleges that the purported drain finger electrode 16(DE) in Fig. 4B meets the non-coplanar limitation because it has an end (purple) that “is on a horizontal plane that is ***not on the same horizontal plane as any part*** of the **main body**” (green) of the drain finger electrode. Petition, 86-87 (applying the same construction of the non-coplanar limitation as in the Fujishima Grounds).



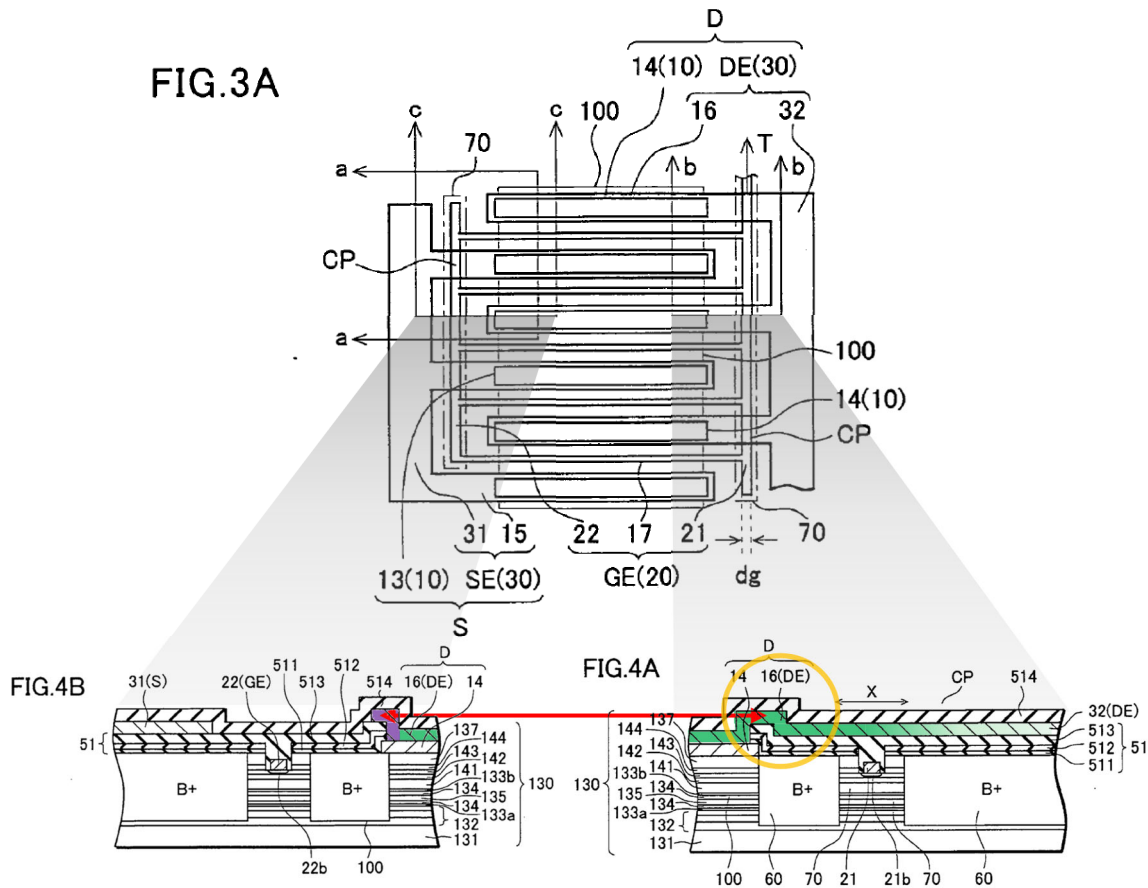
Petitioner’s Annotations to Asano, Figs. 3A, 4B (Petition, 79, 86)

Fig. 4B is taken along line c-c in Fig. 3A (Asano, [0110]) and shows only a small portion of the alleged drain finger electrode main body. Thus, the cited

evidence fails to support Petitioner’s assertion that Asano’s drain finger electrode end “is on a horizontal plane that is not on the same horizontal plane as any part of the **main body**,” because it does not illustrate the *entire* main body.

Petition, 87. Ground 2A fails for that reason alone.

Worse yet, Petitioner ignores Asano Fig. 4A which is taken along line b-b in Fig. 3A and provides additional information about the same drain finger electrode allegedly shown in Fig. 4B. Asano, [0110]. Figs. 4A-4B are shown side-by-side below in alignment with their positions in Fig. 3A. Fig. 4B below uses Petitioner’s highlighting for the alleged “drain finger electrode end” (purple) and the alleged “drain finger electrode main body” (green). *See* Petition, 86. Patent Owner has also annotated Fig. 4A to highlight green the same structure that Petitioner identified in Ground 2A as the main body of the alleged drain finger electrode—element 16(DE). Petition, 85-86.



Asano, Figs. 3A, 4B, 4A (annotated)

Fig. 4A above demonstrates that the alleged main body of Petitioner's drain finger electrode is not planar and has a portion (circled) that is on the same horizontal plane as the alleged drain finger electrode end that Petitioner highlights purple in Fig. 4B. In other words, Asano Fig. 4A—which Petitioner ignores—directly refutes Petitioner's assertion that the purported drain finger electrode 16(DE)'s end is “on a horizontal plane that is not on the same horizontal plane as any part of the **main body**.” Petition, 87. That is fatal to Ground 2A because Petitioner fails to establish that Asano meets Petitioner's own construction for the non-coplanar limitation.

The only difference between Grounds 2A and 2B is that in Ground 2B, Petitioner alleges that the drain finger electrode is met by drain electrode 16(DE) together with another drain electrode 14. But Petitioner advances the same failed analysis that relies entirely on the alleged “end” (purple) and “main body” (green) in Petitioner’s annotated Fig. 4B (above) to purportedly meet the non-coplanar limitation. Ground 2B fails for the same reason that Ground 2A fails, because Petitioner ignores Asano Fig. 4A and fails to establish that the end of the drain finger electrode (16(DE) and 14) is “on a horizontal plane that is not on the same horizontal plane as any part of the **main body**.” Petition, 86-87.

* * *

As detailed below, Petitioner fails to carry its burden of demonstrating a reasonable likelihood of proving any challenged claim unpatentable. Institution should be denied.

II. GROUND 1A (ALLEGED ANTICIPATION BY FUJISHIMA) FAILS

Ground 1A alleges that claims 1-5 and 8-14 are anticipated by Fujishima.

These claims include independent claims 1 and 10.

A. The Claims Require Drain Finger Electrodes Interdigitated with Source Finger Electrodes and at Least a Portion of at Least One Drain Finger End Being Non-Coplanar with its Main Body

Claims 1 and 10 each is directed to a transistor comprising “drain finger electrodes *interdigitated* with source finger electrodes.” See Limitations [1a] and

10[a].² This is referred to herein as the “interdigitated limitation.” Claims 1 and 10 also require at least one drain finger electrode having “a drain finger electrode main body” and “a drain finger electrode end,” “wherein at least a portion of said drain finger end is *non-coplanar* with said drain finger electrode main body.” See Limitations [1c]-[1d] and [10c]-[10d]. This is referred to herein as the “non-coplanar limitation.”

An example of the claimed subject matter is illustrated, for example, in Figs. 6A and 6C of the '755 Patent, reproduced below. Fig. 6A illustrates drain finger electrodes 620 interdigitated with source finger electrodes 610. EX-1001, 9:12-31. Fig. 6C illustrates a drain finger electrode 620b with a main body 624b and a drain finger electrode end 626b that “is non-coplanar with drain finger electrode main body 624b.” *Id.*, 10:5-6.

² Patent Owner herein adopts the Petition’s claim limitation labelling for the Board’s convenience.

FIG. 6A

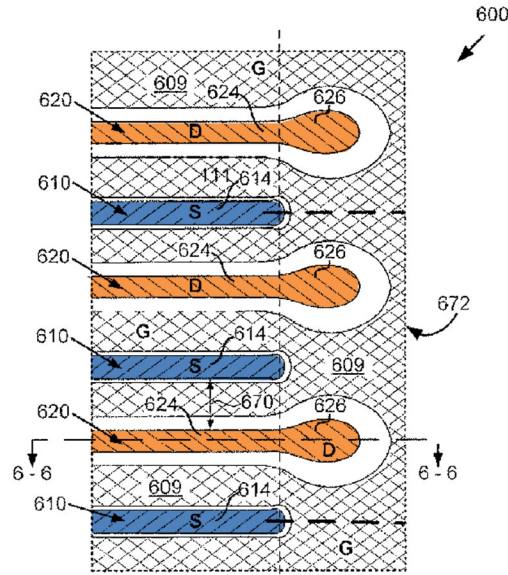
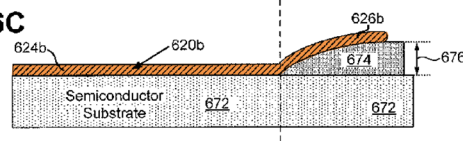


FIG. 6C



'755 Patent, Figs. 6A, 6C (annotated)

Every claim challenged in Ground 1A requires *both* drain finger electrodes interdigitated with source finger electrodes *and* at least one drain finger electrode having a drain finger electrode main body and a drain finger electrode end, wherein at least a portion of said drain finger end is *non-coplanar* with said drain finger electrode main body (*see* Limitations [1a], [1c]-[1d] and [10a], [10c]-[10d]). This is not disclosed by Fujishima.

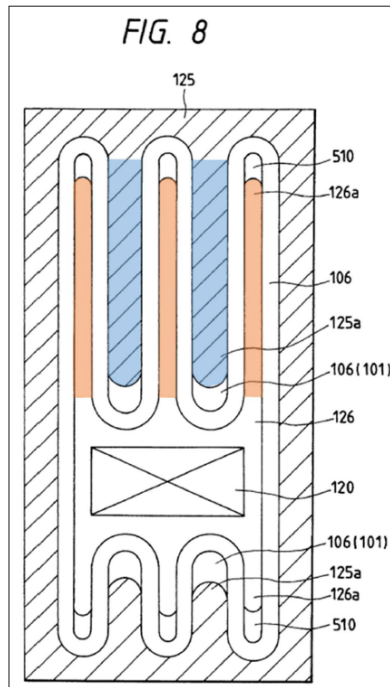
* * *

As discussed below, Ground 1A fails for three independent reasons: (1)
Petitioner fails to establish that Fujishima discloses drain finger electrodes

interdigitated with source finger electrodes; (2) Petitioner fails to establish that Fujishima meets the Petition's own construction of what is allegedly required to meet the non-coplanar limitation; and (3) even if the Board were to find that Petitioner has proven that Fujishima discloses the interdigitated and non-coplanar limitations, Petitioner mixes different embodiments of Fujishima and fails to establish that Fujishima discloses any transistor that meets *both* the claimed interdigitated limitation and the non-coplanar limitation.

B. Petitioner Fails to Establish that Fujishima Discloses Drain Finger Electrodes Interdigitated with Source Finger Electrodes

Petitioner annotates Fig. 8 of Fujishima as shown below and alleges that it discloses drain finger electrodes (colored orange) interdigitated with source finger electrodes (colored blue). Petition, 15-20.

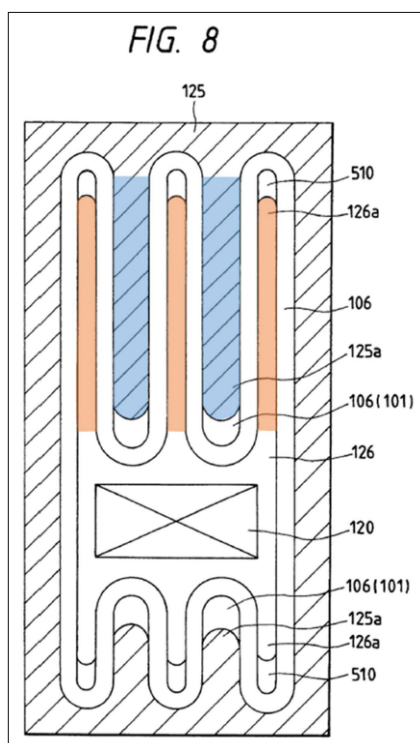


Petitioner's Annotations to Fujishima, Fig. 8 (Petition, 16, 18)

Contrary to Petitioner's assertion, Fujishima does not teach that the interdigitated structures that Petitioner highlights blue and orange in Fig. 8 (as shown above) are source and drain *electrodes*, respectively. Petition, 15-16.

