

U.S. Patent No. 9,263,509 (“’509 Patent”)

Accused Products

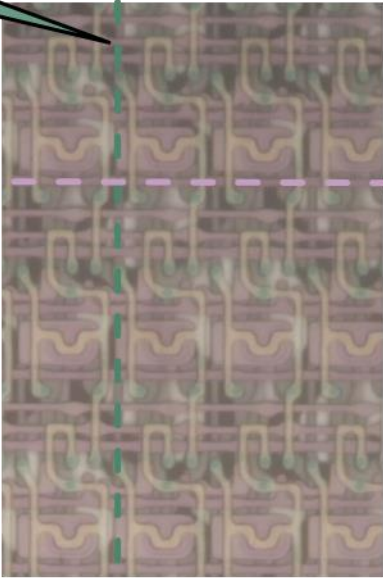
BOE products, including without limitation the BOE OLED panel supplied to Apple and included in the iPhone 13, the BOE OLED panel supplied to Apple and included in the iPhone 14, the BOE OLED panel supplied to Apple and included in the iPhone 14 Plus, the BOE OLED panel supplied to Apple and included 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.

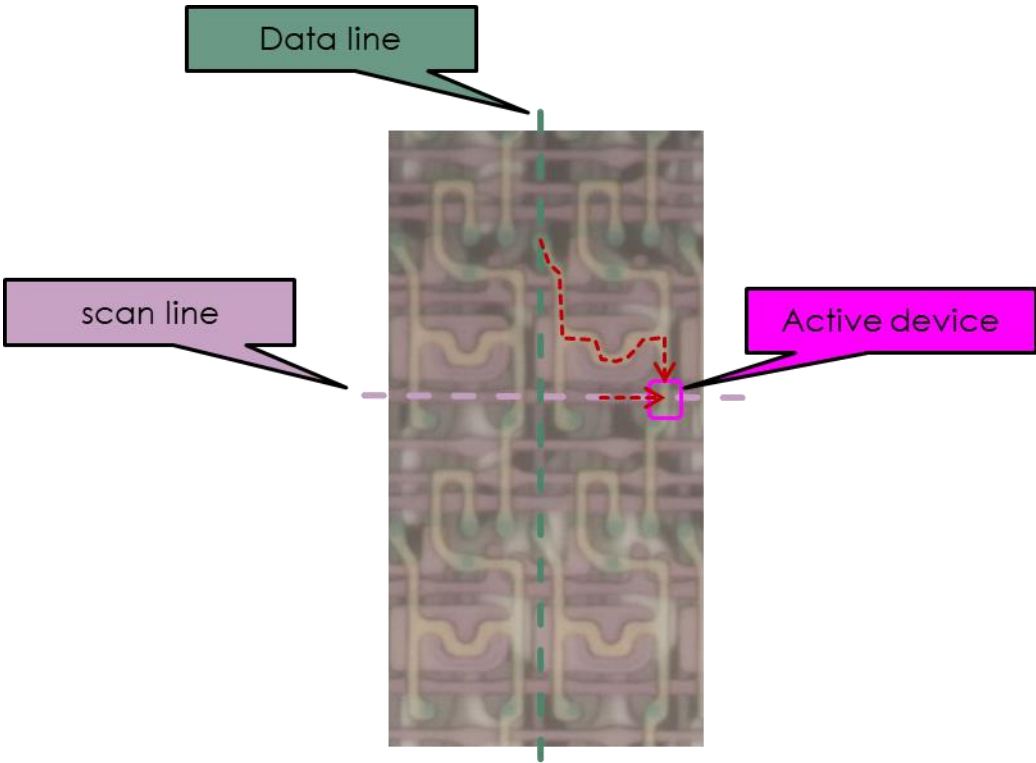
Each Accused Product infringes the claims in substantially the same way, and the evidence shown in this chart is similarly applicable to each Accused Product. Each claim limitation is literally infringed by each Accused Product. However, to the extent any claim limitation is not met literally, it is 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

