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8 *VisionX Technologies, LLC*

9 **UNITED STATES DISTRICT COURT**
10 **CENTRAL DISTRICT OF CALIFORNIA**
11 **SOUTHERN DIVISION**

12 VISIONX TECHNOLOGIES, LLC, a
13 Texas limited liability company,

14 Plaintiff,

15 v.

16 OMNIVISION TECHNOLOGIES
17 INC., a Delaware corporation,

18 Defendant.

Case No. 8:23-cv-2068

**PLAINTIFF VISIONX
TECHNOLOGIES, LLC'S
ORIGINAL COMPLAINT FOR
PATENT INFRINGEMENT**

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1 Plaintiff VisionX Technologies, LLC (“VisionX” or “Plaintiff”) hereby
2 submits this Complaint for patent infringement against Defendant OmniVision
3 Technologies Inc. (“Defendant” or “OmniVision”) and states as follows:

4 **I. THE PARTIES**

5 1. VisionX is a Limited Liability Company organized under the laws of
6 the state of Texas with its principal place of business at 30025 Alicia Pkwy #7042,
7 Laguna Niguel, CA 92677, U.S.A.

8 2. On information and belief, Defendant OmniVision is a corporation
9 organized under the laws of Delaware. Defendant OmniVision has multiple offices
10 worldwide, including offices within the state of California at 150 Progress, Suite
11 250, Irvine, CA 92618 and 4275 Burton Drive, Santa Clara, California, 95054.¹
12 OmniVision is a wholly-owned subsidiary of Chinese semiconductor device and
13 mixed-signal integrated circuit design house, Will Semiconductor.²

14 **II. JURISDICTION AND VENUE**

15 3. This Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and
16 1338(a) because this action arises under the patent laws of the United States, 35
17 U.S.C. § 1 *et seq.*, including 35 U.S.C. § 271.

18 4. This Court has personal jurisdiction over Defendant at least because
19 Defendant conducts business and has committed acts of patent infringement and/or
20 have induced acts of patent infringement by others in this judicial district, the State
21 of California, and elsewhere in the United States. As described in further detail
22 below, on information and belief, Defendant induces others to make, use, offer for
23 sale, sell, or import various image sensor chips or products containing image sensor
24 chips that infringe one or more of VisionX’s patents. On information and belief,
25 these Infringing Products (the ’808 Patent Infringing Products (defined below), the
26

27 ¹ <https://www.ovt.com/company/contact-us/>

28 ² See <https://www.eenewseurope.com/en/omnivision-bought-quietly-by-chinas-will-semiconductor/>

1 '143 Patent Infringing Products (defined below), and the '366 Patent Infringing
2 Products (defined below) are collectively referred to herein as the “Infringing
3 Products”) have been offered for sale, sold, used, and imported in the United States,
4 within the State of California and within this judicial district.

5 5. This court also has personal jurisdiction over Defendant because
6 Defendant placed the Infringing Products into the stream of commerce, with the
7 expectation that they will be purchased and used by customers in the United States,
8 in the State of California and in this judicial district. On information and belief,
9 customers in the State of California and in this judicial district have purchased and
10 used and continue to purchase and use the Infringing Products. Accordingly,
11 Defendant’s conduct and connections with the State of California are such that
12 Defendant should reasonably have anticipated being brought into court here.

13 6. Venue is proper in this District as to Defendant pursuant to 28 U.S.C.
14 §§ 1391(b), 1391(c) and 1400(b) because, among other things, Defendant is subject
15 to this Court’s personal jurisdiction and because, Defendant has offices in this
16 District where a substantial portion of the infringing activities occurred, including at
17 offices at 150 Progress, Suite 250, Irvine, CA 92618.

18 **III. BACKGROUND**

19 7. An image sensor is a semiconductor device within a camera that
20 converts an optical image into an electrical signal. Due to the ubiquity of cameras in
21 cell phones, computers, laptops, tablets, cars, drones, standalone cameras,
22 surveillance cameras, and other devices, there is an enormous demand for image
23 sensors and improvements to image sensor manufacturing technologies.

24 8. Defendant’s image sensors are used in numerous electronic devices,
25 particularly smartphones, where it is utilized in the on-phone camera or cameras. In
26 addition to smartphones, Defendant’s image sensors are used in other industries,
27 including the automotive industry, virtual reality (VR) and augmented reality (AR)
28 headsets and eye glasses, medical imaging (e.g., endoscopes and catheters), optical

1 inspection systems, and other machine vision applications.

2 9. On January 11, 2011, the United States Patent and Trademark Office
3 (“USPTO”) duly and legally issued United States Patent No. 7,867,808 (“the ’808
4 Patent”), titled “Image Sensor and Method for Manufacturing the Same.” The ’808
5 Patent is valid and enforceable.

6 10. On October 11, 2011, the USPTO duly and legally issued United States
7 Patent No. 8,035,143 (“the ’143 Patent”), titled “Semiconductor Device and Method
8 for Manufacturing the Same.” The ‘143 Patent is valid and enforceable.

9 11. On January 11, 2011, the USPTO duly and legally issued United States
10 Patent No. 7,868,366 (“the ’366 Patent”), titled “Image Sensor and Method for
11 Manufacturing the Same.” The ’366 Patent is valid and enforceable.

12 12. The ’808 Patent, the ’143 Patent, and the ’366 Patent (collectively, the
13 “Asserted Patents”) were originally issued to Dongbu HiTek Co., Ltd. (“DB
14 HiTek”). DB HiTek, ranks as one of the top ten foundries in the semiconductor
15 industry.³ DB HiTek entered the semiconductor industry in 1983, when it began
16 supplying silicon wafers to integrated circuit manufacturers.⁴ In 1997, it established
17 the first foundry in South Korea, and since then it has led South Korea’s
18 semiconductor industry with state-of-the-art wafer fabrication capabilities and
19 significant investments in technological development and innovation.⁵

20 13. VisionX is the sole and exclusive owner of all rights, title, and interest
21 in the Asserted Patents, including the sole and exclusive right to prosecute this
22 action, to enforce the Asserted Patents against infringers, to collect damages for
23 past, present and future infringement of the Asserted Patents, and to seek injunctive
24 relief as appropriate under the law, and VisionX has at all times relevant complied
25

26 ³ See [https://dbhitek.com/eng/data/introduction/CSR%20Report%202020-
27 2021%20\(ENG\)_20210812.pdf](https://dbhitek.com/eng/data/introduction/CSR%20Report%202020-2021%20(ENG)_20210812.pdf) (last visited May 4, 2022).

28 ⁴ *Id.*

⁵ *Id.*

1 with the marking provisions of 35 U.S.C. Sec. 287 with respect to the Asserted
2 Patents. Accordingly, Defendant's infringement, as described below, has injured,
3 and continues to injure VisionX.

4 **IV. COUNT I: INFRINGEMENT OF '808 PATENT**

5 14. VisionX incorporates each of the allegations of the foregoing
6 paragraphs.

7 15. Defendant has directly infringed and continues to directly infringe the
8 '808 Patent by, for example, making, using, offering to sell, selling, and/or
9 importing into the United States, without authority, products that infringe one or
10 more claims of the '808 Patent.

11 16. Defendant is not licensed or otherwise authorized to make, use, offer
12 for sale, sell or import any products that embody the inventions of the '808 Patent in
13 the United States.

14 17. Defendant has and continues to directly infringe one or more claims of
15 the '808 Patent, including, for example, claim 1 of the '808 Patent, either literally or
16 under the doctrine of equivalents, by making, using, offering to sell, selling, and/or
17 importing into the United States infringing image sensors without authority and in
18 violation of 35 U.S.C. § 271.

19 18. With respect to the '808 Patent, Defendant's infringing Image Sensor
20 products include OmniVision's PureCel-S and PureCel Plus-S products, including –
21 for example – the following OmniVision products:

- 22 • OmniVision OS12D40
- 23 • OmniVision OV50A
- 24 • OmniVision OX01F10
- 25 • OmniVision OH01A10
- 26 • OmniVision OV48B
- 27 • OmniVision OV48C
- 28 • OmniVision OS02C10

- 1 • OmniVision OV23850
- 2 • OmniVision OV24A1Q
- 3 • OmniVision OV60A
- 4 • OmniVision OV64B
- 5 • OmniVision 0X08A

6 19. Defendant’s infringing products further include any other OmniVision
7 chips in various camera modules that may or may not have OmniVision part
8 numbers, but are made by OmniVision with a similar structure as the above
9 OmniVision Image Sensors.

10 20. The infringing Image Sensor products identified above are collectively
11 referred to as the “’808 Patent Infringing Products.”

12 21. For example, the OmniVision OV60A Image Sensor infringes
13 representative claim 1 of the ’808 Patent.

14 22. Claim 1 of the ’808 Patent claims a method, comprising: providing a
15 first substrate; forming circuitry including a metal interconnection over the first
16 substrate; forming a photodiode in a crystalline semiconductor layer of a second
17 substrate; forming an ion implantation isolation layer in the photodiode; bonding the
18 first substrate to the second substrate to connect the photodiode to the metal
19 interconnection; and removing a lower portion of the second substrate to expose the
20 photodiode, wherein forming the photodiode comprises: forming a second
21 conduction type conduction layer in the crystalline semiconductor layer; and
22 forming a first conduction type conduction layer over the second conduction type
23 conduction layer, wherein forming the ion implantation isolation layer in the
24 photodiode comprises forming a second conduction type first ion implantation
25 isolation layer over the first conduction type conduction layer, wherein forming the
26 ion implantation isolation layer in the photodiode comprises forming a second
27 conduction type second ion implantation isolation layer at an interface between
28 pixels of the photodiode.

1 23. The OmniVision OV60A Image Sensor includes stacked image sensor
 2 (CIS) and image signal processor (ISP). CIS and ISP each includes a metal
 3 interconnection. Figure 1 (below) illustrates an exemplary cross-section of the
 4 stacked CIS and ISP.

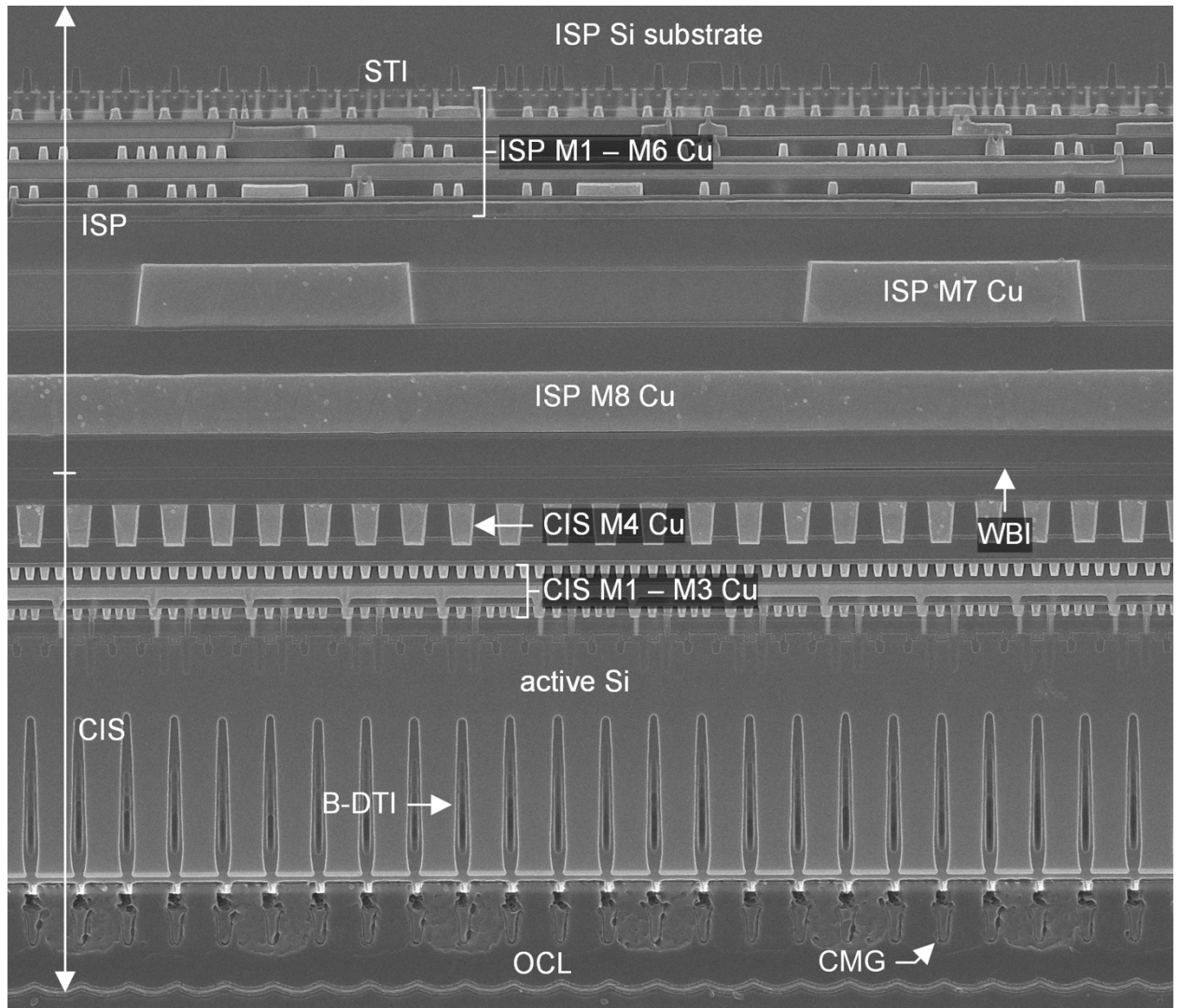


Figure 1

23 24. The CIS includes an array of pixels. Figure 2 (below) illustrates an
 24 exemplary plan view of such pixels. Pixels are highlighted in green.

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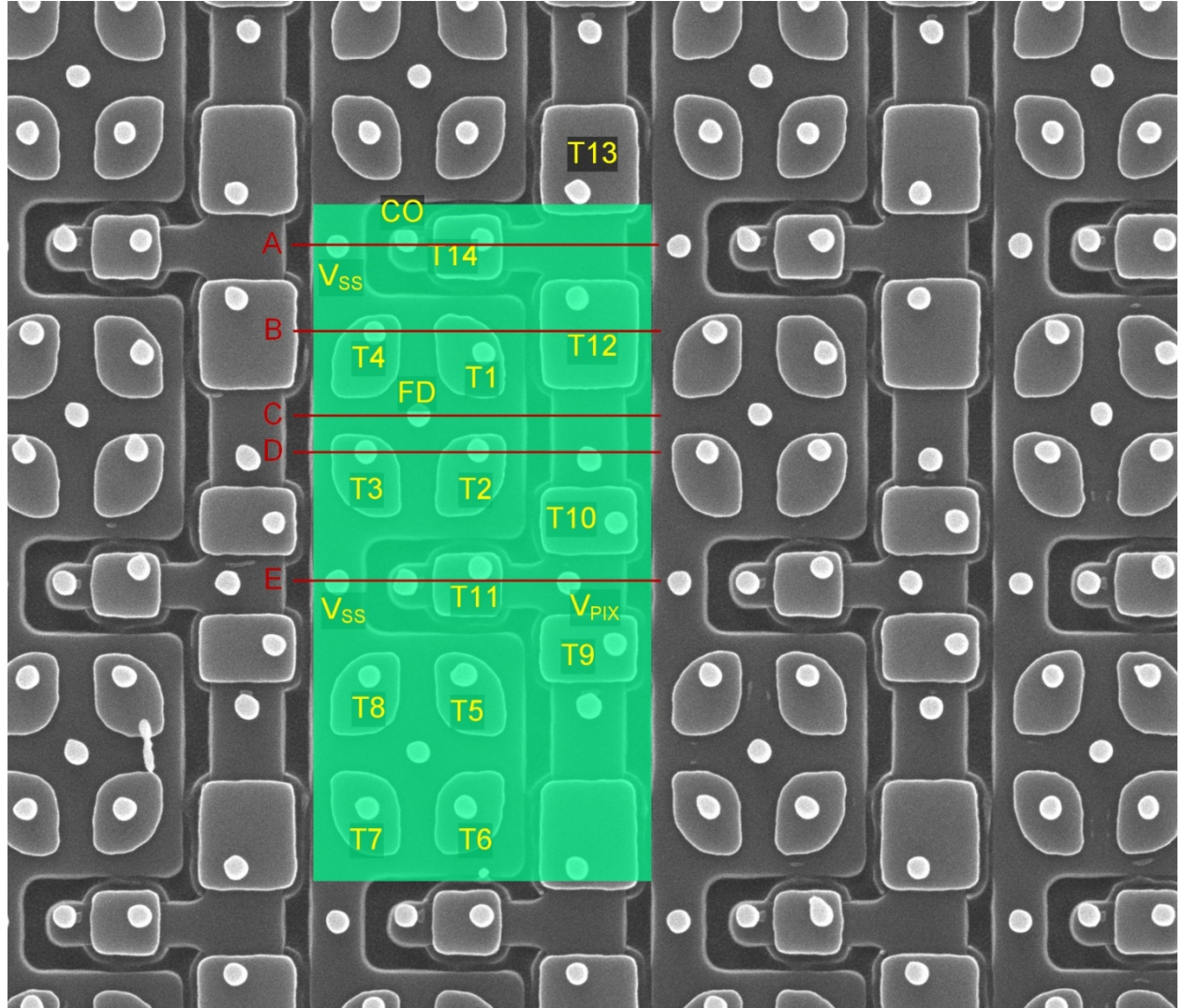


Figure 2

25. Figure 3 (below) illustrates an exemplary scanning capacitance microscope (SCM) cross-section of pixels in the CIS, e.g., a cross-section along line B in Figure 2 (above). As shown in the Figure 3, adjacent pixels are isolated from each other by a combination of P-type isolation layers and back deep trench isolation (B-DTI).