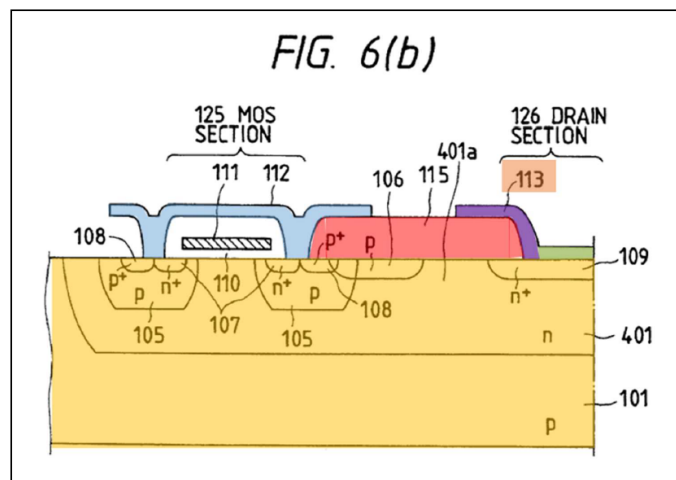
1. Petitioner Conflates the Configuration of Fujishima's Semiconductor Source and Drain Regions with the Configuration of the Electrodes

Petitioner asserts that Fig. 8 “depicts multiple **drain finger electrodes** and **source finger electrodes** ‘juxtaposed in an interdigitated manner.’” Petition, 15-16 (annotating Fig. 8 as reproduced below). That is untrue. The interdigitated structures 125 and 126 in Fig. 8 that Petitioner highlights are Fujishima's “MIS section 125” and “drain section 126.” Fujishima, 15:10-16 (“the *MIS section 125* and the drain section 126 are juxtaposed in an interdigitated manner”).



Petitioner's Annotations to Fujishima, Fig. 8 (Petition, 16, 18)

Petitioner alleges that “the *same* MISFET [Metal Insulator Semiconductor Field Effect Transistor]” shown in Fig. 8’s top view is shown in Fujishima Fig. 6(b), reproduced with Petitioner’s annotations below. Even if this were true (it is not),³ Petitioner fails to establish that Fujishima’s disclosure of interdigitated MIS 125 and drain 126 sections discloses interdigitated source and drain *electrodes*, as claimed.

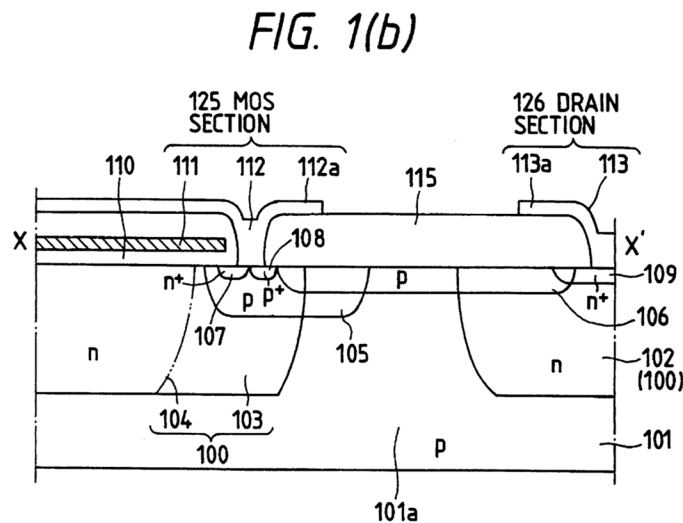


Petitioner’s Annotations to Fujishima, Fig. 6(b) (Petition, 15)

For the discussion herein, Fujishima’s section 125 is referred to as the MOS/MIS section 125, based on Petitioner’s allegation that Fujishima uses the terms “MIS Section” and “MOS Section” “interchangeably.” Petition, 18 n.2. Fujishima introduces MOS/MIS section 125 and drain section 126 in connection with the First Embodiment of Fig. 1. The MOS/MIS section 125 and the drain

³ Petitioner fails to support its assertion that Fujishima’s Fig. 8 embodiment is the “same MISFET” as Fig. 6(b). *See infra* § II.D.

section 126 are sections of Fujishima’s *semiconductor* structure to which the electrodes are connected. In Fig. 1, “MOS section 125 is formed in the first region portion 103 of the well layer 100, while a drain section 126 is formed in the second region portion 102 thereof.” Fujishima, 8:37-41, Fig. 1(b), 8:53-55 (“MOS section 125 has a structure in which the source layer 107 and the base layer 105 are double-diffused”). The well layer 100 in which the MOS/MIS section 125 and drain section 126 are formed is in turn “formed on a... semiconductor substrate 101 by diffusion.” *Id.*, 8:31-33. Thus, the MOS/MIS section 125 and the drain section 126 are doped *semiconductor* sections—they are not source and drain *electrodes*, which are conductors that establish electrical contact with a non-metallic (e.g., semiconductor) part of a circuit. EX-2001, 401 (defining electrode).



Fujishima, Fig. 1(b)

Fujishima never says that MOS/MIS section 125 includes a source electrode. Instead, Fujishima says that a “source electrode 112 is *connected to* the source

layer 107 and the base contact layer 108” and has “a field plate portion 112a which extends over a thick insulating film 115 toward a drain layer 109.” *Id.*, 8:49-54.

Fujishima also refers to MOS/MIS section 125 as one structure and notes that “[i]n **addition**, a high voltage withstanding structure is formed” that includes the field plate portion 112a of the source electrode. *Id.*, 8:53-58.

Moreover, in connection with Fig. 1, Fujishima explains that “MOS section 125 is formed **in** the first region portion 103 of the well layer 100, while a drain section 126 is formed **in** the second region portion 102 thereof.” Fujishima, 8:37-41, Figs. 1(b), 6(b). By contrast, the source electrode 112 is “connected” to the doped “source layer” 107 of the semiconductor that forms the transistor’s source region, and the drain electrode 113 is “connected” to the doped drain layer 109 of the semiconductor that forms the transistor’s drain region. *Id.*, 8:49-54, 8:60-63. The source and drain electrodes are not formed “in” regions of a well layer of the semiconductor material and thus are not part of what Fujishima calls the MOS/MIS region 125 and the drain region 126 formed “in” those semiconductor regions. Fujishima, 8:37-41.

Ignoring Fujishima’s disclosures, Petitioner alleges in conclusory fashion that Fujishima discloses that in Fig. 6(b), the MOS/MIS section 125 “includ[es]” source electrode 112 and the drain section 126 “includ[es]” drain electrode 113. Petition, 18-19 (“Fujishima explains that the MIS Section 125 (**including** **source**

electrode 112) and drain section 126 (including drain electrode 113 ‘are juxtaposed in an interdigitated manner.’ *Id.*, 15:9-24, Fig. 8; see also Ex-1028-1029; Zhao ¶78.”). The only disclosures in Fujishima that Petitioner cites to support this assertion are Fujishima, 15:9-24 and Fig. 8, which are emphasized in the quotation above. *Id.* But neither disclosure supports Petitioner’s assertion.

Fujishima, 15:9-24 provides no support for Petitioner’s assertion that the MOS/MIS section 125 “include[s]” source electrode 112 and the drain section 126 “includ[es]” drain electrode 113. Petition, 18-19. Indeed, this disclosure in Fujishima *never even mentions the source or drain electrode*.

With respect to Fujishima Fig. 8, Petitioner alleges that “Figure 8’s *top* view... depicts multiple drain finger electrodes and source finger electrodes ‘juxtaposed in an interdigitated manner’ with current flowing in-between.” Petition, 15. But Fig. 8 is not a “*top view*” showing the top of the transistor and does not depict drain and source electrodes (let alone the current flowing in between them). Contrary to Petitioner’s mischaracterization, Fujishima describes Fig. 8 as a “plan view.” Fujishima, 7:36-38.⁴

As was well-understood, a “plan view” is projection through a horizontal plane of a three-dimensional object and can be through any horizontal plane. EX-2002, 1064 (defining “plan”: “5. In perspective rendering, one of several

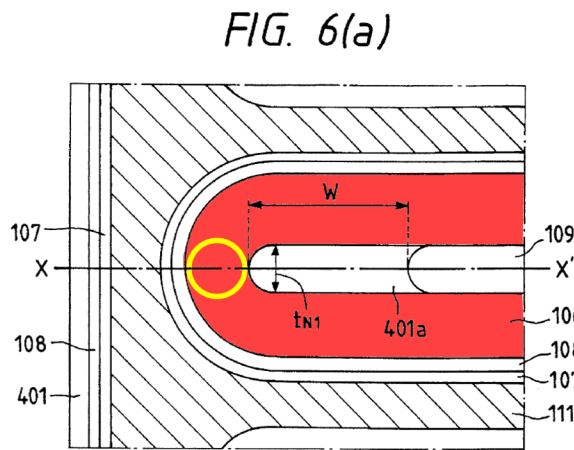
⁴ Fujishima Fig. 6(a) is also a “plan view.” Fujishima, 7:25-27.

imaginary planes perpendicular to the line of vision between the viewer and the object being depicted.”). While the perspective of the plan view of an object may be from the top looking down, the plan view is not a view of the top of the object—it is a view of the structure of the object in the horizontal plane through which the plan view is taken. *Id.* While Fujishima does not identify the horizontal plane through which Fig. 8’s plan view is taken, as discussed below, Fig. 8 does **not** show the top of the transistor because it illustrates at least one structure that is entirely covered by other structures and would not be visible when looking at the top of the transistor. Fig. 8’s plan view is through a horizontal plane of the transistor that is **underneath** the “top” and does not include the electrodes.

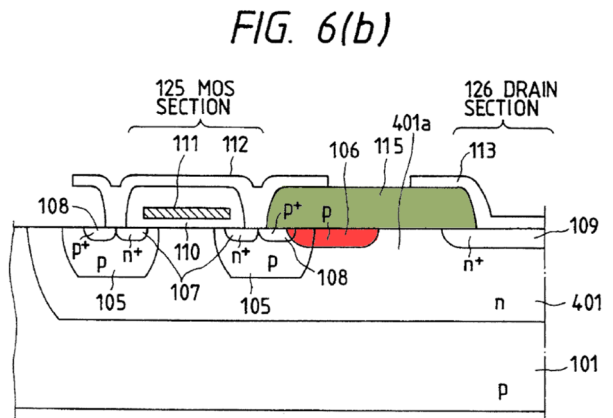
Petitioner’s assertion that Fujishima anticipates the claims challenged in Ground 1A is thus flawed because it is premised on the assertions that Fig. 8 is a “top view” that “depicts” electrodes **and** that it is of the “same MISFET” shown in Fig. 6(b). Petition, 15. As detailed above and in § II.D below, Petitioner has not established that **either** assertion is true. But even if the Board were to believe that one of these assertions were true, they are irreconcilable and cannot **both** be true.

Fig. 6(b) is “a cross-sectional view taken along line X-X' in Fig. 6(a)” (Fujishima, 7:28-29) which is along the center “finger” of the drain region that Petitioner highlights orange. Petition, 18; *see* line X-X' in Fig. 6(a). In the figure below, accepting Petitioner’s assertion that Fig. 6(b) and Fig. 8 show the same

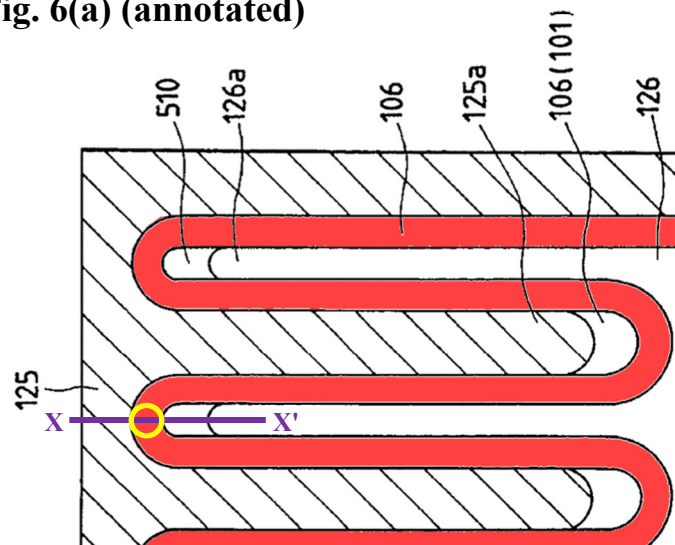
MISFET, then the cross-sectional view in Fig. 6(b) is taken along the purple line X-X' that Patent Owner has added to Fig. 8 below. In the figures below, Patent Owner highlights the offset layer 106 (red). Fujishima, 13:55-56, 15:25-27. Along the cross-section line X-X', Fujishima illustrates that the offset layer 106 is visible in both Figs. 6(a) and Fig. 8 in the areas circled in the figures below (yellow). But in the cross-sectional view of Fig. 6(b), the offset layer 106 is *entirely* covered by insulating film 115 (dark green) and is not visible at the top of the transistor.



