United States District Court,
E.D. Texas, Marshall Division.

PIONEER CORPORATION,
Plaintiff.
v.
SAMSUNG SDI CO., LTD., Samsung Electronics Co., Ltd., Samsung SDI America, Inc. and Samsung Electronics America, Inc,
Defendants.

Civil Action No. 2:06-CV-384 (DF)

Dec. 27, 2007.

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Court-Filed Expert Resumes

CLAIM CONSTRUCTION ORDER

DAVID FOLSOM**, District Judge.**

Before the Court are briefs related to Pioneer Patent Nos. 5,182,489 ("the '489 Patent") and 5,640,068 ("the '068 Patent") and to Samsung Patent Nos. 6,256,001 ("the '001 Patent), 6,650,051 ("the '051 Patent"), 7,106,280 ("the '280 Patent"), and 7,015,648 ("the '648 Patent). Dkt. Nos. 55, 58, 60, 61, 62, 63, 111, 114 and 122.

I. BACKGROUND

On September 21, 2006, Pioneer filed a patent infringement action against Samsung in the Marshall Division, asserting the '489 Patent and the '068 Patent. *Pioneer Corp. v. Samsung SDI Co.,* (Pioneer II), 2-06-cv-384, Dkt. No. 1 at 2-3. Samsung counterclaimed that Pioneer infringed the '001 Patent, the '051 Patent and the '280 Patent. Pioneer II, Dkt. No. 4 at 6. On August 20, 2007, Samsung amended its counterclaim, asserting that Pioneer also infringed U.S. Patent No. 7,015,648 ("the '648 Patent). On September 20, 2006,

Pioneer filed an action in the Northern District of California for declaratory relief of non-infringement of U.S. Patent Nos. 6,090,464, 6,674,237 and 6,828,731. *Pioneer Corp. v. Samsung SDI Co.* (Pioneer I), 2-07-cv-170. Dkt. No. 43, Attachment # 3 at 2. On April 2, 2007, the Eastern District received a transfer order for Pioneer I. Pioneer I, Dkt. No. 43, Attachment # 2. Pioneer I was subsequently assigned to the Marshall Division before this Court. Pioneer I, Dkt. No. 54. The patents-in-suit in Pioneer I are not addressed in this Claim Construction Order.

II. LEGAL PRINCIPLES OF CLAIM CONSTRUCTION

A determination of patent infringement involves two steps. First, the patent claims are construed, and, second, the claims are compared to the allegedly infringing device. Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1455 (Fed.Cir.1998) (en banc).

The legal principles of claim construction were reexamined by the Federal Circuit in Phillips v. AWH Corp., 415 F.3d 1303 (Fed.Cir.2005) (en banc). Reversing a summary judgment of non-infringement, an en banc panel specifically identified the question before it as: "the extent to which [the court] should resort to and rely on a patent's specification in seeking to ascertain the proper scope of its claims." Id. at 1312. Addressing this question, the Federal Circuit specifically focused on the confusion that had amassed from its recent decisions on the weight afforded dictionaries and related extrinsic evidence as compared to intrinsic evidence. Ultimately, the court found that the specification, "informed, as needed, by the prosecution history," is the "best source for understanding a technical term." Id. at 1315 (quoting Multiform Dessicants, Inc. v. Medzam, Ltd., 133 F.3d 1473, 1478 (Fed.Cir.1998)). However, the court was mindful of its decision and quick to point out that *Phillips* is not the swan song of extrinsic evidence, stating:

[W]e recognized that there is no magic formula or catechism for conducting claim construction. Nor is the court barred from considering any particular sources or required to analyze sources in any specific sequence, as long as those sources are not used to contradict claim meaning that is unambiguous in light of the intrinsic evidence.

Phillips, 415 F.3d at 1324 (citations omitted). Consequently, this Court's reading of *Phillips* is that the Federal Circuit has returned to the state of the law prior to its decision in Texas Digital Sys. v. Telegenix, Inc., 308 F.3d 1193 (Fed.Cir.2002), allotting far greater deference to the intrinsic record than to extrinsic evidence. "[E]xtrinsic evidence cannot be used to vary the meaning of the claims as understood based on a reading of the intrinsic record." Phillips, 415 F.3d at 1319.

Additionally, the Federal Circuit in *Phillips* expressly reaffirmed the principles of claim construction as set forth in Markman v. Westview Instruments, Inc., 52 F.3d 967 (Fed.Cir.1995) (en banc), *aff'd,* 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996), Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576 (Fed.Cir.1996), and Innova/Pure Water, Inc. v. Safari Water Filtration Systems, Inc., 381 F.3d 1111 (Fed.Cir.2004). Thus, the law of claim construction remains intact. Claim construction is a legal question for the courts. Markman, 52 F.3d at 979. The claims of a patent define that which "the patentee is entitled the right to exclude." Innova, 381 F.3d at 1115. The claims are "generally given their ordinary and customary meaning" as understood by "a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." Vitronics, 90 F.3d at 1582; *Phillips,* 415 F.3d 1313. However, the Federal Circuit stressed the importance of recognizing that the person of ordinary skill in the art "is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification."

Phillips, 415 F.3d at 1313.

Advancing the emphasis on the intrinsic evidence, the *Phillips* decision explains how each source, the claims, the specification as a whole, and the prosecution history, should be used by courts in determining how a skilled artisan would understand the disputed claim term. *See, generally, id*. at 1314-17. The court noted that the claims themselves can provide substantial guidance, particularly through claim differentiation. Using an example taken from the claim language at issue in *Phillips,* the Federal Circuit observed that "the claim in this case refers to 'steel baffles,' which strongly implies that the term 'baffles' does not inherently mean objects made of steel." *Id*. at 1314. Thus, the "context in which a term is used in the asserted claim can often illuminate the meaning of the same term in other claims." *Id*. Likewise, other claims of the asserted patent can be enlightening, for example, "the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim." *Id*. at 1315 (citing Liebel-Flarsheim Co. v. Medrad, Inc., 358 F.3d 898, 910 (Fed.Cir.2004)).

Still, the claims "must be read in view of the specification, of which they are part." Markman, 52 F.3d at 978. In *Phillips,* the Federal Circuit reiterated the importance of the specification, noting that "the specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.' " Phillips, 415 F.3d at 1315 (quoting Vitronics, 90 F.3d at 1582). To emphasize this position, the court cited extensive case law, as well as "the statutory directive that the inventor provide a 'full' and 'exact' description of the claimed invention." *Id*. at 1316 (citing Merck & Co., Inc. v. Teva Pharms. USA, Inc., 347 F.3d 1367, 1371 (Fed.Cir.2003)); *see also* 35 U.S.C. s. 112, para. 1. Consistent with these principles, the court reaffirmed that an inventor's own lexicography and any express disavowal of claim scope is dispositive. *Id*. at 1316. Concluding this point, the court noted the consistency with this approach and the issuance of a patent from the Patent and Trademark Office and found that "[i]t is therefore entirely appropriate for a court, when conducting claim construction, to rely heavily on the written description for guidance as to the meaning of the claims." *Id*. at 1317.

Additionally, the *Phillips* decision provides a terse explanation of the prosecution history's utility in construing claim terms. The court simply reaffirmed that "the prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be." *Id*. (citing Vitronics, 90 F.3d at 1582-83). It is a significant source for evidencing how the patent office and the inventor understood the invention. *Id*.

Finally, the Federal Circuit curtailed the role of extrinsic evidence in construing claims. In pointing out the less reliable nature of extrinsic evidence, the court reasoned that such evidence (1) is by definition not part of the patent, (2) does not necessarily reflect the views or understanding of a person of ordinary skill in the relevant art, (3) is often produced specifically for litigation, (4) is far reaching to the extent that it may encompass several views, and (5) may distort the true meaning intended by the inventor. *See id*. at 1318. Consequently, the Federal Circuit expressly disclaimed the approach taken in *Texas Digital*. While noting the *Texas Digital* court's concern with regard to importing limitations from the written description, "one of the cardinal sins of patent law," the Federal Circuit found that "the methodology it adopted placed too much reliance on extrinsic sources such as dictionaries, treatises, and encyclopedias and too little on intrinsic sources, in particular the specification and prosecution history." *Id*. at 1320. Thus, the court renewed its emphasis on the specification's role in claim construction.

Many other principles of claim construction, though not addressed in *Phillips,* remain significant in guiding

this Court's charge in claim construction. The Court is mindful that there is a "heavy presumption" in favor of construing claim language as it would be plainly understood by one of ordinary skill in the art. Johnson Worldwide Assocs., Inc. v. Zebco Corp., 175 F.3d 985, 989 (Fed.Cir.1999); *cf. Altiris, Inc., v. Symantec Corp.,* 318 F.3d 1364, 1372 (Fed.Cir.2003) ("[S]imply because a phrase as a whole lacks a common meaning does not compel a court to abandon its quest for a common meaning and disregard the established meaning of the individual words.") The same terms in related patents are presumed to carry the same meaning. *See* Omega Eng'g, Inc. v. Raytek Corp., 334 F.3d 1314, 1334 (Fed.Cir.2003) ("We presume, unless otherwise compelled, that the same claim term in the same patent or related patents carries the same construed meaning.") "Consistent use" of a claim term throughout the specification and prosecution history provides "context" that may be highly probative of meaning and may counsel against "[b]roadening of the ordinary meaning of a term in the absence of support in the intrinsic record indicating that such a broad meaning was intended ...." Nystrom v. TREX Co., 424 F.3d 1136, 1143-46 (Fed.Cir.2005).

Claim construction is not meant to change the scope of the claims but only to clarify their meaning. Embrex, Inc. v. Serv. Eng'g Corp., 216 F.3d 1343, 1347 (Fed.Cir.2000) ("In claim construction the words of the claims are construed independent of the accused product, in light of the specification, the prosecution history, and the prior art.... The construction of claims is simply a way of elaborating the normally terse claim language[ ] in order to understand and explain, but not to change, the scope of the claims.") (citations and internal quotations omitted). Regarding claim scope, the transitional term "comprising," when used in claims, is inclusive or open-ended and "does not exclude additional, unrecited elements or method steps." CollegeNet, Inc. v. ApplyYourself, Inc., 418 F.3d 1225, 1235 (Fed.Cir.2005) (citations omitted). Claim constructions that would read out the preferred embodiment are rarely, if ever, correct. Vitronics, 90 F.3d at 1583-84.

The Court notes that a patent examiner's "Reasons for Allowance," where merely summarizing a claimed invention and not specifically noting that patentability is based on a particular feature, do not limit the scope of the claim. *See* Apex Inc. v. Raritan Computer, Inc., 325 F.3d 1364, 1375 (Fed.Cir.2003). Similarly, an examiner's unilateral statements in a "Notice of Allowance" do not result in the alteration of claim scope. *See id.; see also* Salazar v. Procter & Gamble Co., 414 F.3d 1342, 1346-47 (Fed.Cir.2005). "[F]or prosecution disclaimer to attach, our precedent requires that the alleged disavowing actions or statements made during prosecution be both clear and unmistakable." Omega Eng'g, 334 F.3d at 1326. The Federal Circuit has "declined to apply the doctrine of prosecution disclaimer where the alleged disavowal of claim scope is ambiguous." Id. at 1324.

The doctrine of claim differentiation is often important in claim construction. Phillips, 415 F.3d at 1315 (citing Liebel-Flarsheim, 358 F.3d at 910). "Claim differentiation" refers to the presumption that an independent claim should not be construed as requiring a limitation added by a dependent claim. Curtiss-Wright Flow Control Corp. v. Velan, Inc., 438 F.3d 1374, 1380 (Fed.Cir.2006). This is in part because "reading an additional limitation from a dependent claim into an independent claim would not only make that additional limitation superfluous, it might render the dependent claim invalid." *Id.; see also* SRI Int'l. v. Matsushita Elec. Corp. of Am., 775 F.2d 1107, 1122 (Fed.Cir.1985) ("It is settled law that when a patent claim does not contain a certain limitation and another claim does, that limitation cannot be read into the former claim in determining either validity or infringement.") This doctrine is based in part on the presumption that each claim has a different scope. 35 U.S.C. s. 282; Curtiss-Wright, 438 F.3d at 1380. The difference in meaning and scope between claims is presumed to be significant to the extent that the absence of such difference in meaning and scope would make a claim superfluous. Free Motion Fitness, Inc. v. Cybex Int'l, 423 F.3d 1343, 1351 (Fed.Cir.2005). Although a validity analysis is not a regular component of

claim construction, if possible claims should be construed to preserve their validity. Phillips, 415 F.3d at 1327; *see also* Rhine v. Casio, Inc., 183 F.3d 1342, 1345 (Fed.Cir.1999).

A patentee may set out the elements of a claim in a so-called means-plus-function format. 35 U.S.C. s. 112, para. 6. The patentee may recite in the claim a "means for" achieving a certain function. In exchange for this convenience in claim drafting, the patentee must disclose a corresponding structure in the specification. O.I. Corp. v. Tekmar Co., 115 F.3d 1576, 1583 (Fed.Cir.1997). If the patentee fails to provide corresponding structure sufficient to enable a person of ordinary skill in the art to make and use the invention, then the claim is invalid. See 35 U.S.C. s. 112, para. 1. If the patentee provides sufficient corresponding structure, then the claim scope encompasses that structure "and its equivalents." Id. at s. 112, para. 6; *see also* Default Proof Credit Card Sys. v. Home Depot U.S.A., Inc., 412 F.3d 1291, 1298 (Fed.Cir.2005). A corresponding structure need not enable the claimed invention, rather it need only "include all structure that actually performs the recited function." Default Proof Credit Card Sys., 412 F.3d at 1298. A structure disclosed is only a "corresponding structure" if the "specification or prosecution history clearly links or associates that structure to the function recited in the claim." Med. Instrumentation & Diagnostics Corp. v. Elekta, 344 F.3d 1205, 1210 (Fed.Cir.2003). Accused devices employing the same or equivalent structure will be found to literally infringe the claim. WMS Gaming, Inc. v. Int'l Game Technology, 184 F.3d 1339, 1350 (Fed.Cir.1999) (noting that "to establish literal infringement of a means-plus-function claim, the patentee must establish that the accused device employs structure identical or equivalent to the structure disclosed in the patent and that the accused device performs the identical function specified in the claim").

III. THE PATENTS-IN-SUIT

Briefing was provided by the Parties with regards to the '489 Patent, '068 Patent, '001 Patent, '051 Patent, '280 Patent, and '648 Patent. The Parties have reached agreement as to the construction of all of the previously disputed terms of the '068 Patent. Dkt. No. 92 at 23; Dkt. No. 75 at B-2-1.

Pioneer asserts the '489 Patent, entitled "Plasma Display Having Increased Brightness," which issued on January 26, 1993. The Abstract reads as follows:

A plasma display panel of the surface discharge type in which a maintaining discharge is generated between electrodes formed on the same substrate, includes first and second insulating substrates separated from each other to form a discharge space therebetween. A spacer having a partition wall in the form of a grid is located between the first and second insulating substrates so as to partition the discharge space into a number of pixels. Electrodes for maintaining discharge are provided on the first insulating substrate, and phosphor is located on the second insulating substrate within each of the pixels. The first insulating substrate is located at a display side.

Pioneer asserts Claims 1, 3, 4 and 6 of the '489 Patent, which read as follows:

1. In a plasma display panel of the surface discharge type in which a maintaining discharge is generated between electrodes formed on the same substrate, said display panel including

first and second insulating substrates separated from each other to form a discharge space therebetween,

a spacer having a partition wall in the form of a grid located between said first and second insulating substrates so as to partition said discharge space into a number of pixels, each of said pixels being defined

by said first and second insulating substrates and said partition wall of said spacer, said pixels being separated from one another by said partition wall of said spacer; the improvement comprising:

a discharge gas filling said discharge space,

electrodes on said second insulating substrate for initiating a discharge of said discharge gas in said discharge space and extending in a first direction,

electrodes on said first insulating substrate for maintaining said discharge and extending substantially along said partition wall in a second direction intersecting said first direction,

each of said electrodes for maintaining said discharge including a combination of a transparent electrode and a metal electrode, and

phosphor located on said second insulating substrate and on said discharge initiating electrodes,

said first insulating substrate being located at a display side of said panel.

3. A plasma display panel as claimed in claim 1 wherein said second insulating substrate has visible light reflecting means provided between said phosphor and said second insulating substrate.

4. A plasma display panel as claimed in claim 3 wherein said visible light reflecting means comprised electrodes provided on said second insulating substrate.

6. A plasma display panel as claimed in claim 1 wherein said phosphor is deposited on said second insulating substrate and on an inside surface of said partition wall of said spacer within each of said pixels.

Pioneer asserts the '068 Patent, entitled "Surface Discharge Plasma Display," which issued on June 17, 1997. The Abstract reads as follows:

A surface discharge plasma display apparatus comprising a plurality of pairs of column electrodes extending horizontally in parallel, and a plurality of row electrodes facing the column electrodes at a distance, said row electrodes extending perpendicularly to the column electrodes to define an emitting pixel region with the facing one pair of column electrodes, wherein at least one of the column electrodes in the pair comprises a base portion extending horizontally and a projecting portion extending perpendicularly from the base portion every emitting pixel region, wherein the length of the projecting portion is within the range from 400 (mu)m to 1000 (mu)m. In the surface discharge plasma display apparatus according to the present invention, the emitting efficiency is improved to increase the level thereof, the amount of the current which passes through each of the electrodes may be decreased, thereby the consumption power per emitting pixel region being decreased. Thus, the amount of the heat generated in a unit area of the plasma display apparatus may be decreased, so that the address failure of the emitting pixel region due to the generated heat may be prevented.