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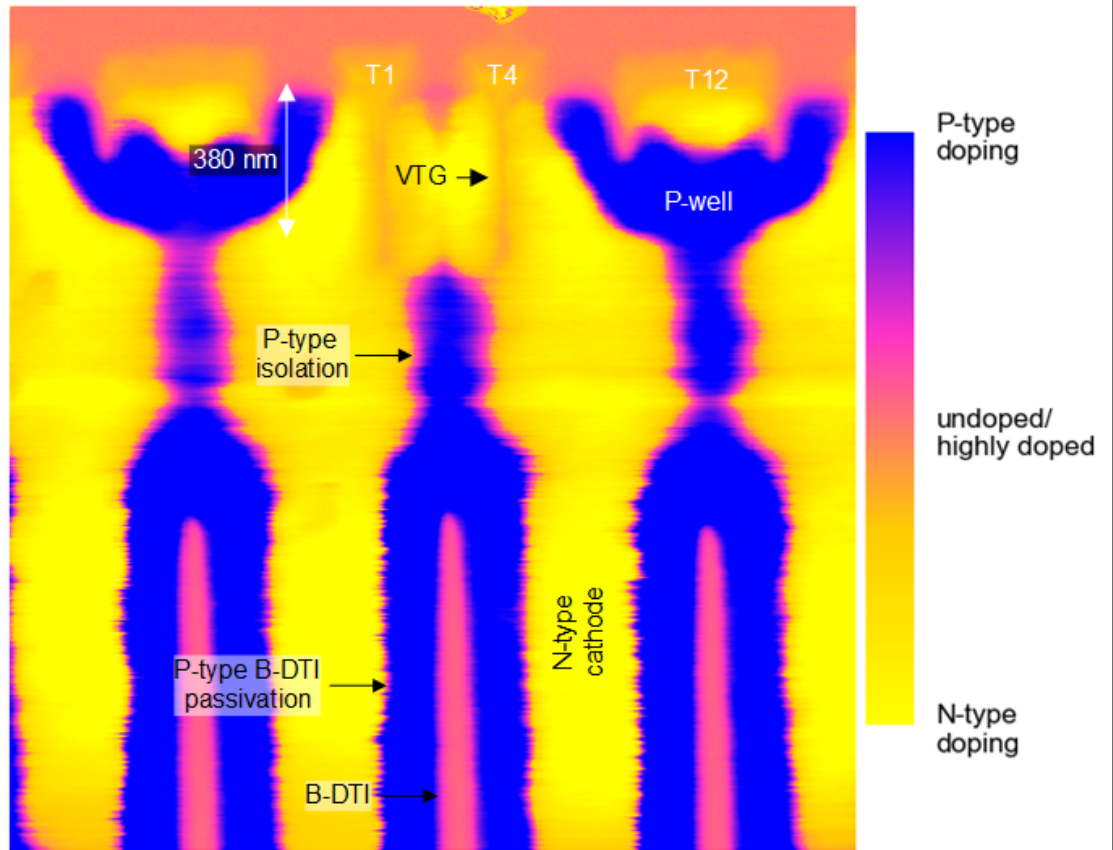


Figure 3

26. The CIS and ISP are connected through direct bonding interconnects (DBIs). Figure 4 (below) represents an exemplary scanning electron microscope (SEM) cross-section of one such DBI.

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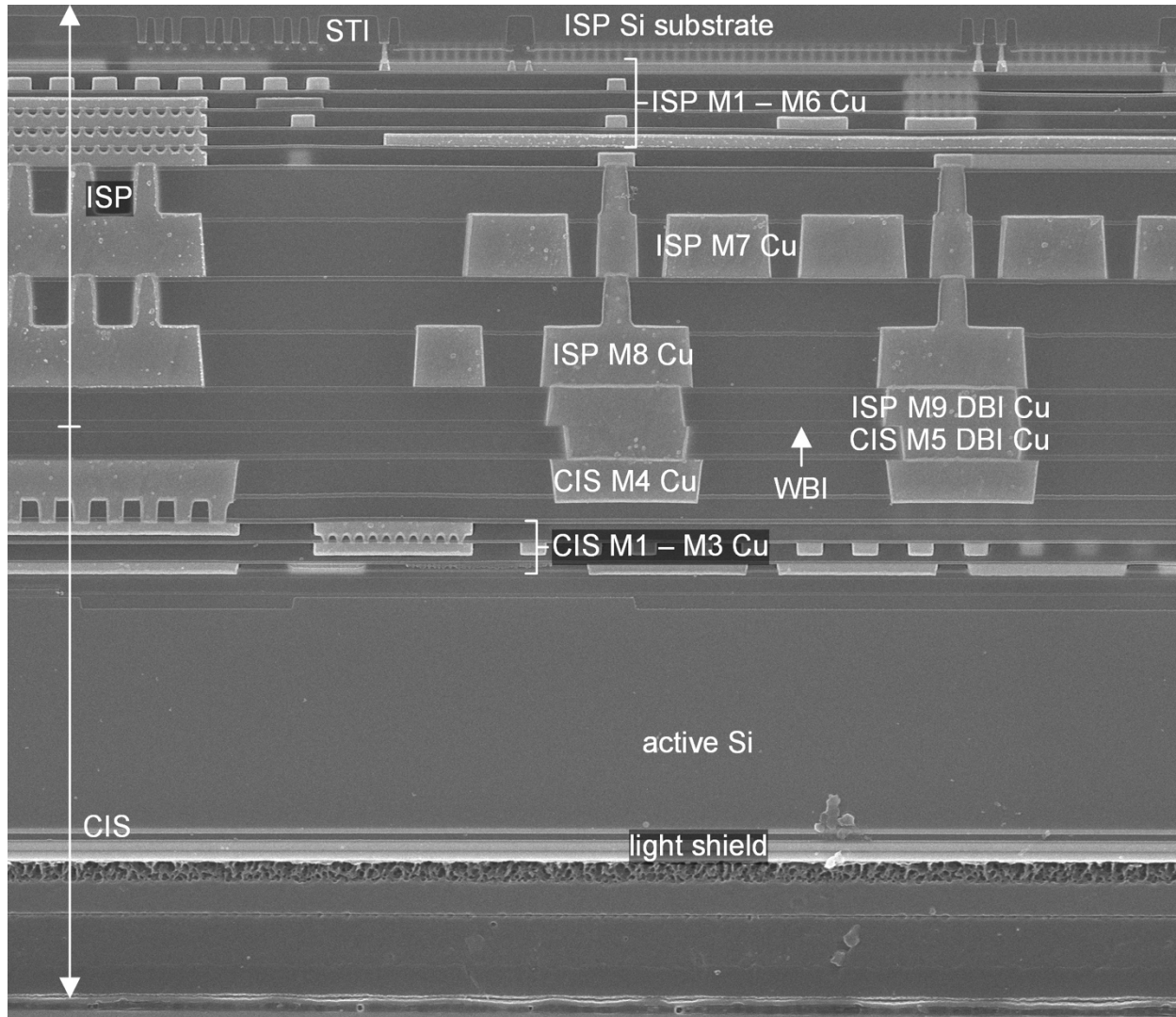
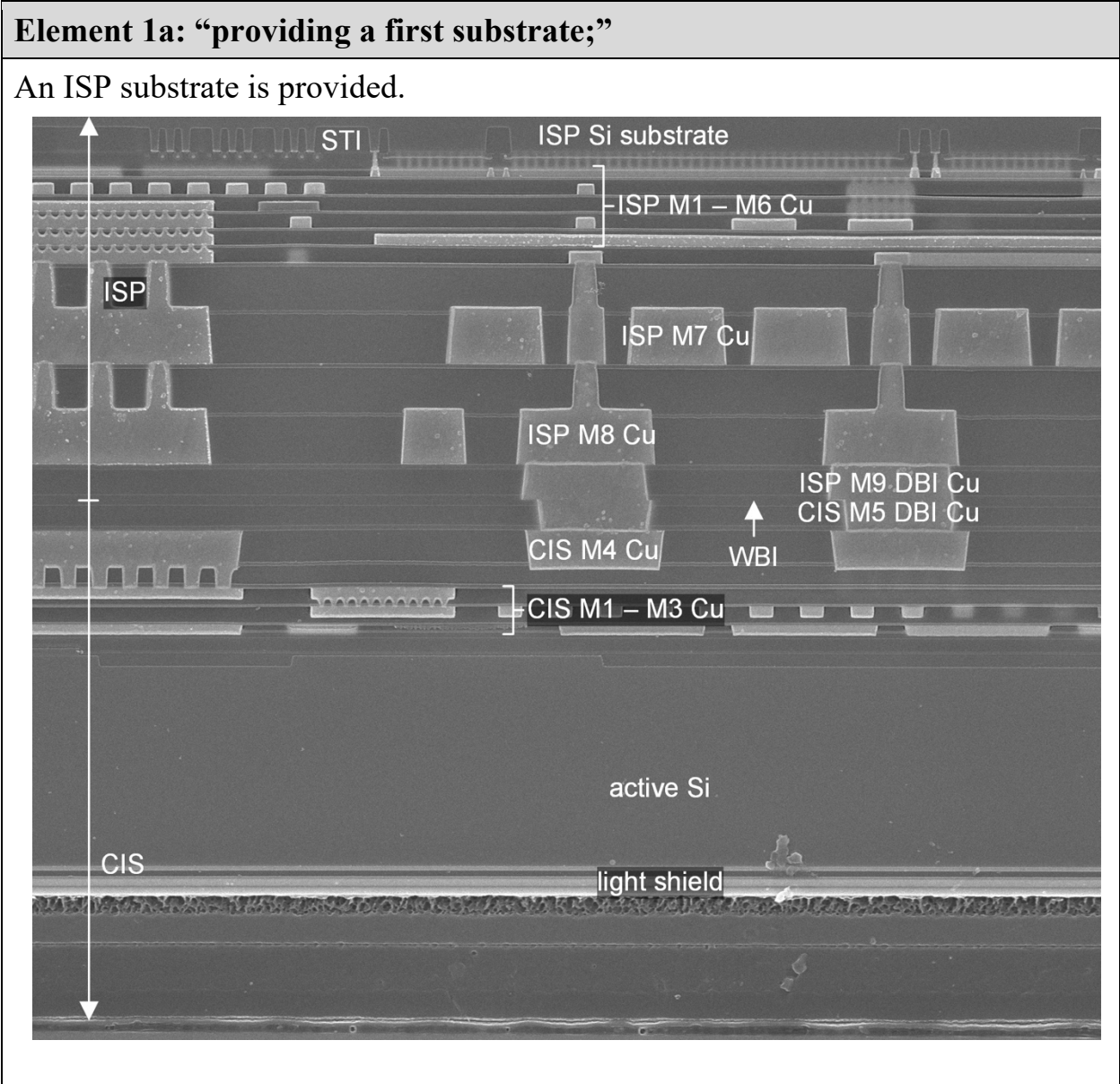


Figure 4

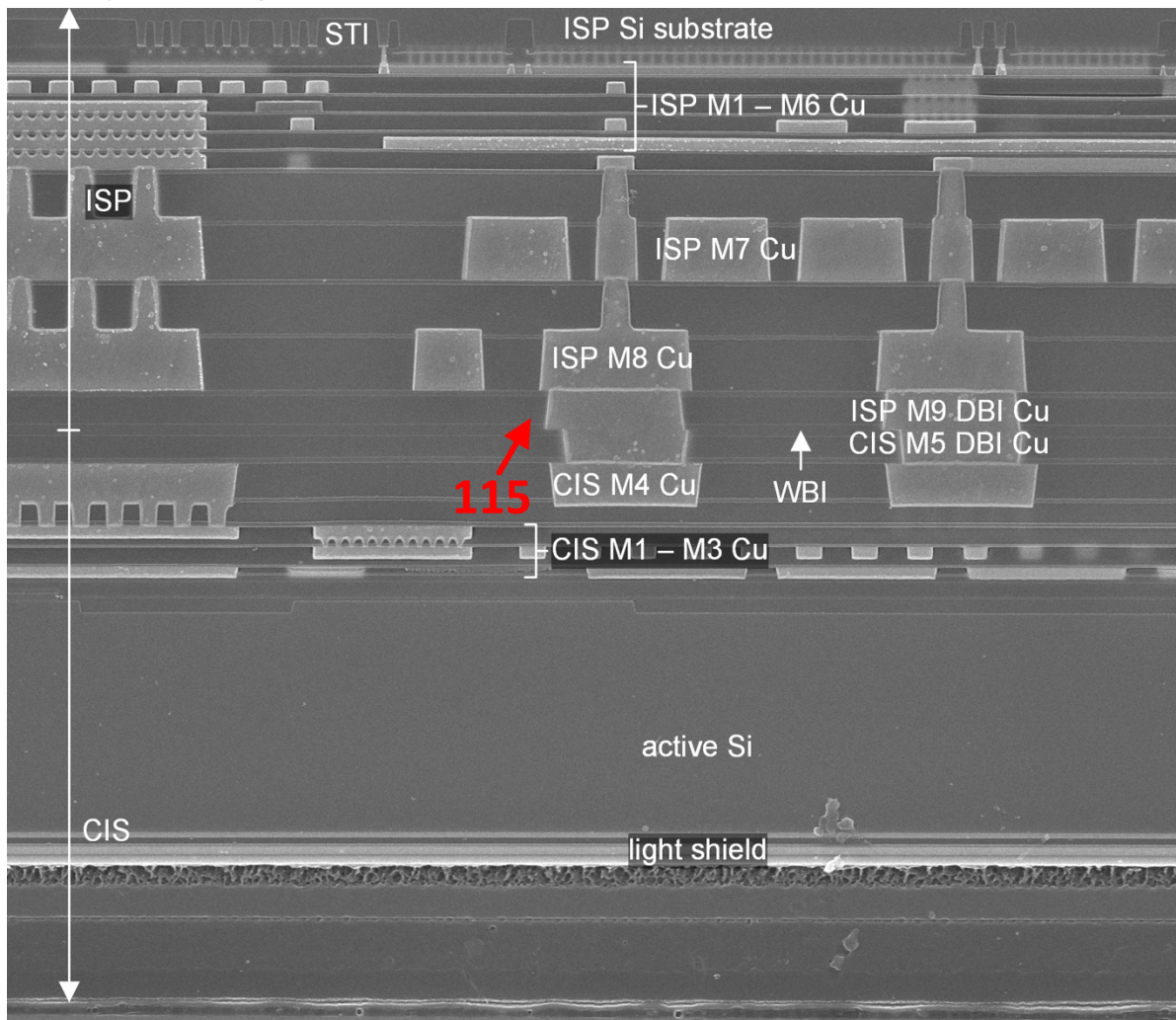
27. As shown in the table below, the OmniVision OV60A Image Sensor infringes representative claim 1 of the '808 Patent:

