

U.S. Patent No. 7,586,121 (“121 Patent”)

Accused Products

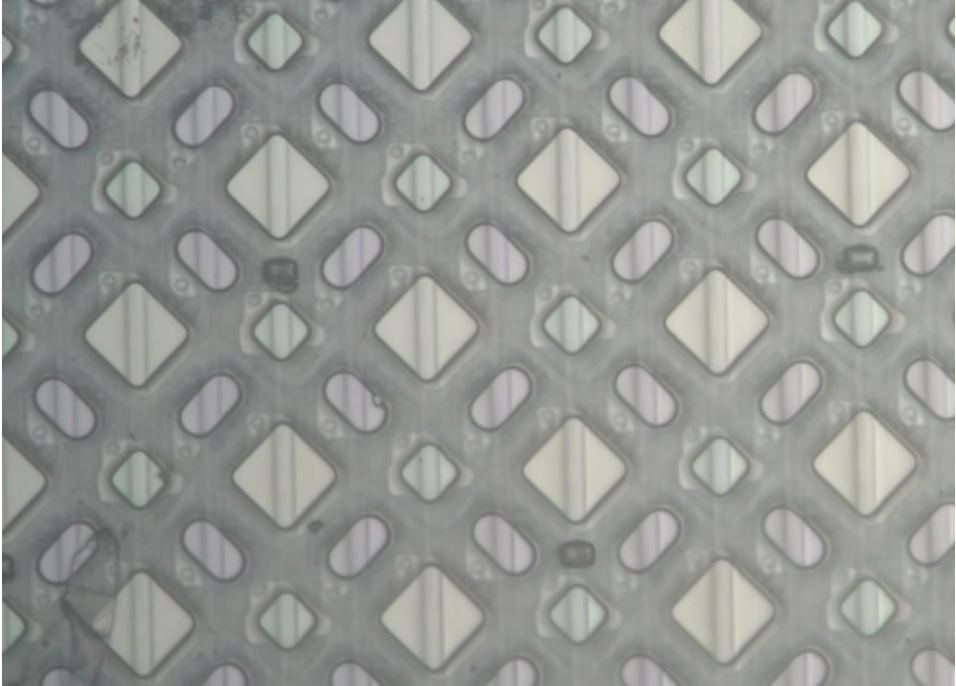
BOE products, including without limitation the BOE OLED panel supplied to Apple and included in the iPhone 13, the BOE OLED panel supplied to Apple and included in the iPhone 14, the BOE OLED panel supplied to Apple and included in the iPhone 14 Plus, the BOE OLED panel supplied to Apple and included in the iPhone 15, the BOE OLED panel supplied to Apple and included in the iPhone 15 Plus, the BOE OLED panel supplied to Motorola and included in the Moto Edge 2021, the BOE OLED panel supplied to Oneplus and included in the Oneplus 12, the BOE OLED panel supplied to Oneplus and included in the Oneplus 12R, the BOE OLED panel supplied to Valve and included in the Steam Deck Gaming Console, the BOE OLED panel supplied to Samsung and included in the Samsung Galaxy M52 5G, and all versions and variations thereof since the issuance of the asserted patent.

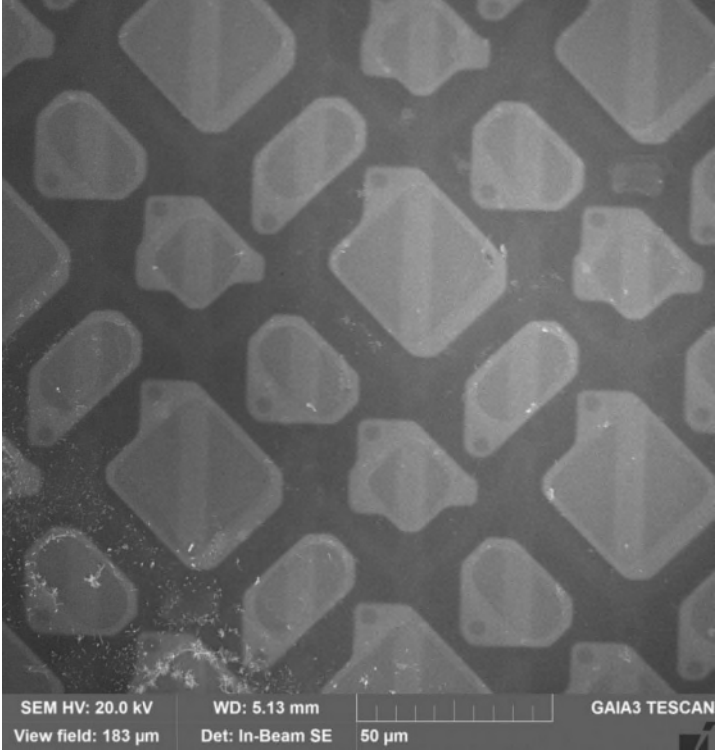
Each Accused Product infringes the claims in substantially the same way, and the evidence shown in this chart is similarly applicable to each Accused Product. Each claim limitation is literally infringed by each Accused Product. However, to the extent any claim limitation is not met literally, it is nonetheless met under the doctrine of equivalents because the differences between the claim limitation and each Accused Product would be insubstantial, and each Accused Product performs substantially the same function, in substantially the same way, to achieve the same result as the claimed invention. Notably, Defendant has not yet articulated which, if any, particular claim limitations it believes are not met by the Accused Products.

Claim 1

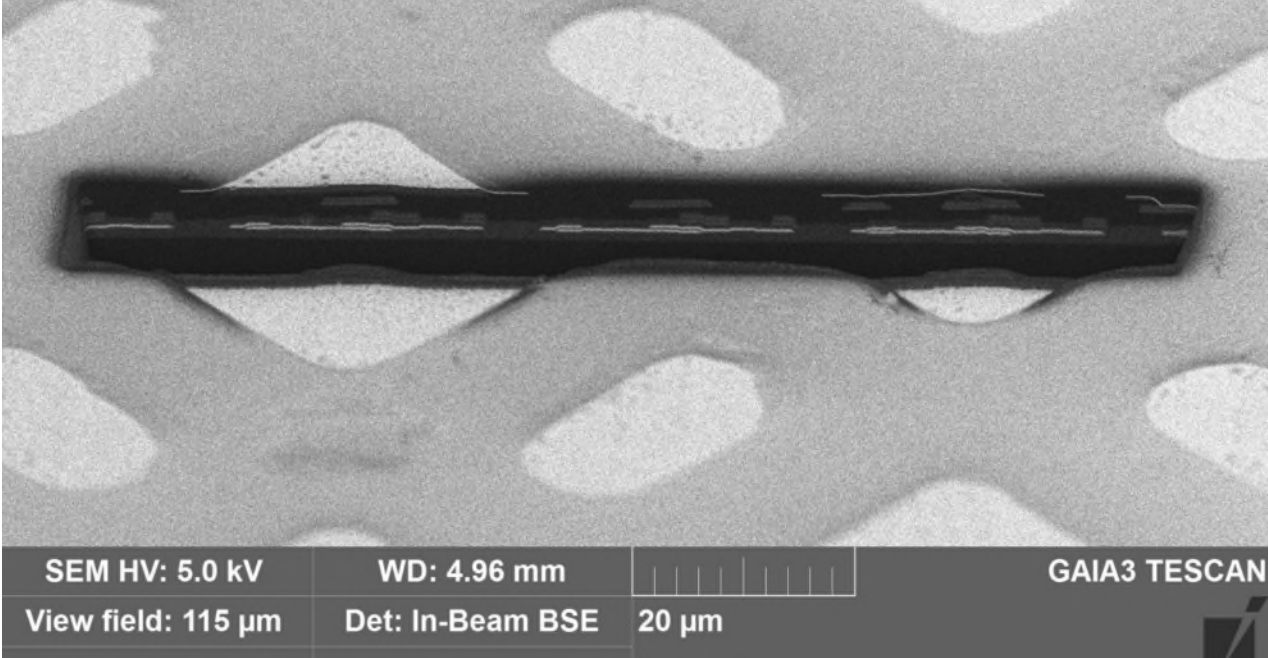
Claim 1	Accused Products
[1pre] An electroluminescence (EL) device, comprising:	To the extent the preamble is limiting, each Accused Product comprises or constitutes an electroluminescence (EL) device. <i>See, e.g.:</i>