Pioneer asserts Claim 3 of the '068 Patent, which reads as follows:

3. A surface discharge plasma display apparatus comprising a plurality of pairs of column electrodes extending in a horizontal direction in parallel, and a plurality of row electrodes facing the column electrodes

at a distance therefrom, said row electrodes extending perpendicularly with respect to the column electrodes to define emitting pixel regions with the pairs of column electrodes wherein at least one of the column electrodes in at least one of the pairs comprises:

a base portion extending straightly in a continuous manner along said horizontal direction; and

a projecting portion projecting from the base portion perpendicularly at every emitting pixel region, said projecting portion including a narrow portion provided adjacent the base portion and a wide portion which has a wider horizontal width than that of the narrow portion, wherein said wide portion faces the other of the column electrodes in the at least one of the pairs by predetermined gap.

Samsung asserts the '001 Patent, entitled "Method of Driving Surface Discharge Plasma Display Panel," which issued on July 3, 2001. The Abstract reads as follows:

A driving method of a surface discharge plasma display panel includes a resetting step, an addressing step and a sustained discharging step. In the resetting step, a first voltage is applied between the scan electrodes and the address electrodes to accumulate wall charges in the respective pixel by a facing discharge, and the wall-charges accumulated by the facing discharge are removed. In the addressing step, a second voltage is applied between a corresponding scan electrodes and selected address electrodes so that a facing discharge occurs, to form wall-charges in the selected pixels. In the sustained discharging step, a third alternating-current voltage is applied between the scan electrodes and the common electrodes so that a surface discharge occurs in the selected pixels.

Samsung asserts Claim 2 of the '001 Patent, which reads as follows:

2. A method of driving a surface discharge plasma display panel having a first substrate and a second substrate space apart and facing each other, and common electrodes, scan electrodes, and address electrodes arranged between said first and second substrates, said common electrodes being arranged in parallel with said scan electrodes, said address electrodes being arranged orthogonal to said common electrodes and said scan electrodes to form respective intersections which each define a corresponding pixel, comprising:

a resetting step of applying a first voltage between the scan electrodes and the address electrodes to accumulate wall charges in the respective pixel by a facing discharge, and removing the wall-charges accumulated by the facing discharge;

an addressing step of applying a second voltage between a corresponding scan electrodes and selected address electrodes so that a facing discharge occurs, to form wall-charges in the selected pixels; and

a sustained discharging step of applying a third alternating-current voltage between the scan electrodes and the common electrodes so that a surface discharge occurs in the selected pixels;

wherein the resetting step includes:

a first resetting step of applying a fourth voltage between the scan electrodes and the common electrodes, and thereby remove remnant wall-charge from a previous sub-field, said fourth voltage has an opposite polarity to a voltage applied last in the sustained discharging step;

a second resetting step of applying said first voltage between the scan electrodes and the address electrodes, and thereby cause the facing discharge in the respective pixel selected from a previous sub-field; and

a third resetting step of applying a fifth voltage between the scan electrodes and the address electrodes, and thereby remove wall-charges accumulated by the facing discharge, said fifth voltage has an opposite polarity to said first voltage and lower than said first voltage.

Samsung asserts the '051 Patent, entitled "Plasma Display Panel" which issued on November 18, 2003. The Abstract reads as follows:

In a plasma display panel, a scanning electrode and a common electrode are alternately formed in strips and parallel to one another on a lower surface of a front substrate. A bus electrode is formed on lower surfaces of the respective scanning and common electrodes to have a narrower width than that of each of the scanning and common electrodes. A black matrix layer is formed of the same insulative material to be parallel to the electrodes at a boundary area between neighboring discharge cells, in which each cell is constituted by a discharge space including a pair of the scanning electrode and the common electrode, and between the scanning and common electrodes and the bus electrode, on a lower surface of the front substrate.

Samsung asserts Claims 18 and 20 of the '051 Patent, which read as follows:

18. A plasma display panel, comprising:

a front substrate;

a plurality of pairs of sustaining electrodes each pair defining a discharge space of a discharge cell, said pairs of said sustaining electrodes are alternately formed in strips parallel to one another on a lower surface of said front substrate;

a plurality of bus electrodes each formed on a lower surface of one of said sustaining electrodes to have a width narrower than that of the corresponding sustaining electrode; and

a black matrix layer formed on the lower surface of said front substrate, parallel to said sustaining electrodes, and in a boundary area between two adjacent cells among said discharge cells, said black matrix layer extending to cover lower surfaces of the bus electrodes associated with the sustaining electrodes of said two adjacent cells which sustaining electrodes are adjacent to said boundary area.

20. The plasma display panel as claimed in claim 18, wherein said black matrix layer continuously extends to cover substantially entirely lower surfaces of the associated bus electrodes.

Samsung asserts the '280 Patent, entitled "Plasma Display Panel and a Method for Driving the Same" which issued on September 12, 2006. The Abstract reads as follows:

A PDP and driving method improve the contrast of an AC PDP by maintaining stable discharge and preventing over-discharging in a low gray state by enhancing voltage control of the scan electrodes and sustain electrodes during initialization control. A PDP driving method includes a step of maintaining the first electrode, after applying a rising ramp voltage up to a first voltage level, to a second voltage level that

is lower than the first voltage level. A voltage of a third voltage level is applied to the second electrode while maintaining the first electrode at the second voltage level, where the third voltage level is lower than the second voltage level. A falling ramp voltage is applied to the first electrode after maintaining the first electrode at the second voltage level.

Samsung asserts Claims 1, 9 and 14 of the '280 Patent, which read as follows:

1. A method for driving a PDP during a reset period, the PDP comprising a first electrode and a second electrode formed substantially in parallel on a first substrate, and an address electrode formed on a second substrate substantially perpendicularly to the first electrode and the second electrode, the method comprising steps of:

applying a rising ramp voltage up to a first voltage level to the first electrode and then maintaining the first electrode at a second voltage level that is lower than the first voltage level;

increasing a voltage applied to the second electrode to a third voltage level and then applying the voltage of the third voltage level to the second electrode while maintaining the first electrode at the second voltage level, the third voltage level being lower than the second voltage level; and

applying a falling ramp voltage to the first electrode after maintaining the first electrode at the second voltage level.

9. A plasma display device, comprising:

a plasma panel comprising:

an address electrode;

pair of a first electrode and a second electrode aligned substantially perpendicularly with the address electrode; and

a discharge cell formed at crossing of the address electrode and the pair of the first electrode and the second electrode;

a controller for receiving video signals and for generating an addressing signal, a first driving signal for the first electrode and a second driving signal for the second electrode;

an address driver for receiving the addressing signal from the controller and for applying a data signal to the address electrode for selecting the discharge cell;

a first electrode driver for receiving the first driving signal from the controller and for applying a voltage to the first electrode of the selected discharge cell in order to induce a discharge; and

a second electrode driver for receiving the second driving signal from the controller and for applying a voltage to the second electrode of the selected discharge cell in order to induce a discharge,

wherein, during a reset period of the plasma panel, the first electrode driver applies a rising ramp voltage up

to a first voltage level to the first electrode, the first electrode driver maintains the first electrode at a second voltage level that is lower than the first voltage level, and the second electrode driver increases a voltage applied to the second electrode to a third voltage level and then applies the voltage of the third voltage level to the second electrode while the first electrode driver maintains the first electrode at the second voltage level, the third voltage level being lower than the second voltage level.

14. A method for driving a PDP, the PDP comprising a first electrode and a second electrode formed substantially in parallel on a first substrate, and an address electrode formed on a second substrate substantially perpendicularly to the first electrode and the second electrode, the method comprising:

during a reset period,

applying a rising ramp voltage up to a first voltage level to the first electrode and then maintaining the first electrode at a second voltage level that is lower than the first voltage level;

applying a voltage of a third voltage level to the second electrode while maintaining the first electrode at the second voltage level, the third voltage level being lower than the second voltage level;

applying a falling ramp voltage to the first electrode after maintaining the first electrode at the second voltage level; and

maintaining the address electrode at a fourth voltage level throughout the reset period.

Samsung asserts the '648 Patent, entitled "Plasma Display Panel Driving Method and Apparatus Capable of Realizing Reset Stabilization" which issued on March 21, 2006. The Abstract reads as follows:

A method and apparatus for driving a plasma display panel (PDP) by which reset stabilization can be achieved are provided. In the method for driving a PDP, successive field periods, each including a reset period for initializing the state of respective cells, an address period for selectively discriminating cells to be turned on from cells not to be turned on and for performing an addressing operation, and a sustain period for discharging the addressed cells are performed. A reset stabilization period for inducing discharging in a discharge space between cells is additionally performed before the reset period if a rest period having a predetermined time duration is present between the sustain period of a preceding field and the reset period of the field. Therefore, the reset operation can be performed in a state where discharge cells between electrodes are sufficiently primed.

Samsung asserts Claims 14, 45, 47, and 53 (claim 53 depends indirectly from claim 45 through claims 47, 48 and 52) of the '648 Patent, which read as follows:

14. A plasma display panel driving apparatus comprising:

a reset signal generator for generating a reset signal initializing the state of respective cells;

an address signal generator for generating an address signal selectively discriminating cells to be turned on from cells to be turned off and for performing an addressing operation; and

a sustain signal generator for generating a sustain signal discharging the cells addressed by the address

signal generator,

wherein if a signal different from the sustain signal is applied for a time period before application of the reset signal, a reset stabilization signal generator generates a reset stabilization signal in the cells prior to the reset signal.

45. A plasma display panel driving apparatus comprising:

a reset signal generator for generating a reset signal initializing the state of respective cells in a reset period;

an address signal generator for generating an address signal selectively discriminating cells to be turned on from cells to be turned off and for performing an addressing operation in an address period;

a sustain signal generator for generating a sustain signal discharging the cells addressed by the address signal generator in a sustain period; and

a signal synthesizing circuit for synthesizing the signals and for applying the signals to each electrode and for positioning a rest period, in which a signal which is different from the sustain signal is applied, between the periods,

wherein a reset stabilization signal generator generates a reset stabilization signal to cause discharging in the cells before application of the reset signal.

47. The apparatus of claim 45, wherein the reset stabilization signal generator is the same as the sustain signal generator.

48. The apparatus of claim 45, wherein the reset stabilization signal generator generates the reset stabilization signal having the waveform different from the waveform of the sustain signal generated from the sustain signal generator.

52. The apparatus of claim 48, wherein the reset stabilization signal generator generates the reset stabilization signal having the pulse width different from the pulse width of the sustain signal generated from the sustain signal generator.

53. The apparatus of claim 52, wherein the reset stabilization signal generator generates the reset stabilization signal having the pulse width wider than that of the sustain signal generated from the sustain signal generator.

IV. CLAIM CONSTRUCTION-THE '489 PATENT

A. "first insulating substrate" and "second insulating substrate"

(1) The Parties' Positions

Pioneer proposes that these terms mean "first/second insulating base material with or without other material deposited on it." Dkt. No. 75 at A-2-1. Samsung proposes that a first insulating substrate means "a glass

plate on which the combinations of metal and transparent electrodes are formed" and that a second insulating substrate means "a glass plate on which the discharge initiating electrodes are formed." *Id*. The primary disputes between the Parties are whether the terms require a glass plate and whether the terms refer to a supporting base alone or a supporting base with the possibility of other materials on it.

Pioneer argues its construction is supported by the plain and ordinary meaning of the terms which Pioneer asserts to be "supporting (or base) material on which other materials may be deposited or fabricated." Dkt. No. 58 at 8-9. Pioneer further noted that its construction clarifies this ordinary meaning by including a reference to other materials that may be deposited on the substrate. *Id*. Pioneer also argues that its construction conforms with the specification and claims. *Id*. at 9. Pioneer further argues that the inclusion of "glass plate" improperly imports limitations from the preferred embodiments. *Id*. at 10.

Samsung asserts that the '489 Patent is defective in that it fails to describe a dielectric layer located on the second substrate which Samsung asserts is essential to the function of a plasma display panel (PDP). Samsung asserts that its construction is designed to prevent Pioneer from arguing to the jury that a phosphor material "on" the dielectric is actually "on" the second substrate. Dkt. No. 61 at 7-8. Samsung also states that Pioneer's construction would render other structures of the claim (electrodes, partition wall, and phosphor) redundant as these structures would become part of the substrate. *Id*. at 8. Samsung further argues that a substrate is limited to a "glass plate" because PDPs must use glass plates. *Id*. at 8-9. Samsung further asserts that the specification states that the substrate is "made of for example soda glass." '489 Patent at 4:10-13.

(2) Construction

Samsung's dispute with regard to the meaning of "on" is more appropriately discussed with regard to the term "phosphor located on" as described below. The Court agrees that what Pioneer characterizes as a "clarification" may in fact cause some confusion as to whether elements such as electrodes form a part of the substrate. The use of the term substrate in the specification is more closely akin to what Pioneer asserts to be the plain and ordinary meaning: "supporting (or base) material on which other materials may be deposited or fabricated." When viewing the specification as a whole, the various embodiments support such a construction. '489 Patent at Figs. 1B, 2, 3B, 4B, 5 and 6. In each of these embodiments the first insulating substrate 10 and second insulating substrate 12 support such a construction.

With regard to the term "glass plate," both Parties acknowledge that the preferred embodiments as disclosed in the specification utilize soda glass. In support of their arguments, both Parties cite the same portion of the specification which states that the substrates are "made of for example soda glass." '489 Patent at 4:10-13. The specification does not provide other language implying that the term substrate must be limited to glass plates, and in general, reference in the specification is merely made to "substrates." Further, the language cited by the Parties appears to imply that the inclusion of the term soda glass within the specification was meant to be one disclosed example ("for example") as opposed to a limiting example. The intrinsic evidence thus supports the conclusion that the term substrate is not limited to the disclosed preferred embodiment.

Finally, it is noted that in its construction Samsung attempts to include reference to the electrodes which are formed on the substrates. The claim language itself however includes a description of which electrodes are formed on each substrate and such claim language should be more appropriately relied upon to define what is on the first and second substrates as opposed to including such limitations within the substrate terms themselves.

The Court construes the term "first insulating substrate" to mean "a first insulating supporting (or base) material on which other materials may be deposited or fabricated" and the term "second insulating substrate" to mean "a second insulating supporting (or base) material on which other materials may be deposited or fabricated."

B. "substantially along"

(1) The Parties' Positions

As used in Claim 1, the term "substantially along" is used in the context of "electrodes on said first insulating substrate ... extending substantially along said partition wall in a second direction." Pioneer proposes that the term "substantially along" means "largely parallel to the lengthwise direction of." Dkt. No. 75 at A-2-1. Samsung proposes that this term means "parallel to and overlapping with the partition wall." *Id*. Pioneer asserts that the plain and ordinary meaning of the term suggests an orientation that is parallel. Dkt. No. 58 at 11-12. Pioneer also argues that the intrinsic evidence supports this definition as each disclosed embodiment is consistent with this definition. Further, Pioneer notes that this term was added in an Examiner's Amendment provided with the Notice of Allowability in which the Examiner stated that this term was added to "make the claims more complete and definite as to the location and orientation of the initiating and maintaining electrodes." Dkt. No. 58 at 12; Dkt. No. 58-8 at 3. Pioneer further argues that claim differentiation implies that the overlapping concept should not be included in the claim 1 term "substantially along" because dependent Claim 2 adds the concept that the "electrode extends along said partition wall of said spacer and substantially covered with said partition wall."

Samsung asserts that the specification discloses the partition wall and electrodes overlapping and such overlap is shown for every embodiment. Dkt. 61 at 12. Samsung also asserts that the stated purpose of the invention is achieved by the overlap. *Id*. at 12-13. Finally Samsung also points to the same Examiner Amendment language cited by Pioneer and asserts that only including the concept of parallel would define only orientation and that to define both "location and orientation" as stated in the Examiner Amendment necessitates the an orientation (parallel) and a location (overlapping). *Id*. at 13.

(2) Construction

Within the specification it is stated that "as seen from FIG. 1A, the partition wall 22 extending in a direction parallel to the row electrodes 14 are located to overlap a corresponding one of the row electrodes 14." '489 Patent at 4:44-47. It is instructive to note that the direction is described with "parallel" and the location is described with "overlap." Every embodiment in the '489 Patent shows a similar configuration. It is also instructive that this language conforms to the Examiner Amendment language cited above which includes the statement that the claim language defines both "location and orientation." The Examiner Amendment resulted from an Examiner Interview in which the Examiner Interview Summary indicates that the inclusion of such language was approved by the Applicant's counsel in the Examiner Interview and that the additions were "agreed to in order to make the claims more complete and definite as to the location and orientation of the initiating and maintaining electrodes." Dkt. No. 58-7 at 1. This intrinsic evidence supports Samsung's position. Further, the specification repeatedly states that a purpose of the invention is to provide a higher brightness PDP. One of the stated ways of achieving this purpose as noted in the Summary of the Invention is "if the metal electrodes are confined within an [sic] region overlapping the partition wall of the spacer." '489 Patent at 3:22-24. In context of the overall intrinsic record, Samsung's position is the more proper construction. As to Pioneer's assertion that the doctrine of claim differentiation prevents Claim 1 from including the overlapping concept, it is noted that Claim 2 does not merely add "overlap." Rather, Claim 2

states that the metal electrode (as opposed to the overall electrode of Claim 1) substantially covers the partition wall. FN1 Thus, the limitations of Claim 2 are not redundant with Samsung's asserted construction for the "substantially along" element of Claim 1.

