

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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BOE TECHNOLOGY GROUP CO., LTD.,

Petitioner,

v.

OPTRONIC SCIENCES LLC,

Patent Owner.

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Case IPR2025-00239

U.S. Patent No. 8,502,757

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**PATENT OWNER'S PRELIMINARY RESPONSE**

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**Patent Owner's Exhibit List**

<b>No.</b>	<b>Description</b>
2001	Docket Navigator Stay Statistics
2002	February 14, 2025, DCO
2003	BOE's April 1, 2025 Invalidity Contentions
2004	Exhibit C-9 to BOE's April 1, 2025 Invalidity Contentions
2005	Exhibit C-5 to BOE's April 1, 2025 Invalidity Contentions
2006	Exhibit 2026 of IPR2024-01133, Dr. Bretschneider's Declaration
2007	Exhibit 2020 of IPR2024-01130, Dr. Bretschneider's Declaration
2008	Exhibit C-6 to BOE's April 1, 2025, Invalidity Contentions
2009	Docket Navigator Median Time-to-Trial Statistics for the Eastern District of Texas
2010	<i>Dabico Airport Solutions Inc. v. Axa Power Aps</i> , IPR2025-00408 (Paper 21)
2011	US8502757B2, GOOGLE PATENTS, available at <a href="https://patents.google.com/patent/US8502757B2/en?q=8%2c502%2c757">https://patents.google.com/patent/US8502757B2/en?q=8%2c502%2c757</a> (accessed July 3, 2025).
2012	BOE Technology, WIKIPEDIA, available at <a href="https://en.wikipedia.org/wiki/BOE_Technology">https://en.wikipedia.org/wiki/BOE_Technology</a> (accessed July 3, 2025).
2013	Declaration of Dr. Eric Bretschneider in Support of Patent Owner's Preliminary Response
2014	<i>Curriculum Vitae</i> of Dr. Eric Bretschneider

## **I. Introduction**

The Board should decline to institute the Petition because the prior art fails to teach the claimed limitations.

## **II. Brief Technical Background**

As display technology advanced, manufacturers sought to increase the refresh rate of displays. Refresh rate refers to how many times per second the screen updates with a new image. A higher refresh rate enables smoother motion and more frames per second, which, for example, enhances the perceived quality of videos, reduces motion blur, and reduces eye strain. However, a problem that plagued the industry as it sought to implement faster refresh rates was image retention phenomena (also called “ghosting”). Ex. 2013, ¶ 30. Ghosting occurs when a previous image frame leaves a faint trace (or “ghost”) behind as the screen transitions to a new frame, resulting in blurry visuals or residual visuals from the previous frame being still visible. *Id.* This phenomenon is often caused by the slower response time of pixels or residual charge in the driving transistors, and it becomes more noticeable at higher refresh rates where rapid image changes demand faster pixel transitions. *Id.*

A separate problem display manufacturers faced was differences in the threshold voltages of thin film transistors (“TFTs”) in a display. Ex. 2013, ¶ 31. These threshold voltage variations can arise from manufacturing inconsistencies, aging effects, or temperature fluctuations, and they lead to uneven current driving

across pixels. *Id.* As a result, image quality can degrade over time, with artifacts such as non-uniform brightness or color shifts. *Id.*

### III. Partial Summary of Patent 8,502,757

Patent 8,502,757 (the “’757 Patent”) relates to the novel design of an organic light emitting display that addresses both threshold voltage compensation *and image retention phenomena*. See Ex. 1001 at Abstract (stating the OLED display avoids “occurrences of image retention phenomenon and pixel brightness distortion” through “the circuit operation of the reset units and the voltage adjustment unit.”).

For instance, the ’757 Patent describes the use of a first reference voltage and second reference voltage to perform the threshold compensation and avoid image retention phenomena:

. . . the first reset unit 235 resets the driving voltage Vdr according to the second scan signal SS2\_n and the first reference voltage Vref1, and the second reset unit 240 resets the control voltage Vctr according to the first scan signal SS1\_n and the driving voltage Vdr. In view of that, the driving operation of the driving unit 230 is reset for avoiding an occurrence of image retention phenomenon.