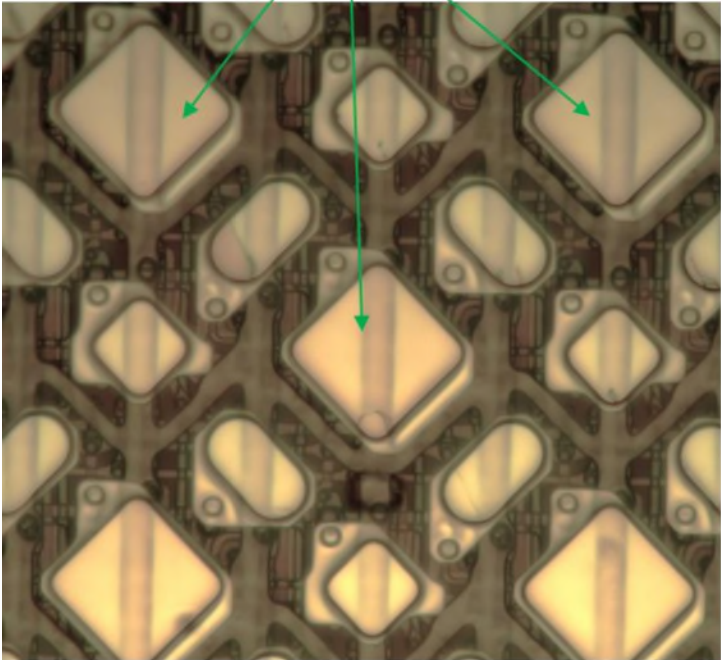
Claim 1	Accused Products
	 Publicity photo of iPhone 14 containing BOE OLED panel.

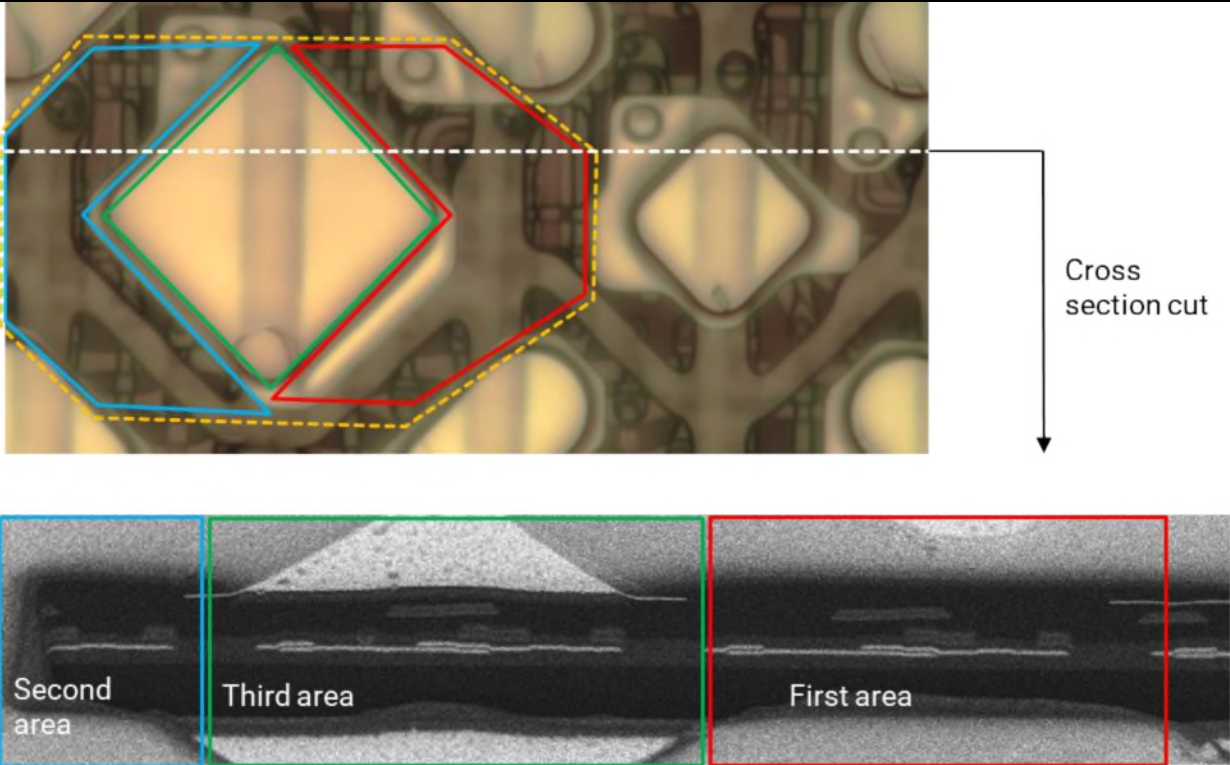
Claim 1	Accused Products
	 Photograph of BOE OLED panel in iPhone 14 (front view).

