

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE

MiiCs & PARTNERS AMERICA, INC., et al.,

Plaintiffs,

v.

TOSHIBA CORPORATION, et al.,

Defendants.

SAMSUNG DISPLAY CO., LTD.,

Intervenor.

Civil Action No. 14-803-RGA

MiiCs & PARTNERS AMERICA, INC., et al.,

Plaintiffs,

v.

FUNAI ELECTRIC CO., LTD., et al.,

Defendants.

SAMSUNG DISPLAY CO., LTD.,

Intervenor.

Civil Action No. 14-804-RGA

*October 24, 2017*

MEMORANDUM OPINION

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ANDREWS, U.S. DISTRICT JUDGE:

Presently before the Court is Samsung Display Co., Ltd.'s Motion for Partial Summary Judgment of Non Infringement and Invalidity (D.I. 404) and related briefing (D.I. 407, 458, 509).<sup>1</sup> The Court held oral argument on October 18, 2017. (D.I. 573) ("Tr."). For the reasons that follow, Samsung's motion is granted in part as to noninfringement of asserted claims 10, 11, and 13 of U.S. Pat. No. 7,460,190.

## I. BACKGROUND

Plaintiffs filed these actions against Defendants Toshiba and Funai on June 24, 2014, alleging infringement of nine patents, including the '190 patent. (D.I. 1). With the Court's permission, Plaintiffs filed First Amended Complaints on March 31, 2015, in which they asserted additional patents. (D.I. 35). On August 11, 2015, this Court stayed these cases pending inter partes review before the PTAB. (D.I. 82). After Plaintiffs agreed to withdraw certain patents on which the PTAB instituted IPRs, the Court lifted the stays on March 23 and 31, 2016, respectively. (D.I. 112; C.A. No. 14-804-RGA, D.I. 117). On June 15, 2016, the Court granted Samsung Display Company's ("SDC") motion to intervene.<sup>2</sup> (D.I. 139). The remaining patents-in-suit generally relate to various liquid crystal display ("LCD") apparatuses and thin film transistors ("TFTs") used therein.

Asserted claim 13 of the '190 patent reads as follows:

13. A liquid crystal display (LCD) device comprising a thin-film-transistor (TFT) substrate mounting thereon a plurality of TFTs, a counter substrate mounting thereon a black matrix, a liquid crystal layer sandwiched between said TFT substrate and said counter substrate for defining an array of pixels, each of said pixels including one of said TFTs and an associated pixel electrode, and a backlight unit disposed at a rear side of said TFT substrate for irradiating said TFT substrate

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<sup>1</sup> All docket references refer to 1:14-cv-00803-RGA unless otherwise noted.

<sup>2</sup> Samsung Display Company and Toshiba will be referred to hereinafter collectively as "Defendants."

with backlight, each of said TFTs having a channel in an ohmic contact layer and a semiconductor layer, said channel being aligned, as viewed normal to said substrates, with said black matrix and a light shield layer disposed between said channel and said backlight unit,

    said channel having a channel length larger at both edge portions of said channel than at a central portion thereof.

('190 patent, claim 13). Asserted claims 10 and 11 also contain the limitation, “each of said TFTs having a channel in an ohmic contact layer and a semiconductor layer.” (*Id.* at claims 10, 11).

## **I.      LEGAL STANDARD**

“The court shall grant summary judgment if the movant shows that there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law.” Fed. R. Civ. P. 56(a). The moving party has the initial burden of proving the absence of a genuinely disputed material fact relative to the claims in question. *Celotex Corp. v. Catrett*, 477 U.S. 317, 330 (1986). Material facts are those “that could affect the outcome” of the proceeding, and “a dispute about a material fact is ‘genuine’ if the evidence is sufficient to permit a reasonable jury to return a verdict for the nonmoving party.” *Lamont v. New Jersey*, 637 F.3d 177, 181 (3d Cir. 2011) (quoting *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986)). The burden on the moving party may be discharged by pointing out to the district court that there is an absence of evidence supporting the non-moving party’s case. *Celotex*, 477 U.S. at 323.