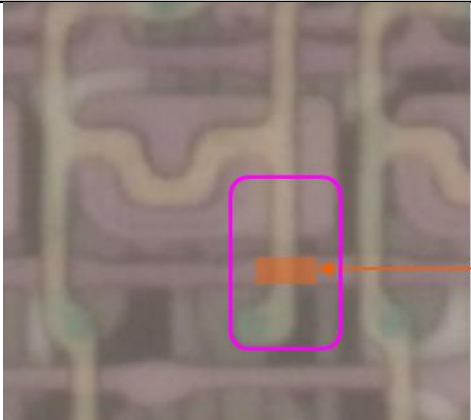
Claim 1

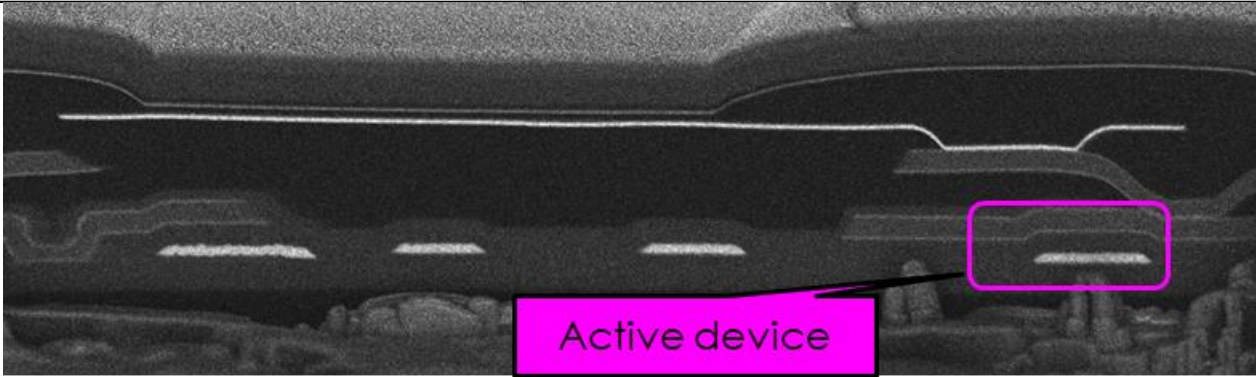
Claim 1	Accused Products
[1pre] A pixel structure, comprising:	To the extent the preamble is limiting, each Accused Product comprises a pixel structure. <i>See, e.g.:</i>

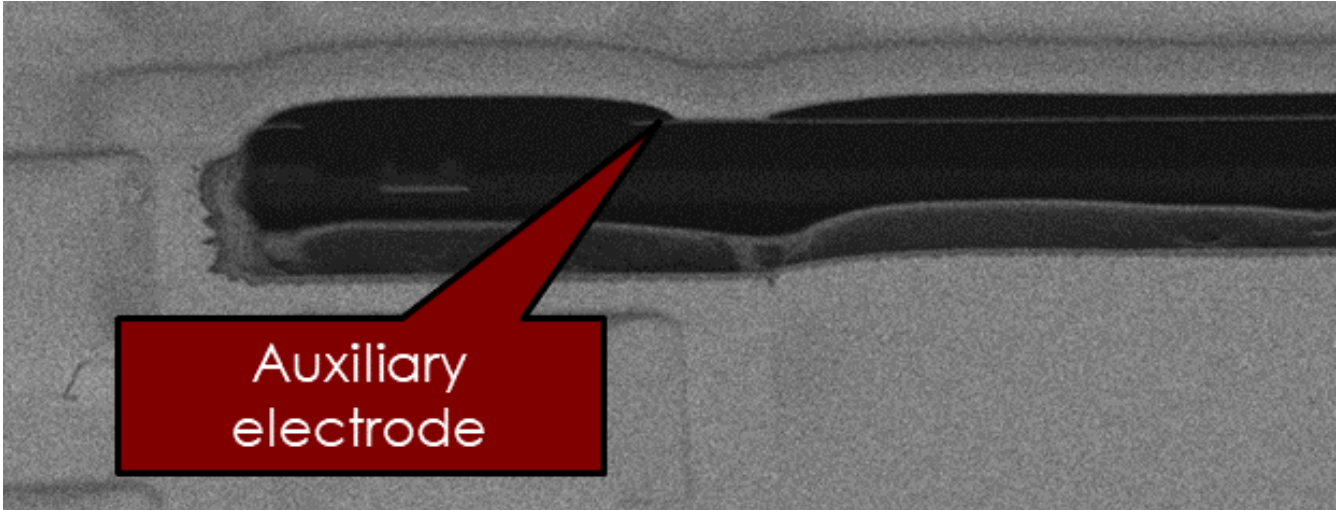
Claim 1	Accused Products
	Publicity photo of iPhone 14 containing BOE OLED panel. Optical image of OLED pixel structure, viewed from polysilicon side with poly-imide substrate removed, of BOE panel in iPhone 14. <i>See also</i> individual limitations below.