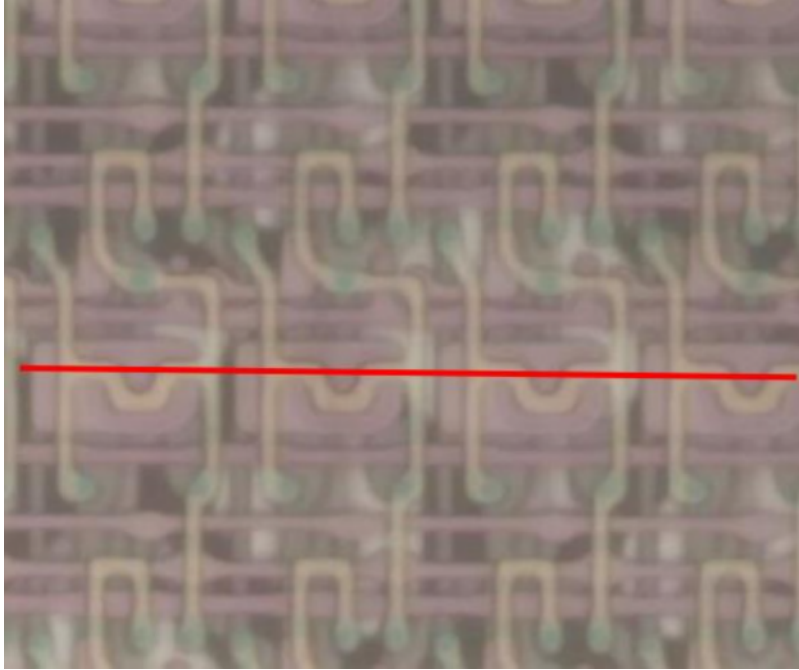
Claim 1	Accused Products
	 SEM image of BOE OLED panel in iPhone 14 (front view).

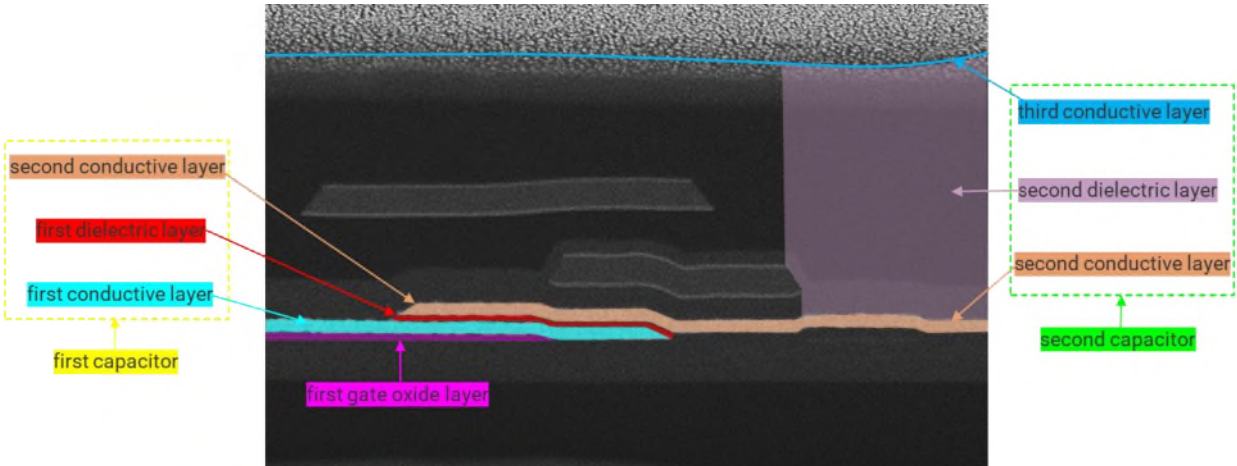
Claim 1	Accused Products
	A photograph showing the front view of a BOE OLED panel from an iPhone 14. The panel features a repeating pattern of diamond-shaped pixels with a yellowish-gold color. The pixels are arranged in a grid, and the overall appearance is slightly textured with some visible circuitry and wiring. Photograph of BOE OLED panel in iPhone 14 (front view). An optical image of the OLED pixel structure, viewed from the polysilicon side with the poly-imide substrate removed. The image shows a repeating pattern of pixel structures, each consisting of a central rectangular area surrounded by a complex, interlocking circuitry pattern. The colors are primarily purple, green, and yellow. Optical image of OLED pixel structure, viewed from polysilicon side with poly-imide substrate removed, of BOE panel in iPhone 14.

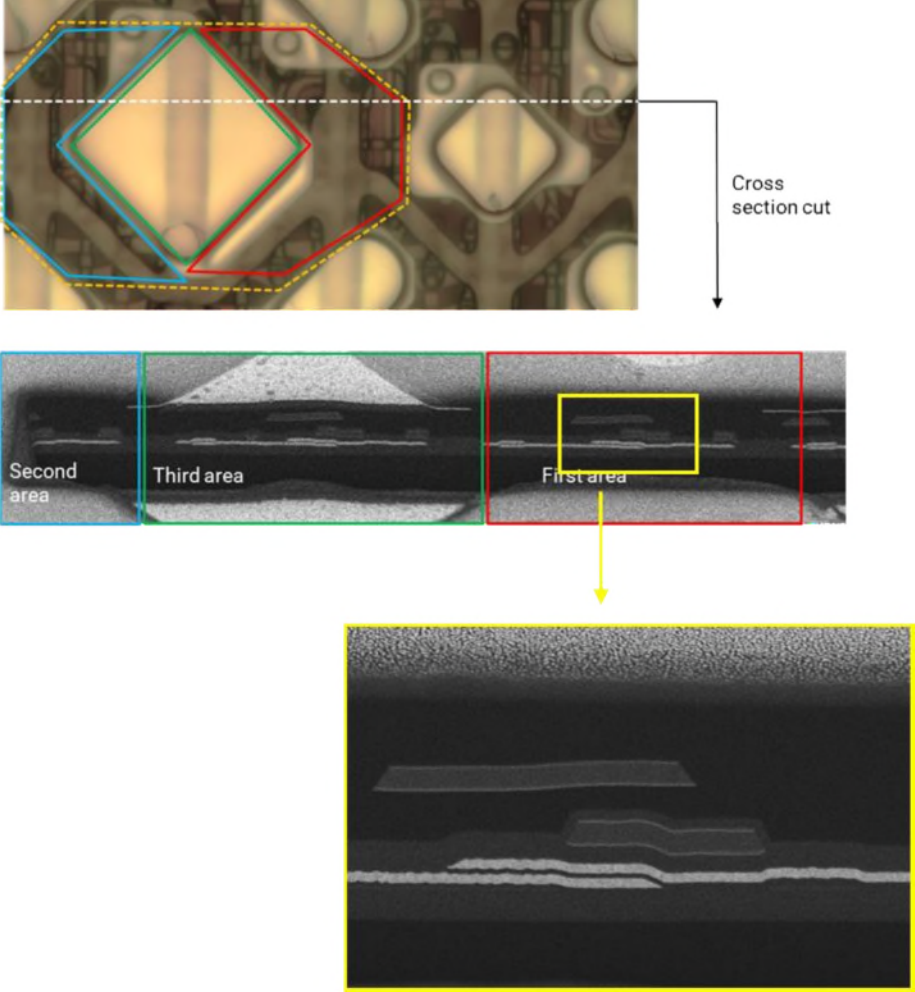
Claim 1	Accused Products
	 SEM cross-section image of portion of BOE OLED panel in iPhone 14. <i>See also</i> individual limitations below.
[1a] a substrate; and [1b] a plurality of pixels formed on the substrate, each pixel being in a respective pixel area, each pixel area including at least a first area, a second area, and a third area, wherein each pixel includes:	Each Accused Product comprises a substrate and a plurality of pixels formed on the substrate, each pixel being in a respective pixel area, each pixel area including at least a first area, a second area, and a third area. For example, the BOE OLED panel in the iPhone 14 contains a matrix of pixels on a substrate with three areas as claimed. <i>See, e.g.:</i>

Claim 1	Accused Products
	plurality of pixels  substrate Annotated optical image of BOE OLED panel in iPhone 14, showing substrate and plurality of pixels.