FN1. Claim 2 also includes additional limitations relating to the stack of the transparent electrode and metal electrode.

The Court construes the term "extending substantially along said partition wall" to mean "extending parallel to and overlapping at least some portion of the partition wall."

C. "maintaining said discharge"

(1) The Parties' Positions

Pioneer asserts that "maintaining said discharge" needs no construction or if construed means "sustaining the discharging of said discharge gas in said discharge space." Dkt. No. 75 at A-2-1. Samsung asserts that this term means "maintaining a discharge initiated by electrodes opposite the display side." *Id*.

Pioneer initially argues that the claim term does not need construction or alternatively that maintaining means "sustain." Samsung utilizes the term maintaining in its construction but argues that the antecedent basis of "said discharge" is the previously recited discharge referred to in the claim limitation "electrodes on said second insulating substrate for initiating a discharge." Samsung argues that it would be helpful to the jury to make clear the antecedent basis of the referred to discharge. Dkt. 61 at 10-11. Pioneer replies that there is no dispute as to what discharge is referred to by the antecedent basis of "said discharge ." However, Pioneer contends that Samsung's briefing asserts that this discharge may be initiated *only* by the electrodes on the second insulating substrate and that Samsung will assert such arguments to the jury if the Court adopts Samsung's construction. Dkt. 63 at 10 (citing Dkt. 61 at 10-11).

(2) Construction

With regard to the distinction between the use of the term "maintain" or "sustain," the Court does not see reason to deviate from the stated claim language in favor of Pioneer's dictionary supported definitions. With regard to the antecedent basis argument, the Court notes that the claims have many elements that are recited in the antecedent basis form using "said." Prior to the "maintaining said discharge" limitation the claim already provides language relating to the electrodes and initiation of the discharge. Samsung has not provided a convincing argument why this claim element needs different treatment with regard to the antecedent basis. At the claim construction hearing Samsung agreed that the relevant discharge is not required to be initiated *only* by the electrodes on the second insulating surface, and thus, Pioneer's concerns regarding Samsung's construction may be alleviated. Dkt. No. 92 at 44-45. Still, the Court is not convinced that Samsung's construction adds clarity beyond the claim language itself and the language proposed by Samsung may lead to jury confusion.

The Court finds that the term "maintaining said discharge" does not need additional construction.

D. "phosphor located on"

(1) The Parties' Positions

The "phosphor located on" limitation appears in Claim 1 in the context of the phrase "phosphor located on said second insulating substrate and on said discharge initiating electrodes" Pioneer asserts that "phosphor located on" needs no construction, or alternatively, should be construed as "phosphor over and supported by." Dkt. No. 75 at A-2-2. Samsung asserts that "phosphor located on" should be construed as "phosphor formed directly on the second insulating substrate and discharge initiating electrode." *Id*. The principal dispute between the Parties relates to whether the phosphor must be directly on the substrate or whether intervening layers may exist between the phosphor and the substrate.

Pioneer asserts that its position is supported by the plain meaning of the claims and the intrinsic evidence. Further, Pioneer asserts that dependent Claims 3 and 5 specifically recite an intervening reflector layer between the phosphor and the substrate. Pioneer also argues that Samsung's construction would exclude the embodiment of Figure 5 which discloses the reflector layer. Dkt. No. 58 at 17. Samsung argues that Pioneer's patent is technically flawed and that Pioneer is attempting to "fix" a mistake in the patent. Dkt. No. 61 at 14. More particularly, Samsung asserts that in a real AC-PDP the phosphor is "located on" a dielectric layer, which in turn is "located on" the substrate and electrodes. *Id*. Further, Samsung asserts that Pioneer's construction would depend upon the PDP's orientation and thus when a PDP is hanging on the wall, the phosphor is not "over" the back substrate. *Id*. Samsung also asserts that Pioneer's definition presents a redundancy because if "on" means "over" the claim language need not say that the phosphor is over both the substrate and electrodes. *Id*. at 15-16. Finally, Samsung asserts that its construction does not contradict the embodiment of the dependent claims because under Samsung's construction the phosphor is in direct contact with the electrodes. *Id*. at 16.

(2) Construction

Dependent Claim 3 depends from Claim 1 and includes "visible light reflecting means provided between said phosphor and said second insulating substrate." Dependent claim 5 depends from Claim 3 and includes "said visible light reflecting means comprised a reflector formed on said second insulating substrate to cover the whole of said second insulating substrate." Figure 5 illustrates a reflector 30 as described in dependent Claims 3 and 5. In addition, the specification states a reflector 30 may be "formed on the inside surface of the second insulating substrate 12." '489 Patent at 7:2-3. "The reflector 30 extends over all the pixel region of the display panel or the whole of a screen of the display panel." *Id*. at 7:9-11. Samsung's construction would exclude from independent Claim 1 the embodiment of Figure 5 that dependent Claims 3 and 5 are directed to. Such constructions should rarely be chosen. *See* Sandisk Corp. v. Memorex Prods., Inc., 415 F.3d 1278, 1285 (Fed.Cir.2005). Samsung's argument that its construction conforms with the dependent claims and Figure 5 fails. The claim language states "phosphor located on said second insulating substrate and on said discharge initiating electrodes." Samsung's proposed language would be read as requiring the phosphor to be in direct contact with *both* the substrate and the electrodes. Samsung is correct that Figure 5 illustrates direct contact with the electrode, however, the embodiment of Figure 5 still does not satisfy the direct contact with the substrate that is required by Samsung's construction. Samsung also raises concerns that a consequence of the use of the term "over" would be that the orientation of a PDP (laying flat verse standing upright such as on a wall) would change whether a layer is "over" another. The Court rejects this argument. Claim construction must be performed in the context of the intrinsic record as a whole. Phillips, 415 F.3d at 1313-15. The frame of reference of the '489 Patent is clear. Cross sections in the '489 Patent are repeatedly shown with a frame of reference that the term "over the substrate" would be consistently viewed by one skilled in the art with reference to that as shown in the patent. '489 Patent at Figures 1B, 2, 3B, 4B, 5, and 6. If a PDP is turned with respect to the frame of reference of the patent, it would be recognized that the frame of reference would also turn.

The Court construes "phosphor located on" as "phosphor over and supported by."

E. "visible light reflecting means"

(1) The Parties' Positions

The disputed element is found in dependent Claim 3. Pioneer proposes that this term does not need construction, but if it is to be construed, that it should mean "material that enhances reflection of the visible light emitted by the phosphor." Dkt. No. 75 at A-2-2. Samsung asserts that this limitation is a means plus function limitation subject to 35 U.S.C. s. 112 para. 6. Samsung asserts that the function is "to reflect light emitted from the phosphor toward the second insulating substrate" and that the structure is "either (1) the electrode on the second insulating substrate; or (2) a film of aluminum, chromium, or titanium on the inside surface of the second insulating substrate." *Id*.

Pioneer argues that the examples from the specification disclose material that enhances reflection. Dkt. No. 58 at 23 (citing '489 Patent, 3:28-36, 6:41-48, 6:62-7:13). Pioneer further submits that, contrary to Samsung's arguments, the "disputed claim language is not in the resolute means-plus-function form- *i.e.,* the limitation does not refer to '*means for* reflecting visible light .' " *Id*. at 23-24. Pioneer cites to *Al-* Site Corp. v. VSI Int'l, Inc., 174 F.3d 1308, 1318 (Fed.Cir.1999) for the proposition that the phrase "means for" invokes s. 112, para. 6. Pioneer argues that the word "means" as used in the disputed term, without more, does not create a means-plus function limitation. Dkt. No. 58 at 24. Pioneer submits that though the word "means" creates a presumption of the statutory mandate, the presumption is rebutted where the intrinsic evidence demonstrates that the patentee used the term to denote structure rather than function. *Id*. (citing Turbocare Div. of Demag Delaval Turbomachinery Corp. v. Gen. Elec. Co., 264 F.3d 1111, 1120-21 (Fed.Cir.2001)). Pioneer asserts that the claim identifies the "visible light reflecting means" as a structure located "between said phosphor and said second insulating substrate." *Id*. at 24. Pioneer argues that the disputed term does not recite functional language as required in a means plus function element in contrast to other claims where functional limitations are contemplated, such as Claim 9 where a visible light reflecting means is provided "so that visible light emitted from said phosphor toward said second insulating substrate is reflected toward said first insulating substrate." *Id*. Pioneer argues that this is in contrast to Claim 3 which merely discloses structural arrangements of the location. *Id*.

Pioneer argues in the alternative that if the claim term is subject to s. 112, para. 6, it should be construed to include reflective electrodes and layers, and equivalent structures. Dkt. No. 58 at 25. Pioneer asserts that the specification repeatedly describes the visible light reflecting means generally as reflectors. Further Pioneer submits that the particular materials disclosed are merely referred to as "examples" and that the specification teaches that other reflective layers could be used. *Id*.

Samsung responds that use of "means" triggers the presumption that s. 112, para. 6 applies and the presumption is rebutted only if Pioneer can "point to an adequate structural recitation in the claim." Dkt. No. 61 at 17 (citing Sage Prods., Inc. v. Devon Indus., Inc., 126 F.3d 1420, 1427 (Fed.Cir.1997)). Samsung refutes Pioneer's interpretation of Cole v. Kimberly-Clark Corp., 102 F.3d 524 (Fed.Cir.1996) as holding that only a recitation of location is required. Dkt. No. 61 at 17. Samsung notes that "Pioneer does not object to Samsung's identification of function for the 'reflecting means.' " Dkt. No. 61 at 17. Samsung asserts that the patent provides two structural embodiments, one being the column electrode and the other being a reflector film. *Id*. Samsung asserts that the only materials asserted for the reflector film are aluminum, chromium and titanium. *Id*. at 17-18.

(2) Construction

The Parties contest the interpretation of Cole v. Kimberly-Clark Corp., 102 F.3d 524 (Fed.Cir.1996). The claim term in *Cole* referred to a "perforations means extending from the leg band means to the waist band means through the outer impermeable layer means for tearing the outer impermeable layer means for removing the training brief in case of an accident by the user." *Id*. at 526-27. The Federal Circuit states the rule that to invoke s. 112, para. 6, "the alleged means-plus-function claim element must not recite a definite structure which performs the described function." *Id*. at 531. The Federal Circuit did not find the claim term to satisfy the means-plus-function requirements because "it describes the structure supporting the tearing function (i.e., perforations) ... its location (extending from the leg band to the waist band) and extent (extending through the outer impermeable layer)." *Id*. The Federal Circuit concluded that an element "with such a detailed recitation of its structure, as opposed to its function, cannot meet the requirements of the statute ." *Id*. The location, while certainly a factor in determining there was structure, was not a dispositive factor.

In *Turbocare Division v. General Electric Co.,* the Federal Circuit determined that "a radial positioning means comprising a compressed spring means biased against said ring segments to forcibly cause said segments to move to said large clearance position" was not a means-plus-function claim because the claim recited the structure of "a compressed spring biased against the seal ring segment." 264 F.3d 1111, 1121 (Fed.Cir.2001).

The use of the word "means" triggers a presumption to "invoke the statutory mandate for means-plus-function clauses." Allen Eng'g Corp. v. Bartell Industries, Inc., 299 F.3d 1336, 1347 (Fed.Cir.2003). The Federal Circuit has stated that the presumption may be overcome in two ways: first, if the claim element recites no function corresponding to the means, and second, "even if the claim element specifies a function, if it also recites sufficient structure or material for performing that function, 112, 6 does not apply." *Id*..

Claim 3 only states "wherein said second insulating substrate has visible light reflecting means provided between said phosphor and said second insulating substrate." Claim 3 does not provide a function of the visible light reflecting means. Rather, only the structural location of the visible light reflecting means is provided. The function of a visible light reflecting means, as noted by Pioneer, is stated in Claim 9, which states that the visible light reflecting means is situated "so that visible light emitted from said phosphor toward said second insulating substrate is reflected toward said first insulating substrate." Further, the intrinsic evidence is clear that a visible light reflector means refers to a material having reflective properties that is located between the phosphor and the second insulating material. '489 Patent at 6:35-48, 6:63-68, Figure 5.

In addition, Claim 4 states that the "visible light reflecting means comprised electrodes provided on said second insulating substrate" and Claim 5 states that "visible light reflecting means comprised a reflector formed on said second insulating substrate." Like *Cole* and *Turbocare,* the Court determines that the electrode and reflector of the claims recite a structure, as opposed to its function. Thus, Claim 3, either read by itself, or in light of Claims 4 or 5, does not meet the requirements to be a means-plus-function limitation.

The specification refers to electrodes and reflectors as having reflective properties. *See id*. Examples are provided regarding what the electrodes and reflectors may be comprised of. *Id*. at 6:20-41, 7:1-32. Within the specification, the term "material" is utilized to describe both electrodes and reflectors. *Id*.

The Court construes "visible light reflecting means" to mean "visible light reflecting material"

V. CLAIM CONSTRUCTION-THE '068 PATENT

The parties' Revised Joint Claim Construction Chart Pursuant to Patent Local Rule 4-5(d) (Dkt. No. 75-2) having come before the Court for consideration, and the Court having considered the prior claim construction filings of the parties (Dkt. Nos. 58, 61, and 63), in view of the parties' agreements on the proper constructions of each of the identified terms of claim 3 of the ' 068 Patent (*see* Dkt. No. 92 at 23; Dkt. No. 75 at B-2-1), the Court adopts the parties' agreed constructions. The proposed constructions represented by the parties in Exhibit B-2 of the August 23, 2007, "Revised Joint Claim Construction Chart for U.S. Patent 5,640,068" (Dkt. No. 75 at B-2-1) as "AGREED" shall govern this case.

VI. CLAIM CONSTRUCTION-THE '001 PATENT

There are eight terms in Claim 2 of the '001 Patent for which the Parties dispute the construction. Samsung asserts that none of these disputed terms should be considered limitations of the claim because all of the disputed terms simply state the results of performing the steps in the claimed methods. Dkt. No. 55 at 18. In support of this proposition, Samsung cites Texas Instruments Inc. v. U.S. International Trade Commission, 988 F.2d 1165, 1172 (Fed.Cir.1993). Samsung thus asserts that no construction is needed. Pioneer contends that in contrast to the *Texas Instruments* case which dealt with a "whereby" clause, the disputed terms at issue in the '001 Patent recite essential features of the claimed invention and do not have a whereby clause. Pioneer also asserts that in a pending Reissue of the '001 Patent Samsung recently asserted to the USPTO that at least one of the disputed terms not only was a limitation of the claim but also the point of distinction over the prior art. Dkt. No. 70 at 2-3.

The court in *Texas Instruments* found that the particular claim limitations at issue at that case merely stated the result of the limitations and added nothing to the patentability or substance of the claim. Texas Instruments, 988 F.2d at 1172. The same cannot be said for the terms at issue in the present case. Samsung has just recently argued for patentability of Claim 2 emphasizing at least one of these limitations. More particularly, Samsung emphasized the "and thereby remove remnant wall-charge from a previous sub-field" limitation and noted that the prior art voltage level "Vs + Vw does not remove remnant wall-charge from a previous sub-field." Dkt. No. 70-3 at 6-7. The terms at issue in the present case do not inherently result from the other portions of the claims. Rather, the disputed claim terms help further define the other portions of the claims. For example, the resetting, addressing and discharging steps recite various voltages (first voltage, second voltage, third voltage, etc.) to achieve the disputed claim terms. However, as taught in the specification not all voltage levels will achieve the disputed claim terms but rather various relative voltage levels and polarities are required to achieve the various states or conditions of the disputed claim terms. '001 Patent at 4:18-5:2. The disputed claim terms thus help define the claimed voltage levels and do not merely state the result of the claim limitations without adding anything to the patentability or substance of the claims. The disputed claim terms shall be construed as described below.

A. The general dispute regarding selected verse unselected pixels

(1) The Parties' Positions

The primary dispute between the Parties regarding many of the terms of the ' 001 Patent revolves around the concept of selected pixels and unselected pixels. In general Pioneer seeks constructions that describe what

occurs in both selected pixels and unselected pixels while Samsung seeks constructions that do not reference unselected pixels. This dispute is common to six of the eight disputed terms of the '001 Patent. The common arguments for these six disputed terms are discussed below together. Arguments that are relevant only to a particular term are discussed individually for each term.

Samsung asserts that the plain language of the claims references only voltages, discharges, and the like related to "selected pixels" and does not reference unselected pixels. *See* Dkt. No. 55 at 20. Samsung asserts that Pioneer's constructions focus not on what the claimed method does but what the claim method does not do. *Id*. Samsung further comments that it is highly irregular to draft claims in a "negative" format and Samsung states that a result of Pioneer's construction would be that Samsung would be required to prove what happens in every cell that is not selected. Samsung states that Pioneer's constructions are fundamentally flawed because Pioneer's construction prescribes what cannot happen in unselected cells while the claim language only discusses what happens in selected cells. Dkt. No. 62 at 10-11. Samsung argues that the "comprising" format of the claims should be construed to be open ended and therefore should not be limited to particular techniques and steps in the unselected pixels. Dkt. No. 55 at 20. Samsung acknowledges that the preferred embodiment does teach that the various steps that form the method taught in the '001 Patent do not occur in unselected pixels. Dkt. No. 55 at 20-21; Dkt No. 92 at 63. However, Samsung asserts that incorporation of the preferred embodiment in the claims is improper. Samsung further notes that the specification did not include any figures relating to the state of the unselected pixels in contrast to the focus on selected pixels that is provided in the figures. Dkt. No. 55 at 21.