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1 **Element 1b: “forming circuitry including a metal interconnection over the**
2 **first substrate;”**

3 Circuitry including a metal interconnection (115) is formed over the ISP substrate.

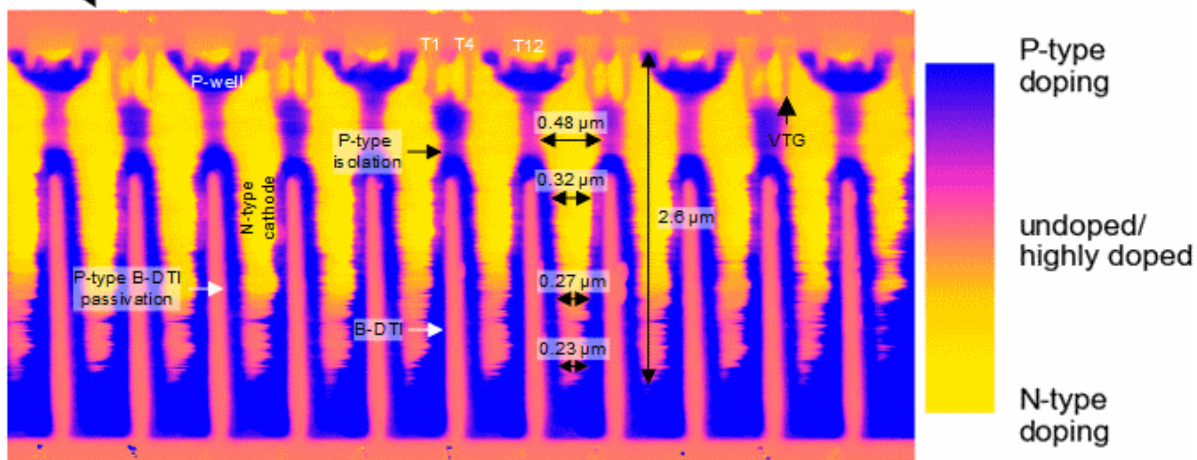


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1 **Element 1c: “forming a photodiode in a crystalline semiconductor layer of a**
2 **second substrate;”**

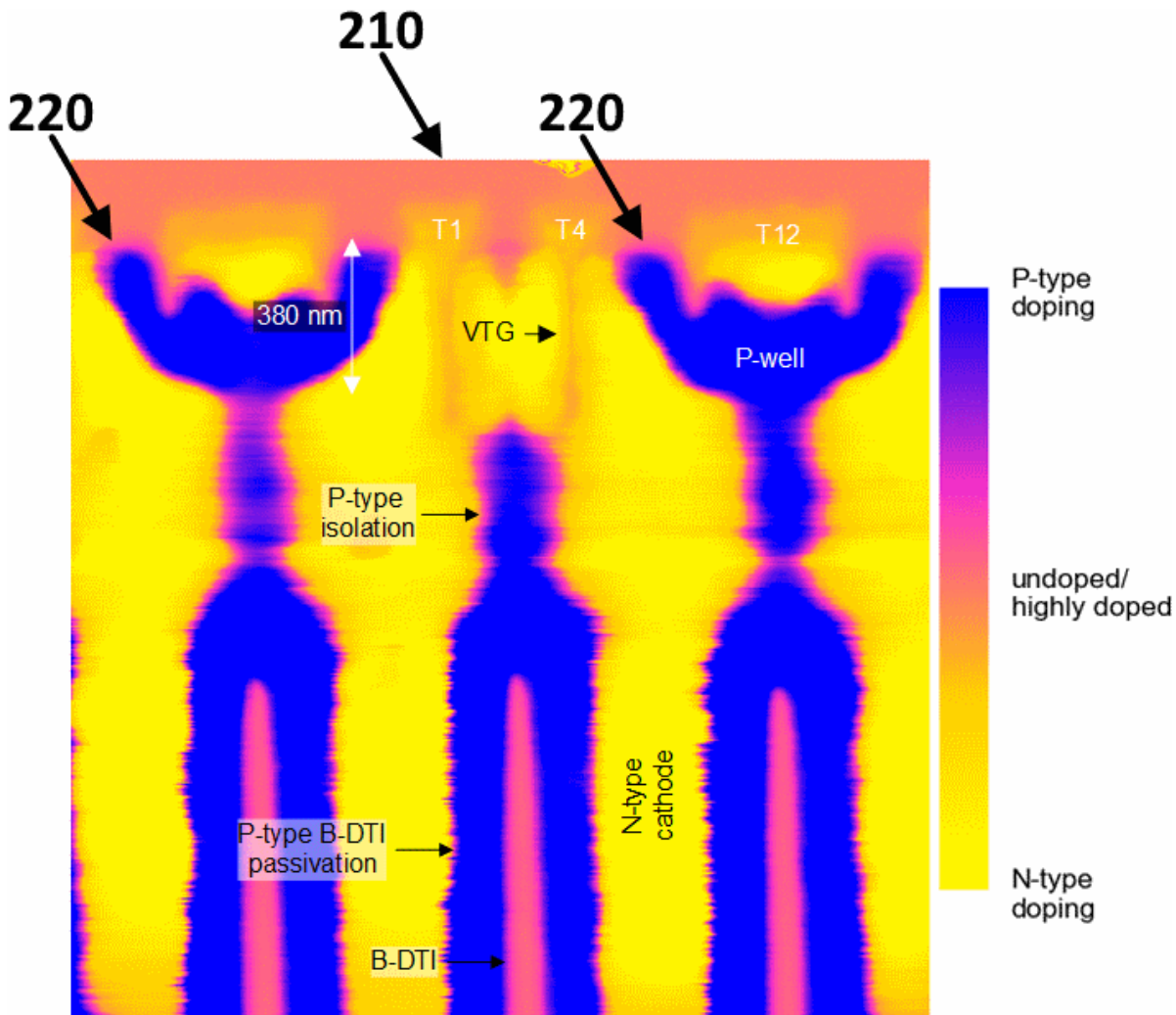
3 Photodiode (210) is formed in a crystalline semiconductor layer of a CIS substrate.

4 **210**



Element 1d: “forming an ion implantation isolation layer in the photodiode;”

An isolation layer (220) of P-type impurity ions is formed in photodiode 210.

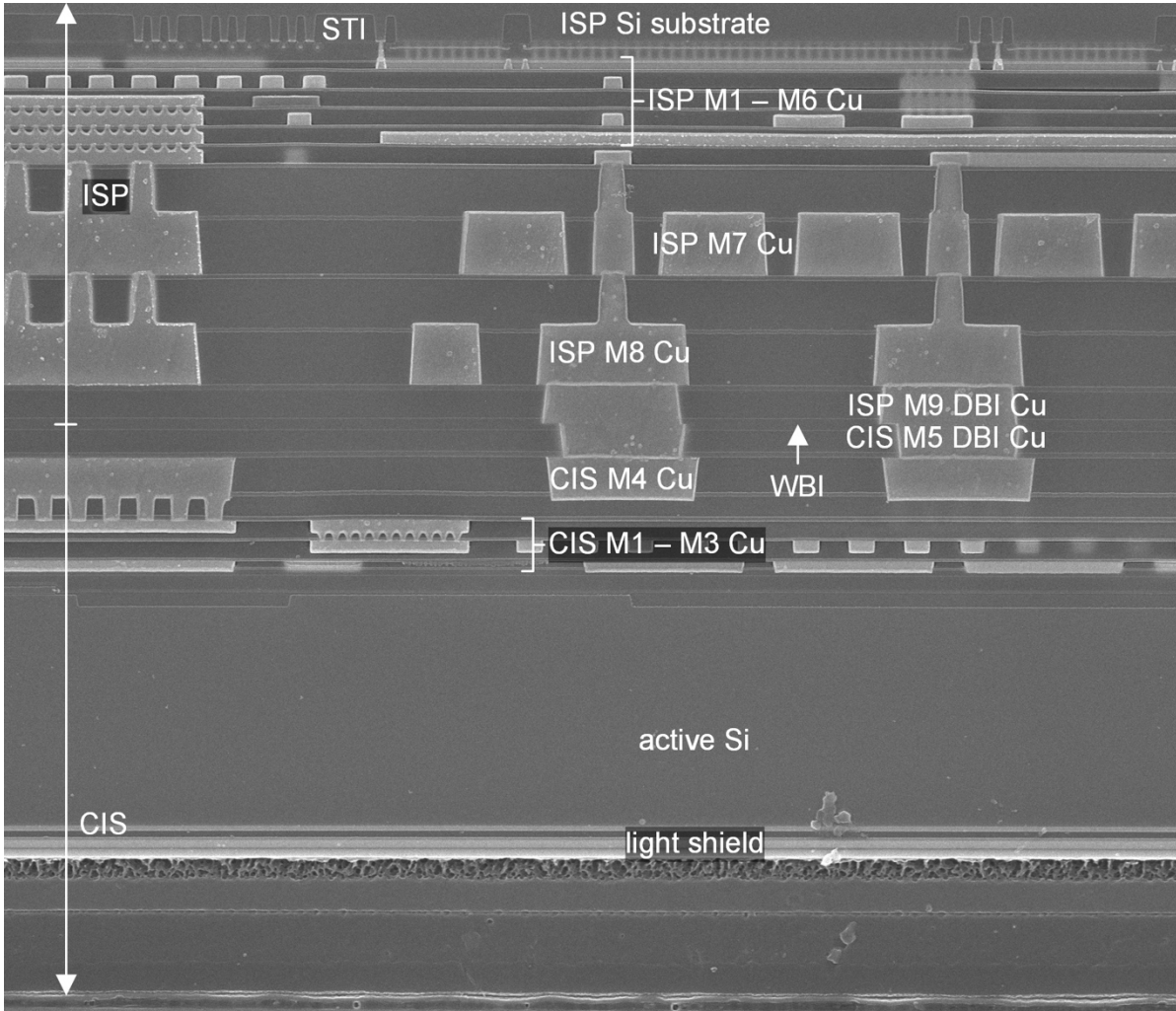


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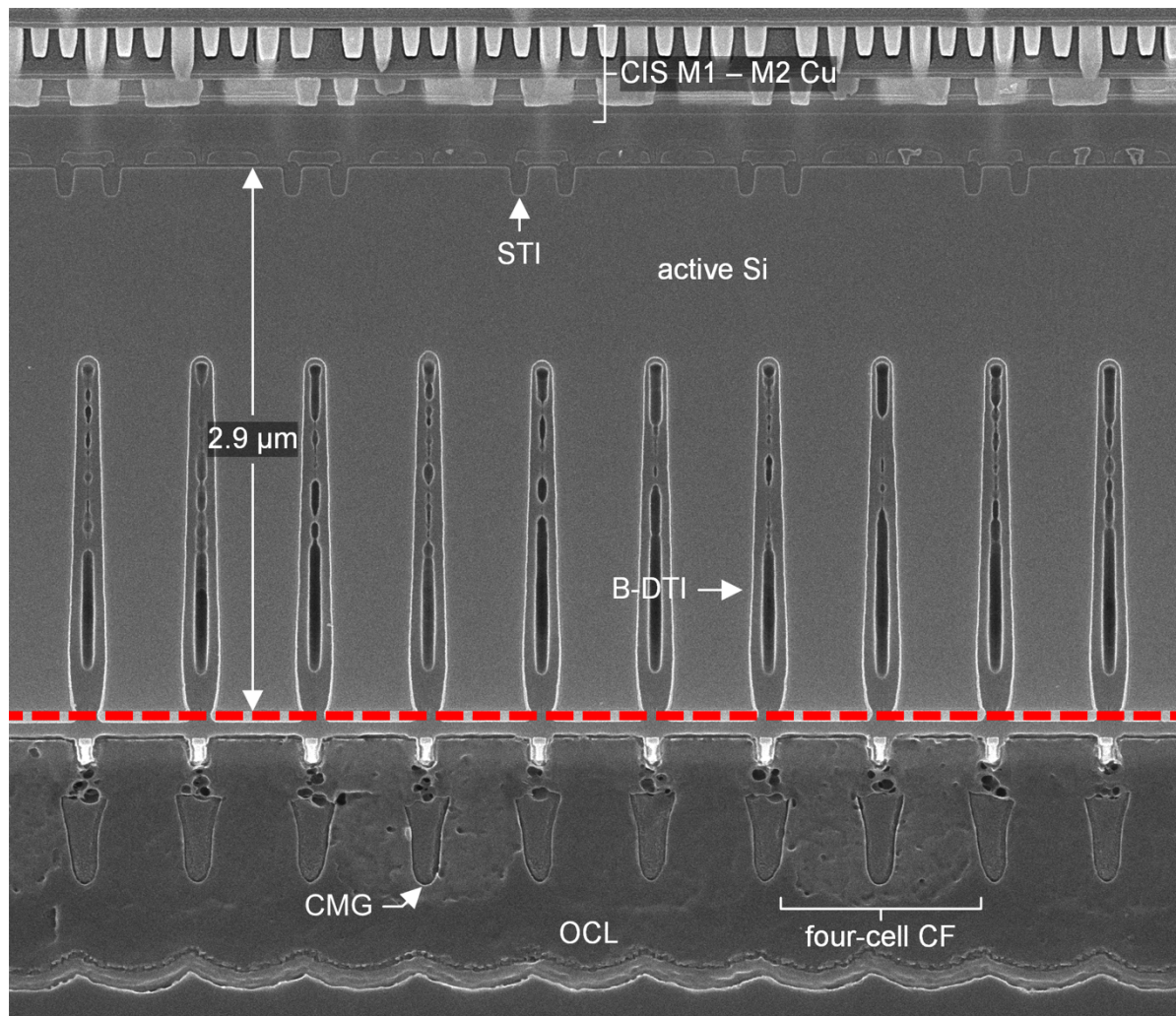
Element 1e: “bonding the first substrate to the second substrate to connect the photodiode to the metal interconnection;”

The ISP and CIS substrates are bonded to connect the photodiode of the CIS substrate to the metal interconnection of the ISP substrate.



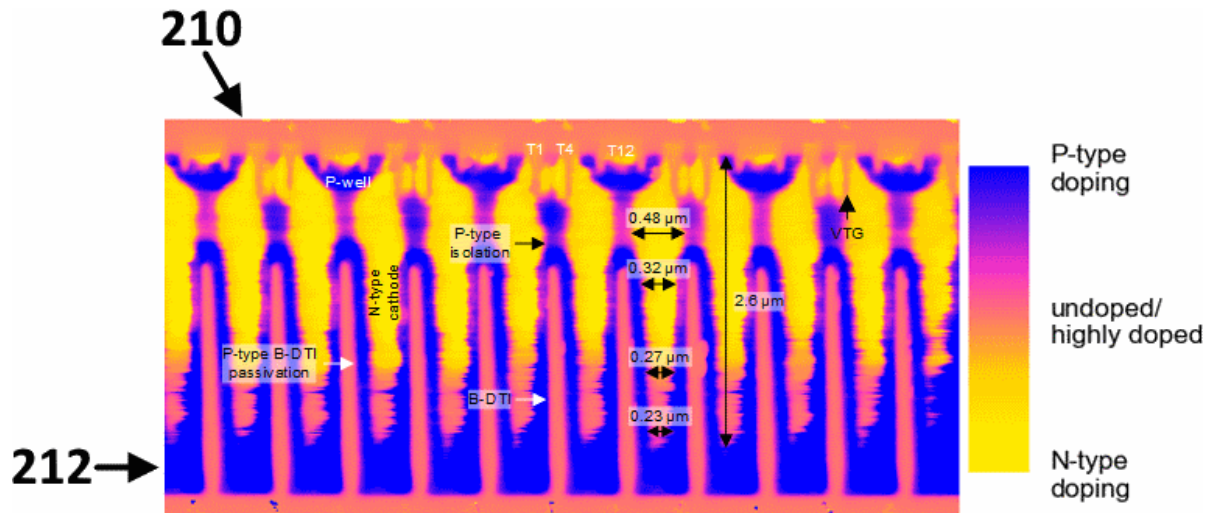
1 **Element 1f: “and removing a lower portion of the second substrate to expose**
2 **the photodiode,”**

3 A lower portion of the CIS substrate is removed to expose the photodiode as
4 illustrated by the dashed red line below.