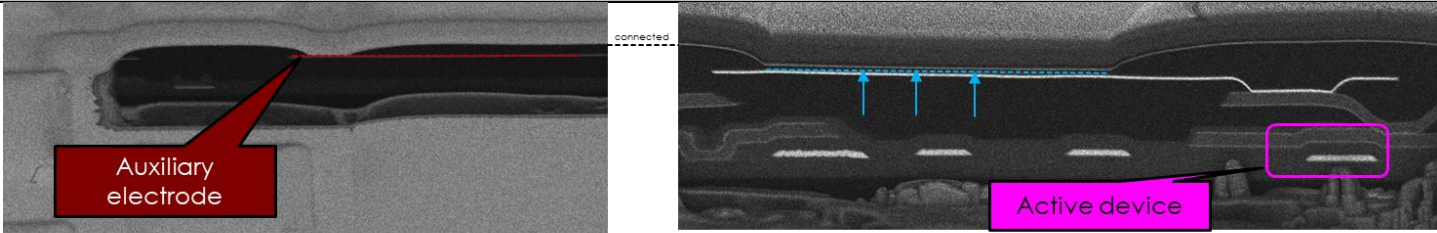
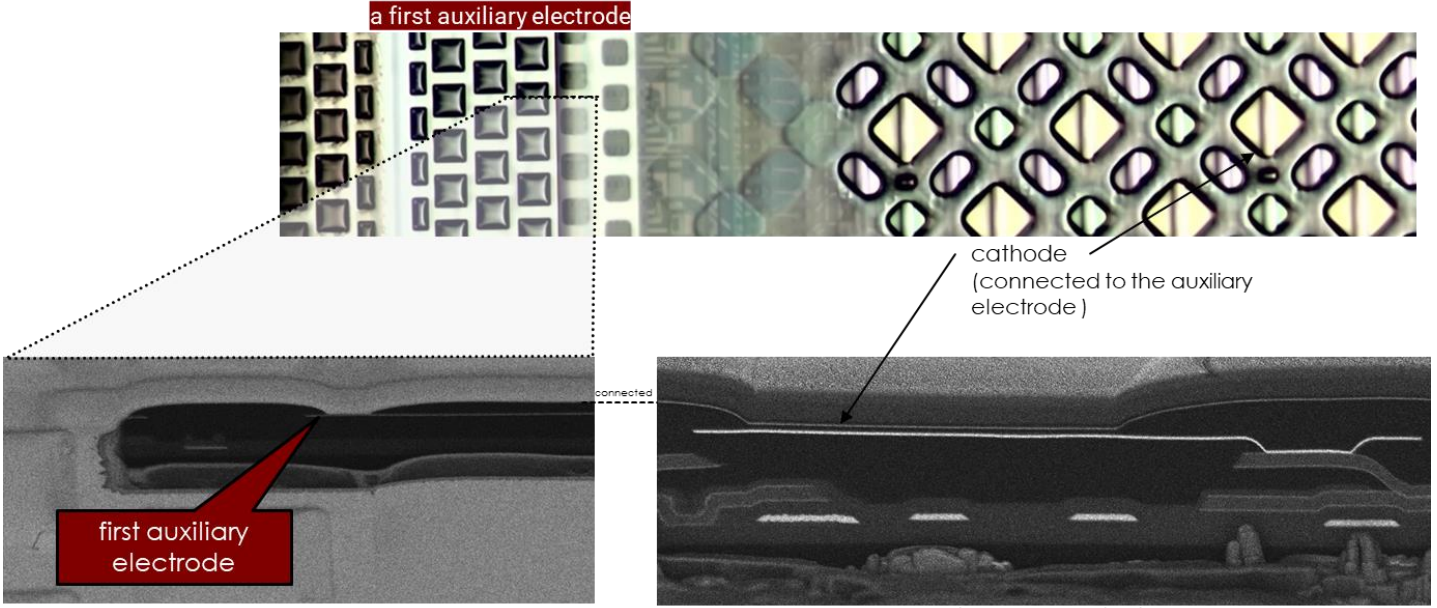
Claim 1	Accused Products
[1a] a data line and a scan line;	Each Accused Product comprises a data line and a scan line. For example, the BOE OLED panel in the iPhone 14 contains a matrix of pixels connected by data and scan lines. See, e.g.:  The image shows a grid of pixel structures. A green dashed line is labeled 'Data line' and a purple dashed line is labeled 'Scan line'. Annotated optical image of OLED pixel structure, viewed from polysilicon side with poly-imide substrate removed, of BOE panel in iPhone 14, showing data and scan lines.