Pioneer counters that the '001 Patent describes a technique in which the key feature of the invention was performing certain methods in selected pixels and not performing those methods in unselected pixels in contrast to the prior art. Pioneer asserts that the invention is described as causing reset discharges only in the previously selected pixels and not in the unselected pixels and also described as leaving residual wall charges only on the address electrodes of the selected pixels. Dkt. No. 60 at 8. Pioneer asserts that the '001 Patent relates to a "display panel" and should be construed to be a plasma display device which by definition has a selective addressing function and thus a person of ordinary skill would understand that surface discharges occur only in the selected pixels. Id. at 12. With regard to forming wall-charges, Pioneer states that if "unselected" cells accumulated wall charges and were thus primed to light up in the sustain step, then the entire display would glow. Id. at 10. Further, Pioneer states that an unselected pixel can have one of two states during the sustaining discharging step: to have discharge and emit light or not to have discharge and not emit light. Id. at 12.

Pioneer states that the specification, file history and the Korean priority application all support the position that the claims should be construed to include reference to the unselected pixels. Pioneer cites a number of cases to support its assertion that Samsung has made a clear disavowal of techniques that include the claimed activities in unselected pixels. Id. at 14.

Pioneer argues that the specification states that the "conventional driving method" resetting step applied a voltage to all the common and scan electrodes such that "light of relatively high brightness is emitted from the unselected pixels, to thereby decrease the contrast of a display screen." Id. at 15 (citing '001 Patent 2:61-67). Pioneer asserts that in contrast all embodiments of the '001 Patent disclose that the first resetting step is intended to ensure selective facing discharge and that this is the invention itself. Id. at 16. Pioneer notes that the specification includes statements that "a facing discharge occurs between the address electrodes Am of ... the pixels selected from the previous sub-field" and "wall charges are accumulated ... in each pixel selected" in contrast to the statements that "a facing discharge does not occur between the Address Electrodes of

pixels where wall-charges are not accumulated in the first reset interval (A-B), that is, the pixels not selected from the previous sub-filed." Id. at 15 (citing ' 001 Patent 5:22-33, 5:38-40, 5:33-37; 7:18-22). Further, Pioneer points to the language in the specification that "wall charges are not accumulated in a pixel region not selected form the previous sub-field." *Id*. at 16 (citing ' 001 Patent 5:20-21; 7:1-3). Pioneer also points to a statement regarding the residual charges in which it was stated "there are residual wall charges on only the address electrodes after the reset step." *Id*. at 19 (citing '001 Patent 7:56-59). From the prosecution history, Pioneer points to an argument in which it was stated that "there are residual wall charges on only the address electrodes." *Id*. at 19 (citing Dkt. No. 60-10 at 6).

Finally Pioneer points to the Korean priority application from which the '001 Patent claims priority. In particular, Pioneer points to the passages which state:

In a conventional driving method described above, during said reset step (interval a-c in FIG. 3), pulses with a relatively high voltage of Vs+Vw are applied between the common electrode (X) and the scan electrodes (Y1, Y2, ..., Yn) to generate surface discharge and, as a result, not only the pixels selected during the previous subfield but also the pixels not selected are discharged. At this point, if the pixels not selected during the previous subfield are selected, luminance becomes relatively low, decreasing the contrast (contrast) of the display screen.

[Technical Object the Present Invention Intends to Achieve]

The purpose of the present invention is to provide a driving method for surface discharge type alternating current plasma display panel that is capable of discharging only the pixels that were selected from the previous subfield during the reset step.

Id. at 13-14 (citing Dkt. No. 60-7 at 12). Pioneer also cites the passage which states:

[Effect of the Present Invention]

As explained above, according to the surface discharge type AC plasma panel drive method of the present invention, because only the pixels that were selected from the previous subfield can be discharged during the reset step, the contrast of the display screen is increased.

Id. at 13-14 (citing Dkt. No. 60-7 at 18). Pioneer asserts that this passage provides a clear representation of what Samsung construed to be the invention.

Samsung counters that Pioneer's approach would have "off" cells entirely devoid of any discharge or wall charge. Samsung asserts that the notion that unselected cells on a PDP can be entirely without wall charge is an idealized one. Samsung further states that one skilled in the art would recognize that the '001 Patent properly covers PDPs where low-level light is produced in unselected pixels, presumably due to some amount of wall charge and discharge as those in the art would recognize the virtual impossibility of an absolute zero potential state on the cell or pixel walls. Dkt. No. 62 at 9.

Samsung points to the specification to bolster the argument that Pioneer's "off" cells is improper. Samsung notes that the specification teaches that some light is emitted from the unselected pixels as the specification states an explicit objective of ensuring that only "light of relatively low brightness" is emitted from the unselected pixels as compared to the high brightness of the prior art. *Id*. at 9-10 (citing '001 Patent 2:65-66).

Thus Samsung asserts that the claims should not be construed to exclude methods that "imperfectly infringe" by having a low-level of light from unselected cells, especially since the specification contemplates such low levels. *Id*. at 10. Samsung also notes that the full citation of the file history arguments presented by Pioneer also support low level light emission from unselected pixels:

The method of the invention is characterized in that the wall charges to be removed are accumulated by the facing discharge in the resetting step. Accordingly, light of relatively low brightness is emitted form [sic] the pixels unselected in each sub-field, to thereby increase the contrast of the display screen. Also there are residual wall charges on only the address electrodes after the resetting step, and hence, the voltage applied in the address interval can be lowered.

See Dkt. No. 60-10 at 6; Dkt. No. 92 at 65-66.

With regard to the Korean priority application Samsung acknowledges that the cases cited by Pioneer "stand for the unremarkable proposition that foreign priority applications are a part of the prosecution history and may help clarify or 'bolster' a particular reading of a claim." Dkt. No. 62 at 10. Samsung asserts that here, however, Pioneer is attempting to utilize an *ad hoc* translation of a priority document to rewrite the specification. FN2 *Id*.

FN2. Samsung has not provided the Court a translation indicating that Pioneer's translation is inaccurate.

(2) Construction

In *Phillips,* the Federal Circuit recognized that in some cases the "specification may reveal an intentional disclaimer, or disavowal, of claim scope by the inventor." 415 F.3d at 1316. "[F]or prosecution disclaimer to attach, our precedent requires that the alleged disavowing actions or statements made during prosecution be both clear and unmistakable." Omega Eng'g, 334 F.3d at 1326. The Federal Circuit has "declined to apply the doctrine of prosecution disclaimer where the alleged disavowal of claim scope is ambiguous." Id. at 1324; *see also* Northern Telecom Ltd. v. Samsung Electronics Co., 215 F.3d 1281 (Fed.Cir.2000); Rexnord Corp. v. Laitram Corp., 274 F.3d 1336 (Fed.Cir.2001); Vanguard Prods. Corp. v. Parker Hannifin Corp., 234 F.3d 1370, 1372 (Fed.Cir.2000) (refusing to narrow the asserted claim based on prosecution disclaimer because "the prosecution history does not support [the infringer]'s argument that the Vanguard inventors 'expressly disclaimed' claim scope beyond products made by co-extrusion").

While the disavowal or disclaimer must be "clear," the Federal Circuit has stated that a clear disavowal does not require the "rigid formalism" of an " 'expression of manifest exclusion or restriction' in the form of 'my invention does not include _____.' " Astrazeneca AB v. Mut. Pharm. Co., 384 F.3d 1333, 1340 (Fed.Cir.2004).

In SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc., 242 F.3d 1337 (Fed.Cir.2001), the Federal Circuit had to determine whether the specification limited the scope of the asserted claims to catheters with coaxial lumens. Id. at 1338. The Federal Circuit stated three factors for finding disclaimer: first, that the abstract referred to the lumens as coaxial in structure; second, the written description discussed the disadvantages of certain prior art structures and distinguished the prior art on the basis of the use of dual lumens while pointing out the advantages of coaxial lumens; and third, the "Summary of the Invention" described that "the present invention" made several references to the lumen being annular, i.e. coaxial. *See*

id. at 1342-43. The Federal Circuit concluded that "inflation lumen separate from the guide wire lumen" were limited to coaxial lumens. Id. at 1342.

In Sunrace Roots Enterprise Co. v. SRAM Corp., 336 F.3d 1298 (Fed.Cir.2003), the Federal Circuit did not find a clear disclaimer where statements in the written description only stated "some of the goals of the invention that are achieved by the apparatus claims" because those are "not the only goals of the invention." Id. at 1304. However, the Court proceeded to discuss some of its oft-cited cases finding disclaimer occurred where: (1) the patent "distinguished prior art on the basis that it did not have the relevant features"; (2) "the patent ... described the preferred embodiment as the invention itself"; and (3) "all the disclosed embodiments contained that element ... [and] the written description expressly distinguished the prior art on the ground that the prior art did not incorporate that element." Id. at 1305 (citing SciMed, 242 F.3d at 1343-44, Wang Labs., Inc. v. Am. Online, Inc., 197 F.3d 1377 (Fed.Cir.1999), and O.I. Corp. v. Tekmar Co., 115 F.3d 1576 (Fed.Cir.1997), respectively).

The Federal Circuit has given similar reasons for finding disclaimer in other cases. *See also* Honeywell Int'l, Inc. v. ITT Indus., 452 F.3d 1312, 1320 (finding that the patentee's "repeated derogatory statements concerning one type of material are the equivalent of disavowal of that subject matter from the scope of the patent's claims"); *On* Demand Mach. Corp. v. Ingram Indus., 442 F.3d 1331, 1340 (Fed.Cir.2006) (stating "when the scope of the invention is clearly stated in the specification, and is described as the advantage and distinction of the invention, it is not necessary to disavow explicitly a different scope."); Astrazeneca, 384 F.3d at 1339 ("Where the general summary or description of the invention describes a feature of the invention (here, micelles formed by the solubilizer) and criticizes other products (here, other solubilizers, including co-solvents) that lack that same feature, this operates as a clear disavowal of these other products (and processes using these products)").

When viewed in the entirety, the intrinsic record before this Court indicates that the claim language which describes various method steps as occurring with regard to "selected" pixels indicates that such method steps are occurring only in the selected pixels and not occurring with regard to the "unselected" pixels. As noted by Pioneer, the '001 Patent specification describes the prior art as problematically applying a relatively high rest voltage to all the common and scan electrodes "so that a surface discharge occurs. Accordingly, the light of relatively high brightness is emitted from the unselected pixels, to thereby decrease the contrast of a display screen." '001 Patent at 2:61-67. The specification then describes a process in which uniformly the various discharges and wall-charges occur or are accumulated in only the selected pixels. For example, "a facing discharge does not occur between the address electrodes Am of pixels where wall-charges are not accumulated in the first reset interval (A-B), that is, the pixels not selected from the previous sub-field." '001 Patent at 5:33-37; 7:18-22. Further "wall charges are not accumulated in a pixel region not selected from the previous sub-field." ' 001 Patent 5:20-21, 5:45-47, 7:1-3; *See* 5:1-2. Likewise, "there are residual wall charges on only the address electrodes after the reset step." '001 Patent 7:56-59. This also conforms with the prosecution history statement that asserted "there are residual wall charges on only the address electrodes after the resetting step ." Dkt. No. 60-10 at 6.

Samsung acknowledges that the Korean priority application is part of the prosecution history and provides no citations to indicate that it should not be evaluated as part of the intrinsic evidence before this Court. Dkt. No. 62 at 10. The Korean priority application also supports the uniform interpretation of the '001 Patent that indicates that "only the pixels that were selected from the previous subfield can be discharged during the reset step." Dkt. No. 60-7 at 15; *See Id*. at 9.

Thus, utilizing the selected concept in the claims requires a discrimination between the selected and the unselected pixels that entails a construction that limits the methods to only the selected pixels. The intrinsic record as a whole acknowledges that activity in selected pixels defines what occurs in selected pixels and that such activity does not occur in the unselected pixels.

Pioneer's proposed constructions, however, risk an overbroad reading that does not conform with the specification. The specification notes that "an object of the present invention" is a driving method "for emitting the light of relatively low brightness from the pixels unselected in each sub-field." ' 001 Patent at 3:1-5. Further the '001 Patent notes that "light of relatively low brightness is emitted from the pixels unselected in each sub-field." '001 Patent at 3:32-22, 4:36-37; 7:54-55. The '001 Patent does not teach the source of the relatively low brightness light. At the claim construction hearing, Pioneer acknowledged that some light might come from unselected pixels. Dkt. No. 92 at 71 and 74-75. However, Pioneer characterizes this light as a non-plasma discharge that is minimal or faint and produced from a non-plasma glow. *Id*. In contrast, Samsung asserted at the hearing that this light results from discharges and that the only way that light is emitted is if charges are moving and discharges are occurring. *Id*. at 64. The parties provided additional briefing regarding the possible causes of this light. Dkt. Nos. 129, 130, 133, and 134. Pioneer asserted that the light may result from Townsend or corona discharges or alternatively may result from afterglow effects. Dkt. No. 129 at 2-3. Samsung asserts that these mechanisms are found only in the extrinsic evidence and that "the only way of producing light in a PDP contemplated by the '001 Patent is through the movement of wall charge or flow of electrical current in a pixel." Dkt. No. 130 at 2; Dkt. No. 134 at 1.

The intrinsic record does not provide guidance as to the source of the light emitted from the unselected pixels. The intrinsic record does not suggest or preclude the alternative mechanisms proposed by Pioneer. From reading the record as a whole, the Court will not limit the source of the low brightness light to only these non-disclosed alternative mechanisms as opposed to including other mechanisms such as those disclosed in the specification. The guidance that is provided is that only light of relatively low brightness is emitted from the unselected pixels. The Court shall construe the disputed terms to generally require the claimed steps to be limited to only the selected pixels except to the extent that light of relatively low brightness may be emitted from the unselected pixels.

B. "form wall-charges in the selected pixels"

(1) The Parties' Positions

The term "form wall-charges in the selected pixels" is found in Claim 2, the only claim of the '001 Patent for which disputed claim constructions are presented. Samsung proposes that this term means "develop wall-charges in the selected pixels." Dkt. No. 75 at E-2-1. Pioneer proposes a construction of "accumulate wall-charges in the pixels selected to emit light for image display during a sustained discharging step of a subfield, and only in those pixels, such that no wall-charges are accumulated in the unselected pixels." *Id*.

The primary dispute between the Parties regarding this term revolves around the use of "selected pixels" as described above.

(2) Construction

Following the guidance provided above, the Court construes the term "form wall-charges in the selected pixels" to mean "form wall-charges only in the selected pixels; however, this does not preclude forming

wall charges in unselected pixels to the extent that only light of relatively low brightness is emitted from the unselected pixel."

C. "surface discharge" and "facing discharge"

(1) The Parties' Positions

Samsung proposes that "surface discharge" means "discharge resulting from applying voltages to scan and common electrodes." Dkt. No. 75 at E-2-1. Pioneer proposes that "surface discharge means "discharge caused by applying a voltage between the scan electrode and the common electrode of a pixel." *Id*.

Samsung proposes that "facing discharge" means "a discharge resulting from applying voltages to scan and address electrodes." *Id*. at E-2-2. Pioneer proposes that "facing discharge" means "discharge caused by applying a voltage between a scan electrode and an address electrode." *Id*.

The primary difference between the Parties' constructions revolves around Samsung's use of "discharge resulting from" and Pioneer's use of "discharge caused by." Samsung asserts that "discharge resulting from" more closely tracks the '001 Patent which has language such as "so that a [surface or facing] discharge occurs". Dkt. No. 55 at 19; '001 Patent at 3:22-29. Samsung asserts that in the true operation of PDP driving schemes, discharges are "caused by" different conditions and steps. Dkt. No. 55 at 19. Samsung expresses concern that "caused by" could itself be improperly construed as sole proximate cause, thus leading to jury confusion. At the claim construction hearing Samsung stated that it would agree to "occurs by" language that is in the claim itself. Dkt. No. 92 at 67.

Pioneer asserts that "cause" is used in the claim language itself and elsewhere in the specification. Dkt. No. 60 at 11; '001 Patent at 3:40-42, 4:47-51. Pioneer asserts that "result" is not utilized in the specification. Dkt. No. 60 at 11.

(2) Construction

The claim language itself helps resolve the proper construction of the disputed terms. With regard to "surface discharge," the term is utilized in the context of "applying a third alternating-current voltage between scan electrode and the common electrodes so that a surface discharge occurs." Use of the term "occurs" more accurately reflects the claim language itself with regard to "surface discharge." Further the specification refers to "a surface discharge occurs." '001 Patent at 3:27-29.

With regard to "facing discharge," this term is utilized in multiple steps of the method claim. In the general resetting step, the claim language merely states applying a first voltage between the scan and address electrodes to accumulate wall charges in the respective pixel "by a facing discharge." However, in the more specific second resetting step the language utilized is "applying said first voltage between the scan electrodes and the address electrodes, and thereby cause the facing discharge in the respective pixel selected." In the addressing step, a second voltage is applied between the scan and address electrodes "so that a facing discharge occurs." The specification also uses similar combinations of "occurs" and "causes." '001 Patent at 3:23-26, 3:40-42, 4:26-28, 4:47-51. In the context of the patent as a whole, there is no disclosure indicating any functional difference between applying voltages "and thereby cause a facing discharge" verses applying voltages "so that a discharge occurs." It is clear from the specification and the claims themselves that the various discharges result from the application of a variety of voltage steps and conditions. To the extent "cause" might be construed as a sole and only cause without other steps such a

construction would be inconsistent with the intrinsic record.