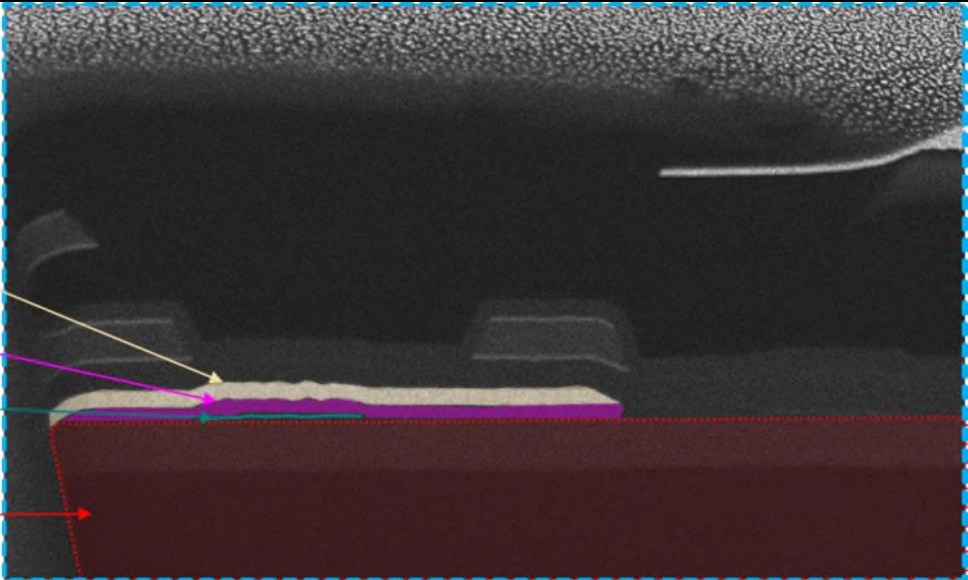
Claim 1	Accused Products
	 Annotated optical image of BOE OLED panel in iPhone 14 and accompanying SEM cross-section, showing first, second, and third areas (in red, blue, and green respectively) and illustrating location of exemplary cross-section imagery with respect to optical image.

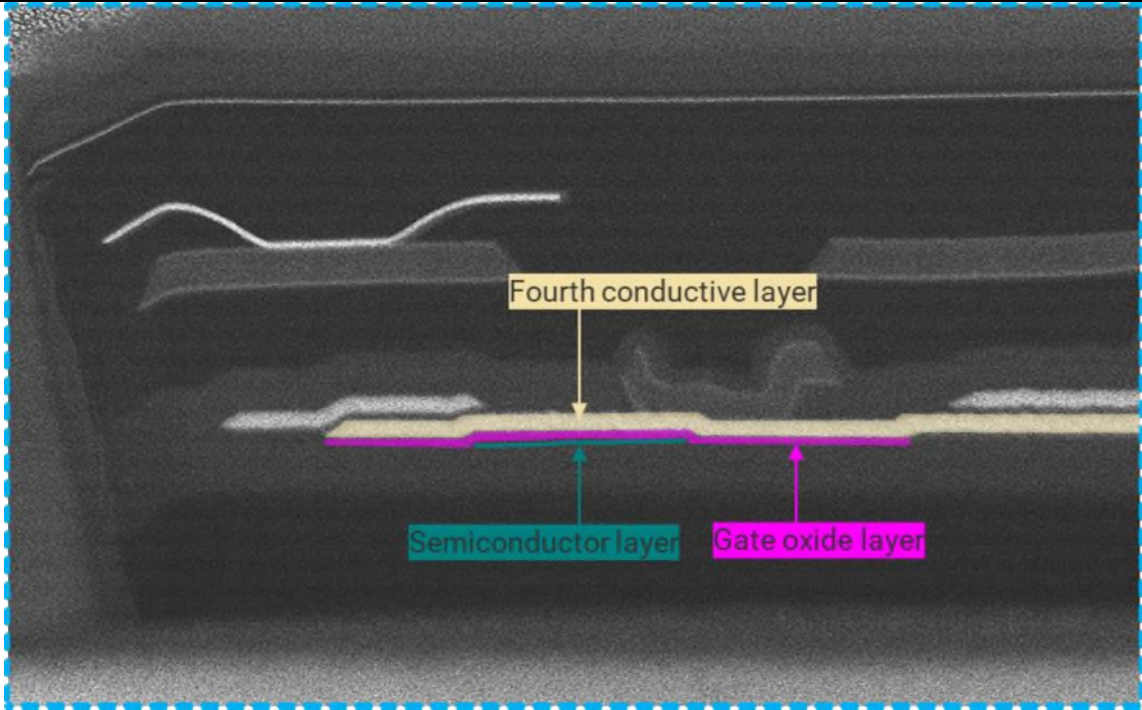
Claim 1	Accused Products
	 Annotated optical image of OLED pixel structure, viewed from polysilicon side with poly-imide substrate removed, of BOE panel in iPhone 14, showing approximate location of cross-section above.
[1c] at least a first capacitor and a second capacitor in the first area, the first capacitor including a first conductive layer formed over a first gate oxide layer, a first dielectric layer over the first conductive layer, and a second conductive layer over the first dielectric layer, and a second capacitor	Each Accused Product comprises at least a first capacitor and a second capacitor in the first area, the first capacitor including a first conductive layer formed over a first gate oxide layer, a first dielectric layer over the first conductive layer, and a second conductive layer over the first dielectric layer, and the second capacitor including the second conductive layer, a second dielectric layer over the second conductive layer, and a third conductive layer over the second dielectric layer. For example, the BOE OLED panel in the iPhone 14 contains a first area with first and second capacitors with each of the claimed layers, as shown below.