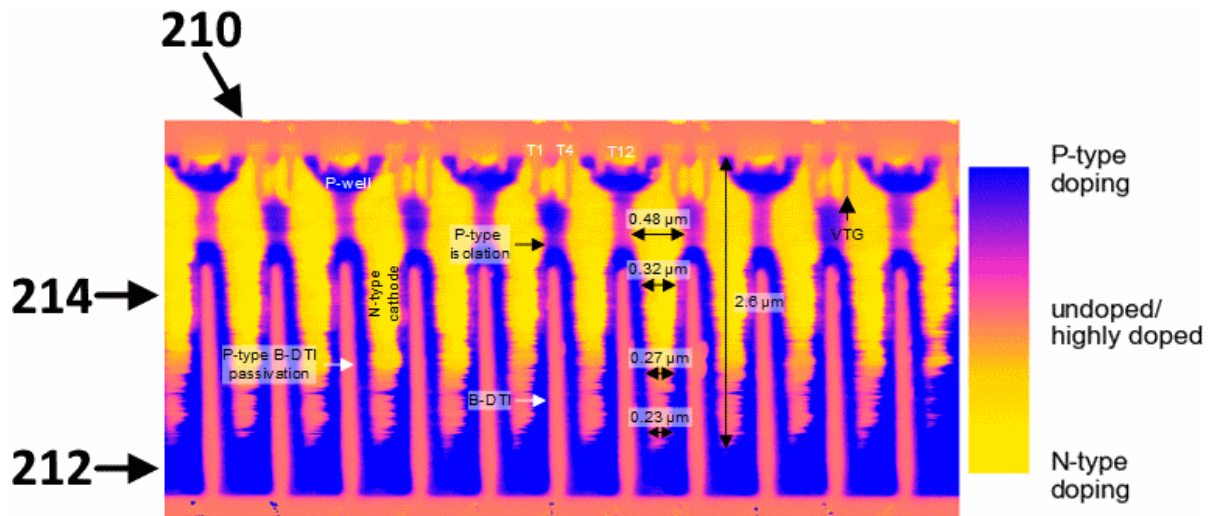
Element 1g: “wherein forming the photodiode comprises: forming a second conduction type conduction layer in the crystalline semiconductor layer;”

A P-type conduction layer (212) is formed in the crystalline semiconductor layer of the CIS substrate. Layer 212 is utilized in forming photodiode 210.



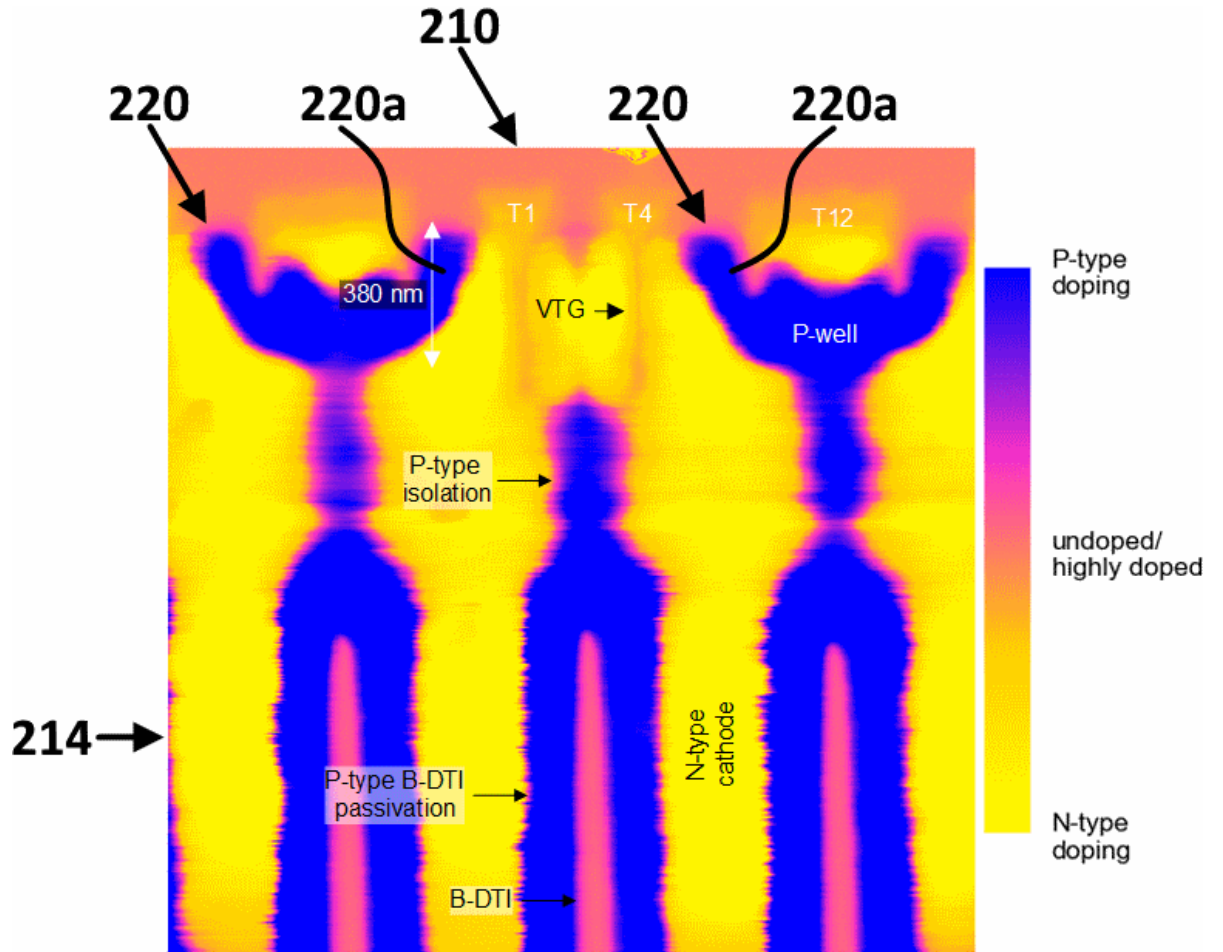
Element 1h: “and forming a first conduction type conduction layer over the second conduction type conduction layer,”

An N-type conduction layer (214) is formed. Layer 214 is situated over P-type conduction layer 212. Layer 214 is utilized in forming photodiode 210.



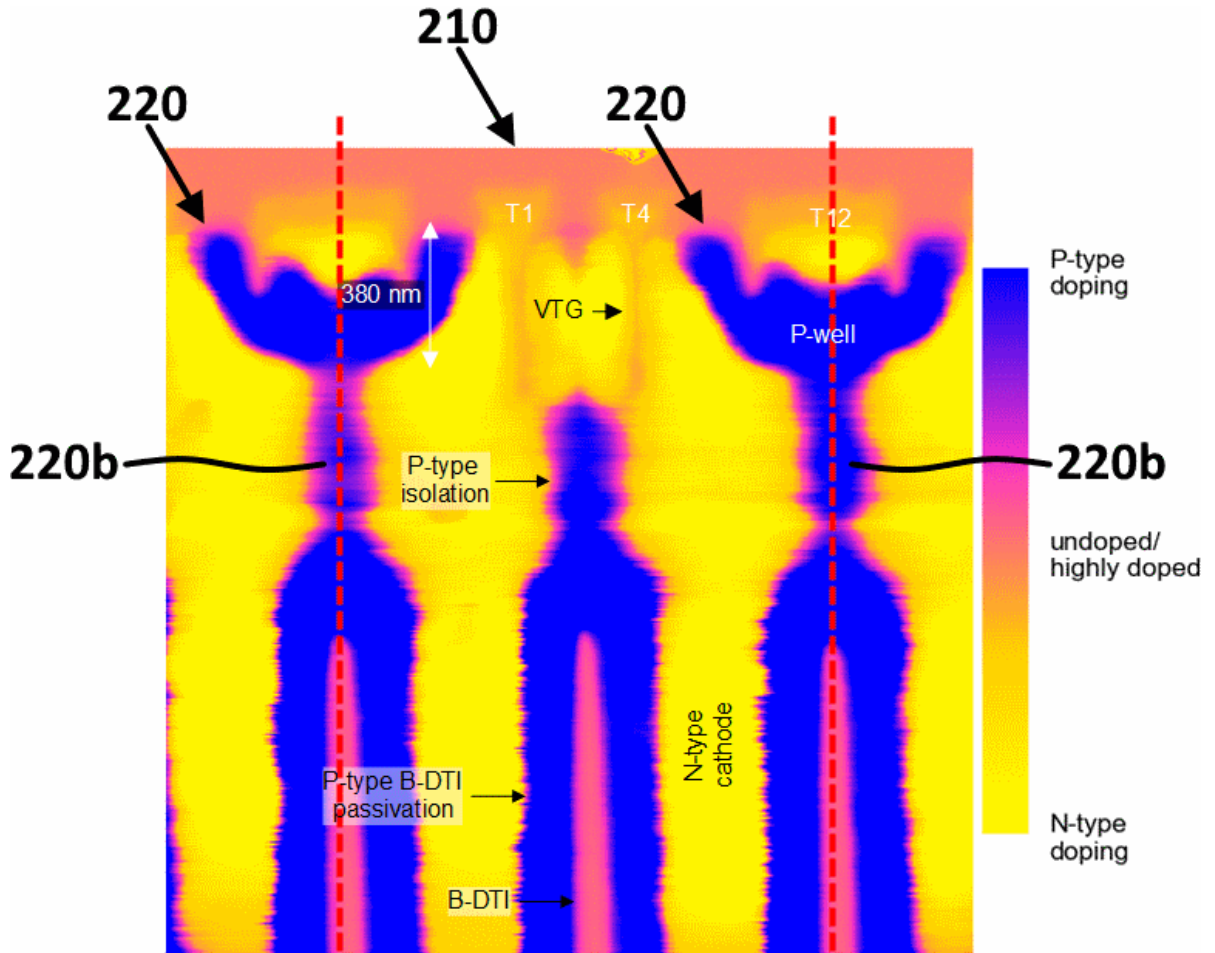
1 **Element 1i: “wherein forming the ion implantation isolation layer in the**
2 **photodiode comprises forming a second conduction type first ion**
3 **implantation isolation layer over the first conduction type conduction layer,”**

4 Forming isolation layer 220 in photodiode 210 includes forming P-type impurity
5 ions as an isolation layer (220a) over N-type conduction layer 214.



1 **Element 1j: “wherein forming the ion implantation isolation layer in the**
 2 **photodiode comprises forming a second conduction type second ion**
 3 **implantation isolation layer at an interface between pixels of the**
 4 **photodiode.”**

5 Forming isolation layer 220 in photodiode 210 includes forming P-type impurity
 6 ions as an isolation layer (220b) at an interface (dashed red lines) between pixels
 7 of photodiode 210.



22 28. On information and belief, the remaining '808 Patent Infringing
 23 Products infringe representative claim 1 of the '808 Patent in the same manner.

24 29. Defendant indirectly infringes the '808 Patent.

25 30. Defendant has and continues to indirectly infringe one or more claims
 26 of the '808 Patent by knowingly and intentionally inducing others to directly
 27 infringe, either literally or under the doctrine of equivalents, by making, using,
 28 offering to sell, selling and/or importing into the United States infringing products

1 that incorporate and/or use the '808 Patent Infringing Products. Defendant induces
2 direct infringement of the '808 Patent by customers, importers, sellers, resellers,
3 and/or end users of the '808 Patent Infringing Products. On information and belief,
4 the direct infringers include, for example, Microsoft Corporation⁶, Dell
5 Technologies, Inc.⁷, Tesla, Inc.⁸, Lenovo Group Ltd.⁹, Qualcomm Incorporated (or
6 alternatively Qualcomm Technologies, Inc.)¹⁰, Nokia Corporation¹¹, ASUSTeK
7 Computer Inc.¹², Motorola Mobility LLC¹³, BLU Products Inc.¹⁴, Arlo
8 Technologies, Inc.¹⁵, Ring LLC¹⁶, HTC Corporation¹⁷, Leopard Imaging Inc.¹⁸,
9 Reolink Innovation Limited¹⁹, VisionMeta²⁰, Huawei, Xiaomi, TCL, Gionee,

11 ⁶ <https://electronics360.globalspec.com/article/15250/teardown-microsoft-surface-pro-x>

12 ⁷ <https://www.ovt.com/press-releases/dell-selects-omnivisions-ov02c-for-the-most-superior-1080p-webcam-performance-in-next-generation-latitude-laptops/>

13 ⁸ <https://teslatap.com/undocumented/>

14 ⁹ <https://www.kimovil.com/en/where-to-buy-lenovo-legion-y70#sec-camera>

15 ¹⁰ <https://www.roadtovr.com/htc-vive-lenovo-standalone-headsets-based-qualcomm-reference-design-components-detailed/>

17 ¹¹ <https://nokiamob.net/2023/04/27/nokia-xr21-5g-coming-after-all-not-xr30/>

18 ¹² <https://www.engadget.com/2017-08-17-asus-zenfone-4-pro-selfie-max-dual-camera.html>

19 ¹³ <https://www.kimovil.com/en/list-smartphones-by-lens-model/omnivision-ov50a>

20 ¹⁴ <https://www.devicerranks.com/en/phone/4786/blu-pure-xl>

21 ¹⁵ <https://www.burglaryalarmsystem.com/product-news/disassemble-teardown-netgear-arlo-battery-powered-wifi-cameras-security-system.html>

22 ¹⁶ <https://www.ovt.com/press-releases/omnivision-provides-ring-producer-of-the-worlds-first-battery-operated-wireless-video-doorbell-with-hd-video-recording-and-streaming-capabilities/>

24 ¹⁷ <https://www.techinsights.com/products/ddt-2206-805>

25 ¹⁸ <https://leopardimaging.com/product/csi-2-mipi-modules-i-pex/csi-2-mipi-modules/rolling-shutter-mipi-cameras/2mp-os02c10/li-os02c10-mipi-cs/>

27 ¹⁹ <https://www.techinsights.com/products/pkg-2201-804>

28 ²⁰ <https://www.visionmeta.com/product/11m-icatch-v39m-3-axis-anti-shake-eis-gimbal-camera-module-for-drone/>

1 OnePlus, Guangdong Oppo Mobile Telecommunications Corp., Ltd.²¹, Honor,
2 Tecno, Qmobile, Allview, Shenzhen Qingzheng Electronic Information Technology
3 Co., Ltd.²², Xinga Digital Electronic (Shenzhen) Co., Ltd.²³, Shenzhen ChuangMu
4 Technology Co., Ltd.²⁴, Kai Lap Technologies Group Ltd.²⁵, Shanghai Belite
5 Technology Co., Ltd.²⁶, and Defendant's subsidiary OmniVision Electronics, Inc.

6 31. Defendant had actual knowledge of the '808 Patent and that the '808
7 Patent Infringing Products infringe that patent at least as of November 1, 2023.

8 Accordingly, at least as of that date, Defendant was on notice, knew and/or should
9 have known that its actions induced direct infringement by third parties.

10 Accordingly, at least as of that date, Defendant induced infringement by third party
11 direct infringers and should have known that its actions would induce actual
12 infringement.

13 32. Additionally, at the very least Defendant had actual knowledge of the
14 '808 Patent and its infringement of the same as of the date of this Complaint.

15 33. Defendant induced infringement by others with the intent to cause
16 infringing acts by others or, in the alternative, with the belief that there was a high
17 probability that others infringe the '808 Patent, but while at best, remaining willfully
18 blind to the infringement.