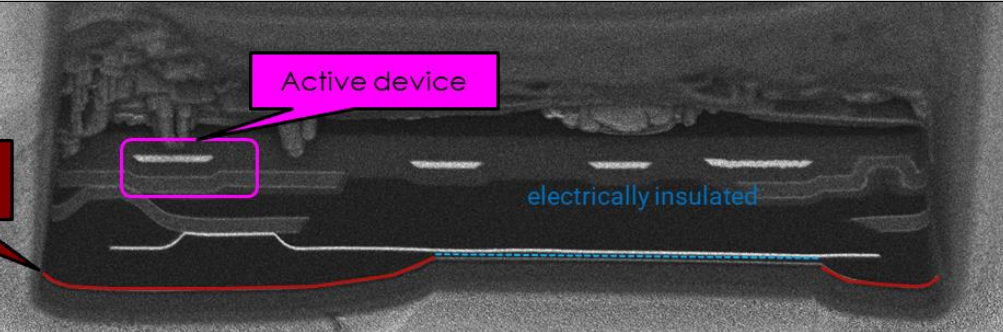
Claim 1	Accused Products
[1b] at least one active device electrically connected with the data line and the scan line, and each active device comprising a gate, a channel layer, a source, and a drain;	Each Accused Product comprises at least one active device electrically connected with the data line and the scan line, and each active device comprising a gate, a channel layer, a source, and a drain. For example, the BOE OLED panel in the iPhone 14 contains a transistor connected to the data and scan lines as shown below. See, e.g.:  Annotated optical image of OLED pixel structure, viewed from polysilicon side with poly-imide substrate removed, of BOE panel in iPhone 14, showing active device.

Claim 1	Accused Products
	 This is an optical micrograph of an OLED pixel structure. A central rectangular region is highlighted with a magenta border. Within this region, a small, dark, rectangular feature is pointed to by an orange arrow labeled 'Gate'. Annotated optical image of OLED pixel structure, viewed from polysilicon side with poly-imide substrate removed, of BOE panel in iPhone 14, showing gate of active device.  This is an optical micrograph of an OLED pixel structure. A central rectangular region is highlighted with a magenta border. Within this region, three distinct features are pointed to by arrows: a light blue feature labeled 'source', a dark red feature labeled 'channel', and a yellow feature labeled 'drain'. Annotated optical image of OLED pixel structure, viewed from polysilicon side with poly-imide substrate removed, of BOE panel in iPhone 14, showing source, channel, and drain of active device.

Claim 1	Accused Products
	 Active device Annotated SEM cross-section image of OLED pixel structure of BOE panel in iPhone 14, showing active device.

Claim 1	Accused Products
[1c] a first auxiliary electrode electrically insulated from the active device; and	Each Accused Product includes a first auxiliary electrode electrically insulated from the active device. For example, the BOE OLED panel in the iPhone 14 contains a first auxiliary electrode, insulated from the active device, as shown below. <i>See, e.g.:</i>  Annotated SEM cross-section image of OLED pixel structure of BOE panel in iPhone 14, showing first auxiliary electrode in auxiliary area.

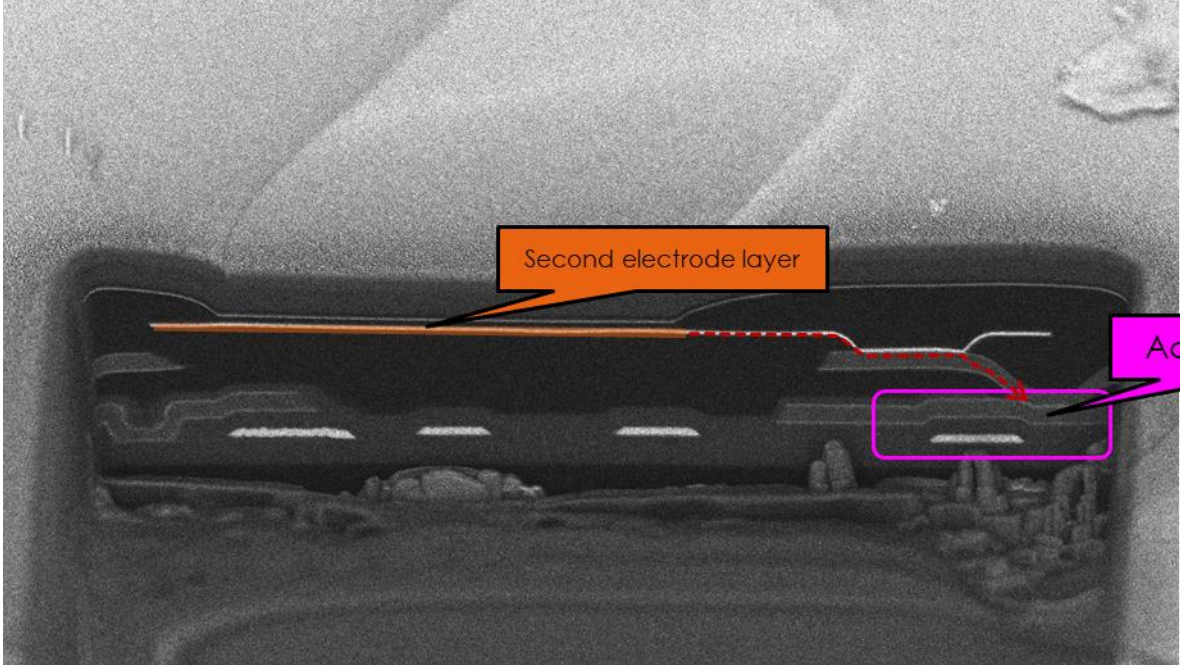
Claim 1	Accused Products
	 Auxiliary area Light emitting area Annotated SEM cross-section image of OLED pixel structure of BOE panel in iPhone 14, showing first auxiliary electrode electrically insulated (gap highlighted in blue) from active device.  Auxiliary area Light emitting area Composite image with plan view at top showing physical context of auxiliary and light emitting areas in BOE panel in iPhone 14.