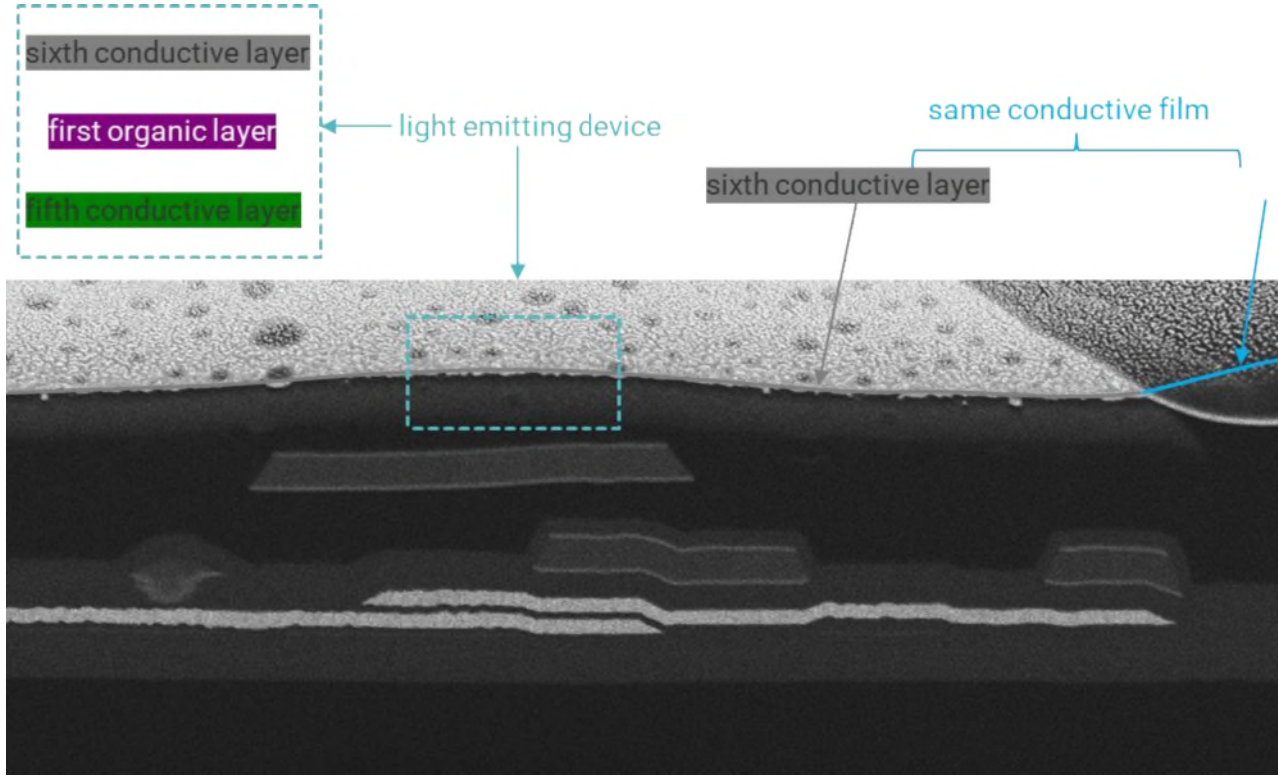
Claim 1	Accused Products
including the second conductive layer, a second dielectric layer over the second conductive layer, and a third conductive layer over the second dielectric layer;	See, e.g.:  Annotated SEM cross-section of BOE OLED panel in iPhone 14, showing a portion of the first area and layers forming two capacitors with layers as claimed.

Claim 1	Accused Products
	 Composite image showing context for SEM cross-section in previous illustration. To the extent Defendant contends that the Accused Products do not literally satisfy the limitation “second capacitor,” this limitation is met under the Doctrine of Equivalents. There are no substantial differences between the accused structure and the claimed invention. For example, the

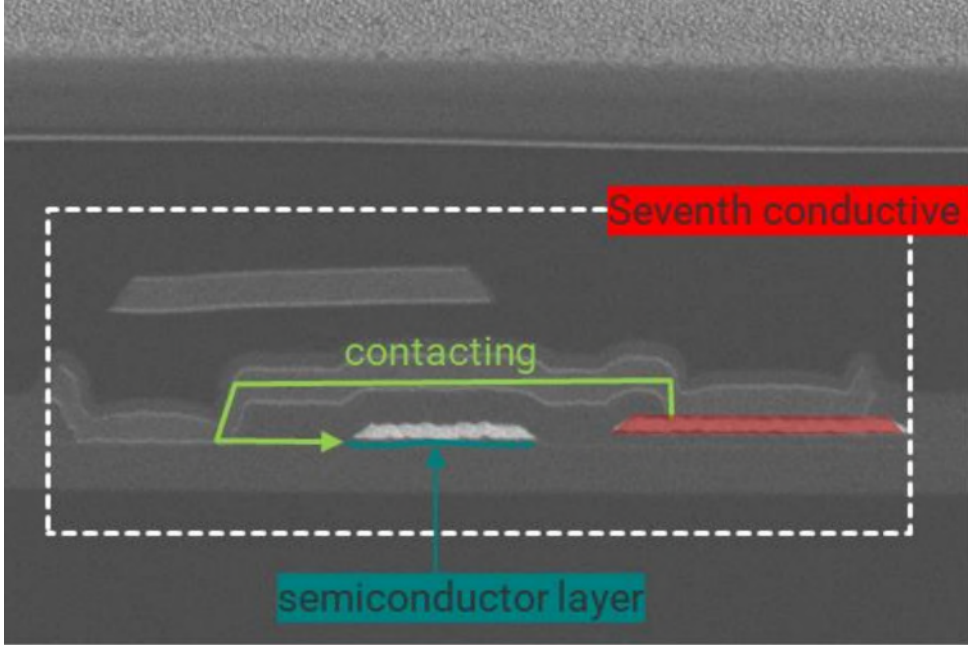
Claim 1	Accused Products
	structure in the Accused Products identified above as the second capacitor contains a pair of conductors separated by a dielectric, which performs substantially the same function (<i>e.g.</i>, storing a charge in conjunction with the claimed first capacitor) in substantially the same way (<i>e.g.</i>, by disposing a dielectric between two conductive layers) to achieve substantially the same result (<i>e.g.</i>, forming a certain storage capacitance within the circuit).
[1d] a transistor in the second area, the transistor including a first semiconductor layer formed on the substrate, the first gate oxide layer over the first semiconductor layer, and a fourth conductive layer over the first gate oxide layer, wherein the fourth conductive layer is formed of the same conductive film as the first conductive layer, and wherein both the first conductive layer and the fourth conductive layer are directly formed on the gate oxide layer; and	Each Accused Product comprises a transistor in the second area, the transistor including a first semiconductor layer formed on the substrate, the first gate oxide layer over the first semiconductor layer, and a fourth conductive layer over the first gate oxide layer, wherein the fourth conductive layer is formed of the same conductive film as the first conductive layer, and wherein both the first conductive layer and the fourth conductive layer are directly formed on the gate oxide layer. For example, the BOE OLED panel in the iPhone 14 contains a transistor in the second area with each of the claimed layers, as shown below. The fourth conductive layer and the first conductive layer are formed of the same conductive film. <i>See, e.g.:</i>

Claim 1	Accused Products
	transistor fourth conductive layer first gate oxide layer first semiconductor layer substrate  Annotated SEM cross-section of BOE OLED panel in iPhone 14, showing a portion of the second area and transistor formed of layers as claimed.