Fujishima, Fig. 6(a) (annotated)



Fujishima, Fig. 6(b) (annotated)



Fujishima, Fig. 8 (excerpted, rotated, annotated)

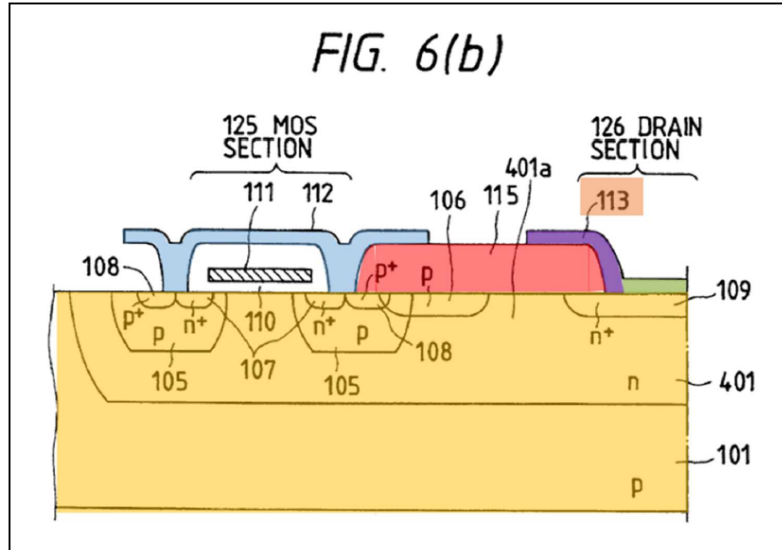
As seen from the foregoing, Petitioner's assertion that Fig. 8 is a "top view" that allegedly shows the source and drain electrodes of the MISFET shown in Fig. 6(b) is unsupported by anything in Fujishima and plainly wrong. These assertions are critical to Petitioner's assertion that Fujishima discloses a MISFET that meets both the interdigitated limitation (allegedly shown by Fig. 8) and non-coplanar limitation (allegedly shown by Fig. 6(b)). That is fatal to Ground 1A.

2. Petitioner's Implicit Assertion that Fujishima's Electrodes are Coextensive with the Entire Semiconductor MOS/MIS and Drain Regions is Unsupported and Wrong

Petitioner would have the Board believe that the source electrode in Fujishima is coextensive with the MOS/MIS section 125 shown in Fig. 8, and that the drain electrode is coextensive with the drain section 126, so Fig. 8 discloses source finger electrodes interdigitated with drain finger electrodes. Nothing supports that implicit suggestion, and it is plainly not true.

The source electrode need only be "*connected to*" a source region of the semiconductor, and the drain electrode need only be connected to a drain region of the semiconductor, to create an electrical contact so that current passing through the transistor channel formed in the semiconductor material can flow through the electrodes. Fujishima, 8:49-54; EX-2001, 401. It is not necessary that the electrodes be coextensive with, and contact every portion of, the source and drain regions of the semiconductor. *See* Fujishima, 8:49-54; EX-2001, 401. The Board

need look no further than Fujishima Figs. 1(b) and 6(b) to see that this is so. As shown in Petitioner’s annotated Fig. 6(b) below, the drain electrode 113 does not contact the entirety of the drain layer 109 that is at the surface of the semiconductor—for example, the portion of the drain layer 109 underlying oxide layer 115 is not in direct contact with the drain electrode. The source electrode 112 similarly does not contact the entirety of source layer 107 that is at the surface of the semiconductor. Quite clearly, the source and drain electrodes need not make contact with the *entirety* of the semiconductor source and drain regions—the electrode need only contact a portion of the semiconductor region to create an electrical connection and thereby allow current flow through the electrode.



Petitioner’s Annotations to Fujishima, Fig. 6(b) (Petition, 15)

Another example is shown in EX-2003 (“Sogo”), which discloses a “drain electrode 10” connected to a “drain region 3” in Figures 11A-11B (annotated below). See EX-2003, 12:24-13:7 (describing “Embodiment 3”). Fig. 11B is a

“plan view illustrating a planar layout” of Fig. 11A’s “cross-sectional view” of a semiconductor device. *Id.*, 5:53-61. In both figures, Patent Owner highlights drain electrode 10 green, and “n-type extended drain region 3”—Sogo’s semiconductor “drain region” (*id.*, 6:27-31)—orange. Fig. 11A shows that drain region 3 includes a “conventional” “drain contact region” (like the one illustrated in Sogo’s Fig. 8) where the semiconductor is in “electrical[] contact” with the drain electrode. *See id.*, 1:12-24 (describing, in Fig. 8’s “conventional semiconductor device,” a “drain contact region 114” which is “part of the n-type extended drain region” and “provided to be in electrical[] contact with a drain electrode”), Fig. 8.

FIG. 11A

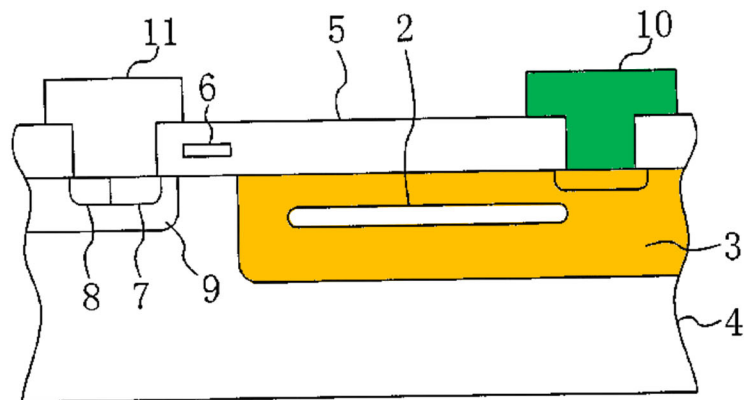
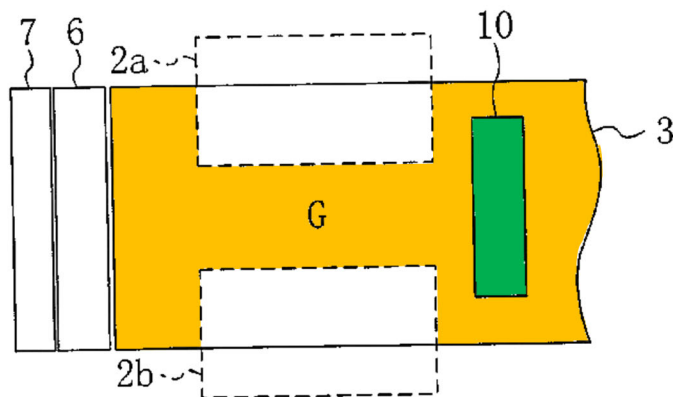


FIG. 11B



Sogo, Figs. 11A-11B (annotated)

As shown above in Fig. 11A, Sogo's drain electrode 10 (green) is not coextensive with drain region 3 (orange) and is only connected to a part of drain region 3, at the drain contact region. And as shown above in Fig. 11B, drain electrode 10 is significantly smaller in area than drain region 3 and plainly does not extend along the entirety of drain region 3 when viewed from above.

Thus, Petitioner's implicit assertion that Fujishima's source and drain electrodes are coextensive with the *entire* MOS/MIS section 125 and drain section 126, respectively, in Fujishima's semiconductor is not only unsupported by Fujishima—it is plainly wrong. This is critical because Petitioner only relies on Fujishima's disclosure that the MOS/MIS section 125 and drain section 126 are interdigitated. Petition, 15-16; Fujishima, Fig. 8 & 15:10-16 (“the MIS section 125 and the drain section 126 are juxtaposed in an interdigitated manner”). Petitioner's failure to establish that the source and drain *electrodes* are respectively coextensive with MOS/MIS section 125 and drain section 126 is fatal to Petitioner's assertion that Fujishima's source and drain *electrodes* are interdigitated.

3. Fujishima's Cross-Sectional View Provides No Information on Whether Any Source and Drain Electrodes are Interdigitated

Petitioner relies on Fujishima Fig. 6(b) to purportedly show a drain finger end of a drain electrode 113 that meets the non-coplanar limitation, and Petitioner

alleges that Fig. 8 shows “the same MISFET” as Fig. 6(b). Petition, 15. Fig. 6(b) is “a cross-sectional view taken along line X-X' in Fig. 6(a).” Fujishima, 7:28-29.

Even if Petitioner were correct that Fujishima’s Figs. 6(b) and 8 disclose “the same MISFET” (Petition, 15), then Fujishima only discloses a cross-sectional view for a small section of Fig. 8’s MOSFET. In annotated Fig. 8 below, Patent Owner has taken Petitioner’s annotated Figure 8 (which Petitioner colored to show allegedly interdigitated source and drain electrodes) and added a line X-X' (purple) to correspond to the line in Fig. 6(a) that illustrates where Fig. 6(b)’s cross-section is taken. As the annotated version of Fig. 8 below makes clear, the cross-sectional view in Fig. 6(b) provides no information whatsoever about the configuration of source *electrodes* (if any) in the areas that Petitioner highlights blue in Fig. 8 to allegedly show “source finger *electrodes*” interdigitated with “drain finger electrodes.” Petition, 18.

FIG. 8

FIG. 8 is a cross-sectional view of a device. A central channel 120 is defined by a top wall 106 and a bottom wall 126. The top wall 106 is composed of a central portion 106(101) and side portions 125a. The bottom wall 126 is composed of a central portion 125a and side portions 126a. The side portions 125a and 126a are connected by curved sections 510. A central portion 125 of the bottom wall is shown with a hatched pattern. A cross-section line X-X' is indicated by a vertical line passing through the center of the device.

Nothing supports Petitioner’s assertion that Fujishima has source finger *electrodes* interdigitated with drain finger *electrodes*. Fujishima’s written description never describes the source and drain electrodes as being interdigitated or as having the configuration that Petitioner alleges in its annotated version of Fig.

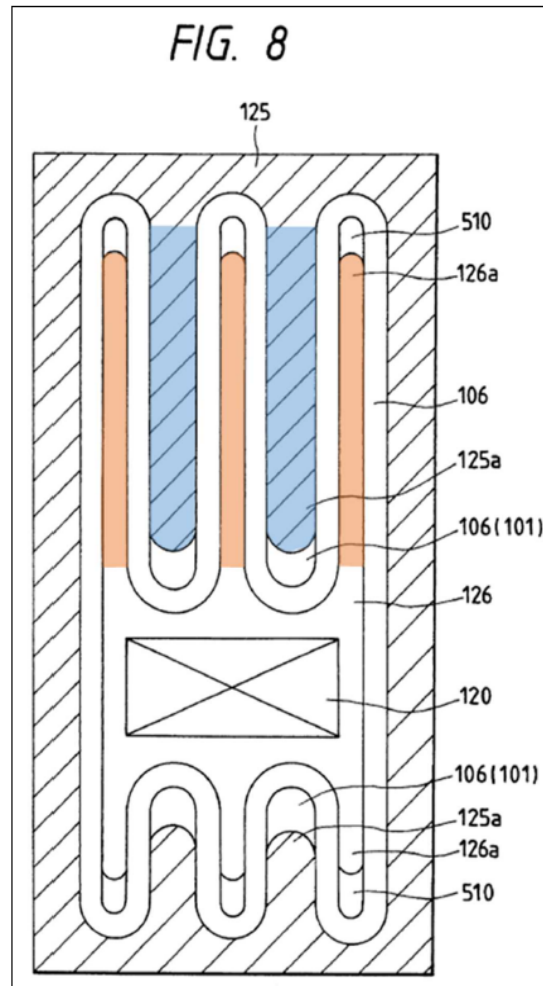
8. And nothing in Fujishima’s figures supports Petitioner’s assertion that the source electrodes extend into the areas that Petitioner highlights blue in Fig. 8 to purportedly show alleged “source finger electrodes” interdigitated with alleged “drain finger electrodes.” Petition, 18. Thus, despite Ground 1A being based on alleged anticipation by Fujishima, Petitioner fails to establish that Fujishima discloses the interdigitated limitation as required by every Challenged Claim.

Petitioner’s expert testimony cannot and does not save the Petition from its failure to show that Fujishima teaches interdigitated source and drain *electrodes*. Petition, 18-19 (citing Zhao ¶78). In the cited testimony, Dr. Zhao merely repeats the Petition’s conclusory assertions virtually word-for-word. *Compare* Petition, 18-19 *with* Zhao ¶78. Dr. Zhao provides no meaningful analysis and cites no corroborating evidence to support his assertion that the interdigitated structures in Fujishima include the source and drain electrodes, so this conclusory testimony warrants no weight under the Board’s precedential *Xerox* decision. *Xerox v. Bytemark*, IPR2022-00624, Paper 9 (Aug. 24, 2022) (precedential), at 15.

4. Fujishima’s Cross-Sectional View Further Shows that Petitioner is Wrong in Asserting that Fujishima’s Source Electrode is Coextensive with Its Source Semiconductor Region

Petitioner never even purports to establish the full metes and bounds of the alleged source electrodes and drain electrodes in Fujishima Fig. 8. To the extent Petitioner suggests that the source electrodes are arranged where Petitioner’s blue

highlighting appears in Fig. 8 (as shown below), that is unsupported by anything in Fujishima. It is also directly contradicted by Fujishima.