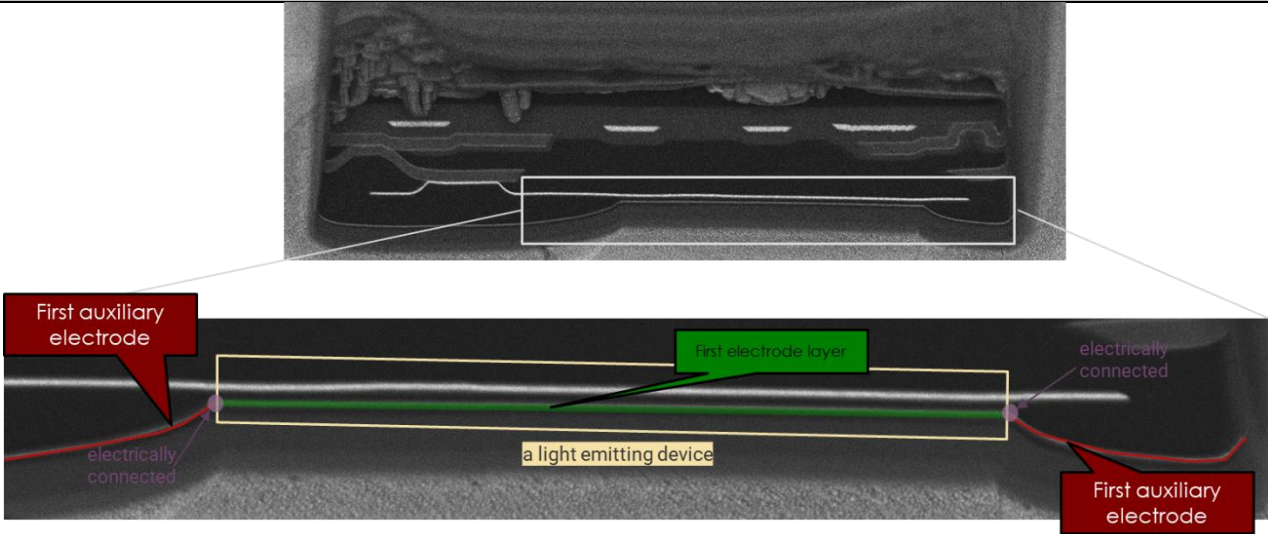
Claim 1	Accused Products
	 Annotated SEM cross-section image of OLED pixel structure of BOE panel in iPhone 14, showing active device and first auxiliary electrode in the alternative.