The Court construes "surface discharge" to mean "discharge that occurs by applying a voltage between a scan electrode and a common electrode." The Court construes "facing discharge" to mean "discharge that occurs by applying a voltage between a scan electrode and an address electrode."

D. "a surface discharge occurs in the selected pixels"

(1) The Parties' Positions

Samsung asserts that the proper construction for this term is "a discharge results in a selected pixel from applying voltages to scan and common electrodes." Dkt. No. 75 at E-2-1. Pioneer asserts that the proper construction is "a surface discharge occurs only in the pixels selected to emit light for image display during a sustained discharging step of a subfield, so that no such discharge occurs in the unselected pixels." *Id*.

Samsung asserts that other than the definition of "surface discharge," no construction is needed. Further, Samsung asserts that the construction should not include limitations related to unselected pixels. Dkt. No. 55 at 25.

Pioneer asserts that the construction should include unselected pixel limitations as described above. Dkt. No. 60 at 12.

(2) Construction

The Court has addressed the issues regarding selected and unselected pixels above. Further, the court has also addressed the construction of "surface discharge." The Court construes "a surface discharge occurs in the selected pixels" to mean "a surface discharge occurs only in the selected pixels; however, this does not preclude surface discharges in unselected pixels to the extent that only light of relatively low brightness is emitted from the unselected pixel." As used in this construction, "surface discharge" has the meaning as construed above.

E. "remove remnant wall-charge from a previous sub-field" and "remove wall-charges accumulated by the facing discharge"

(1) The Parties' Positions

"Remove remnant wall-charge from a previous sub-field" is a term found in the first resetting step of Claim 2. "Remove wall-charges accumulated by the facing discharge" is a term found in the third resetting step of Claim 2.

Samsung asserts that "remove remnant wall-charge from a previous sub-field" in the first resetting step means "remove the wall-charges remaining from a previous subfield." Dkt. No. 75 at E-2-2. Pioneer asserts that the term means "transfer wall-charge between the common electrodes and the scan electrodes in the pixels selected from a previous sub-field, with the transfer of wall-charge occurring only in the pixels selected to emit light for image display from the previous sub-field, and the amount of wall-charge remaining about the same after the transfer, such that no transfer of wall-charge occurs in the unselected pixels." *Id*. Pioneer also notes that "the term 'remove wall-charge' has different meanings in the 'first resetting step' element and the 'third resetting step' element of Claim 2. In the alternative, Claim 2 is invalid

as indefinite for failure to enable and lacking written description." *Id*.

Samsung asserts that "remove wall-charges accumulated by the facing discharge" in the third resetting step means "remove wall-charges gathered as a result of the discharge resulting from applying voltages to scan and address electrodes." Dkt. No. 75 at E-2-3. Pioneer asserts that this term means "erase wall-charges accumulated by the facing discharge in only the pixels selected to emit light for image display from a previous subfield, with residual charges remaining only on the address electrodes of the selected pixels." *Id*.

Samsung asserts that no construction is needed for the term of the first resetting step other than clarifying that "remnant" refers to the wall charge "remaining from the previous subfield." Dkt. 55 at 23. Samsung asserts that Pioneer's addition of the terms "transfer" and "erase" adds terms not contained in the intrinsic record. Dkt. No. 55 at 24. Pioneer asserts that "remove" has a different meaning in the first resetting step from its meaning in the third resetting step. The "remove remnant wall-charge from a previous sub-field" term is found in the first resetting step of Claim 2 and Pioneer proposes this "remove" means "transfer." Dkt. No. 60 at 17. Pioneer asserts that the specification demonstrates that the first resetting step is a swapping of charges in a sustaining discharge, thus a transfer. *Id*. Pioneer asserts that the third resetting step relates to the deletion of charges such as shown in Figs. 6B and 6C, and thus, in that step "remove" means "erase." Dkt. No. 60 at 17-19. Pioneer also asserts that in the Matsushita FN3 litigation Samsung argued for a construction of "remove remnant wall-charge" that was "transfer remaining wall charge." Dkt. No. 60 at 17; Dkt. No. 60-9 at 3-4. Pioneer asserts that Samsung's inclusion of "gathered" in the construction of the term from the third resetting step adds language not supported by the specification and only adds further ambiguity. Dkt. No. 60 at 18.

FN3. *Samsung SDI Co., Ltd. v. Matsushita Elec. Industrial Co., Ltd .,* Civ. No. 05-8493 (C.D.CA).

Both Parties assert arguments regarding the selected and unselected pixels as discussed above.

(2) Construction

The claims utilize "remove" with reference to both the first resetting step and the third resetting step. Different techniques are described within the specification for each of these steps, for example, as shown by the transition from Fig. 5 to Fig. 6A and from Fig. 6B to Fig. 6C. '001 Patent at Figures 5-6C. For each of these steps, the specification refers to the mechanism as "remove." '001 Patent at 4:41-57, 5:3-21, 5:48-62, 6:58-7:3, 7:30-46. As the specification uses remove for both steps uniformly, the intrinsic evidence indicates that even if the first step involves transferring and the third step involves erasing, the term "remove" should be construed more generally to cover both transferring and erasing. As used in the intrinsic record "remove" does not appear to be limited to one mechanism or another. Rather as indicated by the claims themselves the disclosed embodiments, "remove" is used more generally. Limitations are provided through the surrounding claim language itself to reference what is removed and what voltages on which electrodes are utilized for the removal.

In light of the specification, the Court finds that the use of the term "remove" to be appropriate for both resetting steps as opposed to the more specific language proposed by Pioneer. Similarly, the Court is disinclined to utilize the term "gather" as proposed by Samsung as such term also is not found within the specification and appears to add more ambiguity as opposed to the "accumulate" language itself that is found with reference to the preferred embodiment and the claims. It is also noted that with regard to the disputed

term "accumulate wall charges ..." discussed below, Samsung advocates use of the word "accumulate" itself. The inclusion of language related to selected and unselected pixels has been addressed above.

The Court construes "remove remnant wall-charge from a previous sub-field" to mean "remove the wall-charges remaining from a previous sub-field only in the pixels selected from the previous sub-field; however, this does not preclude removing wall charges in unselected pixels to the extent that only light of relatively low brightness is emitted from the unselected pixel."

The Court construes "remove wall-charges accumulated by the facing discharge" to mean "remove wall-charges accumulated by the facing discharge only in the pixels selected from the previous sub-field; however, this does not preclude removing wall charges in unselected pixels to the extent that only light of relatively low brightness is emitted from the unselected pixel."

F. "cause the facing discharge in the respective pixel selected from a previous subfield"

(1) The Parties' Positions

Samsung asserts the disputed term means "cause a discharge resulting from applying voltages to scan and address electrodes in the selected pixels of the previous subfield." Dkt. No. 75 at E-2-3. Pioneer asserts the term means "cause the facing discharge only in the respective pixel selected to emit light for image display from a previous subfield, such that no facing discharge occurs in the pixels that were not selected from the previous subfield." *Id*.

Samsung asserts that the term needs no construction other than inclusion of the construction for the term "facing discharge" as discussed above. Samsung further objects to the inclusion of the selected verse unselected pixel concept as described above. Dkt. No. 55 at 19-20. Pioneer's arguments relate to the selected verse unselected pixel concept described above. Dkt. No. 60 at 13-17.

(2) Construction

In accordance with the guidance provided above with reference to the selected versus unselected pixel concept, the Court construes "cause the facing discharge in the respective pixel selected from a previous subfield" to mean "cause the facing discharge only in the respective pixel selected to emit light for image display from a previous subfield; however, this does not preclude causing the facing discharge in unselected pixels to the extent that only light of relatively low brightness is emitted from the unselected pixel." As used in this construction, "facing discharge" has the meaning as construed above.

G. "accumulate wall charges in the respective pixel by a facing discharge"

(1) The Parties' Positions

Samsung asserts that this term means "accumulate wall-charges in the particular pixel as a result of a discharge resulting from applying voltages to scan and address electrodes." Dkt. No. 75 at E-2-3. Pioneer asserts that this term means "accumulate wall charges by causing a facing discharge only in the respective pixels selected to emit light for image display from a previous subfield, such that no facing discharge occurs and no wall charges are accumulated in the pixels not selected from the previous subfield." *Id*.

Samsung argues for its construction relying upon its previous arguments regarding "facing discharge" and

the selected verse unselected pixel concepts. Dkt. No. 55 at 21-22. Pioneer similarly relies upon it previous arguments. Dkt. No. 60 at 18.

(2) Construction

In accordance with the guidance provided above with reference to the selected verse unselected pixel concept, the Court construes "accumulate wall charges in the respective pixel by a facing discharge" to mean "accumulate wall charges by a facing discharge only in the respective pixels selected from a previous subfield; however, this does not preclude accumulating wall charges by a facing discharge in unselected pixels to the extent that only light of relatively low brightness is emitted from the unselected pixel."

VII. CLAIM CONSTRUCTION-THE '051 PATENT

A. Agreed Terms

The parties' Revised Joint Claim Construction Chart Pursuant to Patent Local Rule 4-5(d) (Dkt. No. 75-2) are before the Court for consideration, and the Court has considered the prior claim construction filings of the parties (Dkt. Nos. 55, 60, 62, and 70). In view of the parties' agreements on the proper constructions of the identified terms of claim 18 of the '051 Patent (*see* Dkt. No. 75 at D-2-1 to D-2-2), the Court adopts the parties' agreed constructions for the terms: "black matrix layer," "formed on the lower surface of said front substrate," "corresponding sustaining electrode," and "boundary area between two adjacent cells among said discharge cells." The proposed constructions for the enumerated terms represented by the parties in Exhibit D-2 of the August 23, 2007, "Revised Joint Claim Construction Chart for U.S. Patent 5,640,068" (Dkt. No. 75 at D-2-1 to D-2-2) as "AGREED" shall govern this case.

Regarding the term, "sustaining electrodes," the Parties have agreed to a definition of "sustaining electrodes" to mean "the transparent electrodes formed from ITO (also referred to as common and scanning electrodes)." The '051 Patent specification refers to "depositing an indium tin oxide (ITO) film." ' 051 Patent, 3:48-49. The Court adopts the agreed construction but seeks to clarify the term "ITO." Therefore, the Court construes the term "sustaining electrodes" to mean "the transparent electrodes formed from indium tin oxide (ITO) (also referred to as common and scanning electrodes)."

B. "extending to cover lower surfaces of the bus electrodes"

(1) The Parties' Positions

Samsung asserts that this disputed claim language of Claim 18 means "extending to spread over lower surfaces of the bus electrode ." Dkt. No. 75 at D-2-1. Pioneer construes the claim language to mean "the black matrix layer extends from the boundary area to cover the lower surfaces-the surfaces facing the interior of the display-of the bus electrodes adjacent to the boundary area." *Id*. The Parties have agreed that "lower surfaces" means "the surfaces facing the interior of the display." *Id*.

Samsung asserts that its construction conforms with the plain meaning of "cover" and is consistent with the ways in which "covering" is utilized in the '051 Patent specification and file history. Dkt. No. 55 at 10. Samsung states that Figures 3, 4, and 6 of the '051 Patent show portions of the black matrix layer formed in discontinuous segments while still "covering" the surface of the element on which the black matrix is formed, and thus, "cover" should include discontinuous covers as indicated by the use of the word "spread" in Samsung's construction. *Id*. Samsung further asserts that "extending to cover" cannot be limited to the

embodiment in Figure 10 because dependent Claim 20 specifies that the black matrix layer "continuously extends to cover." Dkt. No. 62 at 4.

Pioneer asserts that Figure 10 is the only embodiment of the '051 Patent that Claim 18 encompasses as all other embodiments are directed toward a black matrix layer that is between the sustaining electrode and the bus electrode. Dkt. No. 60 at 31-32. Pioneer asserts that Claim 18 conforms with Figure 10 in that a black matrix layer is in the boundary area and "extends to cover" from that boundary area. Pioneer contrasts this with the embodiments which Pioneer asserts are not encompassed by Claim 18 in which black material is placed in different locations as opposed to extending from the boundary area. *Id*. at 32-33. Pioneer asserts these other embodiments are related to Claims 1-17. *Id*.

(2) Construction

Claim 18 requires the black matrix layer to be formed "on the lower surface of said front substrate" and "in a boundary area between two adjacent cells." The claim further requires the black matrix layer "extending to cover lower surfaces of the bus electrodes." Figure 10 of the '051 Patent is the only embodiment that corresponds to such a configuration while the other embodiments show the black matrix material, for example, between the scanning electrode and the bus electrode such elements 22b and 23 of Figure 2. Independent Claims 1 and 15 are drafted in a manner such that "a first black matrix layer" is formed "on the lower surface of said front substrate" and "in a boundary area" while a second black matrix layer" is "formed between" the electrodes. It is noted that Claim 18 relates to the embodiment of Figure 10 and that the "extends to cover" language is not utilized in the other claims with regard to the first black matrix layer.

The language of Claim 18 itself is instructive. First, the claim states that a black matrix layer is formed in a boundary area and then the claim states that this layer "extending to cover." The language of the claim itself thus implies that the black matrix extends from the boundary area. Further, the disclosure supporting Claim 18 (Figure 10) is consistent with such an interpretation.

Samsung's assertion that the doctrine of claim differentiation is relevant is somewhat on point. Claim 20 does include "continuously extends to cover substantially entirely lower surfaces." This language implies that "cover" of Claim 18 does not mean continuous coverage over substantially entirely all the lower surface. However, such language of Claim 20 does not negate the language of Claim 18 as to where the black matrix layer extends from. Rather, Claim 20 helps define the amount of coverage.

The Parties have agreed to the definition of lower surfaces and that language shall be included within the construction so as to provide clarity to the jury.

The Court construes "said black matrix layer extending to cover lower surfaces of the bus electrodes" to mean "said black matrix layer extending from the boundary area to cover lower surfaces of the bus electrodes wherein the lower surfaces are the surfaces facing the interior of the display. The black matrix layer need not be continuous nor entirely covering the lower surfaces of the bus electrodes."

C. "extends to cover substantially entirely lower surfaces of the associated bus electrodes"

(1) The Parties' Positions

The claim term in question may be found in Claim 20. Samsung asserts that the proper construction is "extends to spread over essentially the whole lower surface but not necessarily all of the lower surfaces of

the bus electrodes formed on the sustaining electrodes of the two adjacent cells." Dkt. No. 75 at D-2-2. Pioneer asserts that the proper construction is "the black matrix layer extends continuously from the boundary area to cover the essentially completely the lower surfaces-the surfaces facing the interior of the display-of the two bus electrodes formed on the sustaining electrodes adjacent to the boundary area." *Id.* The Parties have agreed that "lower surfaces" means "the surfaces facing the interior of the display." *Id.*

Many of the Parties' arguments are similar to those asserted with regards to the "extends to cover" language of Claim 18 described above. More particular to Claim 20 itself, Samsung asserts that "substantially entirely" needs little definition. However Samsung states that its proposed construction is the most appropriate and helpful. Samsung also asserts that Pioneer's construction is merely word replacement that does not clarify the claim. Dkt. No. 55 at 12; Dkt. No. 62 at 5. Pioneer asserts that "substantially entirely" should be construed according to its plain meaning to be "completely or essentially completely." Pioneer asserts that both Parties are attempting to convey a similar concept, however Pioneer asserts that its definition is more accurate. Dkt. No. 60 at 34.

(2) Construction

With regard to "extends" the Court has addressed that concept above. With regard to the amount of coverage, neither Party provides compelling intrinsic evidence to support a particular construction. Further, neither construction seems to provide more clarity for a jury than the original claim language. At the end of the disputed term of Claim 20, "associated bus electrodes" are recited. The "associated bus electrodes" may be understood by reference to independent Claim 18 from which Claim 20 depends as Claim 18 refers to "the bus electrodes associated with the sustaining electrodes of said two adjacent cells." The Court will construe the concluding language of the disputed term of Claim 20 more consistent with the claims themselves. Finally, the Court has determined that it will provide more clarity to the jury to construe the entire phrase "the black matrix layer continuously extends to cover substantially entirely lower surfaces of the associated bus electrodes."

The Court construes "the black matrix layer continuously extends from the boundary area to cover substantially entirely lower surfaces of the associated bus electrodes" to mean "the black matrix layer continuously extends from the boundary area to cover all or almost all of the lower surfaces of the bus electrodes associated with the sustaining electrodes of the two adjacent cells, wherein the lower surfaces are the surfaces facing the interior of the display."

VIII. CLAIM CONSTRUCTION-THE '280 PATENT

A. "rising ramp voltage"

(1) The Parties' Positions

Samsung's proposed construction for this term is "a voltage that changes over a period of time from one voltage level to a higher voltage level." Dkt. No. 75 at C-2-1. Pioneer's proposed construction is "a voltage that increases linearly or increases at a constant rate." *Id.*

Samsung asserts that the plain language of "ramp" requires only that the voltage be increased to a higher level. Dkt. No. 55 at 13. Samsung further states the ramp language is used to distinguish instantaneous

voltage changes such as the rise from GND to V1 in Figure 7 as opposed to changes that occur over time. *Id*. Samsung further asserts that Pioneer's construction would result in a construction that depends upon how closely one "zooms in" to view a voltage as changing the scale of a plot may change something from looking relatively linear to looking non-linear. Dkt. No. 62 at 6.