The burden then shifts to the non-movant to demonstrate the existence of a genuine issue for trial. *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 586-87 (1986); *Williams v. Borough of West Chester, Pa.*, 891 F.2d 458, 460-61 (3d Cir. 1989). A non-moving party asserting that a fact is genuinely disputed must support such an assertion by: “(A) citing to particular parts of materials in the record, including depositions, documents, electronically stored

information, affidavits or declarations, stipulations . . . , admissions, interrogatory answers, or other materials; or (B) showing that the materials cited [by the opposing party] do not establish the absence . . . of a genuine dispute . . . .” Fed. R. Civ. P. 56(c)(1).

When determining whether a genuine issue of material fact exists, the court must view the evidence in the light most favorable to the non-moving party and draw all reasonable inferences in that party’s favor. *Scott v. Harris*, 550 U.S. 372, 380 (2007); *Wishkin v. Potter*, 476 F.3d 180, 184 (3d Cir. 2007). A dispute is “genuine” only if the evidence is such that a reasonable jury could return a verdict for the non-moving party. *Anderson*, 477 U.S. at 247-49. If the non-moving party fails to make a sufficient showing on an essential element of its case with respect to which it has the burden of proof, the moving party is entitled to judgment as a matter of law. *See Celotex*, 477 U.S. at 322.

### **III. DISCUSSION**

Whether the accused products infringe the asserted claims of the ’190 patent turns on the plain and ordinary meaning of the claim term “channel in an ohmic contact layer and a semiconductor layer. (Tr. at 91:17-92:4, 99:12-14; D.I. 407 at 11; D.I. 458 at 14). I previously construed this term to have its “plain and ordinary meaning, i.e., ‘a channel in both an ohmic contact layer and a semiconductor layer.’” (D.I. 167 at 34). Although Plaintiffs asserted during claim construction that the channel region did not include the ohmic contact layer, Plaintiffs added the limitation “that the channel be in both the semiconductor layer and the ohmic contact layer” when “seeking to overcome a prior art rejection.” (D.I. 407 at 11; D.I. 116-4 at 91). As Defendants note, Plaintiffs argued during the Markman hearing that the claims as ultimately construed by the Court “do not cover the TFT described in the specification,” and make it “absolutely impossible” to practice the claims because the Court’s construction requires that “a

portion of the semiconductor layer [be located] in both the ohmic contact layer and in a semiconductor layer.” (D.I. 407 at 14; D.I. 160 at 67:3-12). As I noted during claim construction, since Plaintiffs amended the claims to include the ohmic contact layer limitation in order to overcome a prior art rejection, it would be improper to adopt a construction that writes the ohmic contact layer limitation out of the claims. *See, e.g., Chef Am., Inc. v. Lamb-Weston Inc.*, 358 F.3d 1371, 1374 (Fed. Cir. 2004) (“Even a nonsensical result does not require the court to redraft the claims of the [] patent.” (internal citation omitted)). After I construed the claims, Plaintiffs changed their position, and now advance two primary arguments to assert that every accused product contains a channel in both an ohmic contact layer and a semiconductor layer. (*See, e.g.*, D.I. 458 at 14-17).

First, Plaintiffs argue that “in” is “a function word indicating inclusion, location, or position within limits,” which also encompasses the state in which one thing is “bounded by an aperture in” another. (*Id.* at 14 (citing D.I. 409-1 at SA1113 ¶ 38); D.I. 409-1 at SA1113 ¶ 39; Tr. at 100:17-18, 108:5-8, 115:25-116:4). Under this interpretation, Plaintiffs assert that the channel is “in” the semiconductor layer because it physically occupies the entire semiconductor layer, and the channel is also “in” the ohmic contact layer because the semiconductor layer is bounded by the ohmic contact layer. (Tr. at 115:3-15). Defendants respond that Plaintiffs’ interpretation of the word “in” cannot be correct because it would necessitate that a single instance of the word “in” have two different meanings in the same limitation, with the channel physically in the semiconductor layer but bounded by the ohmic contact layer. (D.I. 407 at 12-13; Tr. at 95:6-23). Defendants also attack Plaintiffs’ interpretation of the word “in” on the ground that it would permit Plaintiffs to rewrite the claims to effectively eliminate the “in an ohmic contact layer” limitation. (D.I. 509 at 8).