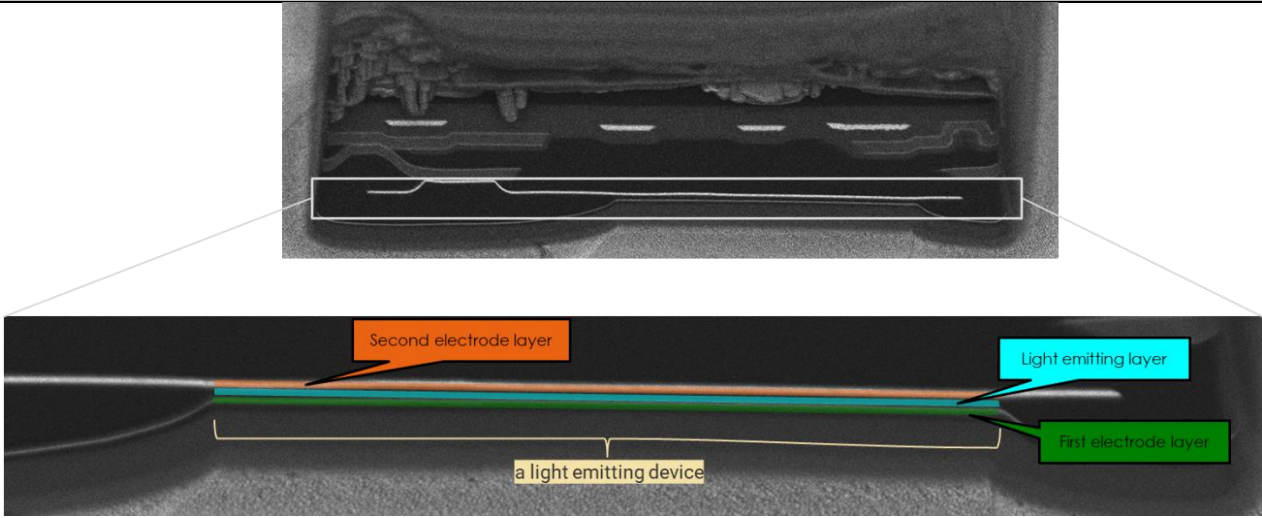
Claim 1	Accused Products
[1d] a light emitting device disposed above the first auxiliary electrode, wherein the light emitting device comprises:	Each Accused Product comprises a light emitting device disposed above the first auxiliary electrode. For example, the BOE OLED panel in the iPhone 14 contains light emitting device disposed above the first auxiliary electrode, as shown below. See, e.g.: The figure consists of two SEM cross-section images of an OLED panel. The left image is labeled 'Auxiliary area' and shows a cross-section with a distance D1 = 4191.44 nm from the substrate to the auxiliary electrode. The right image is labeled 'Light emitting area' and shows a cross-section with distances D1 = 4572.69 nm and D2 = 4328.37 nm from the substrate to the light emitting device. Labels include 'Auxiliary area', 'Light emitting area', 'cathode', 'anode', and 'Auxiliary electrode'. Annotated SEM cross-section images (with plan view above for context) of OLED auxiliary area and light emitting area of BOE panel in iPhone 14, showing distances from the substrate and illustrating that the light emitting device is further from the substrate than the auxiliary electrode.

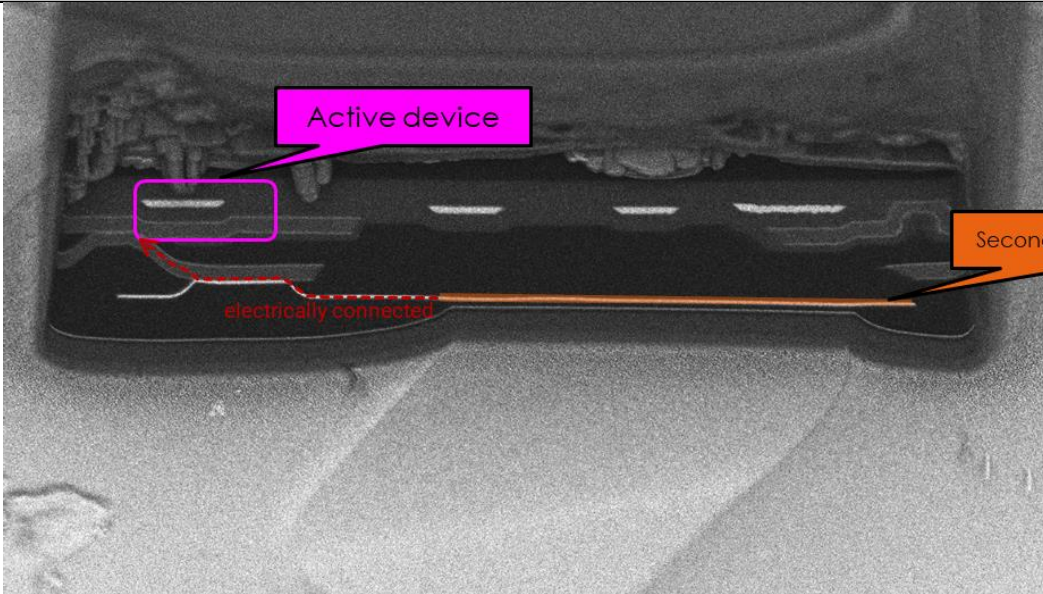
Claim 1	Accused Products
	Additional SEM images of auxiliary electrode. Annotated SEM cross-section image of OLED pixel structure of BOE panel in iPhone 14, showing light emitting device above first auxiliary electrode in the alternative.