*Id.* at 5:15–22.

. . .the voltage adjustment unit 320 adjusts the preliminary control voltage Vctr\_p according to the emission signal EM\_n and the second reference voltage Vref2, and the couple unit 225 adjusts the control voltage Vctr through coupling a change of the preliminary control voltage Vctr\_p, the control voltage Vctr adjusted can be expressed as Formula (4) listed below.

...

Thereafter, the driving unit 230 provides the driving current  $I_{dr}$  according to the control voltage  $V_{ctr}$  of Formula (4) and the first power voltage  $V_{dd}$ , and the driving current  $I_{dr}$  provided can be expressed as Formula (5) listed below.

...

As shown in Formula (5), neither the threshold voltage  $V_{th}$  of the second transistor 231 nor the first power voltage  $V_{dd}$  has an effect on the driving current  $I_{dr}$ . For that reason, the voltage drop occurring to a conductive line for transmitting the first power voltage  $V_{dd}$  has no effect on the driving current  $I_{dr}$ , and therefore an occurrence of pixel brightness distortion on the OLED screen due to the trace resistance of aforementioned conductive line can also be avoided, for improving image display quality of large-size display panels.

*Id.* at 6:44–7:3.

To sum up, with the aid of the reset **and** threshold voltage compensation mechanism according to the present invention described above, occurrences of image retention phenomenon **and** pixel brightness distortion can be avoided in the operation of the organic light emitting display, thereby achieving high image display quality on the OLED screen.

*Id.* at 7:4–9 (emphasis added).

The '757 Patent similarly claims, in independent form, its explanations for how to perform voltage threshold compensation **and** reset and avoid image retention phenomena:

An organic light emitting display, comprising:

a data line for transmitting a data signal;

a first scan line for transmitting a first scan signal;

a second scan line for transmitting a second scan signal;

a transmission line for transmitting an emission signal;

an input unit, electrically connected to the data line and the first scan line, for outputting a preliminary control voltage according to the data signal and the first scan signal;

a voltage adjustment unit, electrically connected to the transmission line and the input unit, for adjusting the preliminary control voltage according to the emission signal and a second reference voltage;

a couple unit, electrically connected to the input unit and the voltage adjustment unit, for adjusting a control voltage through coupling a change of the preliminary control voltage;

a driving unit, electrically connected to the couple unit, for providing a driving current and a driving voltage according to the control voltage and a first power voltage;

a first reset unit, electrically connected to the driving unit and the second scan line, for resetting the driving voltage according to the second scan signal and a first reference voltage;

a second reset unit, electrically connected to the driving unit, the first reset unit and the first scan line, for resetting the control voltage according to the first scan signal and the driving voltage;

an organic light emitting diode for generating output light according to the driving current; and

an emission enable unit, electrically connected to the transmission line, the driving unit and the organic light emitting diode, for providing a control of furnishing the

driving current to the organic light emitting diode  
according to the emission signal.

*Id.* at claim 1.

#### **IV. Summary of the Primary References**

##### **A. U.S. Patent Pub. No. 2007/0103406 (“Kim406,” Ex. 1004)**

Kim406 describes a circuit for addressing threshold voltage compensation. Ex. 1004 at [0071] (“. . . in the pixel according to the embodiments of the present invention and the organic light emitting display device using the same, the amount of current that flows to the OLED is controlled regardless of the threshold voltage of the first transistor. Therefore, it is possible to display an image with uniform brightness. . .”). Notably, Kim406 *does not* disclose anything about preventing image retention phenomena. It also does not disclose resetting using a first and second reference voltage because it uses a single voltage, “Vint,” for threshold voltage compensation. *See id.* at [0070], Fig. 6.

##### **B. U.S. Patent Pub. No. 2009/0040150 (“Senda,” Ex. 1006)**

Senda, like Kim406, only describes a circuit for threshold voltage compensation. *See* Ex. 1006 at [0221] (“As described above, according to the display devices according to the embodiments, variations in the threshold voltage of a driving TFT can be properly compensated for, unwanted light emission from an organic EL element can be prevented, the contrast of a display screen can be enhanced, and the lifetime of the organic EL element can be extended. The present



invention is not limited to the embodiments and the features of the embodiments can be appropriately combined.”). Nothing in Senda addresses preventing image retention phenomena or resetting.