Petitioner's Annotations to Fujishima, Fig. 8 (Petition, 16, 18)

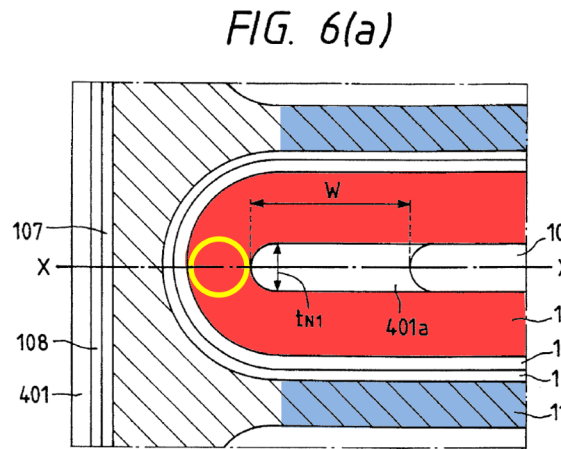
Fig. 8's plan view does not disclose all of the structures shown in Fig. 6(b)'s cross-sectional view, but both figures do show an "offset layer 106." Fujishima, 13:56. This offset layer 106 and its relationship to the source electrode 112 in Fig. 6(b) confirms that even if Petitioner's assertion that Fujishima's Figs. 6(b) and 8 are the "same MISFET" is accepted as true (Petition, 15), then Petitioner has not

accurately identified the configuration of the alleged source electrode in Fig. 8 with the blue highlighting the Petitioner adds to Fig. 8.

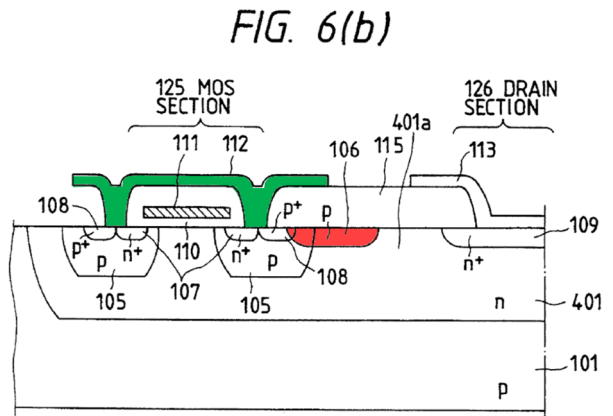
In the figures below, the source electrode 112 is highlighted green in the only figure in which it appears (Fig. 6(b)), and the offset layer 106 is highlighted red in all three figures. Only a tiny portion of offset layer 106 is visible in Fig. 6(b) and it corresponds to the areas circled (yellow) in Figs. 6(a) and 8⁵ annotated below, because these areas are where the line X-X' along which Fig. 6(b)'s cross-sectional view is taken (Fujishima, 13:36-40) intersect with the offset layer 106 in Figs. 6(a) and 8. Fig. 6(b) illustrates that near the end of the drain electrode 113 that Petitioner relies upon to allegedly meet the non-coplanar limitation, the source electrode 112 extends above and overlaps with some but not all of the offset layer 106. Thus, if Petitioner were correct that Figs. 6(b) and 8 illustrate the same MISFET, then the source electrode 112 would extend from the left of Fig. 8 about halfway into the circled area in annotated Fig. 8 below. But Petitioner's blue highlighting purporting to show the location of the source electrodes in Fig. 8 (Petition, 16, 18) does not reflect that—which confirms that Petitioner's blue

⁵ This accepts as true Petitioner's assertion that Figs. 6 and 8 disclose the "same MISFET" (Petition, 15) despite Petitioner's failure to establish it (*see* § II.D *infra*).

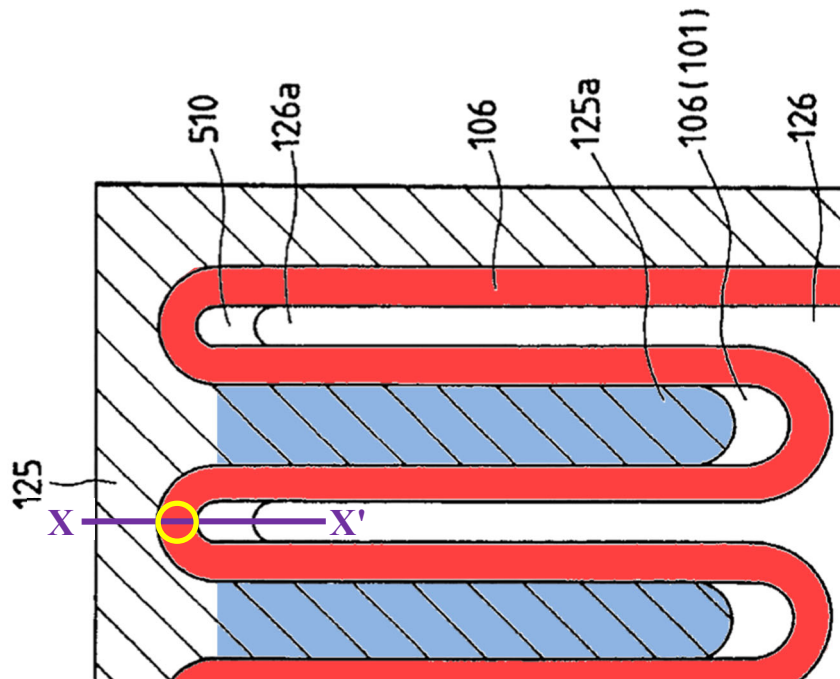
highlighting that purports to show the location of the source electrodes in Fig. 8 is wrong.



Fujishima, Fig. 6(a) (annotated)



Fujishima, Fig. 6(b) (annotated)



Fujishima, Fig. 8 (excerpted, rotated, annotated)

Moreover, Fujishima discloses nothing about where (if anywhere) a source electrode would extend in Fig. 8 other than along the line that corresponds to X-X'

in Fig. 6(a) because only the cross-sectional view there (in Fig. 6(b)) shows source electrode 112. Thus, nothing in Figs. 6(a)-6(b) supports Petitioner’s assertion that a source electrode extends in the areas that Petitioner highlighted blue in Fig. 8 to allege Fujishima discloses source finger electrodes interdigitated with drain finger electrodes.

Ground 1A is based on anticipation. To the extent the Board finds that Fujishima does not unambiguously disclose interdigitated source and drain finger electrodes, that is fatal to Ground 1A because the Federal Circuit has made clear that “as a matter of law” an ambiguous reference cannot anticipate. *See Wasica Fin. GMBH v. Cont’l Auto. Sys., Inc.*, 853 F.3d 1272, 1284 (Fed. Cir. 2017) (“[A]mbiguous references do not, as a matter of law, anticipate”).

It is not Patent Owner’s burden to show that Fujishima does not disclose interdigitated source and drain finger electrodes—it is Petitioner’s burden to show that Fujishima does disclose this. Petitioner fails to carry that burden.

5. Fujishima’s Failure to Disclose the Interdigitated Limitation is Fatal to Fujishima-Based Grounds 1A-1E

As noted, Ground 1A is based on anticipation. While Ground 1B relies on obviousness, it does not do so for the interdigitated limitation in Limitation [1a]. Petition, 17-20. Instead, Ground 1B only relies on obviousness for other limitations like Limitation [1b]. Petition, 20-22.

To demonstrate that Fujishima discloses the interdigitated limitation (Limitations [1a] and [10a]), Petitioner needed to show that Fujishima discloses this limitation either expressly or inherently. *See e.g., HTC Corp. v. Cellular Commc'ns Equip., LLC*, 877 F.3d 1361, 1368 (Fed. Cir. 2017) (“To anticipate a claim, a single prior art reference must disclose every limitation of the claimed invention either expressly or inherently.”) (citations omitted); *PAR Pharms. v. TWI Pharms.*, 773 F.3d 1186, 1195-96 (Fed. Cir. 2014) (“[T]he concept of inherency must be limited when applied to obviousness, and is present only when the limitation at issue is the ‘natural result’ of the combination of prior art elements” that are “explicitly disclosed by the prior art”). Petitioner fails to do so.

As explained above, Fujishima does not expressly disclose this limitation. Moreover, Petitioner does not even allege that the interdigitated limitation is inherently disclosed, let alone submit evidence to meet the high burden required to show inherency. *See Cont'l Can Co. USA v. Monsanto Co.*, 948 F.2d 1264, 1268-69 (Fed. Cir. 1991) (in anticipation analysis, establishing that a limitation is met by inherency requires “evidence [that] must make clear that the missing descriptive matter is ***necessarily present*** in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. ... Inherency, however, may not be established by probabilities or possibilities.”) (citations omitted); *PAR Pharms.*, 773 F.3d at 1195-96 (in obviousness analysis, establishing that a

limitation is met by inherency “may not be established by probabilities or possibilities”—instead “the limitation... necessarily must be present, or the natural result of the combination of elements explicitly disclosed by the prior art.”).

As explained *supra* § II.B.2, it is only necessary that the source electrode connect in some place to the semiconductor source region and that the drain electrode connect in some place to the semiconductor drain region. It is not necessary (and thus not inherent) that the source and drain electrodes be coextensive with the semiconductor regions they connect to, so it is not inherent that Fujishima has interdigitated source and drain *electrodes* as claimed.

C. Petitioner Fails to Establish that Fujishima Meets Petitioner’s Interpretation of the Non-Coplanar Limitation

Petitioner advances a construction of the non-coplanar limitation that is consistent with Petitioner’s litigation construction, but then fails to establish that Fujishima meets Petitioner’s own construction. Fujishima-based Grounds 1A-1E fail for this additional independent reason.

1. Petitioner Alleges that the Non-Coplanar Limitation Requires that the Drain Finger End Not Be on the Same Plane as Any Part of the Drain Electrode’s Main Body

The Board’s rules specify “Content” the Petition “must” have. 37 C.F.R. §§ 42.104, 42.22. Among the required content, the Petition “must” identify “how the challenged claim is to be construed” and “how the *construed* claim is unpatentable.” 37 C.F.R. § 42.104(b).

The non-coplanar limitation requires that “at least a portion of said drain finger end is *non-coplanar* with said drain finger electrode main body.” See Limitations [1c]-[1d] and [10c]-[10d]. In parallel litigation, Petitioner advocated that the non-coplanar limitation requires that the drain finger electrode “end” be “on a horizontal plane that is not on the same horizontal plane as *any part* of [the drain finger electrode’s] main body.” EX-2004, 4 (Respondents’ Construction).

While the Petition alleges that every claim term should be given its “plain meaning” (Petition, 14), for the non-coplanar limitation the plain meaning that the Petition applies is the same construction that Petitioner advances in parallel litigation. Specifically, the Petition alleges that Fujishima meets the non-coplanar limitation in Limitation [1d]⁶ because Fujishima’s alleged drain finger electrode “end is on a horizontal plane that is not on the same horizontal plane as *any part* of the [drain finger electrode’s] main body.” Petition, 25.

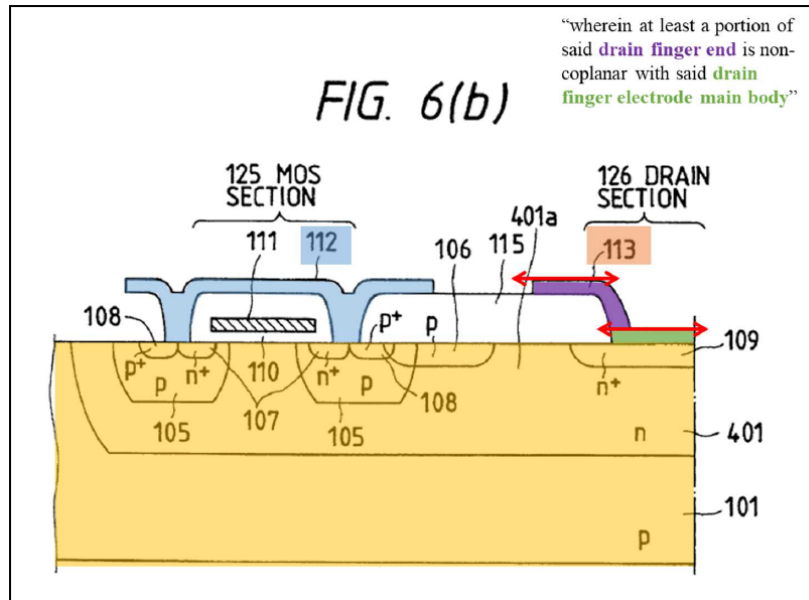
Thus, to demonstrate that the “construed claim” is met by Fujishima (37 C.F.R. § 42.104(b)), Petitioner alleges that Fujishima’s alleged drain finger electrode end “is on a horizontal plane that is not on the same horizontal plane as

⁶ Petitioner alleges that Fujishima also discloses the non-coplanar limitation in independent claim 10 for the same reasons. Petition, 47 (“Fujishima discloses [10d] for the reasons explained for [1d].”).

any part of the [drain finger electrode's] main body.” Petition, 25. The Petition fails to establish that Fujishima discloses this.