Defendants urge that the plain and ordinary meaning of “in” requires that one thing be physically located in another (Tr. at 112:6-10; D.I. 407 at 12-13), and that the channel occupies only a portion of the semiconductor layer near the gate electrode. (Tr. at 93:14-94:1; D.I. 407 at 11-12 (citing Defendants’ expert’s supporting declaration)). To support this construction, Defendants offer (1) language in the patent specification describing the channel as “extend[ing] in the semiconductor layer” in conjunction with Figure 2F, which indicate that the channel is physically located in the semiconductor layer (Tr. at 92:5-12, 94:12-14; ’190 patent at Fig. 2F, 6:4-10); (2) Plaintiffs’ expert’s agreement with the Court’s prior construction of channel as “a portion of the semiconductor layer” (D.I. 409-1 at SA1712 (Fontecchio Dep. 540:5-20)); (3) Plaintiff’s assertions during claim construction that the Court’s ultimate construction would “require[] a portion of the semiconductor layer to physically occupy two different layers” (D.I. 509 at 7 (citing D.I. 158 at 2)); and (4) Defendants’ expert’s supporting declaration that “[t]he channel does not form in the entire semiconductor layer but only in a thin portion of it” (D.I. 407 at 11-12 (citing D.I. 408 at SA0022 ¶ 44-45)). Therefore, Defendants argue that since the channels in the accused products are physically located only in the semiconductor layer, not the ohmic contact layer, none of the accused products infringe the ’190 patent, which requires that the channels be physically located in both the semiconductor layer and the ohmic contact layer. (D.I. 407 at 11). Finally, Defendants contend that “the accused devices do not contain a structure that Plaintiffs recognized is impossible.” (*Id.* at 11).

Plaintiffs now counter that Defendants’ interpretation improperly imports “a limitation requiring ‘physical inclusion’ of the channel in both the ohmic contact layer and the semiconductor layer.” (D.I. 458 at 14 (emphasis omitted)). As support for their interpretation of the plain and ordinary meaning of “in,” Plaintiffs rely on their expert’s conclusory testimony that

“‘bounded by an aperture in’ is equivalent to, or synonymous with, the ‘channel’ being ‘located or positioned within the limits of’ the ohmic contact layer.” (*Id.* at 16 (citing D.I. 462, Ex. E at 529:10-531:18); *see* D.I. 409-1 at SA1113 ¶ 39 (offering no support for the asserted equivalence of “in” and “bounded by an aperture in the ohmic contact layer”)).

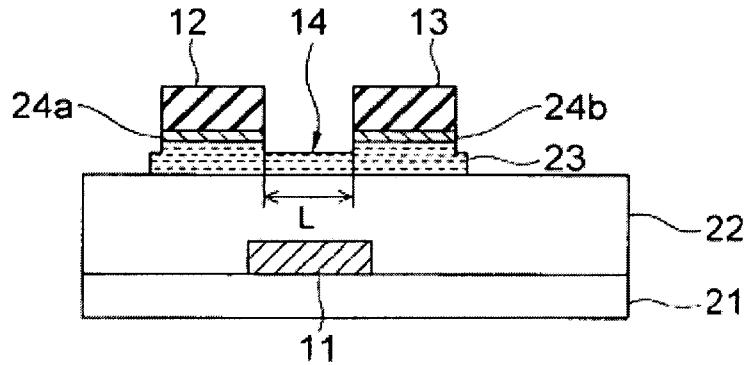
Second, Plaintiffs assert that even if the word “in” refers to physical location, there are portions of the ohmic contact layer that are physically located in the semiconductor layer because the “interface” between the two layers “contains both semiconductor and ohmic contact materials” when examined at the atomic level. (D.I. 458 at 16-17). As Defendants point out, Plaintiffs’ only support for this argument is their expert’s unsupported opinion testimony. (D.I. 407 at 13-14 (citing D.I. 408-1 at SA0734 ¶ 19)). Plaintiffs’ expert admitted during his deposition that he did not inspect or analyze any of the accused products to form his opinion about these atomic interactions, nor did he request samples from Defendants that would have allowed him to perform a nanometer-scale analysis that could support his opinion. (D.I. 409-1 at SA1716-17 (Fontecchio Dep. at 568:12-19; 570:13-571:6)). Instead, Plaintiffs’ expert relied on his prior experience, including his Ph.D. research on surface morphology, as the basis for his opinion about the accused products at issue. (*Id.* at 568:18-569:14). There is no indication that Plaintiffs’ expert’s prior research and experience were related to products that are in any way analogous to the accused products here. Therefore, I decline to credit this atomic level theory as evidence of the physical locations of the semiconductor layer and ohmic contact layer in the accused products.<sup>3</sup>

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<sup>3</sup> Even if I were to accept this theory, it is obvious that the asserted claims do not mean that a channel is in the ohmic contact layer simply because a few atoms of the ohmic contact layer are intermixed with a few atoms of the semiconductor layer. I think any argument to the contrary is completely without merit.