Claim 1	Accused Products
[1e] a first electrode layer electrically connected with the first auxiliary electrode; [1f] a light emitting layer disposed on the first electrode layer; and [1g] a second electrode layer disposed on the light emitting layer, wherein the second electrode layer is electrically connected with the active device.	Each Accused Product comprises a light emitting device comprising a first electrode layer electrically connected with the first auxiliary electrode, a light emitting layer disposed on the first electrode layer, and a second electrode layer disposed on the light emitting layer, wherein the second electrode layer is electrically connected with the active device. For example, the BOE OLED panel in the iPhone 14 contains light emitting devices formed of a light emitting layer between first and second electrode layers, where the second electrode layer is electrically connected with the active device, as shown below. See, e.g.: Annotated SEM cross-section images of OLED auxiliary area and light emitting area of BOE panel in iPhone 14, showing auxiliary electrode electrically connected to first electrode layer. Annotated SEM cross-section image of OLED pixel structure of BOE panel in iPhone 14, showing layer structure of light emitting device.

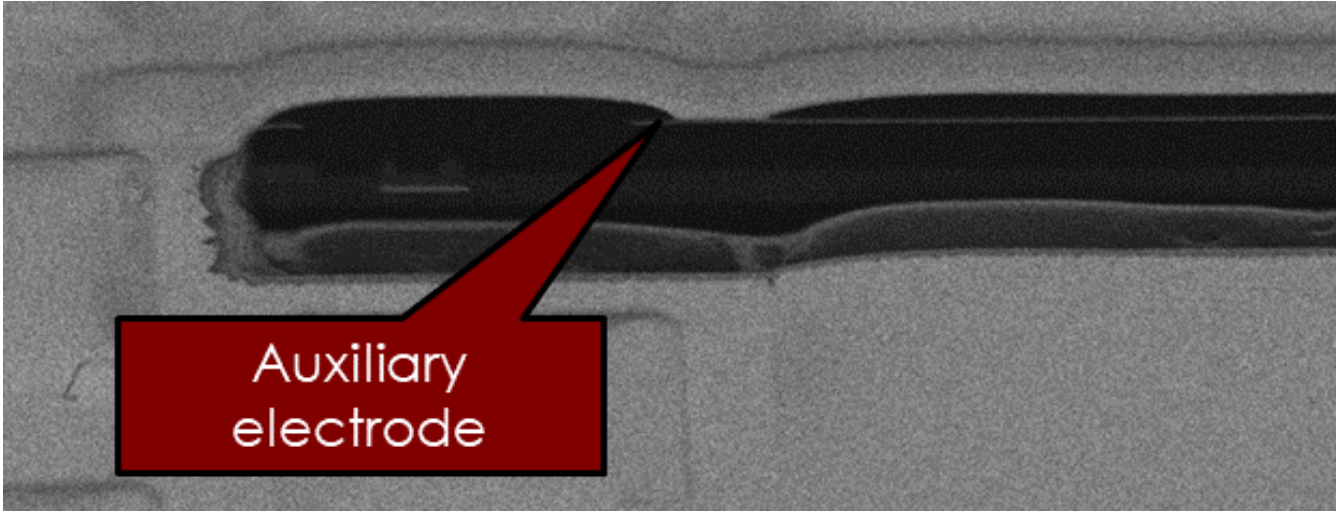
Claim 1	Accused Products
	 Annotated SEM cross-section image of OLED pixel structure of BOE panel in iPhone 14, showing connection between second electrode layer of light emitting device and active device.

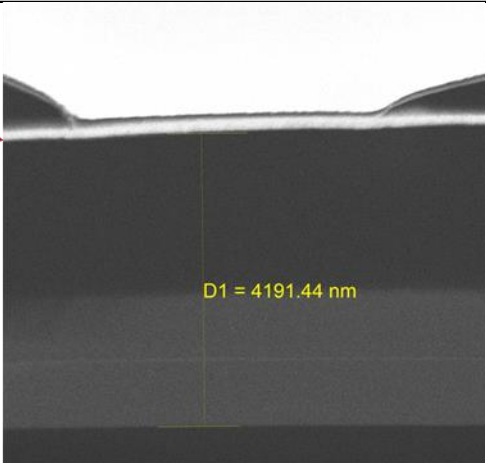
Claim 1	Accused Products
	 Annotated SEM cross-section image of OLED pixel structure of BOE panel in iPhone 14, showing layer structure of light emitting device and electrical connection to first auxiliary electrode in the alternative.

Claim 1	Accused Products
	 Annotated SEM cross-section image of OLED pixel structure of BOE panel in iPhone 14, showing layer structure of light emitting device in the alternative.