2. Petitioner Fails to Establish That Fujishima Meets the Non-Coplanar Limitation Under Petitioner's Own Construction

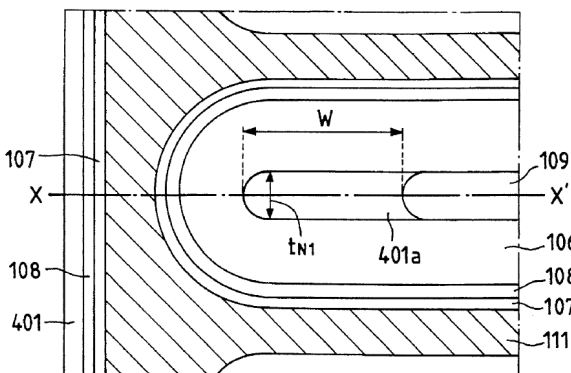
The Petition alleges that “[a]s shown [in Fig. 6(b)], at least a portion of the [drain finger] **end** is non-coplanar with respect to the [drain finger electrode] **main body** because the **end** is on a horizontal plane that is not on the same horizontal plane as any part of the **main body**.” Petition, 25 (citing annotated Fig. 6(b), reproduced below). The problem with Petitioner's assertion is that Fig. 6(b) shows only a tiny portion of the drain electrode 113. Even if Fig. 6(b) could be considered to disclose a drain finger electrode having a main body, Fig. 6(b) illustrates nothing about the vast majority of what the Petition alleges to be the drain finger electrode main body, so Petitioner's assertion that the drain finger electrode “**end** is on a horizontal plane that is not on the same horizontal plane as *any part* of the **main body**” (Petition, 25) is unsupported by citation to Fig. 6(b).



Petitioner's Annotations to Fujishima, FIG. 6(b) (Petition, 25)

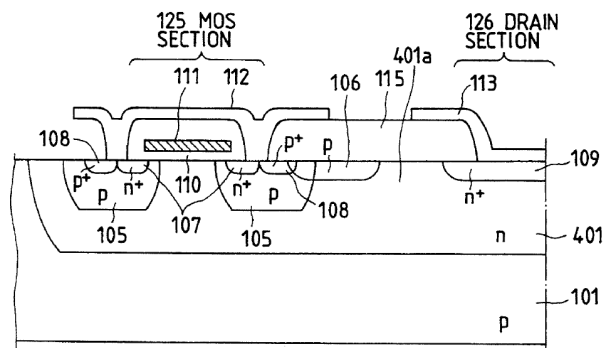
In connection with the interdigitated limitation, the Petition alleges that Fujishima's drain electrode is quite long and extends into the areas that Petitioner highlighted orange in Petitioner's annotated Fujishima's Fig. 8 reproduced below. Petition, 17-20. The cross-sectional view in Fig. 6(b) is along the line X-X' in Fig. 6(a) (Fujishima, 7:28-30) and thus only shows the small area along the line X-X' (purple) that Patent Owner has added to Petitioner's annotated Fig. 8 below. If Petitioner's assertions about the extent of the drain finger electrode are accepted as true—as is needed by Petitioner for Fujishima to meet the interdigitated limitation—then the lion's share of the drain finger electrode's main body is *not* shown in Fig. 6(b).

FIG. 6(a)

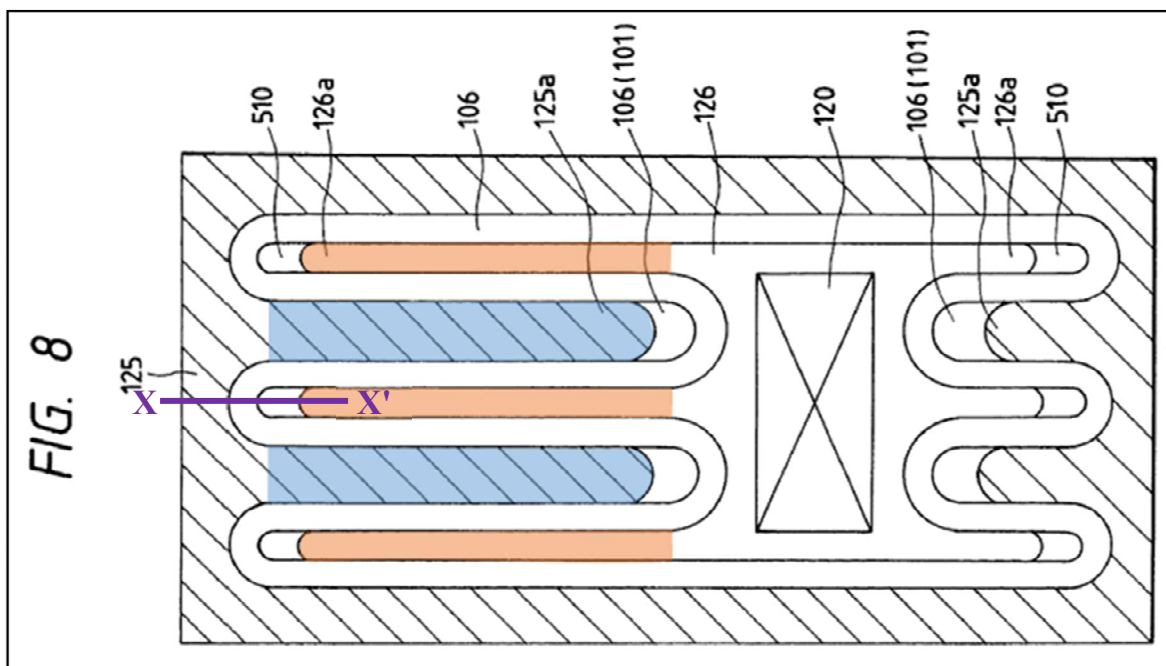


Fujishima, Fig. 6(a)

FIG. 6(b)



Fujishima, Fig. 6(b)



Petitioner's Annotations to Fujishima, Fig. 8 (Petition, 16, 18)
(with additional Patent Owner annotations in purple)

To purportedly support its assertion that “at least a portion of the **end** is non-coplanar with respect to the **main body** because the **end** is on a horizontal plane that is not on the same horizontal plane as *any part* of the **main body**,” the only Fujishima disclosure Petitioner cites is Fig. 6(b) and 12:23-31. Petition, 25.

As demonstrated above, Fig. 6(b) does not support this assertion because it does not disclose **all** the “part[s] of the **main body**” of Fujishima’s alleged drain finger electrode and thus does not provide sufficient information to determine whether “the **end** is on a horizontal plane that is not on the same horizontal plane as **any** part of the **main body**.” Petition, 25.

Fujishima, 12:23-31 also does not support Petitioner’s assertion that Fujishima meets Limitation [1d] for two reasons. **First**, Fujishima, 12:23-31 describes a “Third Embodiment” shown in Figs. 4(a)-4(b) in which “the offset layer... is **not** provided.” Fujishima, 12:5-19. As discussed *supra* §§ II.B.1 & II.B.4, the offset layer 106 is in both the Fig. 8 and Fig. 6(b) embodiments that the Petition relies on to purportedly meet claim 1. *See Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008) (an anticipatory reference must disclose “within the four corners of the document not only ***all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim.***”). Citation to Fujishima, 12:23-31 cannot support Petitioner’s assertion that an alleged embodiment shown in Figs. 6(b) and 8 meets any Challenged Claim. **Second**, Figs. 4(a)-4(b), like Figs. 6(a)-6(b), illustrate only a portion of the drain electrode 113 in cross-section. Figs. 4(a)-4(b) do not disclose **all** the “part[s] of the **main body**” of what Petitioner alleges to be Fujishima’s drain finger electrode and thus does not provide sufficient information to determine whether

“the [drain finger] **end** is on a horizontal plane that is not on the same horizontal plane as **any** part of the [drain finger electrode] **main body**.” Petition, 25.

Petitioner’s cited expert testimony cannot and does not save the Petition from its failure to show that Fujishima meets Petitioner’s own construction of the non-coplanar limitation. Petition, 25 (citing Zhao ¶88). Dr. Zhao merely repeats the Petition’s conclusory assertions in connection with Limitation [1d] virtually word-for-word. *Compare* Petition, 28 with Zhao ¶88. Dr. Zhao provides no meaningful analysis and cites no corroborating evidence to support his assertion that the end of Fujishima’s alleged drain finger electrode is on a horizontal plane that is not on the same horizontal plane as **any** part of the main body of the drain finger electrode, so this conclusory testimony warrants no weight under the Board’s precedential *Xerox* decision. *Xerox*, IPR2022-00624, Paper 9, at 15.

Thus, no **evidence** supports Petitioner’s assertion that Fujishima discloses that the end of Fujishima’s alleged drain finger electrode is on a horizontal plane that is not on the same horizontal plane as **any** part of the main body of the alleged drain finger electrode. Fujishima simply does not provide sufficient information about the configuration of Fujishima’s drain electrode to make that determination. Fujishima says that the entire **MOSFET** in each of Figs. 6 and 8 has an overall planar structure (Fujishima, 13:35-43 and 15:9-10) but never characterizes the drain electrode as planar. Indeed, Fig. 6(b) shows that a drain electrode that is not

planar despite being part of a MOSFET with an overall structure that Fujishima characterizes as planar. Fujishima, 13:35-43 (“In the high voltage MOSFET in accordance with this embodiment, its overall planar structure...”).

Petitioner’s own evidence also reveals that drain electrodes of the type disclosed in Fujishima were known to have non-planar main bodies. *See e.g.*, Asano (EX-1009), Figs. 4A-4B; *see infra* § IV.A (discussing Asano). There is no reason to believe that the entire main body of Fujishima’s alleged drain finger electrode is planar and Petitioner cites no *evidence* establishing that it is.

To demonstrate that Fujishima discloses the non-coplanar limitation (Limitation [1d] and [10d]) under the Petition’s own construction, Petitioner needed to show that Fujishima discloses, either expressly or inherently, that the end of Fujishima’s alleged drain finger electrode is on a horizontal plane that is not on the same horizontal plane as *any* part of the main body of the alleged drain finger electrode. Petition, 25; *HTC Corp.*, 877 F.3d at 1368; *PAR Pharms.*, 773 F.3d at 1195-96. Petitioner fails to do so. As explained above, Fujishima does not expressly disclose this. And Petitioner does not even allege that this is inherently disclosed, let alone submit evidence to meet the high burden required to show inherency. *Cont’l Can Co.*, 948 F.2d at 1268-69; *PAR Pharms.*, 773 F.3d at 1195-96. It is not “necessary” (and thus not inherent) that the main body of Fujishima’s alleged drain finger electrode be planar (*see, e.g.*, Asano, Figs. 4A-4B) or that the

entire main body of the alleged drain finger electrode be on a different plane than the end of the alleged drain finger electrode.

As explained above, the Petition fails to meet the requirement (“must”) in Rule 42.104(b) to establish that the “construed claim is unpatentable,” because Petitioner fails to establish that Fujishima meets the non-coplanar limitation under the Petition’s own construction that requires that “the end is on a horizontal plane that *is not on the same horizontal plane as any part of the main body.*” Petition, 25. The Board routinely denies institution where the Petition fails to meet its own construction of a term. *See e.g., Zillow Group Inc. v. IBM Corp.*, IPR2021-01311, Paper 8, at 7 (Mar. 10, 2022) (denying institution: “For purposes of this decision, we determine that no construction is necessary because Petitioner has failed to meet its burden under its own constructions.”); *Globus Medical, Inc. v. Moskowitz Family LLC*, IPR2020-01310, Paper 7, at 13-14 (Feb. 4, 2021) (denying institution where Petitioner failed to explain how prior art teaches the claims “under Petitioner’s own construction”); *Blackberry Corp. v. Facebook, Inc.*, IPR2019-01600, Paper 7, at 8-10 (Mar. 23, 2020) (denying institution where “Petitioner has not shown a reasonable likelihood of prevailing under its own construction of the” claim). Fujishima-based Grounds 1A-1E fail for this additional independent reason, because Petitioner fails to establish that Fujishima meets the non-coplanar limitation under the Petition’s own construction.

D. The Petition Alleges Anticipation but Relies on Different Embodiments in Fujishima Which Does Not Disclose Any Transistor Having All the Limitations of Any Challenged Claim

Even if the Board were to find that Fujishima Fig. 6(b) discloses the non-coplanar limitation and Fujishima Fig. 8 discloses the interdigitated limitation (neither is true as discussed *supra* §§ II.C and II.B, respectively), the Fujishima-based grounds still fail because Petitioner fails to establish that Fujishima discloses any embodiment that uses *both* of these claimed features together.

Petitioner asserts that Fujishima anticipates independent claims 1 and 10. Petition, 3, 17-25, 45-47. But Fujishima does not disclose a transistor that has both “drain finger electrodes *interdigitated* with source finger electrodes” *and* at least one drain finger electrode having a drain finger electrode main body and a drain finger electrode end, “wherein at least a portion of said drain finger end is *non-coplanar* with said drain finger electrode main body” as required by independent claims 1 and 10. *See* Limitations [1a], [1c]-[1d] and [10a], [10c]-[10d].

1. Anticipation Requires Disclosure of All Claim Limitations Arranged as Claimed

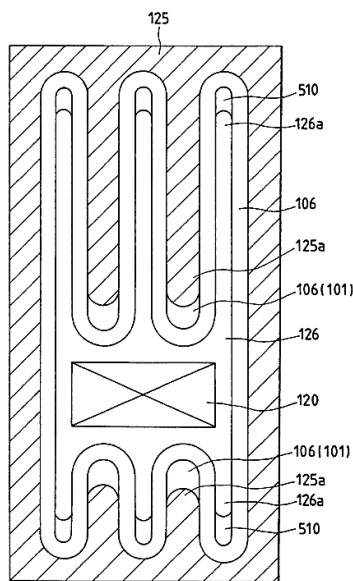
Showing that Fujishima discloses all the claimed limitations is necessary but not sufficient to establish anticipation. To prove anticipation of any Challenged Claim, Petitioner bears the burden to show that Fujishima not only discloses all the limitations of the claim, but also that Fujishima discloses those limitations *arranged as required by the claim*. *Net MoneyIN*, 545 F.3d at 1371. Petitioner

fails to carry that burden because Petitioner relies on disparate embodiments in Fujishima and fails to establish that Fujishima discloses a transistor that meets *both* the interdigitated and non-coplanar limitations.