19 34. On information and belief, Defendant advertises the '808 Patent
20 Infringing Products, publishes specifications and promotional literature encouraging
21

22 ²¹ https://www.gsmarena.com/oppo_reno10-review-2600p5.php

23 ²² <https://www.qz-uav.com/Upload/en/editor/file/20230311/1678482632263687.jpg>

24 ²³ https://www.alibaba.com/product-detail/XINGA-XG23-12MP-OS12D40-FF-MF_1600442097661.html

25 ²⁴ <http://www.camera-module.com/product/hdrcameramodule/2mp-120db-hdr-camera-module-omnivision-os02c10.html>

27 ²⁵ <http://japanese.kailaptech.com/Product.aspx?id=2043&l1=1413>

28 ²⁶ https://www.alibaba.com/product-detail/2MP-OS02C10-USB-Camera-Module-1080P_1600558712606.html

1 customers to implement and incorporate the '808 Patent Infringing Products into
2 end user products, creates and/or distributes user manuals for the '808 Patent
3 Infringing Products that provide instructions and/or encourage infringing use, and
4 offers support and/or technical assistances to its customers that provide instructions
5 on and/or encourage infringing use.

6 35. Defendant encourages and facilitates its customers to infringe the '808
7 Patent by promoting the '808 Patent Infringing Products, for example, on
8 Defendant's website.

9 36. Defendant's customers that incorporate the '808 Patent Infringing
10 Products into other products (e.g., smartphones, vehicles, security cameras, lap tops,
11 virtual reality (VR) and augmented reality (AR) headsets and eye glasses, medical
12 imaging, optical inspection systems, other machine vision applications, etc.) as well
13 as the end users of those products, each directly infringe the Asserted Patents
14 pursuant to Defendant's instructions and advertisements.

15 **V. COUNT II: INFRINGEMENT OF '143 PATENT**

16 37. VisionX incorporates each of the allegations of the paragraphs above.

17 38. Defendant has directly infringed and continues to directly infringe the
18 '143 Patent by, for example, making, using, offering to sell, selling, and/or
19 importing into the United States, without authority, products that practice one or
20 more claims of the '143 Patent.

21 39. Defendant is not licensed or otherwise authorized to make, use, offer
22 for sale, sell or import any products that embody the inventions of the '143 Patent in
23 the United States.

24 40. Defendant has and continues to directly infringe one or more claims of
25 the '143 Patent, including, for example, claim 1 of the '143 Patent, either literally or
26 under the doctrine of equivalents, by making, using, offering to sell, selling, and/or
27 importing into the United States infringing image sensors without authority and in
28 violation of 35 U.S.C. § 271.

1 41. With respect to the '143 Patent, Defendant's infringing Image Sensor
2 products include OmniVision's products, including – for example – the following
3 OmniVision products²⁷:

- 4 • OmniVision V23850
- 5 • OmniVision OS12D40
- 6 • OmniVision OH01A10
- 7 • OmniVision OV48C
- 8 • OmniVision OV50A

9 42. Defendant's infringing products further include any other OmniVision
10 chips in various camera modules that may or may not have OmniVision part
11 numbers, but are made by with a similar structure as the above OmniVision Image
12 Sensors (collectively, the "'143 Patent Infringing Products").

13 43. For example, the OmniVision OV50A Image Sensor infringes
14 representative claim 1 of the '143 Patent.

15 44. Claim 1 of the '143 Patent claims an image sensor comprising: a
16 semiconductor substrate formed on a first surface thereof with a readout circuitry
17 and a photodiode area; a metal interconnection layer formed on the first surface; a
18 connection via metal extending from the first surface to a second surface of the
19 semiconductor substrate, the connection via metal having a projection part
20 projecting from the second surface; an insulating layer formed on the second surface
21 of the semiconductor substrate to expose the projection part while surrounding a
22 portion of a lateral side of the projection part; and a metal pad formed on the
23 insulating layer such that the metal pad covers the projection part, wherein the
24 insulating layer has a thickness thinner than a projection height of the projection
25 part.

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27 _____
28 ²⁷ Plaintiff is currently investigating whether certain single-die OmniVision Image Sensor products may also infringe one or more claims of the '143 patent.

1 45. The OmniVision OV50A includes stacked CIS and ISP. Figure 5
2 (below) illustrates an exemplary scanning electron microscope (SEM) cross-section
3 of the stacked CIS and ISP where the interface of the CIS and ISP is indicated by a
4 dashed yellow line.

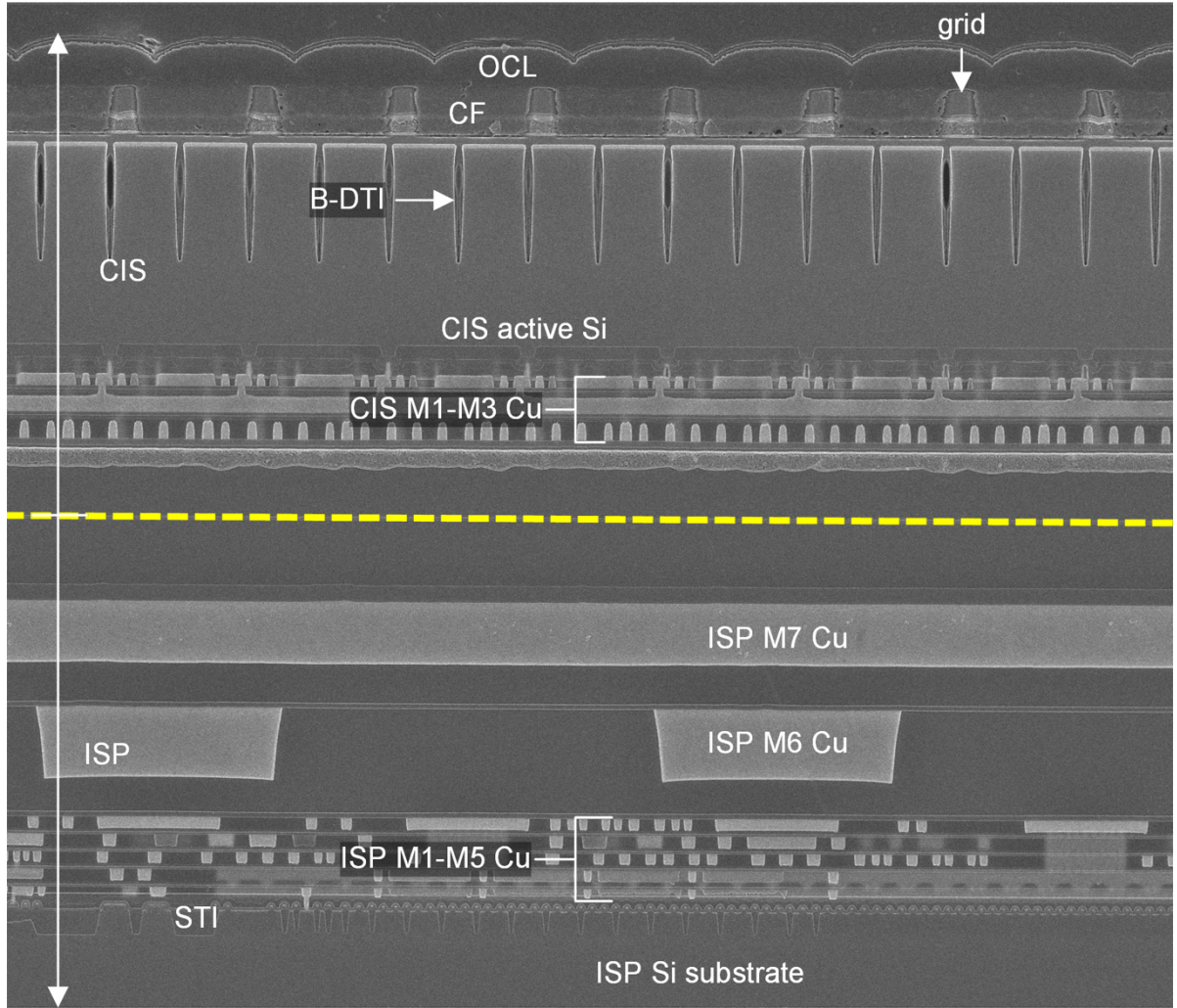
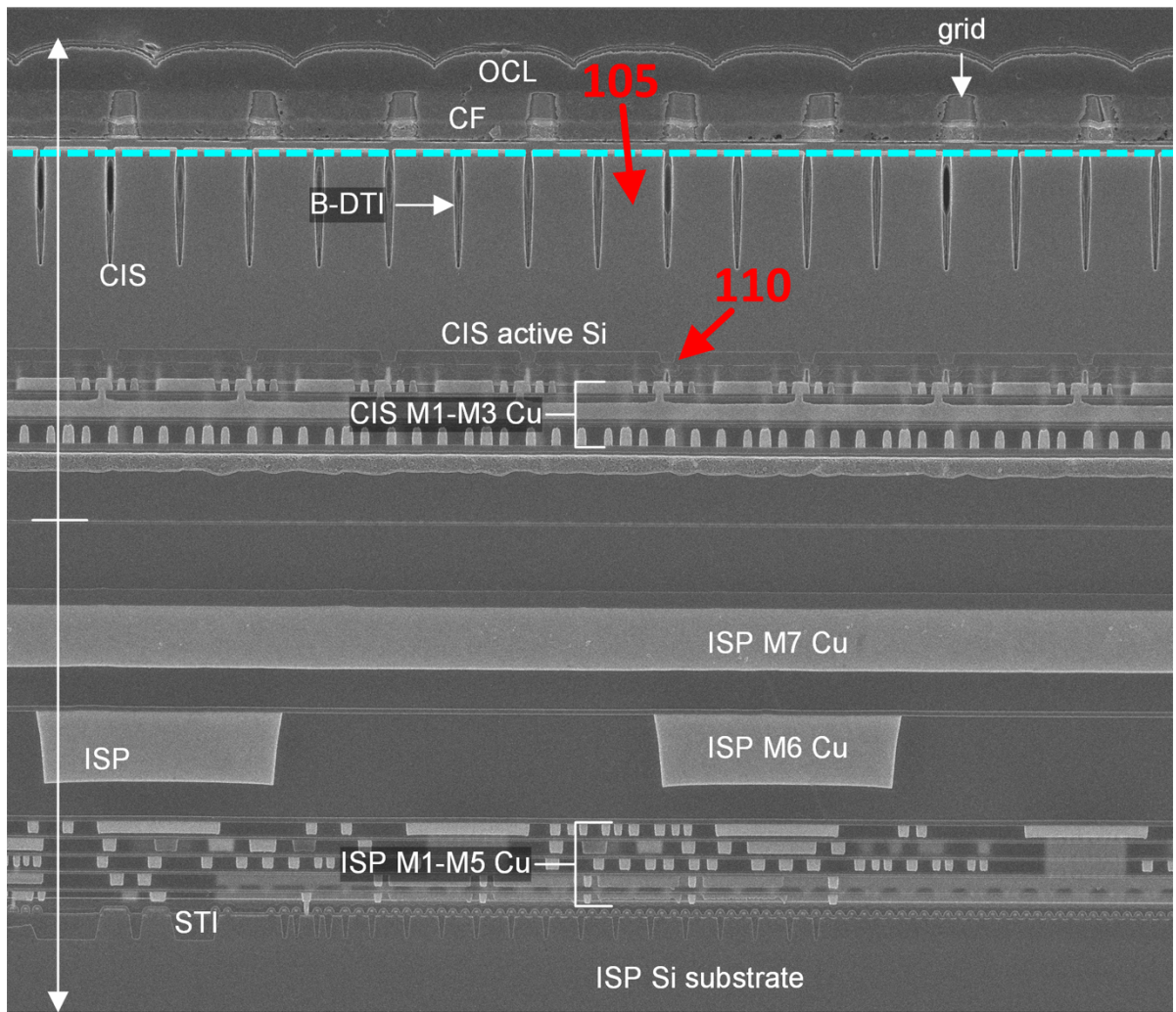


Figure 5

1 46. As shown in the table below, the OmniVision OV50A infringes
 2 representative claim 1 of the '143 Patent:

3 **Element 1a: “a semiconductor substrate formed on a first surface thereof**
 4 **with a readout circuitry and a photodiode area;”**

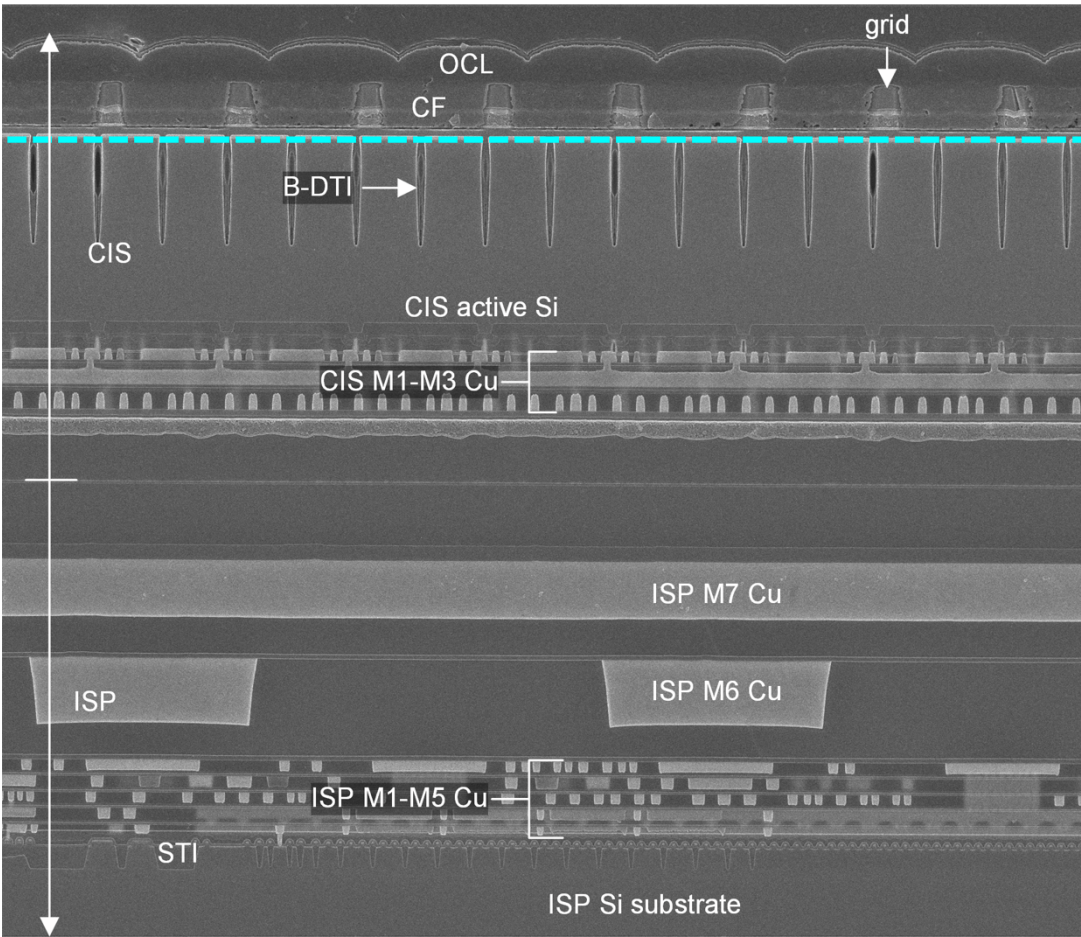
5 The OmniVision OV50A includes a pixel array having photodiodes (105) and
 6 corresponding readout circuitry (110) situated on a first surface (dashed blue
 7 line) of CIS substrate.