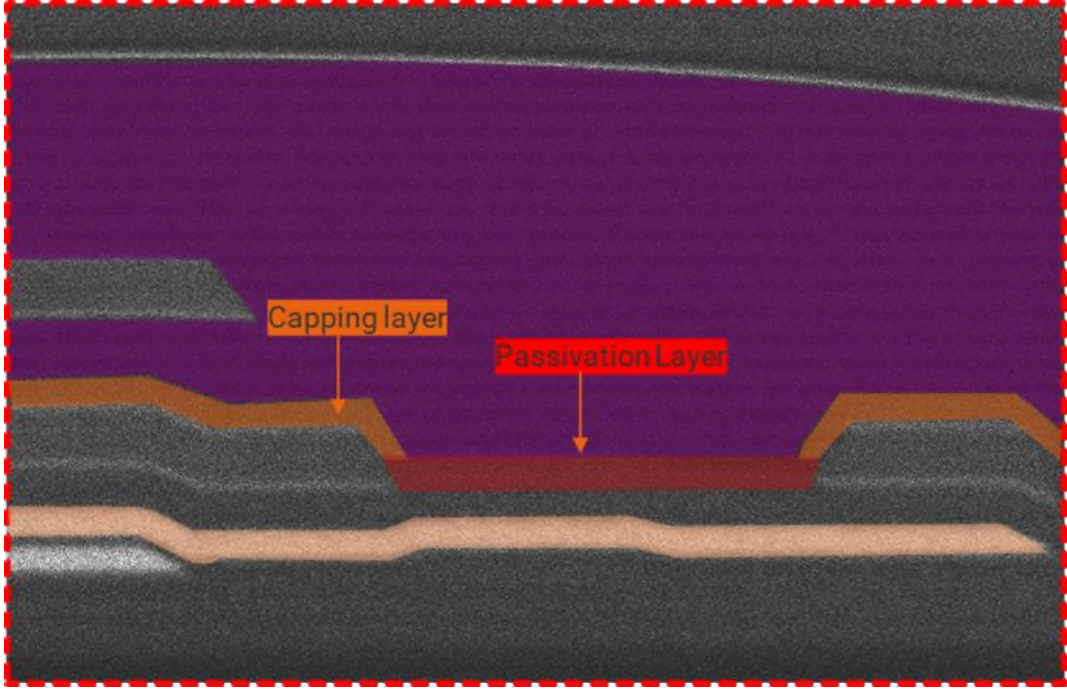
Claim 1	Accused Products
	 Annotated SEM cross-section of BOE OLED panel in iPhone 14, showing a portion of the second area and transistor formed of layers as claimed.
[1e] a light emitting device in the third area, the light emitting device including a fifth conductive layer, a first organic layer over the fifth conductive layer, and a sixth conductive layer over the first organic layer, wherein the sixth conductive layer is formed of the same conductive	Each Accused Product comprises a light emitting device in the third area, the light emitting device including a fifth conductive layer, a first organic layer over the fifth conductive layer, and a sixth conductive layer over the first organic layer, wherein the sixth conductive layer is formed of the same conductive film as the third conductive layer. For example, the BOE OLED panel in the iPhone 14 contains an OLED device in the third area, including the conductive and organic layers as claimed. The fifth conductive layer corresponds to the OLED anode, and the sixth conductive layer corresponds to the OLED cathode. The third conductive layer is an interconnect between cathodes, formed of the same conductive film.

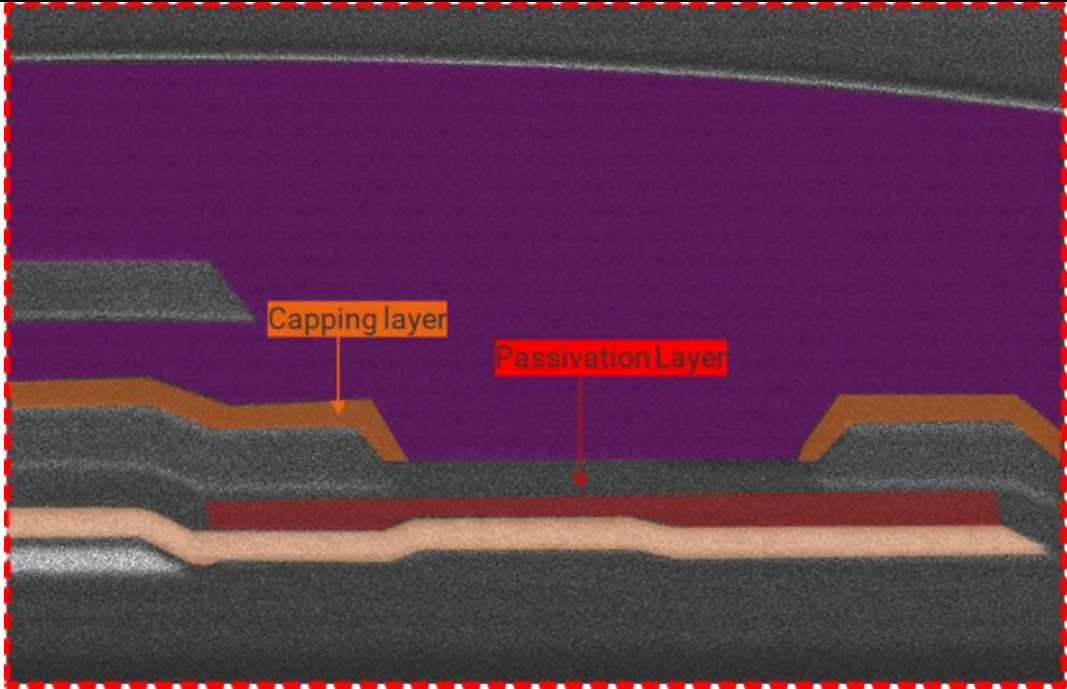
Claim 1	Accused Products
film as the third conductive layer.	See, e.g.:  Annotated SEM cross-section image of OLED pixel structure of BOE panel in iPhone 14, illustrating layer structure of OLED light emitting device.