Pioneer asserts that the '280 Patent figures and text consistently describe a ramp voltage as being linear. Dkt. No. 60 at 20. Pioneer further asserts that the plain meaning to one skilled in the art is a linear or constant rate change. *Id*. at 19-20. Pioneer further states that with regard to similar voltage signals in another patent in another litigation,FN4 Samsung has asserted that "rising ramp voltage" is a voltage that changes "at a generally uniform rate." *Id*. at 20. Finally, Pioneer asserts that Samsung's construction would lead to a nonsensical result by encompassing many different shapes that are clearly not ramp voltages. *Id*. at 21.

FN4. U.S. Patent No. 6,954,188 in *Samsung SDI Co., Ltd. v. Matsushita Elec. Industrial Co., Ltd.,* Civ. No. 05-8493 (C.D.CA).

(2) Construction

The '280 Patent illustrates and describes a variety of voltages that change over time as opposed to an instantaneous time. For example, the ramp voltage in question relates to the first electrode (such as for example the voltage of the scan electrode Y(Vy)), which is shown in Figures 4, 7, and 9 to increase from Vs to Vset. The prior art scan electrode Y was also shown to increase to Vset over time. In each of these cases, the figures illustrate a linear or constant increase. With regard to Figure 3, the specification states "a signal applied to the scan electrode Y is increased linearly in a rising ramp period." '280 Patent at 2:20-21. Similarly, the linear or constant increase of Figure 7 is described with "the scan driver 200 applies a rising ramp voltage signal to the scan electrode Y." '280 Patent at 5:38-39. In general, the specification consistently refers to "ramp voltages" in examples that show a linear or constant rate change. This interpretation is also consistent with the plain meaning to one skilled in the art. Dkt. No. 60 at 19-20. The Court acknowledges Samsung's assertion that the "zoom" or "scale" of a plot may impact whether something appears linearly or not. However, the Court agrees that Samsung's proposed language would result in nonsensical "ramps." Samsung's concerns are better addressed by recognizing that what is viewed as a linear or constant rate is considered in light of the frame of reference and scale of the '280 Patent as a whole.

The Court construes "rising ramp" to mean "a voltage that increases linearly or increases at a constant rate."

B. "falling ramp voltage"

(1) The Parties' Positions

Samsung's proposed construction for this term is "a voltage that changes over a period of time from one voltage level to a lower voltage level." Dkt. No. 75 at C-2-1. Pioneer's proposed construction is "a voltage that decreases linearly or decreases at a constant rate." *Id*. For construction of "falling ramp voltage," the Parties rely upon similar construction arguments as described above with "rising ramp voltage."

(2) Construction

For the same reasons as stated above, the Court construes "falling ramp voltage" similar to the construction of "rising ramp voltage." The Court construes "falling ramp" to mean "a voltage that decreases linearly or

decreases at a constant rate."

C. "and then maintaining the first electrode at a second voltage level" and "applying the voltage of the third voltage level to the second electrode while maintaining the first electrode at the second voltage level"

(1) The Parties' Positions

The two claim terms in dispute are both in asserted Claims 1 and 14. The arguments of the Parties with regard to the two terms overlap and are best understood together.

The first disputed claim term is found in context of "applying a rising ramp voltage up to a first voltage level to the first electrode *and then maintaining the first electrode at a second voltage level*." Samsung asserts that no claim construction is needed for the "and then maintaining the first electrode at a second voltage level" limitation. Dkt. No. 75 at C-2-1. Pioneer asserts that the proper construction is "subsequently to a rising ramp period, in an intermediate period between the rising ramp period and the falling ramp period, applying a driving signal to the first electrode to hold the voltage of the first electrode at a second voltage level throughout the intermediate period which is approximately 50 microseconds in duration." *Id*.

With regard to the second disputed term, "applying ... at the second voltage level," Samsung asserts the term means "applying the voltage of the third voltage level to the second electrode during a period of time when the first electrode is maintained at the second voltage level." Dkt. No. 75 at C-2-2. Pioneer asserts that the second disputed term should be construed such that "the term 'while maintaining the first electrode at the second voltage level' means 'during the intermediate period between the rising ramp period and the falling ramp period in which a driving signal is applied to the first electrode to hold the voltage of the first electrode at the second voltage level throughout the intermediate period, the intermediate period being approximately 50 microseconds in duration." *Id*.

The primary disputes between the Parties relate to whether the numerical limitation of "50 microseconds" should be included and whether the claim term "while" should be interpreted to include the concept of "throughout the intermediate period." As to the other differences between the proposed constructions, the Parties each assert their own construction adds clarity and understanding to the claim language.

Samsung asserts that Pioneer is attempting to improperly add a numerical limitation to the claim from the preferred embodiments. Dkt. No. 55 at 14. Further, Samsung asserts that the language of the first claim term as written is more clear than Pioneer's with regard to Pioneer's replacement in the first claim term of "and then" with "subsequently to a rising ramp period" and Pioneer's replacement of "maintaining" with "applying ... to hold the voltage of." Dkt. No. 55 at 14-15. Samsung asserts that Pioneer's construction of "while" improperly inserts a specific period of time ("throughout the intermediate period") that the third voltage level must at a level lower than the second voltage level. Samsung states that Pioneer's construction would exclude the embodiments of Figures 7 and 10 of the '280 Patent. Dkt. No. 55 at 16; Dkt. No. 92 at 56. Samsung further asserts that the Summary of Invention contemplated embodiments that would merely "reduce" self-erasing light and that overlap through the entire intermediate period is not required for merely reducing self-erasing light. Dkt. No. 62 at 7. Samsung states that the '280 Patent only disclaimed the prior art embodiment of Figure 4 in which during region b the X electrode voltage (the third voltage) is never lower than the Y electrode voltage (the second voltage). Dkt. No. 62 at 7.

Pioneer asserts that "maintaining" implies active driving of a voltage level as opposed to the passive voice

adopted by Samsung which Pioneer asserts would encompass merely letting a voltage passively float. Dkt. No. 60 at 24-25. In addition, Pioneer asserts that the specification teaches that some duration of time of the maintaining should be achieved that is more than the inherent delay presented in the reaction time of electrical circuits. Dkt. No. 60 at 22-23. Pioneer further asserts that the specification teaches a 50 microsecond delay and cites to Modine Mfg. Co. v. United States Int'l Trade Comm'n, 75 F.3rd 1545, 1554 (Fed.Cir.1996) for the proposition that a numerical limitation from the specification should be included within the construction. *Id*. Pioneer further asserts that the maintaining must be accomplished throughout the intermediate period (region b such as seen in Fig. 7). Dkt. No. 60 at 25. Pioneer asserts that its construction is consistent with Fig. 7 of the '480 Patent as Pioneer's construction does not prevent the second electrode from remaining at the third voltage level beyond the intermediate period. *Id*. Pioneer also argues that Samsung's construction would include waveforms in which the voltage of the second electrode is higher than the first electrode during the intermediate period. *Id*. Pioneer states that the '280 Patent makes clear that such a voltage configuration would cause the self-erase and mal-discharge problem that the '280 Patent purports to avoid. Dkt. No. 60 at 26.

(2) Construction

The refusal to read in numerical limitations is derived from the claim construction doctrine that refuses to import limitations of the preferred embodiments to limit claim scope. *See* RF Delaware, Inc. v. Pacific Keystone Tech., Inc., 326 F.3d 1255, 1263 (Fed.Cir.2003); Free Motion Fitness, Inc. v. Cybex Int'l, Inc. 423 F.3d 1343, 1350 (Fed.Cir.2005). However, numerical limitations have been allowed for similar reasons that any limitation would be allowed, such as when a patentee distinguishes the invention over the prior art or limiting language in the prosecution history. *See* Edwards Sys. Tech., Inc. v. Digital Control Sys., Inc., 99 Fed. Appx. 911, 919 (Fed.Cir.1998); Modine Mfg. Co. v. United States Int'l Trade Comm'n, 75 F.3d 1545, 1554 (Fed.Cir.1996).

Figure 10 of the '280 Patent provides a voltage plot that includes a time scale. The specification states that Figure 10 relates to "a second preferred embodiment of the present invention." '280 Patent at 5:1-3; 8:13-15. Figures 9 shows a voltage plot similar to Figure 10 and also relates to the "second preferred embodiment." *Id*. at 4:65-67; 6:55-59; 7:5-8. Figure 7 is yet another voltage plot which relates to a first preferred embodiment. *Id*. at 4:59-61; 6:55-59. Each of these Figures includes the intermediate period referred to by Pioneer. With reference to Figure 10 it is noted that "[a]s can be seen in FIG. 10 no output luminance is produced during a range of 200-250 (mu) is(mu)is that corresponds to the periods b of FIG. 7 and A of FIG. 9." *Id*. at 8:16-19. It is instructive to note that the first embodiment of Figure 7 and the plot of Figure 9 do not include a time scale. Further, the specification does not provide any discussion indicating that the intermediate period should be 50 microseconds or even that the particular length of time of this period is of importance. When taken as a whole, the intrinsic record appears to indicate that Figure 10 is just an example of one of the embodiments. Absent more compelling evidence in the intrinsic record, Federal Circuit precedent has discouraged the importation of numerical limitations. *See* RF Del., Inc. v. Pacific Keystone Techs., Inc., 326 F.3d 1255, 1263 (Fed.Cir.2003); In re Omeprazole Patent Litigation, 483 F.3d 1364, 1372 (Fed.Cir.2007). The Court does not construe the various disputed terms of the '280 Patent to require a 50 microsecond construction.

The specification generally teaches that in the prior art the X electrode voltage would exceed the Y electrode voltage during the period defined by the intermediate region between the rising ramp period and the falling ramp period. This was described to be undesirable due to the generation of self-erasing light and a mal-discharge may occur. '280 Patent at Figure 4; 2:65-3:4; 3:45-63. The '280 Patent states "[t]he present

invention is directed to a plasma display panel and its driving method that can improve the contrast by reducing or preventing self-erasing light that may be produced in an intermediate period between a rising ramp period and a falling ramp period ..." *Id*. at 4:5-9. The patent generally teaches that such undesirable discharge may be avoided by keeping the X electrode lower than the scan base voltage applied to the Y electrode in the region b. *Id*. at 5:57-62; 7:1-4; 7:33-39. With reference to Figure 9, "self-erasing light is prevented and discharge in the falling ramp period is retarded because the second voltage V2 of the positively charged sustain electrode X is lower than the scan base voltage Vs of the scan electrode Y during the region A." *Id*. at 7:50-55. Similarly the patent concludes, "[a] s described above, during a reset period of a PDP, a voltage lower than a scan base voltage Vs, such as the first voltage V 1 and the second voltage V2, is applied to the sustain electrode X during the period A of applying the intermediate driving signal to the scan electrode Y ..." *Id*. at 8:19-23. Thus, when taken as a whole the specification repeatedly emphasizes that an important condition in all of the disclosed embodiments of the invention is that the electrode X is at a lower voltage than electrode Y during the intermediate period.

Samsung's attack on Pioneer's construction as requiring entire overlap misinterprets Pioneer's construction. As noted by Pioneer, holding the first electrode (the Y electrode in the figures) at the second voltage throughout the intermediate period does not impact the endpoint or starting point of the application of the third voltage to the third electrode (the X electrode in the figures). Thus, Pioneer's construction does not conflict with the embodiments of Figure 7 or Figure 10. However, the Court is not persuaded that the first electrode voltage must be maintained at the second voltage level throughout the intermediate period as construed by Pioneer. Although each preferred embodiment does show the first electrode voltage held constant at the second voltage level for the whole intermediate period, the specification as whole does not emphasize this aspect. Rather, as mentioned above, the specification merely emphasizes the importance of the fact that the third voltage level (electrode X) is lower than the second voltage level (electrode Y) during this period. Therefore it would be improper to read into the claim the preferred embodiments which hold the second voltage at a constant second voltage level during the whole intermediate period. However, based upon the guidance of *Phillips* the claim terms should not be construed so broadly so as to allow the electrode X voltage level to exceed the electrode Y voltage level during the intermediate period. The Court construes the disputed terms to require the second electrode to be at a lower voltage level than the first electrode during the intermediate period when the first electrode is maintained at the second voltage level. The remaining differences between the Parties' constructions are primarily differences directed toward minor wording differences that each Party seeks for the sake of clarity.

The Court finds that "and then maintaining the first electrode at a second voltage level" does not need construction. The Court construes "applying the voltage of the third voltage level to the second electrode while maintaining the first electrode at the second voltage level" to mean "applying the voltage of the third voltage level to the second electrode during a period of time. For at least a portion of this same period of time the first electrode is maintained at the second voltage level. The second electrode is at a lower voltage level than the first electrode throughout an intermediate period when the first electrode is maintained at the second voltage level."

D. "after maintaining the first electrode at the second voltage level"

(1) The Parties' Positions

The claim term in dispute is also found in Claims 1 and 14. Samsung proposes that no construction is needed. Dkt. No. 75 at C-2-2. Pioneer's proposed construction for this term is "subsequent to the intermediate period of approximately 50 microseconds during which a driving signal is applied to the first

electrode to hold the voltage of the first electrode at the second voltage level throughout the intermediate period." *Id*. Both Parties primarily rely upon their prior arguments for the maintaining and applying terms discussed above. Samsung further states that Pioneer's replacement of "after" with "subsequent to" adds no clarity to the claims as written. Dkt. No. 55 at 15. Pioneer counters that "subsequent to" matches the plain and ordinary meaning of "after" and provides a dictionary citation. Dkt. No. 60 at 26.

(2) Construction

In conformance with the constructions provided above for the maintaining and applying terms, the Court finds that it does not need to construe "after maintaining the first electrode at the second voltage level." As to the distinction between "after" and "subsequent to," the Court finds that the claims sufficiently clear without further construction and that "subsequent to" does not add clarity beyond the claim terms themselves.

E. "the first electrode driver maintains the first electrode as a second voltage" and "while the first electrode driver maintains the first electrode at the second voltage level"

(1) The Parties' Positions

Both of these two terms are found in Claim 9. Both Parties rely upon the same arguments as presented for the "maintaining ..." and "applying ..." limitations of Claims 1 and 14 discussed above.

Samsung asserts that no construction is needed for the term "the first electrode driver maintains the first electrode at a second voltage." Dkt. No. 75 at C-2-3. Pioneer's proposed construction is "the first electrode driver applies a driving signal to the first electrode to hold the voltage of the electrode at a second voltage level throughout the intermediate period between the rising ramp period and the falling ramp period, the intermediate period being approximately 50 microseconds in duration." *Id*.

For the second term, "while the first electrode driver maintains the first electrode at the second voltage level," Samsung proposes a construction of "during a period of time when the first electrode driver maintains the first electrode at the second voltage level." Dkt. No. 75 at C-2-3. Pioneer proposes a construction of "during the intermediate period between the rising ramp period and the falling ramp period in which the first electrode driver applies a driving signal to the first electrode to hold the voltage of the electrode at a second voltage level throughout the intermediate period which is approximately 50 microseconds in duration." *Id*.

(2) Construction

The Court construes these terms consistent with the discussion above regarding the corresponding terms of Claims 1 and 14. The Court finds that "the first electrode driver maintains the first electrode as a second voltage" does not need construction. For consistency with the claim construction of claims 1 and 14, the parties do not object to the Court construing the whole phrase "applies the voltage of the third voltage level to the second electrode while the first electrode driver maintains the first electrode at the second voltage level." Dkt. No. 129 at 2; Dkt. No. 130 at 2. The Court construes "applies the voltage of the third voltage level to the second electrode while the first electrode driver maintains the first electrode at the second voltage level" to mean "applies the voltage of the third voltage level to the second electrode during a period of time. For at least a portion of this same period of time the first electrode driver maintains the first electrode at the second voltage level. The second electrode is at a lower voltage level than the first electrode

throughout an intermediate period when the first electrode is maintained at the second voltage level."

F. "increasing/increases a voltage applied to the second electrode to a third voltage level"

(1) The Parties' Positions

This term is found in Claims 1 and 9 (Claim 1 using "increasing" and Claim 9 using "increases"). Samsung asserts that these terms need no construction. Dkt. No. 75 at C-2-3. Pioneer asserts that these terms should be construed to mean "increasing/increases the magnitude of the voltage applied to the second electrode until the voltage reaches a third voltage level." *Id*. The primary dispute between the Parties relates to the inclusion of "magnitude" in the construction.

Samsung asserts that utilizing "magnitude" to construe the claim would result in jury confusion. Dkt. No. 55 at 17-18. Samsung asserts that magnitude is not referred to within the specification or claims and at most is suggested by the plots of '280 Patent that show a horizontal x-axis. Samsung further notes that Figure 9 does not even show a reference axis. *Id*. Samsung notes that waveforms generated with an oscilloscope may have their axis arbitrarily adjusted and though such adjustment will not change which voltage level is higher or lower relative to another voltage level, such adjustments could effect the magnitude (for example V1 = -1V and V2 = 5V verses an axis adjusted V1 = -5V and V2 = 1V). *See id.;* Dkt. No. 92 at 50-51.