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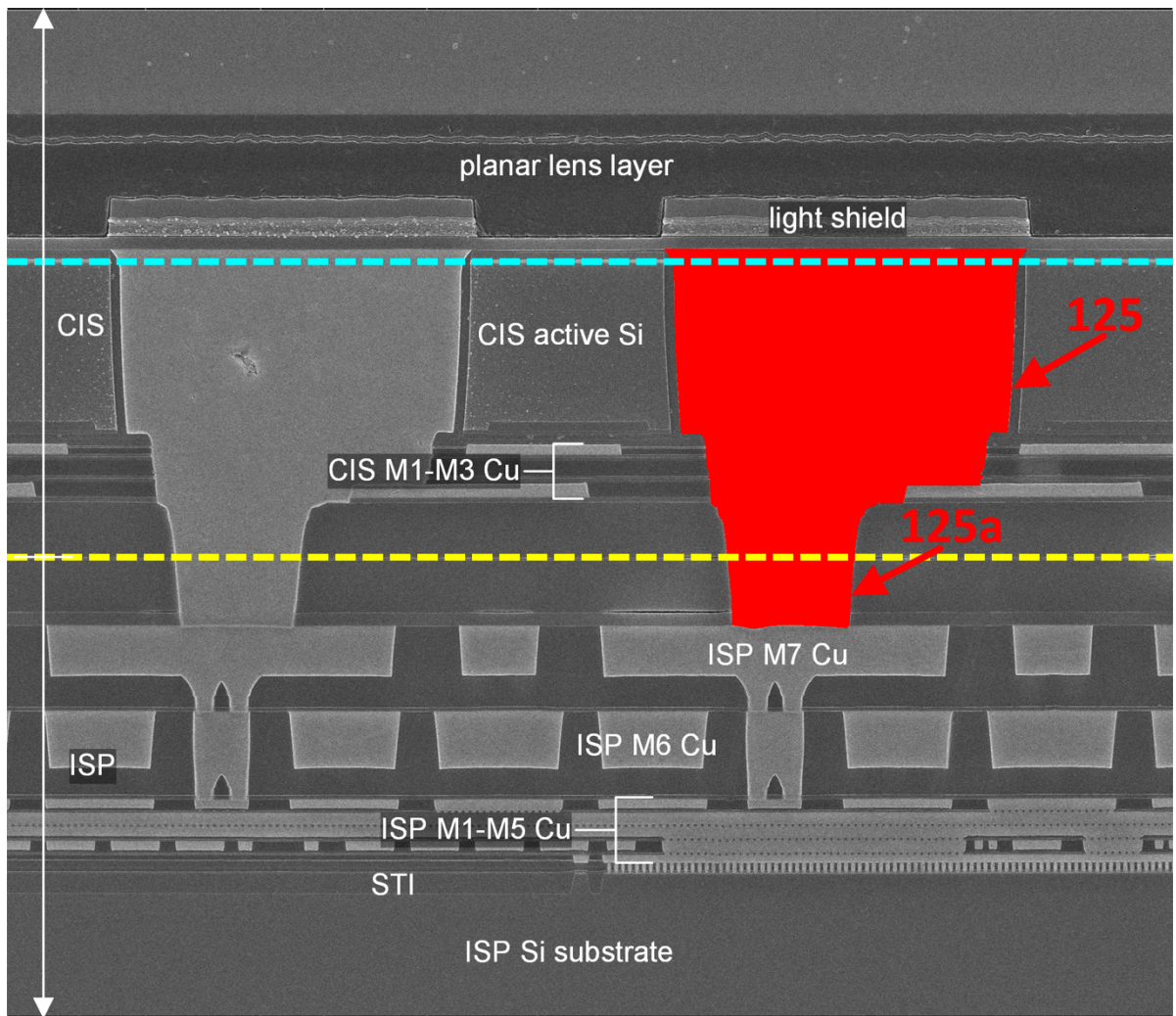
Element 1b: “a metal interconnection layer formed on the first surface;”

A metal interconnection layer (130) is situated on the first surface.



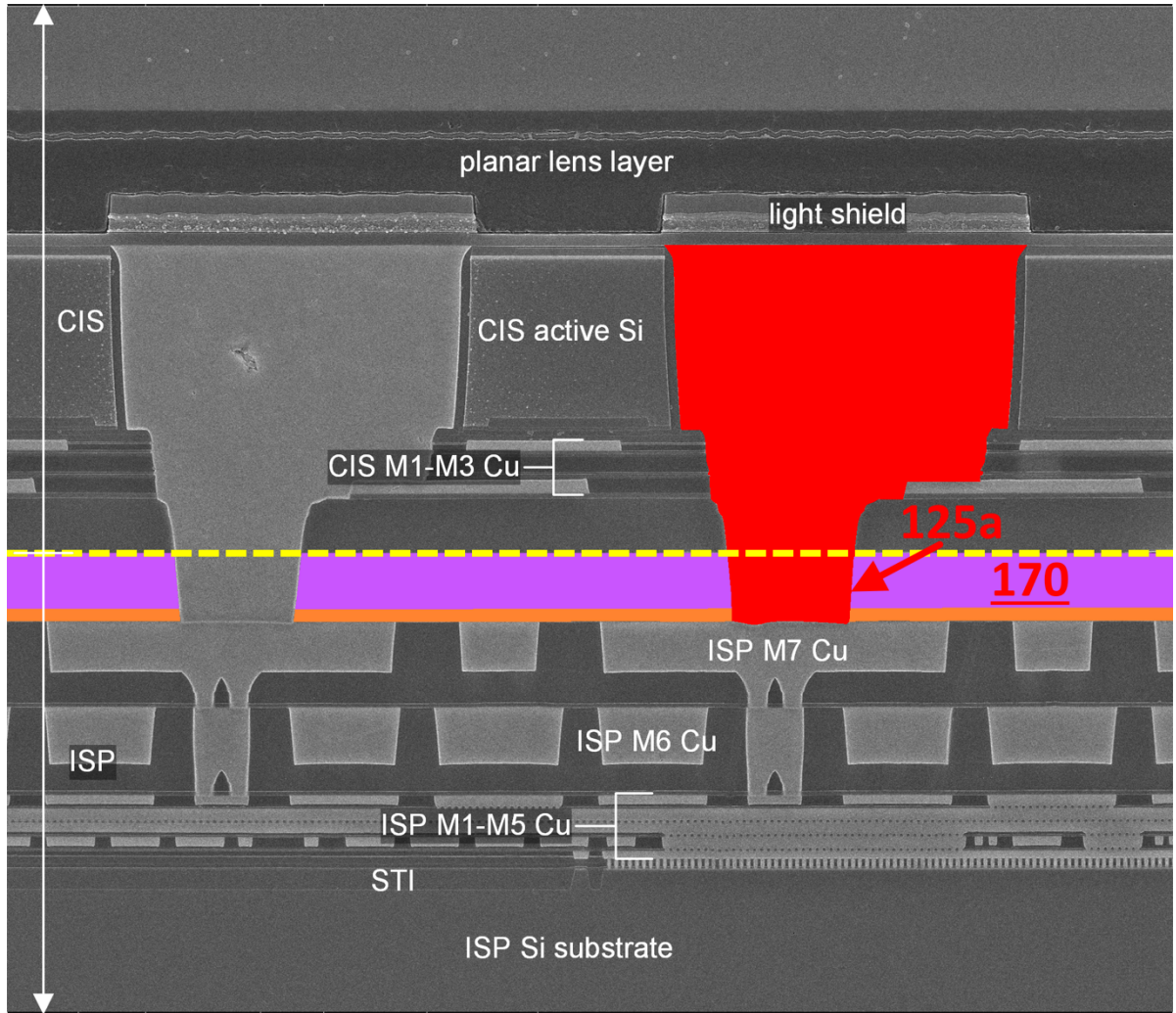
1 **Element 1c: “a connection via metal extending from the first surface to a**
2 **second surface of the semiconductor substrate, the connection via metal**
3 **having a projection part projecting from the second surface;”**

4 A connection via metal (red, labeled 125) extends from the first surface (dashed blue line) of the CIS substrate to a second surface (dashed yellow line) of the
5 CIS substrate. The connection via metal comprises electrically conductive
6 copper (Cu) metal. The connection via metal electrically connects to a transistor
7 of the pixel array through the stack of CIS M1 – M3. Projection part (125a) of
8 the connection via metal projects from the second surface (dashed yellow line) of
9 the CIS substrate.



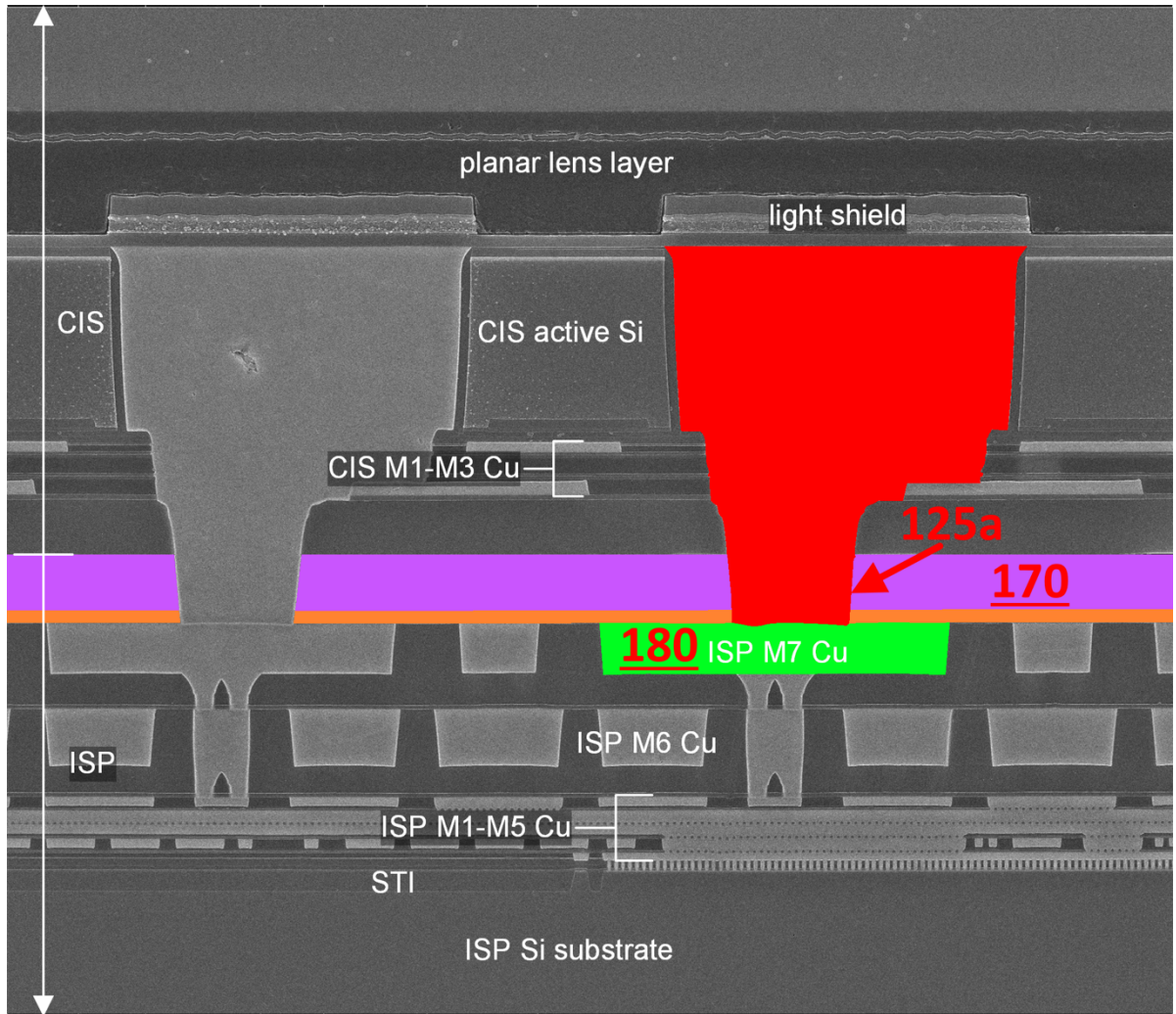
1 **Element 1d: “an insulating layer formed on the second surface of the**
2 **semiconductor substrate to expose the projection part while surrounding a**
3 **portion of a lateral side of the projection part; and”**

4 An insulating layer (purple, labeled 170) is formed on the second surface (dashed
5 yellow line) of the CIS substrate. The insulating layer 170 leaves some of the
6 projection part 125a exposed while surrounding a portion of a lateral side of the
7 projection part 125a.



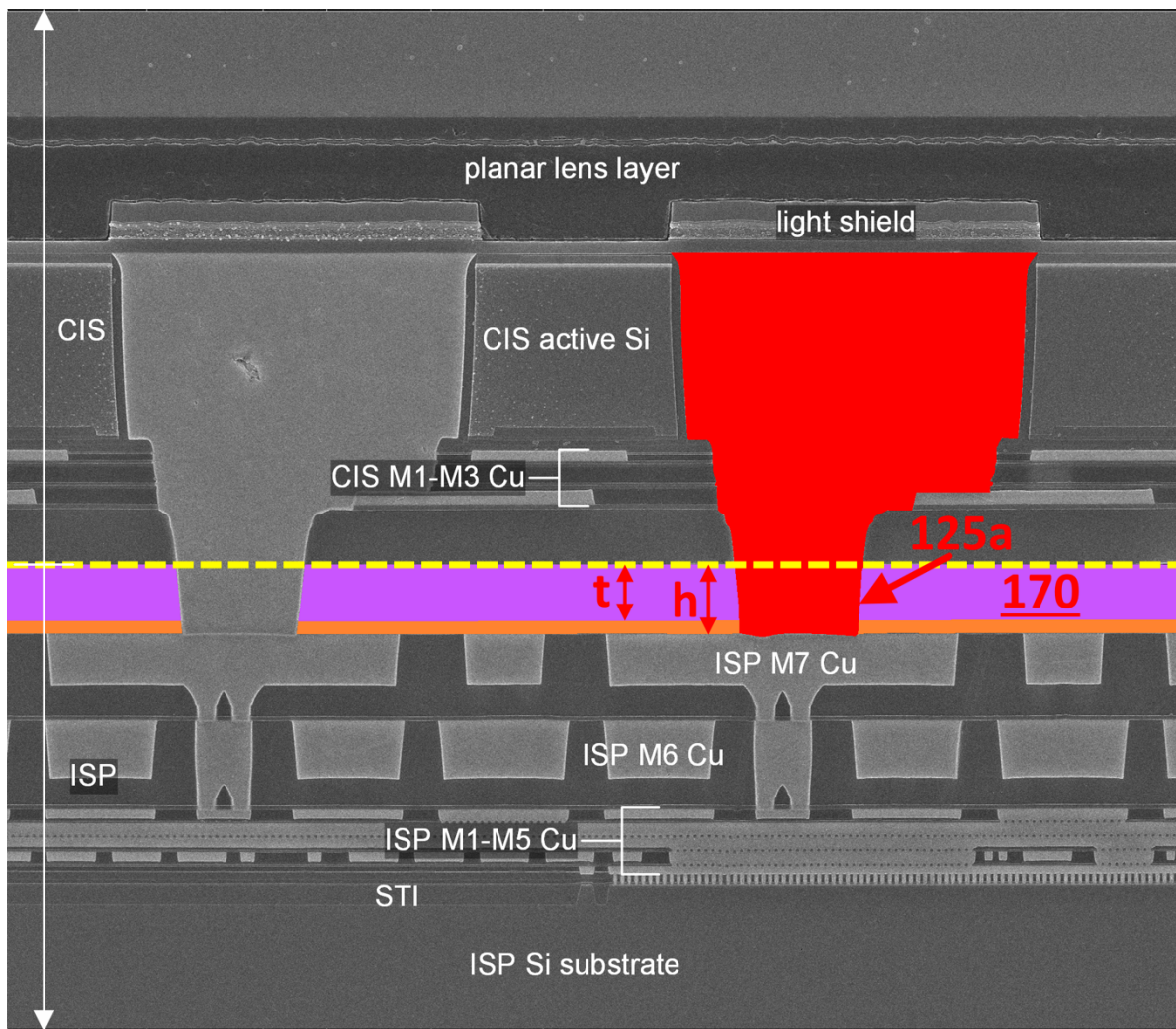
1 **Element 1e: “a metal pad formed on the insulating layer such that the metal**
2 **pad covers the projection part,”**

3 A metal pad (green, labeled 180) at ISP metal level seven (M7) comprises
4 electrically conductive Cu metal situated on insulating layer 170 and covers
5 projection part 125a.



Element 1f: “wherein the insulating layer has a thickness thinner than a projection height of the projection part.”

The thickness (t) of insulating layer 170 is less than the height (h) of projection part 125a.



47. On information and belief, the remaining '143 Patent Infringing Products infringe representative claim 1 of the '143 Patent in the same manner.