Claim 1	Accused Products
	 Annotated SEM cross-section image of OLED pixel structure of BOE panel in iPhone 14, showing connection between second electrode layer of light emitting device and active device in the alternative.

Claim 5

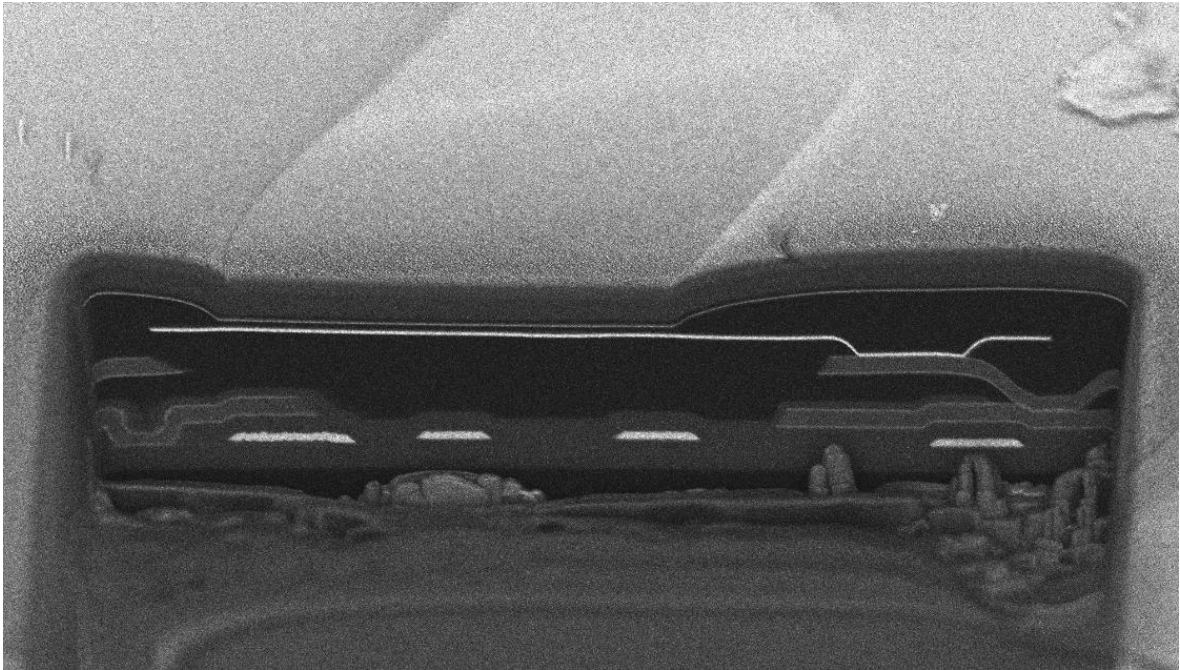
Claim 5	Accused Products
5. The pixel structure according to claim 1, wherein the first auxiliary electrode is a single electrode layer.	Each Accused Product comprises the pixel structure according to claim 1, wherein the first auxiliary electrode is a single electrode layer. <i>See, e.g.:</i>  Annotated SEM cross-section image of OLED pixel structure of BOE panel in iPhone 14, showing single-layer first auxiliary electrode in auxiliary area.

Claim 5	Accused Products
	Auxiliary electrode  D1 = 4191.44 nm Annotated SEM cross-section image of OLED pixel structure of BOE panel in iPhone 14, showing single-layer first auxiliary electrode in auxiliary area.

Claim 10

Claim 10	Accused Products
10. The pixel structure according to claim 1, further comprising a second auxiliary electrode electrically insulated from the active device and disposed at a side of the light emitting device, wherein the second auxiliary electrode is electrically connected with the first electrode layer of the light emitting device.	Each Accused Product comprises the pixel structure according to claim 1, further comprising a second auxiliary electrode electrically insulated from the active device and disposed at a side of the light emitting device, wherein the second auxiliary electrode is electrically connected with the first electrode layer of the light emitting device. For example, each Accused Product includes cathode power lines surrounding the panel, disposed at a side of the light emitting device, and connected to the cathode (first electrode layer).

Claim 12

Claim 12	Accused Products
12. The pixel structure according to claim 1, wherein the light emitting device is a top-emission organic electroluminescent device.	Each Accused Product comprises the pixel structure according to claim 1, wherein the light emitting device is a top-emission organic electroluminescent device. For example, each Accused Product emits light through the cathode towards the viewer without an intermediate TFT and/or electrode. <i>See, e.g.:</i>  Cross-section of exemplary OLED pixel; front of display is up, with light emitted away from the substrate.