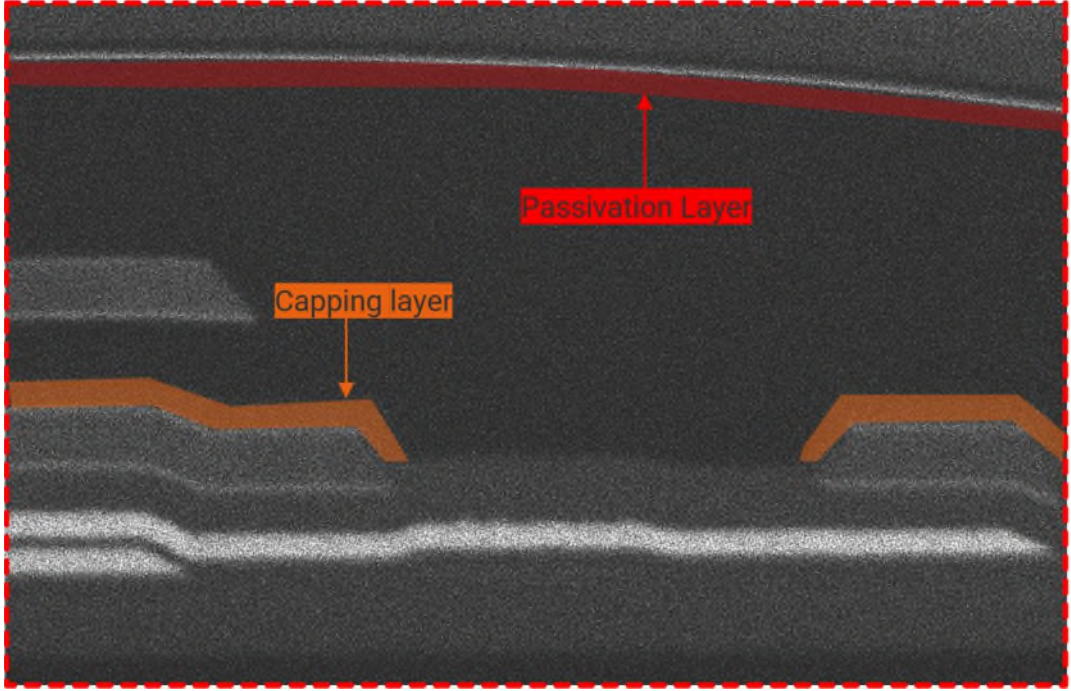
Claim 2

Claim 2	Accused Products
2. The device of claim 1, each pixel further comprising a seventh conductive layer in the second area for providing contact to the first semiconductor layer.	Each Accused Product comprises the device of claim 1, each pixel further comprising a seventh conductive layer in the second area for providing contact to the first semiconductor layer. <i>See, e.g.:</i>  Annotated SEM cross-section image of second area of OLED pixel structure of BOE panel in iPhone 14, showing seventh conductive layer and contact path to the semiconductor layer.

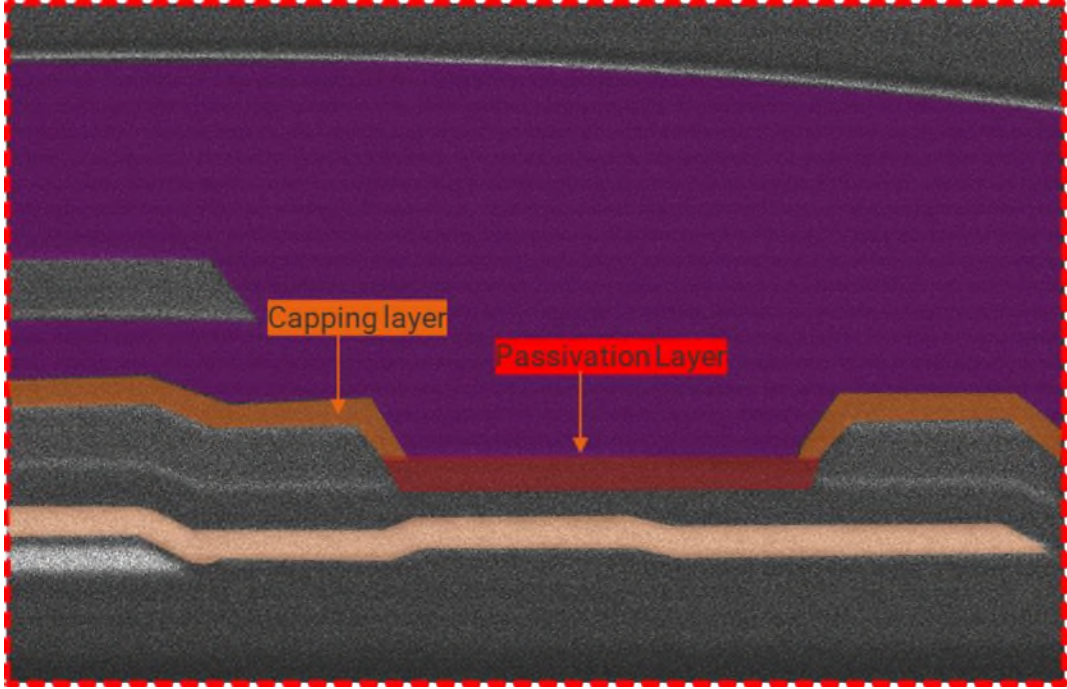
Claim 3

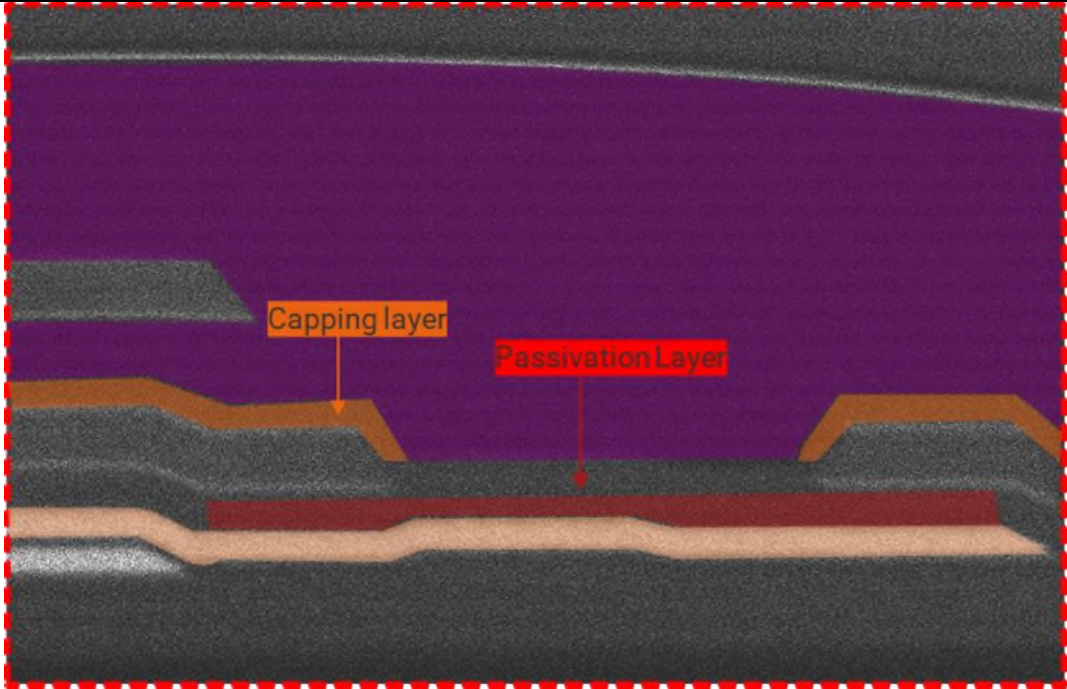
Claim 3	Accused Products
3. The device of claim 1, wherein the second dielectric layer comprises a passivation layer and a capping layer.	Each Accused Product comprises the device of claim 1, wherein the second dielectric layer comprises a passivation layer and a capping layer. <i>See, e.g.:</i>  Annotated SEM cross-section image of first area of OLED pixel structure of BOE panel in iPhone 14, showing exemplary capping layer and passivation layer.