**V. Institution Should Be Denied Because Petitioner’s Arguments are Based on Flawed Claim Constructions and Misinterpretations**

The Board should deny institution because the Petition fails to identify critical claim elements in each Ground, and thus has not established a reasonable likelihood of prevailing on the merits.

While the Petition contains a number of flaws that will be addressed in a POR, if necessary, an exemplary flaw in the Petition is reliance on flawed claim constructions. Patent Owner disagrees with all of Petitioner’s proposed constructions. But, for the purposes of this POPR only, Petitioner’s construction of “first reference voltage” and “second reference voltage” is dispositive because, if rejected, Petitioner cannot meet its burden for institution.

Petitioner seeks to broaden the reference voltage terms by offering the primary construction that the “‘first’ and ‘second’ reference voltages encompasses reference voltages that are the same or different.” Petition at 12. In other words, Petitioner argues that the claimed “first reference voltage” and “second reference voltage” can be voltages from the same reference source, effectively removing the “first” and “second” limitations from the claims. This argument is contrary to the plain and ordinary meanings of the terms. The claims specifically claim two different

reference voltages, a first and a second. Nothing in the claims suggests the source of these reference voltages refer to the same source. A POSITA would not have such an understanding. Ex. 2013, ¶ 74. The specification further discloses separate sources for the first and second reference voltages where it discloses a “first reference voltage  $V_{ref1}$ ” and a “second reference voltage  $V_{ref2}$ .” Ex. 1001 at Fig. 4, 4:5, 6:35-36. Nor has Petitioner identified any clear and unambiguous evidence that the inventors intended that the first and second reference voltages could be from the same reference source. Accordingly, Petitioner’s assertion that “the ordinary meaning of ‘first’ and ‘second’ reference voltages encompasses reference voltages that are the same or different” deprives the modifiers “first” and “second” of their meanings.

Petitioner’s alternate construction is no better and again is contrary to the intrinsic evidence. Petitioner alternatively argues that, instead of overly broadening the terms, the Board should overly narrow the terms to require that actual voltage values must be “limited to different voltages.” Petition at 13. In other words, if the first and second reference voltages happen to have the same value, there would be no infringement. Again, Petitioner cites to no evidence to support limiting the terms in this manner. As explained above, the terms refer to different reference voltages, not the actual numeric value of those reference voltages. There must be a first and second reference voltage (such as the preferred embodiment using a  $V_{ref1}$  and

Vref2), but it does not matter if the measured voltages are the same or different.

This claim construction issue particularly affects Ground 1 (purported anticipation by Kim406) where Petitioner argues that Kim406 discloses a first and second reference voltage by pointing to the same initialization voltage (Vint). *E.g.*, Petition at 25, 33, 35, 41, 44. This argument is based exclusively on Petitioner's flawed primary construction for the first and second reference voltages.

Further, for all the Grounds with Kim406 (*e.g.*, Grounds 1 and 2), Petitioner admits it has no evidence that Kim406's initialization voltage is a reference voltage. Rather, Petitioner simply states that the word "reference" is "not relevant" and uses this bare assertion as a basis for its conclusory argument that "Vint in Kim406 is a reference voltage." Petition at 20 ("Kim406 discloses M25 is connected to 'Vint' while the corresponding structure 321 is connected to 'Vref2,' but this difference in naming convention is not relevant. Vint in Kim406 is a reference voltage, which is all that is required under the primary construction. Under the alternative construction, see below for [1i]."), 26 ("Kim406 discloses M24 is connected to "Vint" while the corresponding structure 326 is connected to "Vref1," but this difference in naming convention is not relevant. Vint in Kim406 is a reference voltage, which is all that is required under the primary construction. EX1002, ¶101."). Petitioner's bare assertions are insufficient to meet its burden, and institution should be denied.