The parties do not dispute that the channel is physically located in the semiconductor layer (Tr. at 92:10-12, 103:17-19) but they disagree regarding whether the channel occupies the entire semiconductor layer from top to bottom between the drain and source electrodes (Tr. at 93:14-94:1; 115:4-15; D.I. 409 at SA1716 (Fontecchio Dep. at 568:3-6 (“the channel is not physically located inside of the ohmic contact layer, it’s bounded by the ohmic contact layer)); *see* D.I. 509 at 10). Under Plaintiffs’ interpretation of “in,” the channel could be “in the ohmic contact layer” if the channel were to occupy the entire semiconductor layer, because the semiconductor layer is “bounded by” the ohmic contact layer. As the ’190 patent specification makes clear, however, the plain and ordinary meaning of the word “in” is physically located within. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005) (“[The specification] is the single best guide to the meaning of a disputed term.”). Figure 2F of the ’190 patent depicts the channel’s location in the TFT in relation to the semiconductor layer and the ohmic contact layer:

**FIG. 2F**



(’190 patent, fig. 2F). In Figure 2F, 14 represents the channel region, L represents the length of the channel, 12 represents the drain electrode, 13 represents the source electrode, 23 represents the semiconductor layer, and 24a and 24b represent the ohmic contact layer. (*Id.* at 6:4-10). In describing Figure 2F, the patent states that “[t]he resultant channel region 14 has a length L and extends in the semiconductor layer.” (*Id.* at 6:7-8). The drawing of Figure 2F confirms that the channel region is physically located in the semiconductor layer. Similarly, the ’190 patent

specification's remaining references to the channel that use the term "in" use "in" to refer to the channel's physical location. (See, e.g., *Id.* at 3:38-39 ("TFTs having a channel in a semiconductor layer"), 5:33-34 ("channel region 14 disposed therebetween in an a-Si layer").)

When referring to a channel, the '190 patent specification does not use the word "in" to describe anything other than physical location. In light of the patent specification, and the Court's construction of "channel" as "a portion of the semiconductor layer between a source electrode and a drain electrode whose conductivity is controlled by the gate voltage," the channel is not "in" the ohmic contact layer under any reasonable interpretation of the term "in." Therefore, I decline to adopt Plaintiffs' interpretation and conclude that the plain and ordinary meaning of "in" in the context of the channel in the asserted claims refers to the channel's physical location.

Since I have rejected Plaintiffs' atomic level theory, and decided that the plain and ordinary meaning of "in" refers to physical location, whether the channel occupies the entire space between the electrodes in the semiconductor layer is irrelevant. Even if the channel were to occupy the entire semiconductor layer, it would at most be merely bounded by, not physically located in, the ohmic contact layer. Defendants' expert testified that none of the accused products infringe the asserted claims because "the channel in the accused products, as in all products containing amorphous silicon TFTs, is located only in the semiconductor layer." (D.I. 407 at 11-12). Plaintiffs do not dispute that the channel in the accused products is physically located within the semiconductor layer. (Tr. at 103:17-19). Under the meaning of "in" I have adopted, Plaintiffs' infringement assertions thus necessarily rely on their flawed atomic level theory argument. (See D.I. 458 at 16-17). Therefore, Plaintiffs have presented no evidence to raise a genuine issue of material fact that the accused products infringe the asserted claims.

Accordingly, I will grant summary judgment of noninfringement of the asserted claims of the '190 patent.

**IV. CONCLUSION**

For the reasons set forth above, Samsung Display Co. Ltd.'s Motion for Partial Summary Judgment of Noninfringement and Invalidity (D.I. 404) is granted-in-part as to noninfringement of asserted claims 10, 11, and 13 of the '190 patent. An appropriate order will be entered.