48. Defendant indirectly infringes the '143 Patent.

49. Defendant has and continues to indirectly infringe one or more claims of the '143 Patent by knowingly and intentionally inducing others to directly infringe, either literally or under the doctrine of equivalents, by making, using, offering to sell, selling and/or importing into the United States infringing products

1 that incorporate and/or use the '143 Patent Infringing Products. Defendant induces
 2 direct infringement of the '143 Patent by customers, importers, sellers, resellers,
 3 and/or end users of the '143 Patent Infringing Products. On information and belief,
 4 the direct infringers include, for example, Microsoft Corporation²⁸, Dell
 5 Technologies, Inc.²⁹, Tesla, Inc.³⁰, Lenovo Group Ltd.³¹, Qualcomm Incorporated (or
 6 alternatively Qualcomm Technologies, Inc.)³², Nokia Corporation³³, ASUSTeK
 7 Computer Inc.³⁴, Motorola Mobility LLC³⁵, BLU Products Inc.³⁶, Arlo
 8 Technologies, Inc.³⁷, Ring LLC³⁸, HTC Corporation³⁹, Leopard Imaging Inc.⁴⁰,
 9 Reolink Innovation Limited⁴¹, VisionMeta⁴², Huawei, Xiaomi, TCL, Gionee,

11 ²⁸ <https://electronics360.globalspec.com/article/15250/teardown-microsoft-surface-pro-x>

12 ²⁹ <https://www.ovt.com/press-releases/dell-selects-omnivisions-ov02c-for-the-most-superior-1080p-webcam-performance-in-next-generation-latitude-laptops/>

13 ³⁰ <https://teslatap.com/undocumented/>

14 ³¹ <https://www.kimovil.com/en/where-to-buy-lenovo-legion-y70#sec-camera>

15 ³² <https://www.roadtovr.com/htc-vive-lenovo-standalone-headsets-based-qualcomm-reference-design-components-detailed/>

17 ³³ <https://nokiamob.net/2023/04/27/nokia-xr21-5g-coming-after-all-not-xr30/>

18 ³⁴ <https://www.engadget.com/2017-08-17-asus-zenfone-4-pro-selfie-max-dual-camera.html>

19 ³⁵ <https://www.kimovil.com/en/list-smartphones-by-lens-model/omnivision-ov50a>

20 ³⁶ <https://www.deviceranks.com/en/phone/4786/blu-pure-xl>

21 ³⁷ <https://www.burglaryalarmsystem.com/product-news/disassemble-teardown-netgear-arlo-battery-powered-wifi-cameras-security-system.html>

22 ³⁸ <https://www.ovt.com/press-releases/omnivision-provides-ring-producer-of-the-worlds-first-battery-operated-wireless-video-doorbell-with-hd-video-recording-and-streaming-capabilities/>

24 ³⁹ <https://www.techinsights.com/products/ddt-2206-805>

25 ⁴⁰ <https://leopardimaging.com/product/csi-2-mipi-modules-i-pex/csi-2-mipi-modules/rolling-shutter-mipi-cameras/2mp-os02c10/li-os02c10-mipi-cs/>

27 ⁴¹ <https://www.techinsights.com/products/pkg-2201-804>

28 ⁴² <https://www.visionmeta.com/product/11m-icatch-v39m-3-axis-anti-shake-eis-gimbal-camera-module-for-drone/>

1 OnePlus, Guangdong Oppo Mobile Telecommunications Corp., Ltd.⁴³, Honor,
2 Tecno, Qmobile, Allview, Shenzhen Qingzheng Electronic Information Technology
3 Co., Ltd.⁴⁴, Xinga Digital Electronic (Shenzhen) Co., Ltd.⁴⁵, Shenzhen ChuangMu
4 Technology Co., Ltd.⁴⁶, Kai Lap Technologies Group Ltd.⁴⁷, Shanghai Belite
5 Technology Co., Ltd.⁴⁸, and Defendant's subsidiary OmniVision Electronics, Inc.

6 50. Defendant had actual knowledge of the '143 Patent and that the '143
7 Patent Infringing Products infringe that patent at least as of November 1, 2023.
8 Accordingly, at least as of that date, Defendant was on notice, knew and/or should
9 have known that its actions induced direct infringement by third parties.

10 Accordingly, at least as of that date, Defendant induced infringement by third party
11 direct infringers and should have known that its actions would induce actual
12 infringement.

13 51. Additionally, at the very least Defendant had actual knowledge of the
14 '143 Patent and its infringement of the same as of the date of this Complaint.

15 52. Defendant induced infringement by others with the intent to cause
16 infringing acts by others or, in the alternative, with the belief that there was a high
17 probability that others infringe the '143 Patent, but while at best, remaining willfully
18 blind to the infringement.

19 53. On information and belief, Defendant advertises the '143 Patent
20 Infringing Products, publishes specifications and promotional literature encouraging
21

22 ⁴³ https://www.gsmarena.com/oppo_reno10-review-2600p5.php

23 ⁴⁴ <https://www.qz-uav.com/Upload/en/editor/file/20230311/1678482632263687.jpg>

24 ⁴⁵ https://www.alibaba.com/product-detail/XINGA-XG23-12MP-OS12D40-FF-MF_1600442097661.html

25 ⁴⁶ <http://www.camera-module.com/product/hdrcameramodule/2mp-120db-hdr-camera-module-omnivision-os02c10.html>

27 ⁴⁷ <http://japanese.kailaptech.com/Product.aspx?id=2043&l1=1413>

28 ⁴⁸ https://www.alibaba.com/product-detail/2MP-OS02C10-USB-Camera-Module-1080P_1600558712606.html

1 customers to implement and incorporate the '143 Patent Infringing Products into
2 end user products, creates and/or distributes user manuals for the '143 Patent
3 Infringing Products that provide instructions and/or encourage infringing use, and
4 offers support and/or technical assistances to its customers that provide instructions
5 on and/or encourage infringing use.

6 54. Defendant encourages and facilitates its customers to infringe the '143
7 Patent by promoting the '143 Patent Infringing Products, for example, on
8 Defendant's website.

9 55. Defendant's customers that incorporate the '143 Patent Infringing
10 Products into other products (e.g., smartphones, vehicles, security cameras, lap tops,
11 virtual reality (VR) and augmented reality (AR) headsets and eye glasses, medical
12 imaging, optical inspection systems, other machine vision applications, etc.) as well
13 as the end users of those products, each directly infringe the Asserted Patents
14 pursuant to OmniVision's instructions and advertisements.

15 **VI. COUNT III: INFRINGEMENT OF '366 PATENT**

16 56. VisionX incorporates each of the allegations of the paragraphs above.

17 57. Defendant has directly infringed and continues to directly infringe the
18 '366 Patent by, for example, making, using, offering to sell, selling, and/or
19 importing into the United States, without authority, products that practice one or
20 more claims of the '366 Patent.

21 58. Defendant is not licensed or otherwise authorized to make, use, offer
22 for sale, sell or import any products that embody the inventions of the '366 Patent in
23 the United States.

24 59. Defendant has and continues to directly infringe one or more claims of
25 the '366 Patent, including, for example, claim 1 of the '366 Patent, either literally or
26 under the doctrine of equivalents, by making, using, offering to sell, selling, and/or
27 importing into the United States infringing image sensors without authority and in
28 violation of 35 U.S.C. § 271.

1 60. With respect to the '366 Patent, Defendant's infringing Image Sensor
2 products include OmniVision's "stacked" products, including – for example – the
3 following OmniVision products:

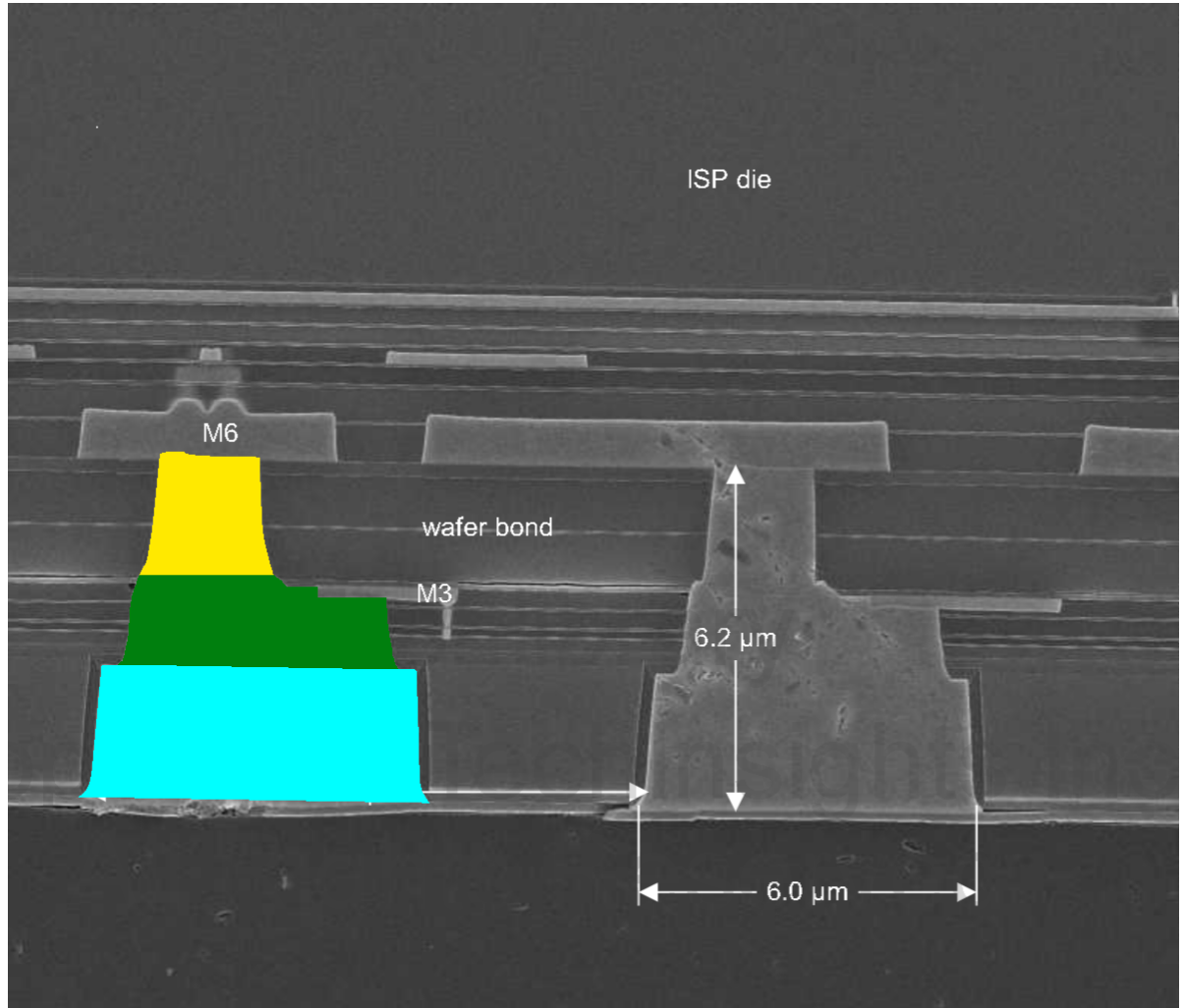
- 4 • OmniVision OS12D40
- 5 • OmniVision OH01A10
- 6 • OmniVision OV48C
- 7 • OmniVision OV50A
- 8 • OmniVision OV23850

9 61. Defendant's infringing products further include any other OmniVision
10 chips in various camera modules that may or may not have OmniVision part
11 numbers, but are made by with a similar structure as the above OmniVision Image
12 Sensors (collectively, the "'366 Patent Infringing Products").

13 62. For example, the OmniVision OV23850 image sensor infringes
14 representative claim 1 of the '366 Patent.

15 63. Claim 1 of the '366 Patent claims an image sensor, comprising: a
16 second semiconductor substrate including a second metal interconnection and a
17 second interlayer dielectric; a second via penetrating the second interlayer dielectric
18 so that the second via is connected to the second metal interconnection; a first
19 semiconductor substrate on the second interlayer dielectric, the first semiconductor
20 substrate having a unit pixel; a pre-metal dielectric on the first semiconductor
21 substrate; a first via penetrating the pre-metal dielectric and the first semiconductor
22 substrate, the first via being connected to the second via; a first interlayer dielectric
23 on the pre-metal dielectric including the first via; a first metal interconnection on the
24 first interlayer dielectric and connected to the first via and the unit pixel; a
25 conductive barrier layer on the first metal interconnection; and a color filter and a
26 microlens on the first interlayer dielectric on the unit pixel.

27 64. The OmniVision OV23850 chip includes stacked CIS and ISP. Figure
28 6 (below) illustrates an exemplary cross-section of the stacked CIS and ISP.



18 *Figure 6*

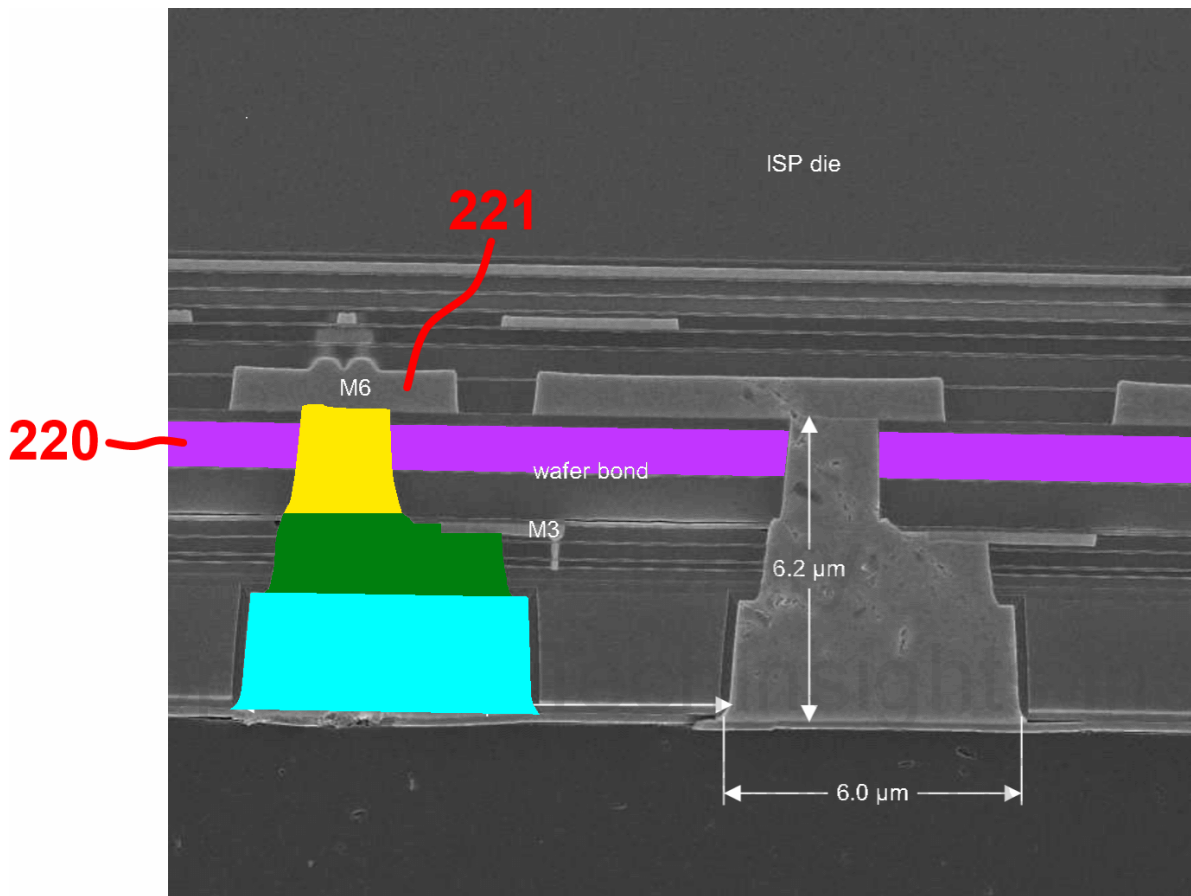
19 65. The CIS and ISP are electrically connected by three vias corresponding
20 to three distinct holes: one via corresponding to a widest hole reaching into the CIS
21 active silicon, another via corresponding to a wide hole reaching slightly beyond CIS
22 metal level three (CIS M3), and yet another via corresponding to a narrowest hole
23 reaching to ISP metal level six (ISP M6). In Figure 6 (above), these three vias are
24 colored blue, green, and yellow, respectively.