Pioneer asserts that it is precisely because a voltage *level* may be arbitrary and relative that one needs to include the concept of the magnitude of a voltage when describing an increase or decrease. Dkt. 60 at 27. Pioneer further asserts that the magnitude concept is included in the plain language of the claim as the disputed claim term employs "voltage" differently from "voltage level." *Id*.

(2) Construction

Pioneer does not point to evidence from the intrinsic record that warrants adding the term "magnitude" to the claim construction. The specification not only does not include the term "magnitude" it does not include the concept of magnitude. Rather as described above, the specification generally refers to various voltages being higher or lower relative to each other. *See supra* section VIII.C. As Samsung points out, the concept of magnitude adds confusion as relative magnitudes of two voltages may change depending upon an axis location even though the relative voltage levels stay the same. It is noted that Figure 9 of the specification does not provide an x-axis and in Figure 10 negative values are provided.

The Court finds that the term "increasing/increases a voltage applied to the second electrode to a third voltage level" does not require construction.

G. "a data signal ... for selecting the discharge cell"

(1) The Parties' Positions

The disputed term may be found in asserted Claim 9 in the context of "applying a data signal to the address electrode for selecting the discharge cell." Samsung proposes a meaning of "an electrical signal ... for selecting particular cells in which a discharge is intended to occur." Dkt. No. 75 at C-2-4. Pioneer proposes that the term means "a non-zero signal applied to the address electrode to select the discharge cell that will undergo surface discharge during the sustain period." *Id*.

Samsung argues that there is no support in the specification to exclude a zero level signal. Dkt. No. 55 at 18. Samsung further states that the address signal value that is shown in the '280 Patent is of a prior art technique in Figure 3 and even in Figure 3 the zero level cannot be inferred because the "zero" baseline voltage may be set to any level. *Id*. Pioneer responds with an illustration of a "zero signal" being a flat non changing signal and the "non-zero signal" having a digital pulse. Dkt. No. 60 at 28. Pioneer asserts that common sense and the specification make it apparent that "a data signal" is something other than a flat-line zero signal. *Id*.

(2) Construction

At the claim construction hearing it became apparent that the Parties held different understandings as to what is meant by a "zero" signal. Samsung interpreted a "zero signal" to be a signal which when active has a zero level (such as a pulse which moves from a base line voltage to a zero volts level). Pioneer interprets a "zero" signal to be a signal that does not change. The terms "zero signal" and "non-zero signal" are not found within the intrinsic evidence and inclusion of such terms would require a separate construction of the definition of "zero signal" which likely would lead even further from the intrinsic record. The specification does provide an address electrode A with regard to Figure 3 that illustrates a pulse signal on the address electrode A during the address period. '280 Patent at Figure 3. The specification further notes that "[t]he controller 400 receives video signals from an outside source, generates an addressing signal S_A ... The address driver 500 receives addressing signals from the controller 400 and then applies a data signal to the respective address electrodes in order to select discharge cells." *Id*. at 5:22-30; *see id*. at 7:7-16. The intrinsic evidence provides little other guidance as to the data signal provided from the address driver and the particular nature of the address signal does not appear to be emphasized when the intrinsic record is viewed as a whole (in contrast to the importance of the X and Y electrodes during the reset period). Samsung's assertion that a data signal is an electrical signal is more closely aligned with the specification. Further, the specification indicates that this signal changes over time.

The Court construes "applying a data signal to the address electrode for selecting the discharge cell" to mean "applying an electrical signal that changes over time for selecting a cell in which discharge is to occur."

IX. CLAIM CONSTRUCTION-THE '648 PATENT

A. "address signal" and "cells addressed by the address signal generator"

(1) The Parties' Positions

The two terms in question may be found in claims 14 and 45. Samsung proposes that no construction is needed for these terms, or in the alternative, asserts that "address signal" means "a signal that identifies cells" and asserts that "cells addressed by the address signal generator" means "cells identified with address signal." Dkt. No. 124 at B-4. Pioneer proposes that "address signal" means "address pulse" and that "cells addressed by the address signal generator" means "cells that received an address pulse from the address signal generator." *Id*. The principal dispute between the parties revolves around Pioneer's inclusion of "pulse" in the construction.

Samsung asserts that the claims themselves provide guidance as to the meaning of address signal as the claims recite "an address signal selectively discriminating cells to be turned on from cells to be turned off."

Dkt. No. 111 at 6. Samsung asserts that Pioneer's construction impermissibly narrows the terms to pulses thereby excluding an addressing scheme in which "on" cells are selected with a flat signal and "off" cells are selected with a pulse signal. *Id*. at 7. Samsung notes that the preferred embodiment in the specification is a pulse signal but Samsung asserts that one skilled in the art would recognize that any signal that discriminates on and off could be used as an address signal. Samsung then asserts that nothing in the specification disclaims other address signals. Dkt. No. 122 at 12-13.

Pioneer asserts that the specification notes that the address signals are pulses. Dkt. No. 114 at 26-27 (citing '648 Patent at 1:56-61 and 7:9-16). Pioneer asserts that "address signal" therefore cannot be construed as any type of waveform.

(2) Construction

The specification does not provide guidance to suggest that an address signal should be limited to a particular type of address signal. The citations provided by Pioneer in fact support a more general reading of the term. For example the specification merely states "cells to be turned on and cells not to be turned on in a panel are selected by scan pulses ... and address pulses." ' 648 Patent at 1:56-59. Also, the specification states "the address pulse generator 643 generates an address signal for discriminating cells to be turned on from cells not to be turned on." *Id*. at 7:11-13. These passages emphasize that the address signal merely selectively discriminates between cells to be turned on and cells to be turned off, which also matches the specific claim language surrounding the terms in question as noted by Samsung. The Court construes "address signal" to mean "a signal that identifies cells" and construes "cells addressed by the address signal generator" to mean "cells identified with the address signal."

B. "signal different from the sustain signal"

(1) The Parties' Positions

The term "signal different from the sustain signal" is found in claims 14 and 45. Samsung initially proposed that no construction of this term was needed. Dkt. No. 124 at B-2. Pioneer's asserted construction of the term was modified to be "the rest period signal ." *Id*. At the claim construction Samsung indicated it agreed with Pioneer's construction. Dkt. No. 131 at 41-43.

(2) Construction

The Court adopts the parties' agreed construction. The Court construes the term "signal different from the sustain signal" to mean "the rest period signal."

C. "reset stabilization signal"

(1) The Parties' Positions

"Reset stabilization signal" appears in asserted claims 14, 45, 47 and 53. Samsung proposes that no construction of this term is needed, or in the alternative, a construction of "a signal applied to cells that causes discharging to occur in the cells prior to the generation of the reset signal." Dkt. No. 124 at B-1. Pioneer proposes a construction of "signal applied to discharge cells after a rest period in order to create sufficient priming in the cells so that the following reset operation can be stabilized." *Id*.

Samsung asserts that the surrounding claim language provides guidance as to the meaning of a reset stabilization signal. In particular, Samsung notes that claim 45 includes "a reset stabilization signal to cause discharging in the cells before the application of the reset signal." Dkt. No. 111 at 10-11. Samsung objects to Pioneer's requirement that the signal occur after a rest period as Samsung asserts that a rest period is not recited in claim 14. *Id*. at 11. Samsung further objects to Pioneer's "priming" language as improperly importing limitations from the preferred embodiment. *Id*. at 12; Dkt. No. 122 at 8. In addition, Samsung asserts that "sufficient priming" is ambiguous as to what amount of priming would be sufficient. Dkt. No. 111 at 12.

Pioneer asserts two key points regarding the claim term: (1) "stabilization" requires a sufficient priming effect for a subsequent reset operation, and (2) a reset stabilization signal is applied after a rest period. Dkt. No. 114 at 12-14. With regard to the first point, Pioneer asserts that a number of citations in the '648 Patent link the stabilization signal to the priming effect. Id. at 12-13. Samsung states that the patent background teaches that a normal reset operation is disrupted when the priming effect in discharge cells is weakened by a long rest period preceding the reset. Id. (citing the '648 Patent at 2:18-25, 4:4-6, 4:16-19). Pioneer then notes a number of passages that relate reset stabilization and priming:

A reset stabilization period for inducing discharging in a discharge space between cells is additionally performed before the reset period if a rest period having a predetermined time duration is present between the sustain period of a preceding field and the reset period of the field. Therefore, the reset operation can be performed in a state where discharge cells between electrodes are sufficiently primed. '648 Patent at Abstract.

According to the preferred embodiments of the present invention, reset stabilization is performed after a rest period in which no sustain discharging occurs and before a reset period so that a reset operation in a subfield following the rest period can be performed in a state where discharge cells are sufficiently primed, thereby stabilizing the reset operation. In other words, the reset operation performed immediately after the rest period can be stabilized by sufficiently priming the discharge space. '648 Patent at 6:30-38.

If the rest period is short, less discharge pulses are required during the reset stabilization period to sustain the priming effect. Alternatively, when the rest period is long, the width of discharge pulses applied for the reset stabilization may be increased wider than sustain discharge pulses or a voltage may be increased to obtain a sufficient priming effect. Usually, one to three discharge pulses (i.e., discharging one to three times) are enough to achieve the reset stabilization. '648 Patent at 4:37-45.

Pioneer asserts that there is no known definition for "reset stabilization," and thus as opposed to importing limitations in a known term, Pioneer is instead using the specification to identify an idiosyncratic term defined by the patent in the specification. Dkt. No. 114 at 14.

Pioneer's second identified feature of a "reset stabilization signal" is that the signal is applied after a rest period. Pioneer notes that the specification states that "according to the present invention, discharging is caused to occur between electrodes before a reset period following a rest period by performing a reset stabilization operation immediately before the reset period...." Dkt. No. 114 at 14 (citing '648 Patent at 8:15:22).FN5 Further, Pioneer asserts that the embodiments disclosed in the ' 648 Patent that utilize a reset stabilization signal apply that signal after a rest period. Pioneer cites a number of cases to assert that such clear expressions of the inventor's intention of the "present invention" are deemed dispositive. Dkt. No. 114 at 15. Pioneer also asserts that the whole point of the reset stabilization signal is to recover the priming

effect that is weakened by a rest period and therefore a proper definition should include reference to a rest period. Pioneer provides a graphical depiction of the priming process to indicate the effect of priming after a rest period. Dkt. No. 114 at 5-6.

FN5. Pioneer also cites to similar language in the Korean priority document. Dkt. No. 114 at 14-15.

Pioneer attacks Samsung's definition as neither specifying what a reset stabilization signal is nor distinguishing the signal from other signals. In particular, Pioneer points to the address signals and sustain signals of Figure 3 (prior art) and Figure 4B and notes that Samsung's definition of a reset stabilization signal would encompass those other signals also. Dkt. No. 114 at 16-17. Pioneer also notes that the *Samsung SDI v. Matsushita* case involves the '648 Patent's parent patent (U.S. Patent No. 6,670,774) and in that case the Special Master found that the reset stabilization signal occurs after a rest period. Id. at 18. Finally, Pioneer points to Samsung's infringement contentions to indicate the ramifications of Samsung's constructions. In particular, Pioneer pointed to testimony regarding a waveform that indicates Samsung is reading "reset stabilization signal" upon "an additional pulse" after the sustain period but prior to the rest period. Id.

With regard to the reset stabilization signal construction being so broad as to encompass address and sustain signals, Samsung asserts that the asserted claims recite address and sustain signals elsewhere in the claim and the claims plain meaning establishes the other signals are not the same as a reset stabilization signal. Dkt. No. 122 at 9. Further Samsung rebuts Pioneer's assertion that a reset must follow a rest period. In particular, Samsung objects to Pioneer's graphical depiction of the priming process in which Pioneer shows a reset stabilization period as being required after the rest period. *Id*. at 10. Rather, Samsung provides its own graphical depiction of a reset stabilization period before the rest period which Samsung asserts would provide the same effect. *Id*. at 11. Samsung concludes that the '648 Patent does not include a disclaimer that requires the reset stabilization signal to occur before a rest period.

(2) Construction

Neither party asserts that "reset stabilization signal" has a meaning to one skilled in the art outside of the context of the '648 Patent. The Court is not convinced by Samsung's argument that claim 45 self-defines the term. Samsung is correct that claim 45 states "a reset stabilization signal to cause discharging in the cells before application of the reset signal," however, limiting the definition to merely "causes discharging to occur in the cells prior to the generation of the reset signal" is such a general definition that it provides little guidance of the meaning of the term. Pioneer is correct in that such a general definition would encompass any of the signals before the reset period that cause discharging including the address and sustain signals. The reset stabilization signal concept is extensively described within the ' 648 Patent with regard to the embodiment of Figures 4A and 4B in a manner indicative that this term carries some meaning beyond any generic discharging signal (such as address and sustain signals). In addition, it is noted in the specification that if a long rest period does not exist, then the sustain period may prime the discharge space, however, such use of a sustain period signal for priming is not described as a reset stabilization signal. '648 Patent at 3:55-4:3. The intrinsic record indicates that a reset stabilization signal is more than mere discharging such as performed by the other signals.

The use of "stabilization" in the term itself implies that the signal is related to stabilization and the patent specification provides extensive support for the explicit relationship of this signal and the concept of

stabilizing the reset period. Samsung does not contest that the embodiment that relates to reset stabilization includes the priming concept. *See* Dkt. No. 111 at 12; Dkt. No. 122 at 8. More importantly, the passages from the specification cited above by Pioneer make clear that in the context of the intrinsic record as a whole this term is related to the stabilization concept. '648 Patent 6:30-38, 4:37-45, Abstract; *see* '648 Patent at 2:18-25, 4:17-20. As for Samsung's objections to the use of the term "sufficient," this is the very description given within the intrinsic record to define the priming that the reset stabilization signal performs. '648 Patent 6:30-38, 4:37-45, Abstract. As noted above, *Phillips* indicates that the intrinsic record generally provides the best source of guidance in claim construction. The Court shall construe the reset stabilization signal to include the concept of sufficient priming to achieve stabilization.

The issue of whether the reset stabilization signal only occurs after a rest period still requires resolution. Again it is noted that neither party asserts that a "reset stabilization signal" is a term known in the art. This unique term is described within the specification only in the context of a signal that is applied after a rest period. The very problem this term is described to address is the existence of a rest period interposed between the sustain period and the reset period. '648 Patent at 3:55-4:51, 2:18-33; 6:30-38. It is also instructive that the width, period and voltage levels of reset stabilization signal may be "the same or may slightly differ" from that of the sustain signals applied in the sustain period. '648 Patent at 4:46-51. In addition, the '648 Patent teaches that when a sustain period is close in time to the reset period, the sustain pulse itself primes enough to enable a normal reset operation. Id. at 3:56-64. Thus, the distinction provided in the '648 Patent between the sustain and reset stabilization signals appears to focus on when the reset stabilization signals occur. As agreed by both parties, the disclosed embodiment only teaches a reset stabilization after a rest period. Utilizing Samsung's definition, the sustain signals or a subset of the sustain signals could merely be called a reset stabilization signal, a result the specification teaches against through its use of different terminology and the specific example shown. The Court is disinclined however to adopt a definition of reset stabilization signal that internally requires a rest period deferring instead to the other language of the claims to establish the presence of a rest period. However, if a rest period is present the reset stabilization signal follows such rest period.

The Court construes "reset stabilization signal" to mean "a signal applied to cells causing discharging to occur in the cells, after a rest period if a rest period is present, in order to create sufficient priming in the cells so that a reset operation can be stabilized."

D. "generates a reset stabilization signal in the cells" and "cause discharging in the cells"

(1) The Parties' Positions

The term "generates a reset stabilization signal in the cells" is found in claim 14. The term "cause discharging in the cells" is found in claim 45. Samsung asserts that neither term needs construction and that the plain meaning of the terms should apply. Dkt. No. 124 at B-3. Pioneer asserts that "generates a reset stabilization signal in the cells" means "generates a reset stabilization signal in all of the cells" and that "cause discharging in the cells" means "cause discharging in all of the cells." *Id*. The primary dispute revolves around the inclusion in Pioneer's construction of "all" of the cells.

Samsung asserts that Pioneer's construction impermissibly excludes a selective rest signal that is applied to less than all of the cells on the panel. Samsung acknowledges that the specification refers to embodiments where the reset stabilization signal is applied to all cells but Samsung notes that the specification also explicitly states "[i]n the reset stabilization period, discharge may be caused to occur in all cells or in only the cells in which a sustain discharge occurred in the last subfield of the (n-1)th frame ." Dkt. No. 111 at 13

(citing '648 Patent at 4:52-54).

Pioneer asserts that the claim itself provides guidance as to the proper construction. In particular, Pioneer states that the phrase in question is "the cells" so the antecedent basis for "the cells" should be considered. Dkt. No. 114 at 25-26. Pioneer argues that in claim 14 the relevant antecedent basis is the "respective cells" of the phrase "a reset signal initializing the state of respective cells." *Id*. Pioneer further asserts that the specification teaches that all cells are reset since the specification states "[f]or the reset period, the charge state in each cell is initialized so as to smoothly perform an addressing operation in each cell." *Id*. (citing '648 Patent at 1:54-56). Pioneer further asserts that the use of the word "respective cell" appears to be an artifact of the translation of the Korean word for "each cell." *Id*. at 26.