2. Petitioner Relies on Different Fujishima Embodiments to Meet the Interdigitated and Non-Coplanar Limitations and Fails to Establish that Fujishima Teaches Using Them Together

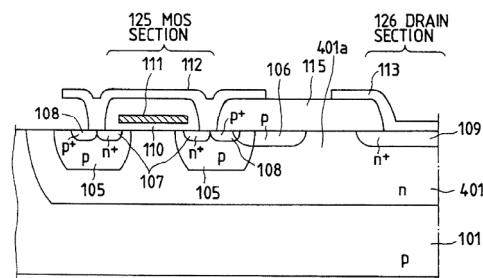
Petitioner alleges that Fujishima discloses the interdigitated limitation in FIG. 8 (reproduced below). Petition, 17-20 (Limitation [1a]), 45 (“Fujishima discloses [10a] for the reasons explained for [1a]”). Petitioner alleges that Fujishima discloses the non-coplanar limitation in FIG.6(b) (also reproduced below). Petition, 25 (Limitation [1d]), 47 (“Fujishima discloses [10d] for the reasons explained for [1d]”).

FIG. 8



**Fujishima, Fig. 8
(Seventh Embodiment)**

FIG. 6(b)



**Fujishima, Fig. 6(b)
(Fifth Embodiment)**

Petitioner bases its anticipation argument on the assertion that Fujishima's "Figure 8 is a **top view** of the device in Figure 6(b)" (Petition, 18) and that Fig. 8 illustrates "the same MISFET" as Fig. 6(b) (Petition, 15). Petitioner is wrong.

Fujishima FIG. 6(b) illustrates Fujishima's "Fifth Embodiment" described in Fujishima at 13:35-14:25. *See also* Fujishima, 7:25-29 (FIGs. 6(a)-6(b) show "a **fifth** embodiment"), 13:36-40 ("FIG. 6(a) is a plan view illustrating a configuration of a high voltage MOSFET in accordance with a **fifth embodiment** of the present invention. FIG. 6(b) is a cross-sectional view thereof taken along line X-X' in FIG. 6(a).").

Fujishima FIG. 8 illustrates Fujishima's "Seventh Embodiment" described in Fujishima at 15:1-59. *See also* Fujishima, 7:36-38 (FIG. 8 shows "a **seventh** embodiment"), 15:2-3 ("FIG. 8 shows a high voltage MOSFET in accordance with **seventh** embodiment of the present invention").

Petitioner never even acknowledges that Fujishima characterizes Figs. 6 and 8 as being directed to different embodiments, let alone explain how or why Fujishima would do so if these figures describe the "same MISFET" (Petition, 15-16) and the same "device" (Petition, 18) as Petitioner erroneously alleges.

Petitioner provides no analysis and cites no evidence in Fujishima to support its assertion that Figs. 6(b) and 8 describe the same MISFET. Petitioner simply alleges it in two conclusory assertions. First, Petitioner alleges Figure 8 is a "top

view of the *same MISFET*” shown in Figure 6(b). Petition, 15-16 (citing the figures and “[Fujishima], 13:37-51; Zhao ¶¶70-74”). Second, Petitioner alleges that “Figure 8 is a top view of *the device* in Figure 6(b), showing the ‘overall planar structure’ including the **drain finger electrodes** and **source finger electrodes**.” Petition, 18 (citing Fujishima,13:41-44).

Petitioner is wrong in asserting that Figs. 6 and 8 show the “same MISFET” and that Fig. 8 is a view of “the device in Figure 6(b).” None of the evidence that Petitioner cites supports this assertion. *See supra* § II.C.2 (discussing the disclosures in Fujishima, 13:37-51).

Petitioner relies on Fujishima’s Fig. 8 to allegedly meet the interdigitated limitation. Petition, 17-20. But Petitioner fails to establish that this Fig. 8 embodiment has the same source electrode configuration that is shown in Fig. 6(b) and alleged to meet the non-coplanar limitation. When a later embodiment has the same “cross-sectional structure” as a prior embodiment, Fujishima states that explicitly. Fujishima, 18:7-19 (in Fig. 12’s Tenth Embodiment the “cross-sectional structure is substantially identical to the cross-sectional structure shown in FIG. 10(b)”). But Fujishima never says that Fig. 8’s Seventh Embodiment has the same cross-sectional structure as Fig. 6’s Fifth Embodiment. What Fujishima does say is that “in FIG. 8, portions common to those of the high voltage MOSFET in accordance with the fifth embodiment shown in FIG. 6 are denoted by the same

reference numerals.” *Id.*, 15:4-7. Those “common portions” do not include Fig. 6(b)’s ***drain electrode 113*** that Petitioner relies on to purportedly meet the non-coplanar limitation. Petition, 25. Fig. 8 never labels a drain electrode as 113 despite Petitioner alleging that Fig. 8 illustrates drain finger electrodes. Petition, 18-19 (highlighting alleged “drain finger electrodes” in Fig. 8 orange).

In Fig. 8’s Seventh Embodiment, “the offset layer 106 is not formed around a drain corner portion 126a in which the drain layer 126 exhibits a protruding shape in a plan view” so “an n-type well layer 510 remains.” Fujishima, 15:25-28. There is no n-type well layer 510 shown in Figs. 6(a)-6(b) or described for Fig. 6’s Fifth Embodiment. Thus, Fig. 8’s Seventh Embodiment has an n-type well layer 510 but Fig. 6’s Fifth Embodiment does not. This further refutes Petitioner’s assertion that Figs. 8 and 6(b) illustrate the “same MISFET.” Petition, 15.

Petitioner’s expert testimony cannot and does not save the Petition from its failure to show that Fujishima’s Fig. 8 embodiment has the allegedly non-coplanar drain electrode disclosed in Fig. 6(b). Petitioner’s assertion that “Figure 8’s top view [is] of the same MISFET” in Fig. 6(b) cites Zhao ¶¶70-74. Petition, 15-16. Of the cited testimony, only ¶74 alleges that Fig. 8 shows the same MISFET as Fig. 6(b). And ¶74 does so solely by making the exact same conclusory assertion in language that parrots the Petition’s conclusory assertion virtually word-for-word. Zhao, ¶74 (“A POSA would have also understood that Fujishima’s Figure 8 shows

the top view of the same MISFET configuration in Figure 6(b).”). The Petition also cites Zhao ¶78 which states in similarly conclusory fashion that “Figure 8 shows the ‘overall planar structure’ from a top view of the transistor that is partially shown in Figure 6(b), with Figure 8 showing drain finger electrodes and source finger electrodes.” Petition, 18-19. Dr. Zhao provides no meaningful analysis and cites no corroborating evidence to support his assertion that Fujishima’s Figures 6(b) and 8 disclose the same MISFET, so this conclusory testimony warrants no weight under the Board’s precedential *Xerox* decision. *Xerox*, IPR2022-00624, Paper 9, at 15.

The Board also should not credit Dr. Zhao’s testimony because he fails to acknowledge that Fujishima characterizes Fig. 6 as a Fifth Embodiment and Fig. 8 as a Seventh Embodiment (Fujishima, 13:35-14:25, 15:1-60), and because he fails to explain why the Seventh Embodiment’s “n-type well layer 510” (Fujishima, 15:25-28) is not shown in Figs. 6(a)-6(b) or described in connection with the Fifth Embodiment.

Not one piece of credible evidence supports Petitioner’s assertion the Fujishima’s Figs. 6(b) and 8 disclose the same MISFET and the same device. Petition, 15-16, 18.

3. Conclusion: Petitioner Fails to Establish that Fujishima Discloses a Transistor Meeting Both the Interdigitated and Non-Coplanar Limitations

The *only* argument Petitioner advances to purportedly establish that Fujishima discloses an allegedly non-coplanar drain electrode end in the Fig. 8 embodiment alleged to meet the interdigitated limitation is that Figures 8 and 6(b) disclose the “same MISFET” and the same “device.” Petition, 15-16, 18. Nothing supports that assertion. Thus, Petitioner fails to meet its burden to show that Fujishima discloses any transistor that meets *both* the non-coplanar *and* interdigitated limitations as required by law to establish anticipation (*see supra* § II.D.1) of any Challenged Claim.

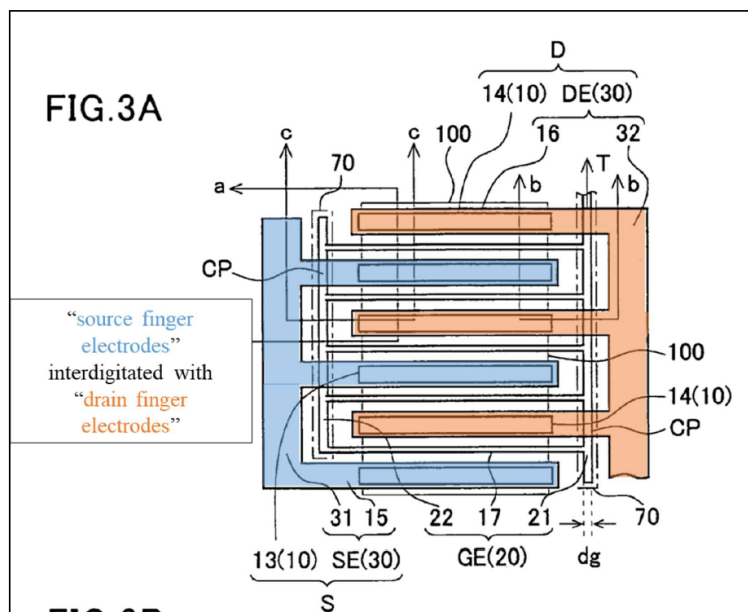
III. GROUNDS 1B-1E FAIL WITH GROUND 1A

Grounds 1B-1E rely entirely on Ground 1A’s failed arguments to meet the interdigitated and non-coplanar limitations in Limitations [1a]/[10a] and [1d]/[10d]. *See* Petition, 20-22 (Ground 1B presents obviousness theories only for Limitation [1b], and claims 5-9 and 13), 54-63 (Ground 1C challenges only claims 6-7), 63-69 (Ground 1D challenges only claims 8-9 and 14), 70-75 (Ground 1E challenges only claim 13). Grounds 1B-1E rely entirely on Ground 1A’s showing to purportedly meet the interdigitated and non-coplanar limitations in Limitations [1a]/[10a] and [1d]/[10d]. Thus, Grounds 1B-1E inherit all of the above-discussed failings and fail for the same reasons that Ground 1A fails as discussed *supra* § II.

IV. GROUND 2A (ALLEGED ANTICIPATION BY ASANO) FAILS

Ground 2A alleges that claims 1-4 and 8-9 are anticipated by Asano (EX-1009). This ground fails because Petitioner fails to establish that Asano discloses the non-coplanar limitation in Limitation 1[d].

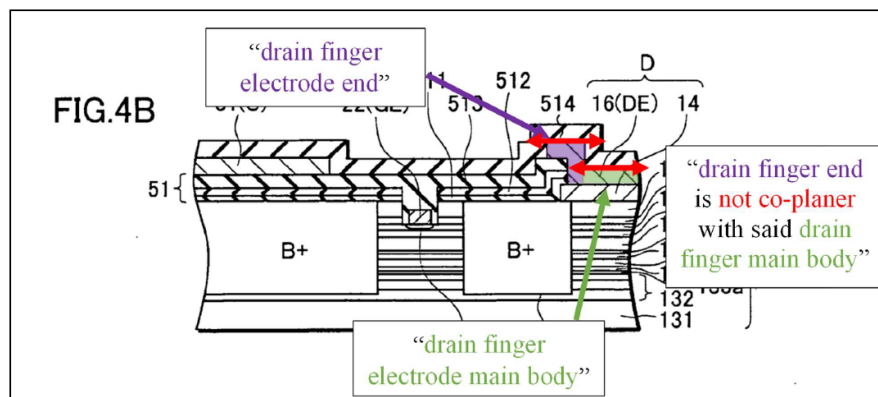
Petitioner alleges that Asano Fig. 3A shows drain finger electrodes (orange) interdigitated with source finger electrodes (blue) in Petitioner's annotated Fig. 3A (reproduced below). Petition, 79. Petitioner says that in each alleged source finger electrode there are two source electrodes 13 and 15, and in each alleged drain finger electrode there are two drain electrodes 14 and 16. Petition, 79. Petitioner alleges that the interdigitated limitation is met by "[e]ither the first set of source and drain electrodes (i.e., 13/14), second set (i.e., 15/16), or both collectively." *Id.*



Petitioner's Annotations to Asano, Fig. 3A (Petition, 79)

Petitioner relies on the two sets of electrodes “collectively” only for Ground 2B, which is offered “to the extent a single combined source finger electrode and single combined drain electrode is needed.” Petition, 79-80. Ground 2B treats source electrodes 13 and 15 as one source finger electrode and drain electrodes 14 and 16 as one drain finger electrode. Petition, 79-80. This difference between Grounds 2A and 2B is immaterial to the reasons why the grounds fail. *See infra* § V (explaining that Ground 2B fails for the same reasons that Ground 2A fails). Additionally, for purposes of this POPR only, Patent Owner does not dispute that Asano discloses interdigitated source and drain electrodes, because the Asano grounds fail for other reasons explained below.