As another example of the deficiencies, the Petition cannot provide an adequate motivation to combine Kim406 and Kim730. As the Petition notes, “Kim730 shares the common inventor with Kim 406.” Petition at 44. In other words, the inquiry of what would be obvious to a hypothetical POSITA is easy because it is not hypothetical—the common inventor of Kim had both references in front of him and did not find it obvious to provide an embodiment with the combination Petitioner proposes.

As another example, Grounds 3 and 4 are based on hindsight similar to Ground 2. As noted above, nothing in Senda addresses image retention phenomena. Rather, the Petition points to a “modified third embodiment” of Senda. Petition at 47. As acknowledged by Petitioner, Senda depicts changes to a fifth embodiment (Figure 11), resulting in Figure 15. Petition at 47; Ex. 1006, Figs. 11 and 15 (reproduced below):

Fig. 11

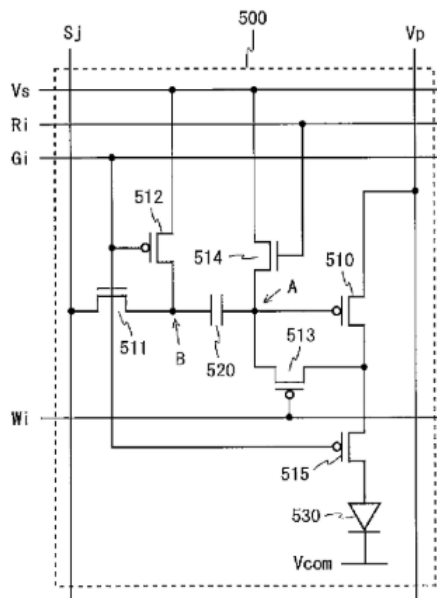
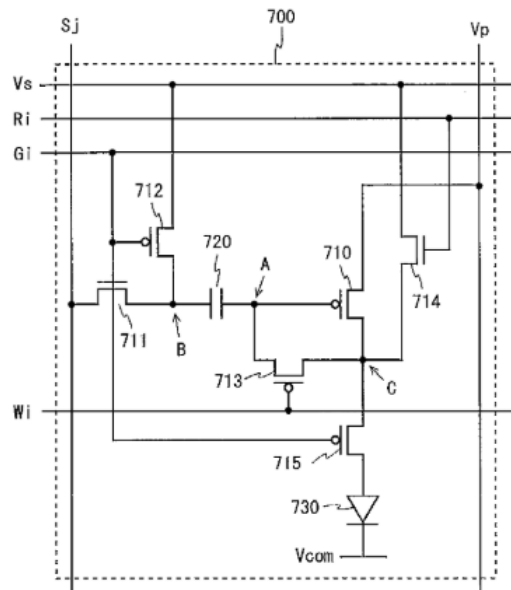
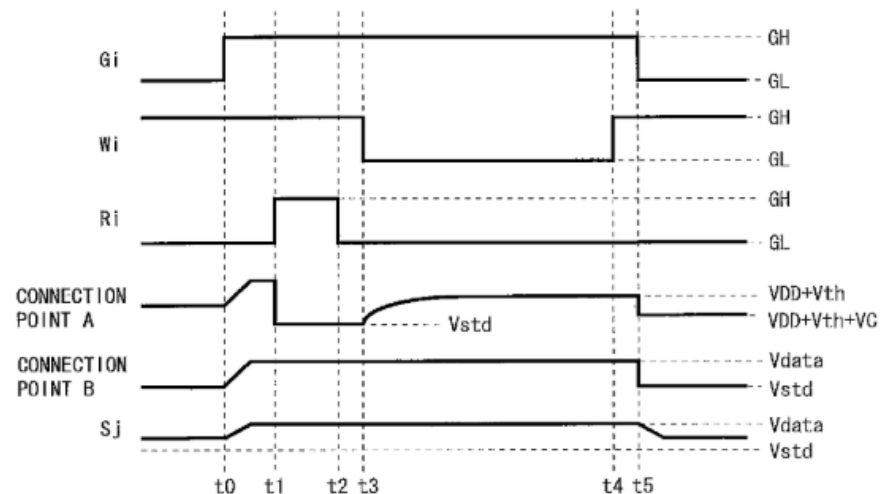