(2) Construction

Pioneer's construction conflicts with the most clear statement in the specification regarding this issue: "[i]n the reset stabilization period, discharge may be caused to occur in all cells or in only the cells in which a sustain discharge occurred in the last subfield of the (n-1)th frame." '648 Patent at 4:52-54. Moreover, the single citation Pioneer provides from the Background of the Invention with reference to resetting cells does not demonstrate a clear requirement that "respective cells" should be interpreted to be all cells of a panel. Absent other evidence, the requirement that respective cells must be all cells fails. In contrast the specification is clear that during reset stabilization all cells do not have to have a discharge. In addition, in the context of the explicit surrounding claim language of both claims, the most natural reading of "the cells" refers to "cells addressed by the address signal generator" (claim 14) and cells which are subjected to "application of the reset signal" (claim 45). As such the Court does not construe the terms in question to require "all cells." Further as the surrounding claim language itself provides sufficient guidance and context to the meaning of the term, the Court shall not construe the terms "generates a reset stabilization signal in the cells" and "cause discharging in the cells."

E. "prior to reset signal" and "before application of the reset signal"

(1) The Parties' Positions

The term "prior to reset signal" is found in asserted claim 14. The term "before application of the reset signal" is found in asserted claim 45. Dkt. No. 124 at B-2. Samsung contends that neither term needs construction. Pioneer asserts that both terms should be construed as "immediately before the reset signal." *Id*. The parties' dispute relates to the inclusion of "immediately." At the claim construction hearing Pioneer asserted that it would accept the use of "temporally close to" in place of "immediately." Dkt. 131 at 23. The Court notes that claim 14 also includes the phrase "before application of the reset signal" however the parties have not sought construction of this phrase in the context of claim 14.

Samsung asserts that the terms "before" and "prior to" are clear to comprehend and need no construction. Dkt. No. 111 at 14. Samsung acknowledges that "the '648 Patent specification proposes a reset stabilization signal immediately before the reset period in a preferred embodiment." Dkt. No. 111 at 11. However, Samsung asserts that the general description in the patent anticipates that it is only preferable to sequence the reset stabilization signal immediately before the rest period:

In other words, a reset stabilization period of applying a predetermined number of discharge pulses is performed between the rest period of the (n-1)th frame and the first reset period of the (n)th frame, and preferably immediately before the reset period of the (n)th frame. Preferably, a portion of the reset period is

used as the reset stabilization period.

'648 Patent at 4:28-34. Samsung asserts that Pioneer is improperly importing limitations of the preferred embodiment into the claim. Dkt. No. 111 at 12. At the claim construction hearing, Samsung further asserted that one skilled in the art would recognize that when "immediate" was meant in the claims it would be spelled out explicitly as done with reference to claim 18. Dkt. No. 131 at 8. Samsung further noted that claim 14 references the use of two signals before the reset signal and that both of these signals can not be "immediately before." FN6 *Id*. at 8-9.

FN6. Claim 14 includes "signal different from the sustain signal is applied for a time period before application of the reset signal" and "a reset stabilization signal in the cells prior to the reset signal." '648 Patent at 50-55.

Pioneer asserts that the '648 Patent consistently demonstrates a reset signal that is immediately before the reset period. In particular, Pioneer cites to the written specification and figures. Dkt. No. 114 at 19. For example, Pioneer notes the passage:

As described above, in the PDP driving method and apparatus according to the present invention, discharging is caused to occur between electrodes before a reset period following a rest period by performing a reset stabilization operation immediately before the reset period, ...

'648 Patent at 8:15-19. Pioneer also points to Figures 4A and 4B and other passages that state "[i]n the preferred embodiments of FIGS. 4A and 4B, a reset stabilization period is provided immediately before the reset period in the first subfield" and "when discharges pulses are applied immediately before the reset period as in the present invention, ..." '648 Patent at 4:23-32; 7:54-59. Pioneer further asserts that the concepts of reset stabilization as disclosed in the '648 Patent are dependent upon the reset stabilization signal being temporally close to the reset period. Dkt. No. 114 at 20-21. For example, Pioneer asserts that a long rest period interposed between the reset stabilization period and the reset period would not be operable as the existence of long rest period immediately prior to the reset period was the intended problem being addressed by the patent. *See id*.

(2) Construction

The claims themselves indicate that mere use of the terms "prior" and "before" do not require immediacy as claim 14 indicates two different signals that are "before" and "prior" to a reset signal, both of which can not be immediate. However, Pioneer's assertion that the specifications multiple and consistent reference to immediacy must still be addressed. Pioneer is correct that the preferred embodiments illustrate a reset stabilization signal immediately prior to the reset signal. The Court must look to the intrinsic record as a whole as to whether non-immediate signals have been disclaimed from the proper construction. The Court finds that such a disclaimer has not been made. In the passage noted by Samsung above, the specification makes a specific reference to applying the reset stabilization signal "between the rest period of the (n-1) frame and the first reset period." The passage then continues that it is merely "preferably immediately." '648 Patent at 4:28-34. Though the preferred embodiments are immediate, this cited passage provides indication that immediacy is not required. Further, as Samsung noted, in another claim (claim 18) "immediate" was specifically utilized when referencing certain periods. '648 Patent at 10:24. As to Pioneer's assertions that the complete purpose of a reset stabilization signal would not be contemplated if "immediate" and/or

"temporally close" were not included in the definition of "before" or "prior," the Court finds that the nature of what a reset stabilization signal is and does has been addressed in the definition of "reset stabilization signal" itself. As noted above, the Court's definition of reset stabilization signal includes the concept of creating sufficient priming in the cells so that a reset operation can be stabilized.

The Court find that the terms "prior to a reset signal" and "before application of the reset signal" do not need construction.

F. "rest period"

(1) The Parties' Positions

The term "rest period" is found in claim 45. Samsung proposes that no construction is needed for this term, or alternatively, that the term should be construed as "a period when the electrode voltages applied to cells are insufficient to cause discharges in those cells." Dkt. No. 124 at B-1. Pioneer proposes that rest period means "an extended period of no voltage change during which no cell discharges occur." *Id*. The primary dispute relates to the length of time of a rest period and whether a rest period is an extended period. At the claim construction hearing, Samsung also indicated disagreement with the inclusion of a negative limitation relating to discharge ("no cell discharges occur") but Samsung acknowledged that Pioneer's use of the phrase "period of no voltage change" was acceptable. Dkt. No. 131 at 15.

Samsung asserts that the Summary of Invention defines the scope of the claimed rest period as a "rest period in which no discharge in cells occurs for a predetermined period of time." Dkt. No. 111 at 15 (citing the '648 Patent at 2:60-62). Samsung asserts that its alternative construction clarifies the lack of discharge by stating that the voltage levels are insufficient to cause discharge because the patent depicts rest periods in terms of voltage waveforms rather than discharges in the cells. *Id*. Samsung asserts that the pertinent evidence before the jury will be waveforms and thus Samsung's construction will best assist the jury. *Id*. at 15-16.

Pioneer asserts that its use of "extended" is consistent with the specification which states "a long rest period, during which the voltage applied to the electrodes of a panel is maintained constant and discharging does not occur." Dkt. No. 114 at 8 (citing the '648 Patent at 3:66-4:1). Pioneer also asserts that the inventors conceded in depositions that the rest period is extended. *Id*. However, Pioneer primarily relies upon known video signal standards to assert that a rest period must be extended. *Id*. at 8-10. In particular, Pioneer asserts that the patent teaches that a rest period is at the boundary of two consecutive frames and that this would correspond to the known blanking intervals that exist in video signal standards. *Id*. at 8-9. Pioneer asserts that the length of blanking intervals between frames are well known to be in the 1.67 millisecond time frame with is extended compared to the normal microsecond time scale of plasma discharges and pulses. *Id*. at 9-10. Pioneer asserts that this conforms to the specification which discloses experimental examples of 2 and 5 millisecond rest periods. *Id*. at 10 (citing the '648 Patent at 7:50-59). Thus, Pioneer asserts that it would be recognized by one in the art that a rest period is an extended period of time as compared to other periods.

Pioneer also asserts that Samsung's definition of rest period does not distinguish from other periods of discharge, and that in contrast, the patent teaches that not every period of no discharge is a rest period. Dkt. No. 114 at 11. In particular, Pioneer asserts that the patent teaches that short periods of no discharges occurring between subfields do not dilute priming and therefore do not require reset stabilization in contrast to long periods which require reset stabilization. *Id*. Pioneer asserts that it is these long periods that are rest periods. Pioneer points to the following passage in the ' 648 Patent:

The rest period is generally interposed between the last subfield of a(n-1)th frame and the first subfield of an (n)th frame. For the subfields other than the first subfield of the (n)th frame, the reset period is temporally close to the sustain period of the preceding subfield so that the priming effect by sustain discharging in the preceding subfield is exerted on the reset period of the current subfield, thereby enabling a normal reset operation in the current subfield. However, a reset discharging operation is likely to be improperly performed in the first subfield of the (n)th frame because a long rest period, during which the voltage applied to the electrodes of a panel is maintained constant and discharging does not occur, following a last sustain discharging in the (n-1)th frame dilutes the priming effect in a discharge space.

'648 Patent at 3:56-4:3. Pioneer asserts that the patentee has disavowed relatively short periods that do not interfere with normal reset operations from the scope of "rest period." *Id*.

Citing *Markman,* Samsung contends that Pioneer's reliance on inventor deposition testimony has little probative value. Dkt. No. 122 at 5-6. Further, Samsung asserts that Pioneer's reliance on the vertical blanking periods of industry standards is wholly based on extrinsic evidence. *Id*. at 6. At the claim construction hearing, Samsung further pointed out that the patent teaches a rest period with regard to Figure 5 which is not in between two frames, thus, directly contradicting the vertical blanking interval linkage suggested by Pioneer. Dkt. 131 at 16-17. With regard to Pioneer's disavowal argument, Samsung asserts that cited portion of the specification is not a disclaimer of scope because no distinction was being made over the prior art. Dkt. No. 122 at 6-7. Samsung further asserts that the patent describes the problem caused by rest periods in the context of "diluting" the priming effect. *Id*. at 7 (citing the '648 Patent at 4:2). Samsung asserts that counteracting the diluting effect to any extent serves the purposes of the invention and the claims should not be limited to a specific length of the rest period. Finally, at the claim construction hearing Samsung noted that the specification explicitly refers to rest periods that are "long" and rest periods that are "short" thus indicating that the term rest period itself can not be limited to long periods. Dkt. No. 131 at 17.

(2) Construction

Pioneer's linkage of the term rest period to the external evidence regarding industry standards for frames, vertical blanking periods between frames and the length of time of blanking periods to other periods is attenuated at best. The fact that such linkage directly conflicts with the rest period of the embodiment of Figure 5 in which a rest period is not located at the boundary of two frames further discredits the extrinsic evidence cited by Pioneer. *See* ' 648 Patent at Figure 5 and 6:39-58. The Court will rely upon the intrinsic evidence to reject the reliance by Pioneer upon the extrinsic blanking frame evidence.

Pioneer's assertion that the patent has disavowed short periods is more relevant. The passage of the patent quoted above which was cited by Pioneer does appear to state that the need for a reset stabilization period arises when rest periods are long and that short rest periods do not require such reset stabilization periods. However, in view of the intrinsic record as a whole, the Court does not find that this passage is sufficient to create a disavowal such that the use of the "rest period" equates to a long period. The specification itself repeatedly recites "rest period" in a more general sense and in contrast the applicants appear to use the terms "long" and "short" when distinguishing the length of the rest period. *See* '648 Patent at 2:13-16 ("rest period is too long" and "a short rest period"); 3:66 ("long rest period"); 4:16-17 ("long rest period"); 4:35-40 ("depending upon the duration of the rest period," "if the rest period is long," and "if the rest period is short"). Finally, as noted by Samsung, the patent describes the invention with regard to the diluting effect of rest periods and the patent does not suggest that the advantages obtained would not be beneficial for short rest periods.

The remaining question relates to the Pioneer's use of "no cell discharges" verses Samsung's "voltages applied to cells are insufficient to cause discharges." Even Samsung has acknowledged that the patent characterizes the period in question as a "rest period in which no discharge in cells occurs for a predetermined period of time." '648 Patent at 2:60-62. Further Samsung acknowledges that this description "properly informs the scope of the claimed 'rest period.' " Dkt. No. 111 at 15. The intrinsic record provides clear guidance.

The Court construes "rest period" to mean "a period of no voltage change during which cell discharge does not occur."

G. "positioning a rest period"

(1) The Parties' Positions

This term is found in claim 45. Samsung asserts that "positioning a rest period" does not need construction, or in the alternative, means "causing a rest period to occur." Dkt. No. 124 at B-2. Pioneer asserts that the proper construction is "shifting the position of a rest period."

Samsung asserts that a jury would know that "position" means to cause the rest period to occur at some point in time. Dkt. No. 111 at 16. In addition, Samsung asserts that the specification discloses two different embodiments: (1) the use of a reset stabilization operation, and (2) shifting the position of the rest period. Dkt. No. 111 at 16 (citing '648 Patent at 8:15-20). Samsung asserts that Pioneer's interpretation would require the claim to include the second embodiment even though the asserted claims in question require the first embodiment: application of a reset stabilization signal. *Id*. at 16-17

Pioneer asserts that the patent repeatedly uses the term "position" with reference to the second embodiment of Figure 5. Dkt. No. 114 at 21-22 (citing the '648 Patent at 8:15-20 and 6:41-50). Pioneer notes that the surrounding claim language at issue includes "a signal synthesizing circuit for applying the signals to each electrode and for positioning the position of a rest period." Pioneer asserts that this language indicates that the single circuit is capable of supporting both of the embodiments of the '648 Patent. Dkt. No. 114 at 22. Further, Pioneer asserts that if claim 45 was limited to the reset stabilization signal embodiment than the position language would be superfluous as the position never changes in the embodiment applying the reset stabilization signal. *Id*. at 22-23.

(2) Construction

The Court is disinclined to adopt Pioneer's position for multiple reasons in the context of the specification as a whole. Although Pioneer accurately points to use of the position concept with regard to the embodiment of Figure 5, the patent also uses position in a broader context. For example, the patent states that "the rest position is usually positioned in the last subfield of each frame." '648 Patent 7:67-8:1. In addition, the patent states that "the PDP driving method enabling reset stabilization according to the present invention can also be applied when the rest period is in other positions in the frame, in consideration of the relation between the subfield having the rest period and the following subfield." '648 Patent at 8:4-8. Thus, the specification itself uses "position" in at least one passage generally with reference to the location of the rest period in the context of reset stabilization. In light of this disclosure it can not be said that positioning only relates to the second embodiment, but rather, the term also relates to merely where the rest period occurs in the first embodiment also. In addition, the '648 Patent uses the word "shifting" in one place, however, this citation

does not necessarily imply a changing of the rest period from one location to another within a given embodiment. *See* '648 Patent at 8:18-20. This citation may be more appropriately referencing that the position in the second embodiment is shifted with respect to the position of the first embodiment, particularly since the patent does not teach elsewhere that within one embodiment the rest period initially occurs in one position and is then shifted to another. Thus, use of the term "shifting" would require further construction of that term itself.

In the context of the first embodiment (reset stabilization of Figures 4A and 4B) and the second embodiment (the rest period located earlier in the sub-field as shown in Figure 5), it can be seen that a rest period may be located in different locations. The Court does not construe the use of "positioning" in claim 45 to mandate the use of the Figure 5 embodiment. Rather based upon the discussion above, the Court construes "positioning a rest period" to mean "causing a rest period to occur."

H. "between the periods"

(1) The Parties' Positions

Samsung proposes that the term "between the periods," which is found in claim 45, does not need construction or alternatively should be construed as "intermediate any two periods." Dkt. No. 124 at B-3. Pioneer proposes that the term means "between any two of: the reset period, the address period, and the sustain period." *Id*.

At the claim construction hearing Samsung asserted that Pioneer's construction was acceptable as long as "between" is not interpreted to mean bounded by. Dkt. No. 131 at 11-12. Samsung further noted that the embodiment of Figure 4A illustrates a rest period between a sustain period and a reset period as long as "between means between" and not "bounded by." *Id*. At the claim construction hearing Pioneer did not respond to Samsung's assertions regarding the meaning of "between."

Pioneer asserts that Samsung's original proposed construction merely replaces "between" with "intermediate" and would not provide any additional assistance to the jury. Dkt. No. 114 at 23. Further, Pioneer asserts that with regard to the embodiment of Figure 5, the specification describes the rest period in the context of "between" the reset period and the address period or between the address period and the sustain period. *Id*.

(2) Construction

The claim language in question falls in the longer phrase, "... for positioning a rest period, in which a signal which is different from the sustain signal is applied, *between the periods*." As noted above, the parties have agreed that the "signal which is different from the sustain signal" is the rest period signal. Claim 45 also recites the use of a reset stabilization signal generator that generates a reset stabilization signal. '648 Patent at 12:31-34. As shown in Figures 4A and 4B, the rest period is located between the sustain period of the (n-1)th Frame and the reset period of the nth Frame. In this embodiment, the rest period is not directly adjacent the reset period but rather the reset stabilization period is intervening. It would be improper to interpret claim 45 in a limiting manner that would exclude the embodiment which discloses a reset stabilization period. The Court shall adopt Pioneer's construction with the clarification requested by Samsung. The Court construes "between the periods" to mean "between any two of: the reset period, the address period, and the sustain period, with the clarification that between does not require being bounded directly by the reset period, the address period, and the sustain period."

X. CONCLUSION

Accordingly, the Court hereby **ORDERS** the disputed claim terms construed consistent herewith.

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