Petitioner annotates Asano Fig. 4B (reproduced below) to purportedly show that Asano meets Limitation [1d]’s non-coplanar limitation. Petition, 86.



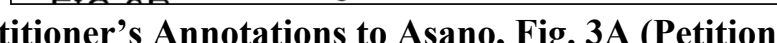
Petitioner’s Annotations to Asano, Fig. 4B (Petition, 86)

Petitioner alleges that the area highlighted purple is the end of Asano’s drain finger electrode, the area highlighted green is the main body of the drain finger electrode, and that the non-coplanar limitation is met by Fig. 4B because “the **end** is on a

horizontal plane that is not on the same horizontal plane as any part of the **main body**.” Petition, 87; *see also* Petition, 84-85 (“Figure 4B shows that Asano’s drain finger electrode 16 has a drain finger electrode end at the elevated tip of a drain finger electrode main body.”), 86-87 (“[T]he end portion of drain finger electrode 16 is elevated and not co-planar with drain finger electrode 16’s main body”).

As with the Fujishima-based grounds, Ground 2A adopts Petitioner’s litigation construction of the non-coplanar limitation, alleging that Limitation [1d] is met because Asano’s drain finger electrode end “is on a horizontal plane that is not on the same horizontal plane as any part of the **main body**.” Petition, 87; EX-2004, 4. But Petitioner relies entirely on Asano’s Fig. 4B to show the alleged “horizontal plane” of the main body. That reliance fails because Fig. 4B shows only a tiny portion of the drain finger electrode’s main body.

Fig. 4B is taken along line c-c in Fig. 3A and Petitioner’s own annotated Fig. 3A (reproduced again below) shows that the drain finger (orange) has a main body that extends well beyond the area corresponding to Fig. 4B’s cross-section. Thus, the evidence that Petitioner cites fails to support Petitioner’s assertion that Asano’s drain finger electrode end “is on a horizontal plane that is not on the same horizontal plane as any part of the **main body**,” because it does not illustrate the *entire* main body. Petition, 87. Ground 2A fails for that reason alone because



A. Petitioner Fails to Establish that Asano Meets Limitation [1d]’s Non-Coplanar Limitation

As discussed in connection with the Fujishima Grounds, the Board has two rules specifying “Content” the Petition must have. 37 C.F.R. §§ 42.22, 42.104. Among the required (“must”) content, the Petition “must” identify “how the challenged claim is to be construed” and “how the *construed* claim is unpatentable.” 37 C.F.R. §42.104(b)(3)-(4). The Petition must specify “where each element of the claim is found in the prior art patents or printed publications relied upon.” 37 C.F.R. §42.104(b)(3)-(4). The Petition “must” also include “a detailed explanation of the significance of the evidence.” 37 C.F.R. 42.22(a).

The Petition fails to meet these requirements for Limitation [1d].

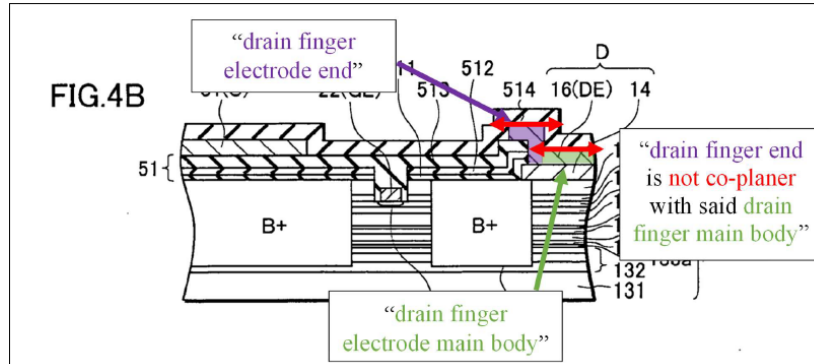
1. Petitioner Alleges that the Non-Coplanar Limitation Is Met When the Drain Finger End is Not on the Same Plane as Any Part of the Drain Finger Electrode’s Main Body

As discussed in connection with the Fujishima Grounds, while the Petition alleges that every claim term should be given its “plain meaning” (Petition, 14), for the non-coplanar limitation the plain meaning that the Petition applies is the same construction Petitioner advances in parallel litigation. Specifically, in alleging that Asano meets Limitation [1d], Petitioner asserts that its “**drain finger electrode end** is non-coplanar with respect to the **drain finger electrode main body** because the **end** is on a horizontal plane that is not on the same horizontal plane as any part of the **main body**.” Petition, 87; EX-2004, 4.

As detailed below, Petitioner fails to demonstrate “how the *construed* claim is unpatentable” because Petitioner fails to establish that Asano meets the Petition’s own construction of Limitation [1d]. 37 C.F.R. § 42.104(b)(4). The Board routinely denies institution in such circumstances where the Petition fails to demonstrate that the prior art meets the Petition’s own construction. *Zillow Group*, at 7; *Globus Medical*, at 13-14; *Blackberry Corp.*, at 8-10.

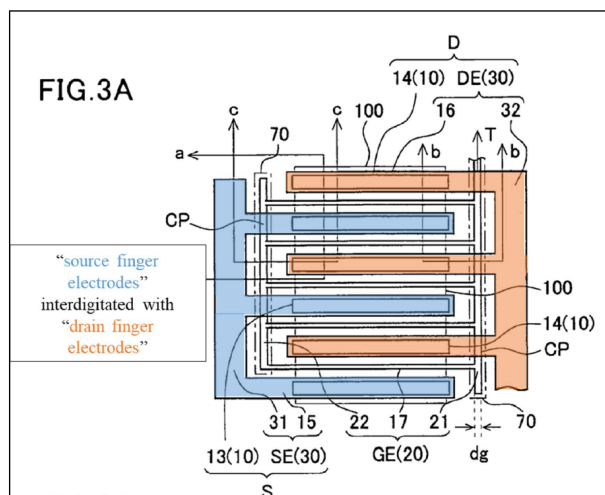
2. Petitioner Relies Solely on Asano FIG. 4B Which Does Not Illustrate the Entire Main Body of the Alleged Drain Finger Electrode

Petitioner’s showing for how and why Asano allegedly meets Limitation [1d]’s non-coplanar limitation relies entirely on Fig. 4B (reproduced below with Petitioner’s annotations). Petition, 86-87. The Asano structure that Petitioner alleges is a drain finger electrode in Ground 2A is labeled 16(DE) in Fig. 4B. Asano describes a “drain electrode 16” and “drain wiring 32” as shown in Fig. 3A, and uses the label DE to refer to a “drain wiring electrode DE (the second drain electrode 16 and the drain wiring 32).” Asano, [0118]. Thus, DE refers to an aggregated structure that includes drain electrode 16 and drain wiring 32. Even if Petitioner’s implicit suggestion that 16(DE) refers to the drain electrode 16 portion of the DE structure is accepted as true, the Asano grounds fail.



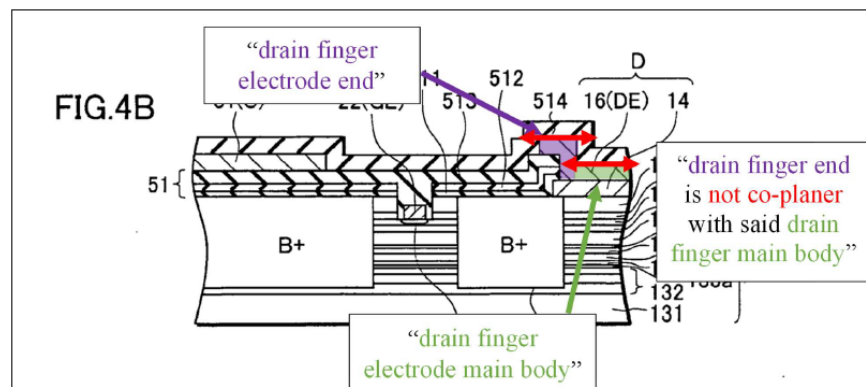
Petitioner's Annotations to Asano, Fig. 4B (Petition, 86)

FIG. 4B only shows a tiny portion of drain electrode 16(DE), which is cut off at the right edge of FIG. 4B. This is confirmed by Petitioner's annotated version of Fig. 3A (reproduced below) which highlights orange the structure alleged to be the drain finger electrode. Petition, 79. "Fig. 4B is a cross-sectional view along the line c-c in Fig. 3A." Asano, [0110]. Thus, the left and right edges of Fig. 4B correspond to the positions of the up arrows labelled "c" in Fig. 3A. As Fig. 3A makes clear, there is large portion of the alleged main body of the drain finger electrode that is not shown in Fig. 4B's cross-sectional view.



Petitioner's Annotations to Asano, Fig. 3A (Petition, 79)

The basis of Petitioner’s assertion that Asano meets Limitation [1d] is that the drain finger electrode’s “**end**” is on a horizontal plane that is not on the same horizontal plane as **any part** of the **main body**.” Petition, 87. To substantiate that assertion, Petitioner would need to establish what horizontal planes are occupied by the *entire* alleged main body of the alleged drain electrode. But as shown below, FIG. 4B’s cross-sectional view does not provide sufficient information to support Petitioner’s assertion. And the Petition cites no other teaching in Asano that shows all the horizontal planes occupied by the alleged main body of the alleged drain finger electrode. Petition, 86-87.



Petitioner’s Annotations to Asano, Fig. 4B (Petition, 86)

Petitioner thus fails to establish that Asano meets Limitation [1d] under the Petition’s own construction, because the Petition does not cite any *evidence* that supports Petitioner’s assertion that the drain finger electrode shown in Asano’s Fig. 4B has an end that is “on a horizontal plane that is not on the same horizontal plane as **any part** of the **main body**.” Petition, 87.

Petitioner’s expert cannot and does not save the Petition from its failure to cite evidence supporting Petitioner’s assertion that Asano discloses a drain finger electrode end that “is on a horizontal plane that is not on the same horizontal plane as any part of the **main body**” of the drain finger electrode. Petition, 86-87 (citing Zhao, ¶¶213-216). The cited testimony tracks the Petition’s failed analysis for Limitation [1d], largely word-for-word, without citing any evidence or providing any analysis to support the assertion that Asano’s drain finger electrode end “is not on the same horizontal plane as any part of the **main body**.” Petition, 87. Thus, this testimony warrants no weight. *Xerox*, IPR2022-00624, Paper 9, at 15. But even if everything Dr. Zhao says is credited, his testimony still provides no support for the Board to find that Asano meets Limitation [1d] because, like the Petition, Dr. Zhao relies entirely on Fig. 4B which shows only a tiny portion of the alleged drain finger electrode’s main body.

* * *

It is not Patent Owner’s burden to prove that Asano does not meet the non-coplanar limitation—it is Petitioner’s burden to demonstrate that Asano **does** meet it. As demonstrated above, Petitioner fails to carry that burden. That should end the matter and Ground 2A should be denied. Despite that, Patent Owner goes further below and demonstrates that other teachings in Asano—that Petitioner ignores—directly refute Petitioner’s assertion that Asano’s drain finger electrode

end “is not on the same horizontal plane as any part of the **main body**” of the drain finger electrode. Petition, 87.

3. Asano’s Disclosures Contradict Petitioner’s Assertion that No Portion of the Drain Finger Electrode Main Body Is Coplanar with the Drain Finger Electrode End

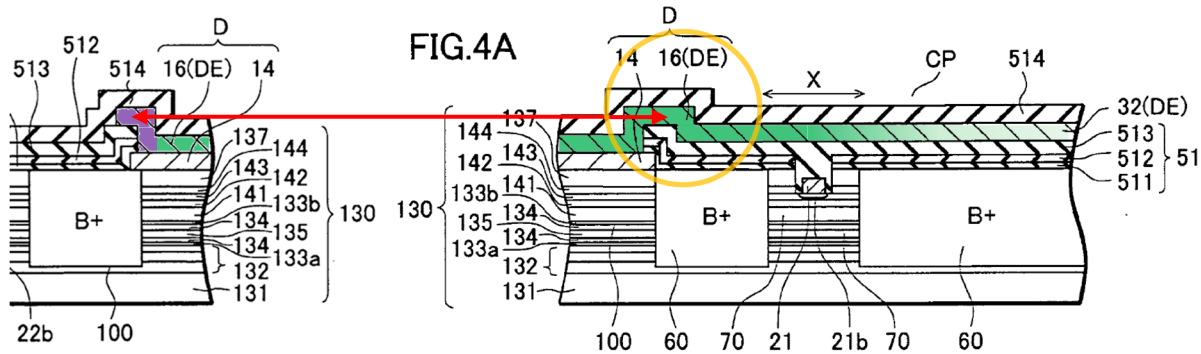
Asano’s FIG. 4A contradicts Petitioner’s argument. “FIG. 4A is a cross-sectional view along the line b-b in FIG. 3A, and FIG. 4B is a cross-sectional view along the line c-c in FIG. 3A.” Asano, [0110]. As the locations of the lines b-b and c-c in Fig. 3A (below) make clear, Figs. 4A and 4B show different parts of the same alleged drain finger electrode 16(DE). The below-annotated figures illustrate how the cross-sections of FIGs. 4A (right) and 4B (left) are oriented with respect to FIG. 3A. Patent Owner has also annotated Fig. 4A to adopt Petitioner’s convention of highlighting 16(DE) green.

electrode in Fig. 4B (purple) is specifically labelled 16(DE) in Fig. 4A, which is the same structure that Petitioner highlights green in Fig. 4B as the main body.