Fig. 15



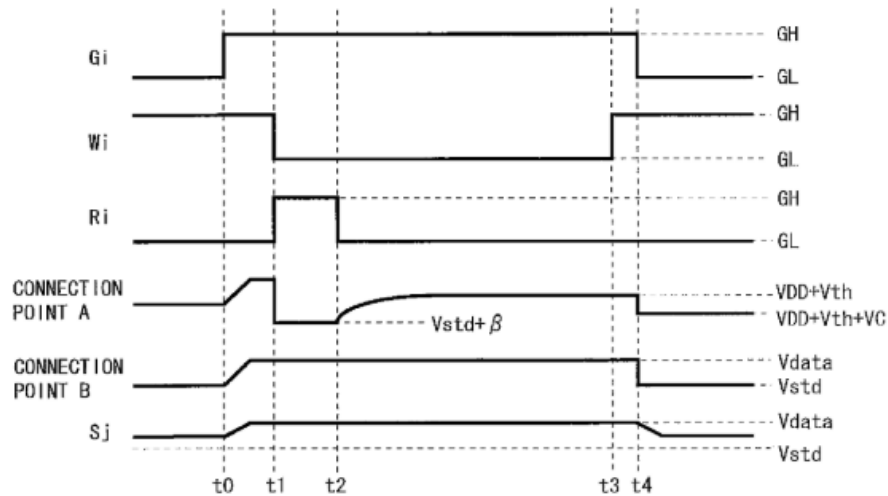
Notably, accompanying the changes to *structure* of the fifth embodiment above, Senda contemplates corresponding changes to the *operation* of the circuit, shown in the figures below:

Fig. 12



Ex. 1006, Fig. 12 (corresponding to the fifth embodiment shown in Fig. 11).

*Fig. 16*



*Id.* at Fig. 16 (corresponding to the modified fifth embodiment shown in Fig. 16). As may be seen above, the two circuits have different timing periods—for example, Figure 12 has an additional time period not present in Figure 16, and the timing of the Wi signal is materially changed.

By contrast, the Petition relies on the *same timing chart* shown for the third embodiment as it does for the modified third embodiment. Petition at 49 (“a POSITA would have understood the Modified 3rd Embodiment to still use the timing chart of Figure 7.”). Indeed, the Petition states “[b]ased on Senda’s disclosure that the only modification that should be made to the third embodiment is to connect the transistor to Node C, a POSITA would have understood the Modified 3rd Embodiment to still use the timing chart of Figure 7.” Petition at 49. But Petitioner misstates Senda because, as disclosed above, Senda’s “modified fifth embodiment” required modifying the structure to result in a modified timing of operations of the

resulting circuit. The Petition's reliance, therefore, on the pre-modification timing chart for its hypothetical "modified third embodiment" argument is therefore contradicted by the actual teaching of Senda and does not support Petitioner's analysis of how the resulting circuit actually operates.

Petitioner's theory in Grounds 3 and 4 are thus based on 1) a modified circuit for structure but 2) rely on pre-modification timings of circuit operation. Petitioner has fundamentally failed to describe or analyze how the post-modification circuit operates to meet the claims. Petitioner has not put forth sufficient evidence to meet its burden.

#### **VI. Conclusion: The Board Should Deny the Petition**

The Board should deny the Petition on the merits because the references fail to disclose or render obvious various claim elements, and Petitioner has not met its burden for institution.

Respectfully submitted,

Dated: July 18, 2025

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**CERTIFICATION REGARDING WORD COUNT**

Pursuant to 37 C.F.R. §42.24(d), Patent Owner certifies that there are 2340 words in the paper excluding the portions exempted under 37 C.F.R. §42.24(a)(1).

Dated: July 18, 2025

/ Jefferson Cummings /  
Jefferson Cummings



**CERTIFICATE OF SERVICE (37 C.F.R. § 42.6(e)(1))**

The undersigned hereby certifies that the above document was served on July 18, 2025, by filing this document through P-TACTS as well as delivering a copy via electronic mail upon the following attorneys of record for Petitioners:

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