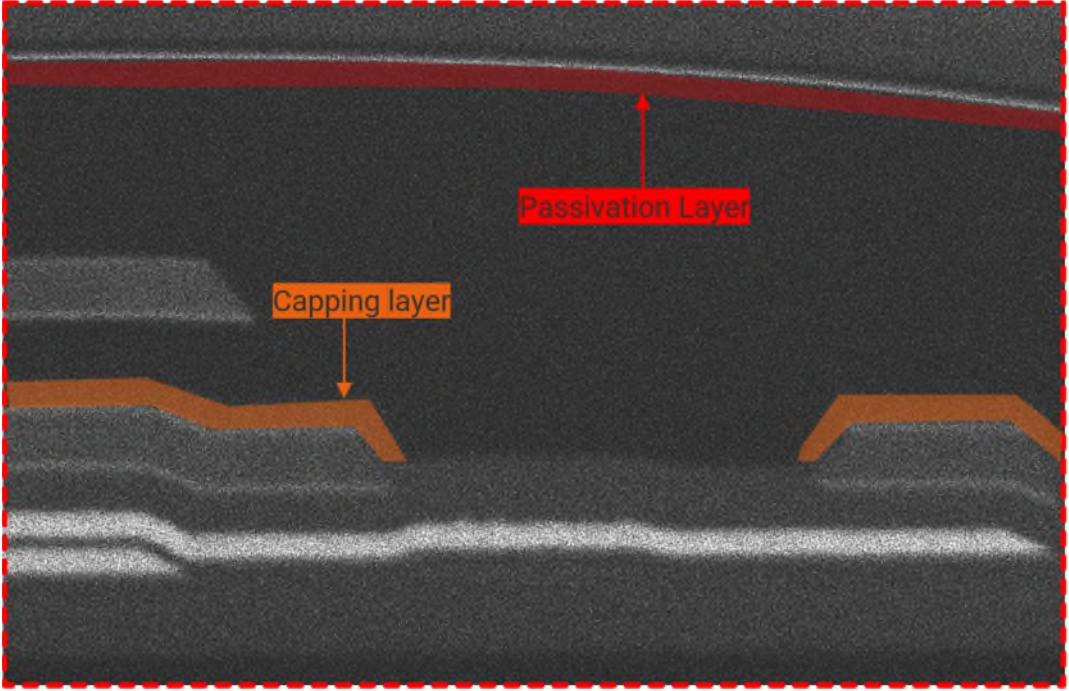
Claim 3	Accused Products
	 Annotated SEM cross-section image of first area of OLED pixel structure of BOE panel in iPhone 14, showing alternative exemplary capping layer and passivation layer.

Claim 3	Accused Products
	 Annotated SEM cross-section image of first area of OLED pixel structure of BOE panel in iPhone 14, showing another alternative exemplary capping layer and passivation layer.

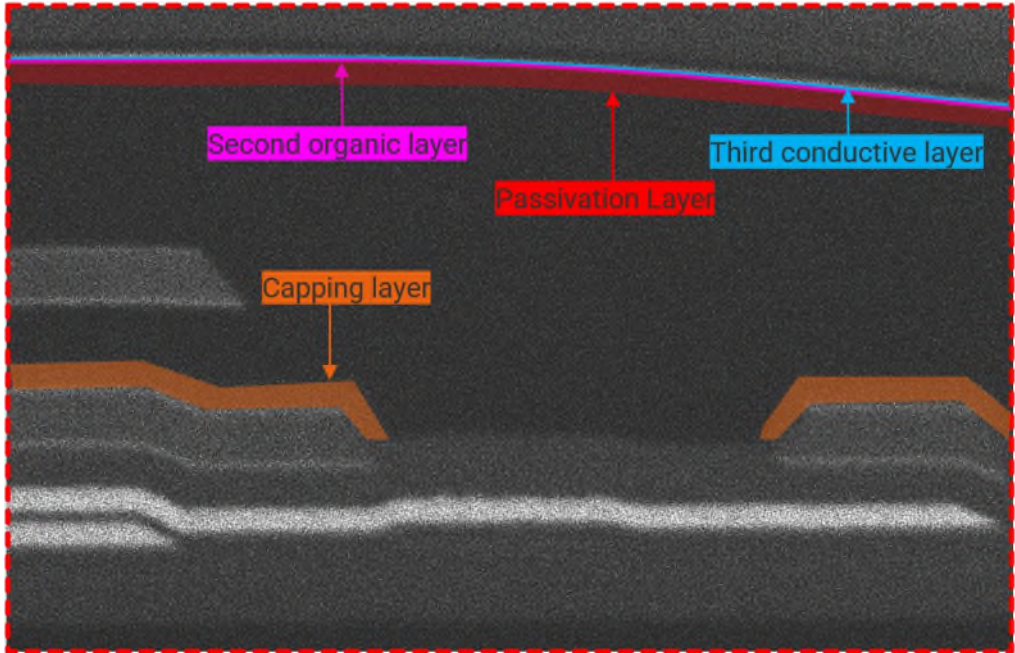
Claim 4

Claim 4	Accused Products
4. The device of claim 3, wherein at least one of the passivation layer and the capping layer comprises silicon nitride.	Each Accused Product comprises the device of claim 3, wherein at least one of the passivation layer and the capping layer comprises silicon nitride. <i>See, e.g.:</i>  Annotated SEM cross-section image of first area of OLED pixel structure of BOE panel in iPhone 14, showing exemplary capping layer and passivation layer. According to EDX measurements, both of these layers appear to be formed of silicon nitride.

Claim 4	Accused Products
	 Annotated SEM cross-section image of first area of OLED pixel structure of BOE panel in iPhone 14, showing alternative exemplary capping layer and passivation layer. According to EDX measurements, the capping layer shown appears to be formed of silicon nitride.

Claim 4	Accused Products
	 Annotated SEM cross-section image of first area of OLED pixel structure of BOE panel in iPhone 14, showing exemplary capping layer and passivation layer. According to EDX measurements, both of these layers appear to be formed of silicon nitride.

Claim 6

Claim 6	Accused Products
6. The device of claim 1, wherein the second dielectric layer comprises a layer of passivation silicon nitride and a second organic layer formed on the layer of passivation silicon nitride, the second organic layer comprising the same material as the first organic layer.	Each Accused Product comprises the device of claim 1, wherein the second dielectric layer comprises a layer of passivation silicon nitride and a second organic layer formed on the layer of passivation silicon nitride, the second organic layer comprising the same material as the first organic layer. See, e.g.:  Annotated SEM cross-section image of first area of OLED pixel structure of BOE panel in iPhone 14, showing exemplary passivation layer and second organic layer formed on the passivation layer.