The right-hand edge of Fig. 4B and the left-hand edge of Fig. 4A have the same layers—they are arranged in the same way and identified using the same reference characters. This illustrates that the cross-sectional configuration of Asano’s device does not change in the area in Fig. 3A between the right-most “up” arrow c of line c-c and the left-most “up” arrow b of line b-b. But Fig. 4A illustrates that the cross-sectional configuration in the area corresponding to line b-b in Fig. 3A is different than what is shown in Fig. 4B for the area corresponding to line c-c in Fig. 3A.

Larger versions of the above-annotated Figs. 4A-4B are provided below for easier viewing. Fig. 4A reveals that the main body of the alleged drain finger electrode 16(DE) is not planar. Indeed, the reference character 16(DE) in Fig. 4A identifies a portion of this alleged drain finger electrode—circled in the annotated figure below—that sits atop drain electrode 14 *and* layers 511-513 and is in a higher horizontal plane than the portion of the drain finger electrode at the left-hand edge of Fig. 4A. Petitioner entirely ignores this. Petitioner only alleges that the portion of the main body of the drain finger electrode 16(DE) *shown in Fig. 4B* “is not on the same horizontal plane” as the end that Petitioner highlights purple. Petition, 87. That is insufficient to substantiate Petitioner’s assertion that

the drain finger electrode 16(DE)'s end "is not on the same horizontal plane as any part of the **main body**." Petition, 87.

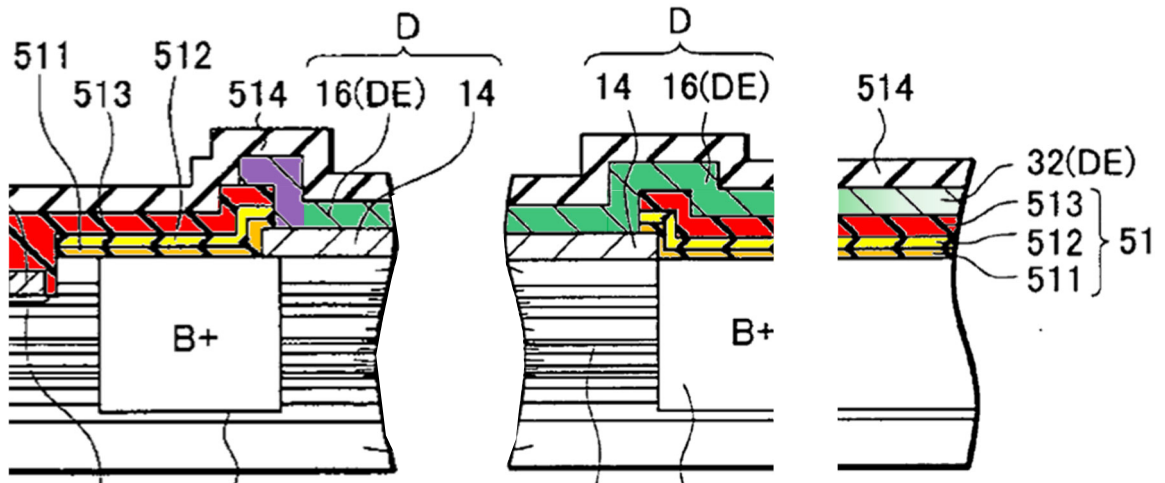


Asano, Figs. 4B, 4A (annotated)

To substantiate Petitioner's assertion that the drain finger electrode 16(DE)'s end "is not on the same horizontal plane as any part of the **main body**" (Petition, 87), Petitioner would have needed to establish that the above-circled portion of the alleged drain finger electrode 16(DE) is not on the same horizontal plane as the end that Petitioner highlights purple in Fig. 4B. Neither Petitioner nor its expert even allege that this is so, let alone submit any evidence to establish that it is so. Once again, that should end the matter because Petitioner has failed to cite any **evidence** that supports its assertion about how and why Limitation [1d] is allegedly met by Asano. 37 C.F.R. §42.104(b)(3)-(4).

Worse yet, Fig. 4A illustrates that the above-circled part of the drain finger electrode 16(DE)'s main body is on the same plane as the end that Petitioner highlights purple. Petitioner alleges that "Figure 4B shows a 'nitride film 513'

elevating the **drain finger electrode end** to a non-coplanar position above the plane of the **drain electrode finger main body.**” Petition, 86. In Fig. 4B, the nitride film 513 sits atop two other nitride films 511 and 512 and a portion of drain electrode 14. Asano, [0100]. This is the mirror image of the structure in the above-circled area of Fig. 4A as further illustrated below.



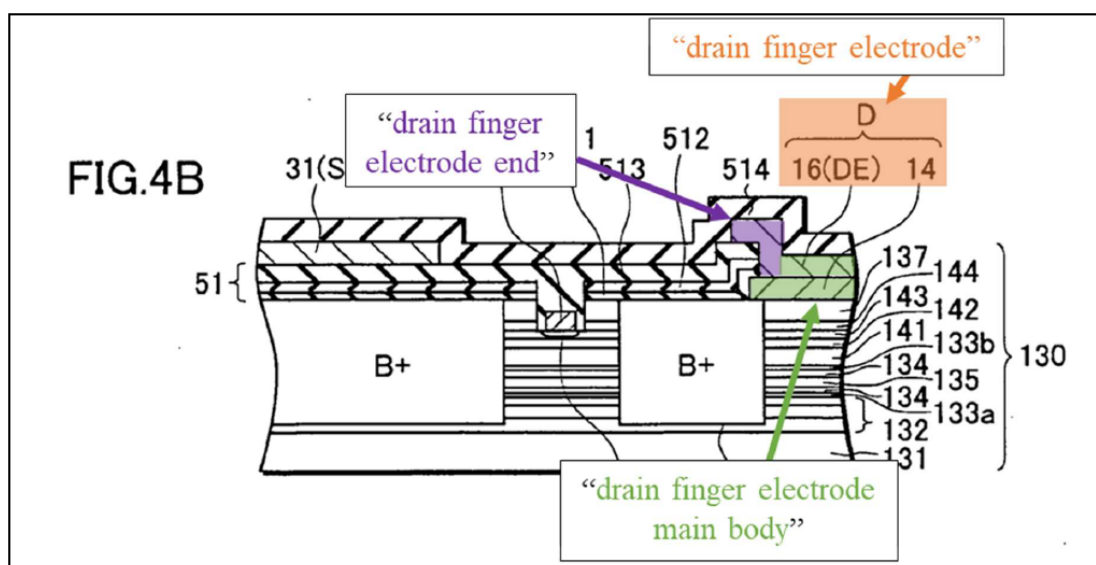
**Asano, Fig. 4B
(right side excerpted,
annotated)**

**Asano, Fig. 4A
(left and right side
excerpted, annotated)**

Petitioner appears to allege that films 511 (orange above) and 512 (yellow) have a thickness equal to that of 16(DE) so that only film 513 (red) is considered to “elevat[e]” the alleged drain finger electrode end. *See* Petition, 86; Asano, Fig. 4B. But as shown in Fig. 4A, the above-circled portion of the main body of the alleged drain finger electrode 16(DE) sits atop the very same nitride film layers 511, 512, and 513. The nitride film 513 “elevates” this portion of the drain finger electrode 16(DE)’s main body by the same amount that the very same nitride film 513

V. GROUND 2B FAILS

In Ground 2B, Petitioner alleges that the claimed drain finger electrode with an end and a main body (*see* Limitation [1c]) is met by Asano's "drain electrodes 14/16 collectively." Petition, 85. Petitioner annotates Asano Fig. 4 in largely the same manner as Petitioner did for Ground 2A, but also highlights Asano's drain electrode 14 green and characterizes electrode 14 as another part of the "main body" of a drain finger electrode 14/16. *Id.* (see Fig. 4B annotated below).

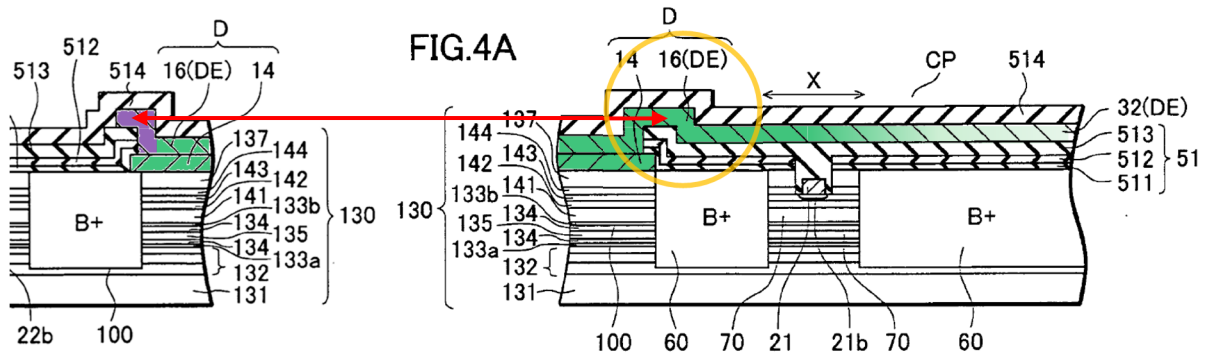


Petitioner's Annotations to Asano, Fig. 4B (Petition, 85)

Under its analysis of the non-coplanar Limitation [1d], Petitioner uses the wrong figure for Ground 2B by reusing the exact same annotated figure used for Ground 2A rather than the above figure that also annotates the electrode 14 green. Petition, 87. But that is immaterial. The Petition seeks to map Limitation [1d] to the alleged "drain electrodes 14/16 collectively," but Petitioner's showing for Ground 2B fails for the same reasons that Ground 2A fails. Petition, 86-87.

Petitioner’s analysis for Ground 2B that purports to establish how and why Limitation [1d]’s non-coplanar limitation is met is substantively the same as for Ground 2A. Petition 87 (annotating Asano Fig. 4B and stating that “[u]nder both mappings [i.e., for Grounds 2A and 2B], at least a portion of the drain finger electrode end is non-coplanar with respect to the drain finger electrode main body because the end is on a horizontal plane that is not on the same horizontal plane as *any part* of the main body.”).

Ground 2B fails for the same reasons that Ground 2A fails. The inclusion of electrode 14 along with electrode 16 does not change Petitioner’s analysis for Limitation [1d]’s non-coplanar limitation. As with Ground 2A, Petitioner’s analysis in Ground 2B relies on Fig. 4B but fails to acknowledge that Fig. 4B does not show the entire main body of the alleged electrode 14/16 and thus does not provide sufficient information to establish that Asano meets the Petition’s own construction of Limitation [1d]. *See supra* § IV.A.2. And as explained for Ground 2A, Asano Fig. 4A (shown below) reveals that the electrode 14/16 has a portion of its alleged main body that is on the same plane as the end Petitioner highlights purple, demonstrating that Asano does not meet the Petition’s own construction of Limitation [1d]. *See supra* § IV.A.3.



Asano, Figs. 4B, 4A (annotated)

VI. CONCLUSION

For the reasons demonstrated above, Petitioner fails to establish a reasonable likelihood of establishing the unpatentability of any Challenged Claim. Institution should be denied.

Respectfully submitted,
Infineon Technologies Austria AG

Date: February 20, 2025

/Richard Giunta/

Richard F. Giunta, Reg. No. 36,149
WOLF, GREENFIELD & SACKS, P.C

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24, the undersigned certifies that the foregoing **PATENT OWNER'S PRELIMINARY RESPONSE** contains 11,742 words excluding; a table of contents, a table of authorities, a certificate of service or word count, or appendix of exhibits or claim listing. Patent Owner has relied on the word count feature of the word processing system used to create this paper in making this certification.

Date: February 20, 2025

/MacAulay Rush/
MacAulay Rush
Paralegal
WOLF, GREENFIELD & SACKS, P.C.

CERTIFICATE OF SERVICE UNDER 37 C.F.R. § 42.6 (e)(4)

I certify that on February 20, 2025, I will cause a copy of the foregoing document, including any exhibits filed therewith, to be served via electronic mail, as previously consented to by Petitioner, upon the following:

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