25 66. As shown in the table below, the OmniVision OV23850 infringes
26 representative claim 1 of the '366 Patent:

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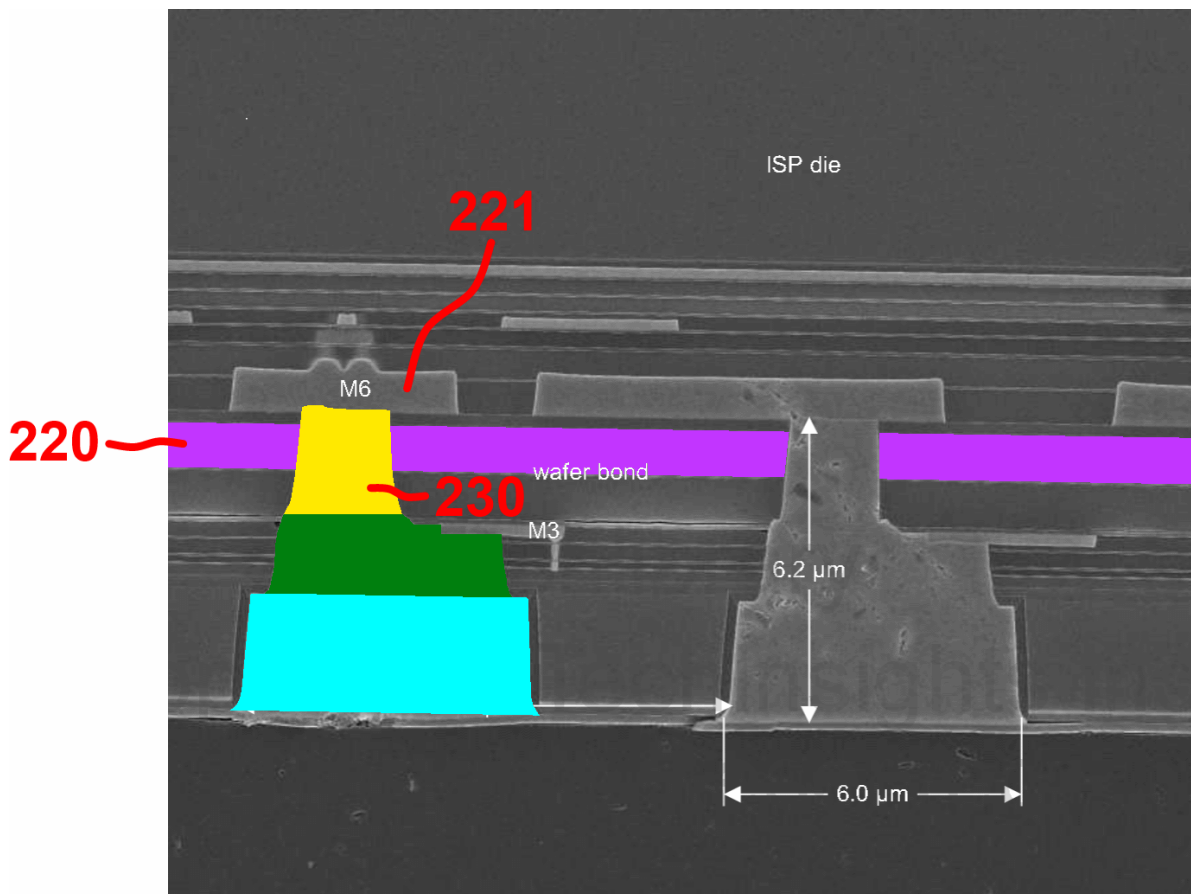
1 **Element 1a: “a second semiconductor substrate including a second metal**
2 **interconnection and a second interlayer dielectric;”**

3 The OmniVision OV23850 comprises an ISP substrate which includes a second
4 metal interconnection (221) and a second interlayer dielectric (purple, labeled
5 220)



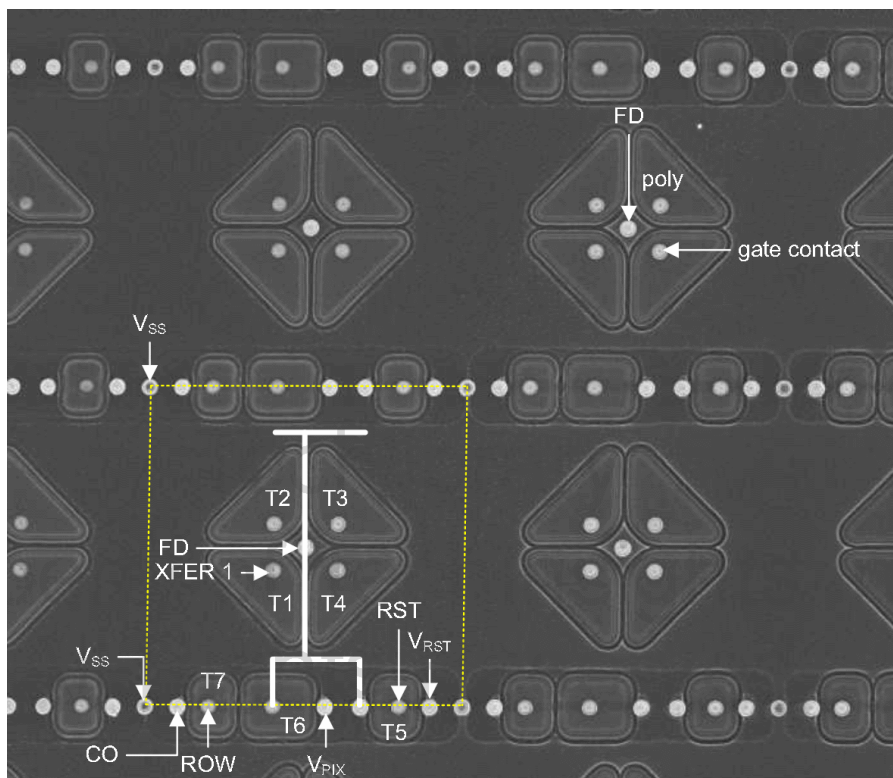
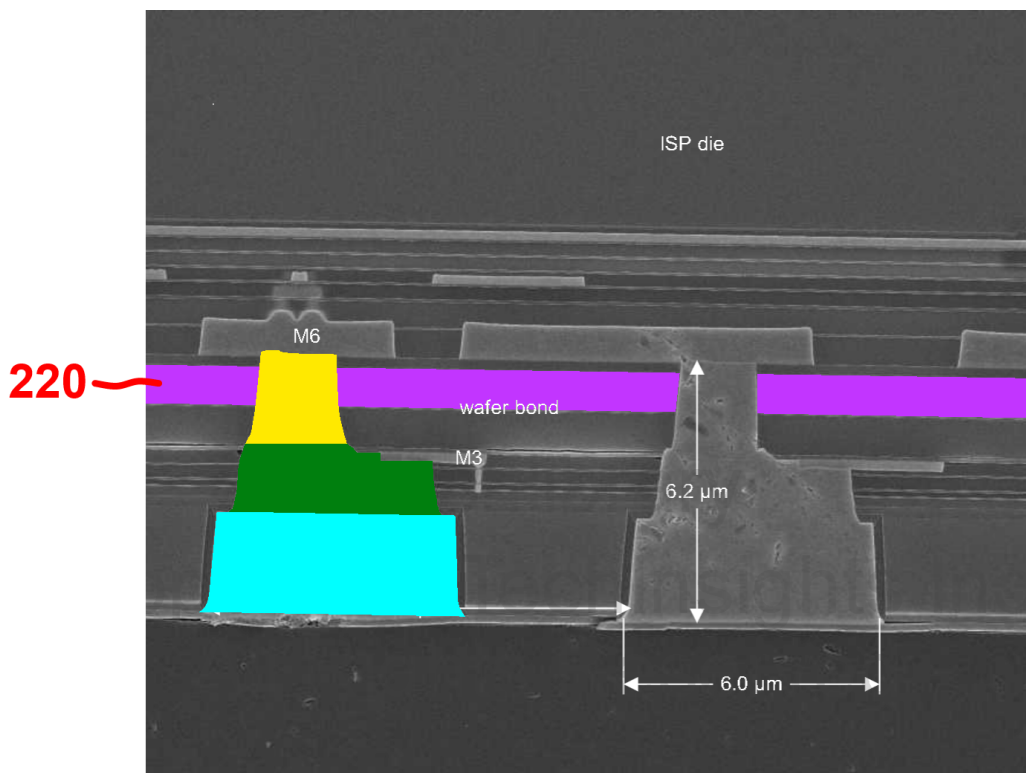
1 **Element 1b: “a second via penetrating the second interlayer dielectric so**
2 **that the second via is connected to the second metal interconnection;”**

3 A second via (yellow, labeled 230) penetrates the second interlayer dielectric
4 220. The second via 230 is connected to the second metal interconnection 221.



Element 1c: “a first semiconductor substrate on the second interlayer dielectric, the first semiconductor substrate having a unit pixel;”

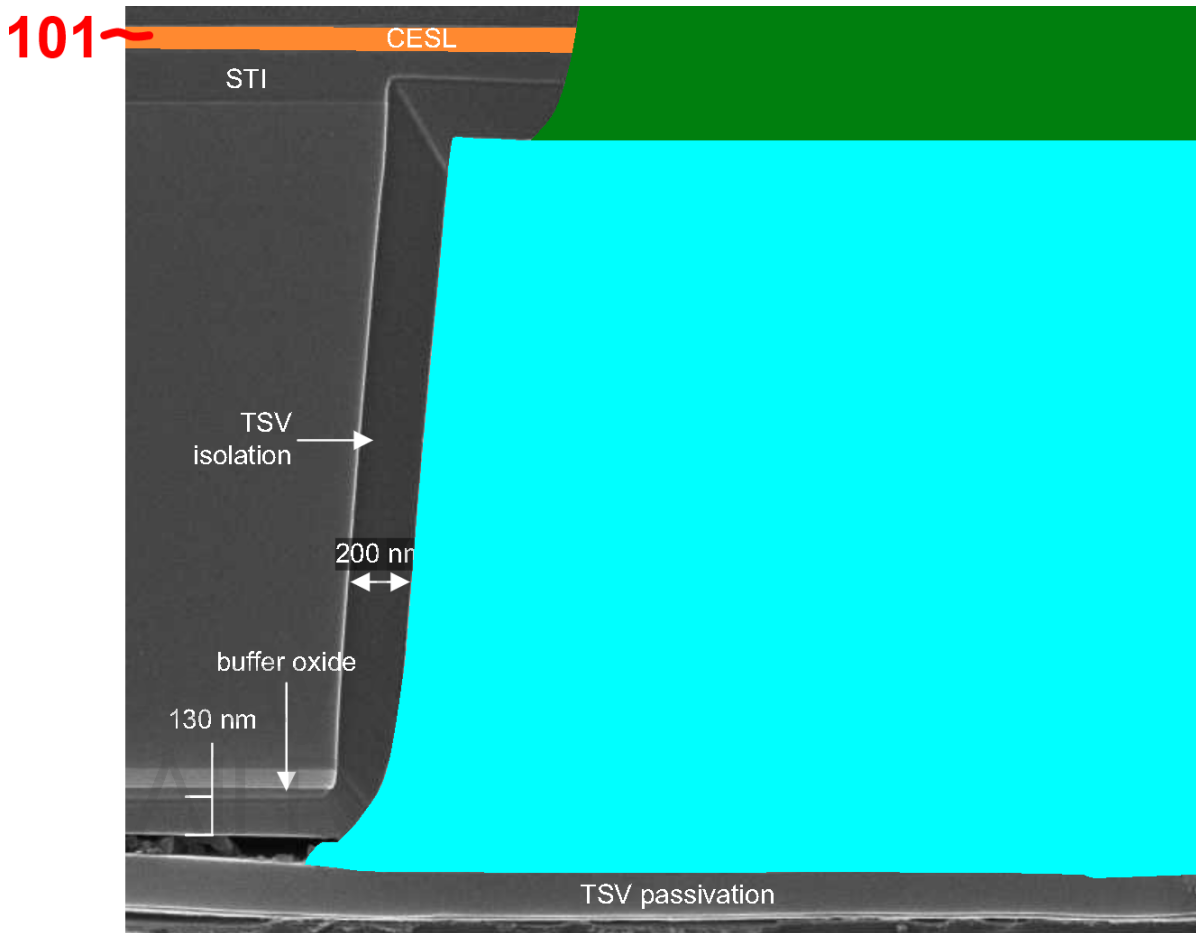
A CIS substrate is on the second interlayer dielectric 220. The CIS substrate includes an array of unit pixels, one such unit pixel is outlined by yellow dots.



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Element 1d: “a pre-metal dielectric on the first semiconductor substrate;”

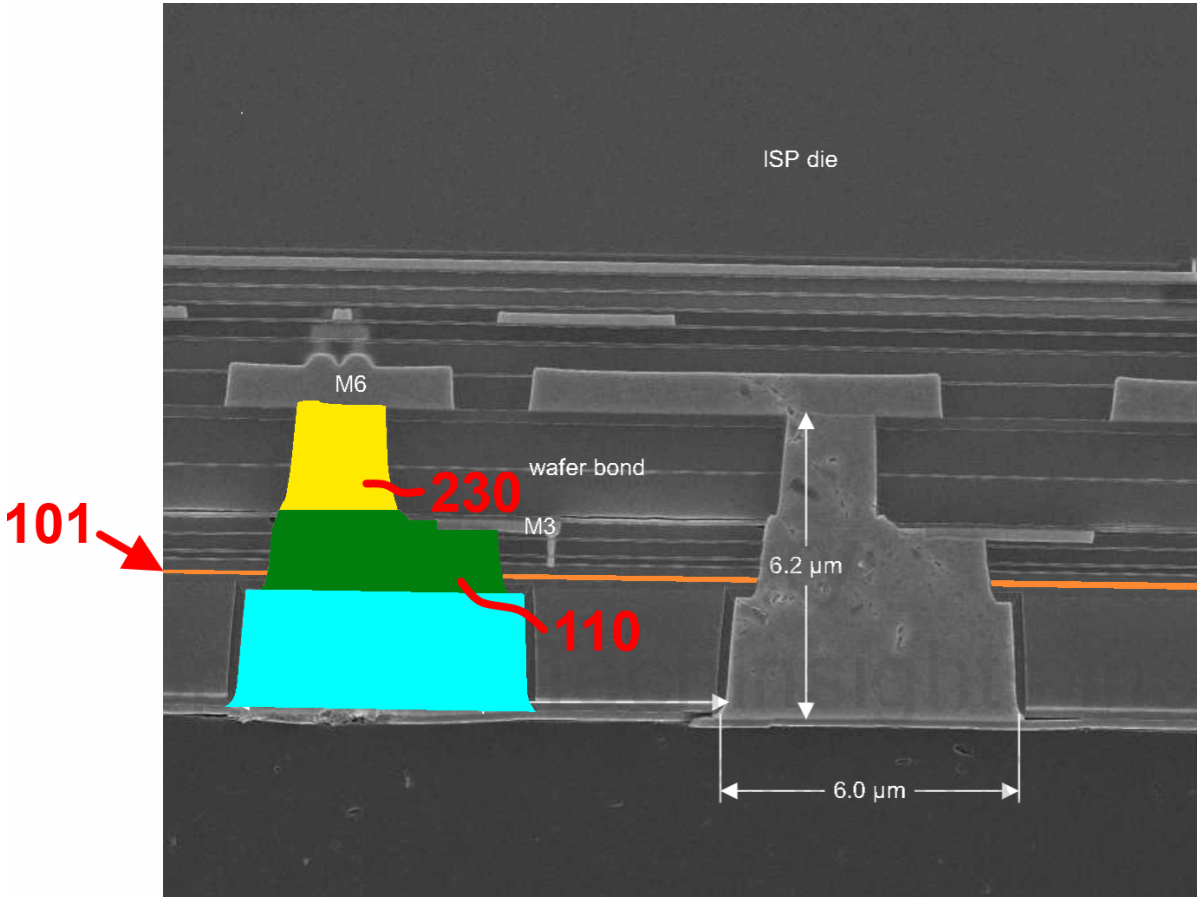
A pre-metal dielectric (orange, labeled 101) is on the CIS substrate.



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Element 1e: “a first via penetrating the pre-metal dielectric and the first semiconductor substrate, the first via being connected to the second via;”

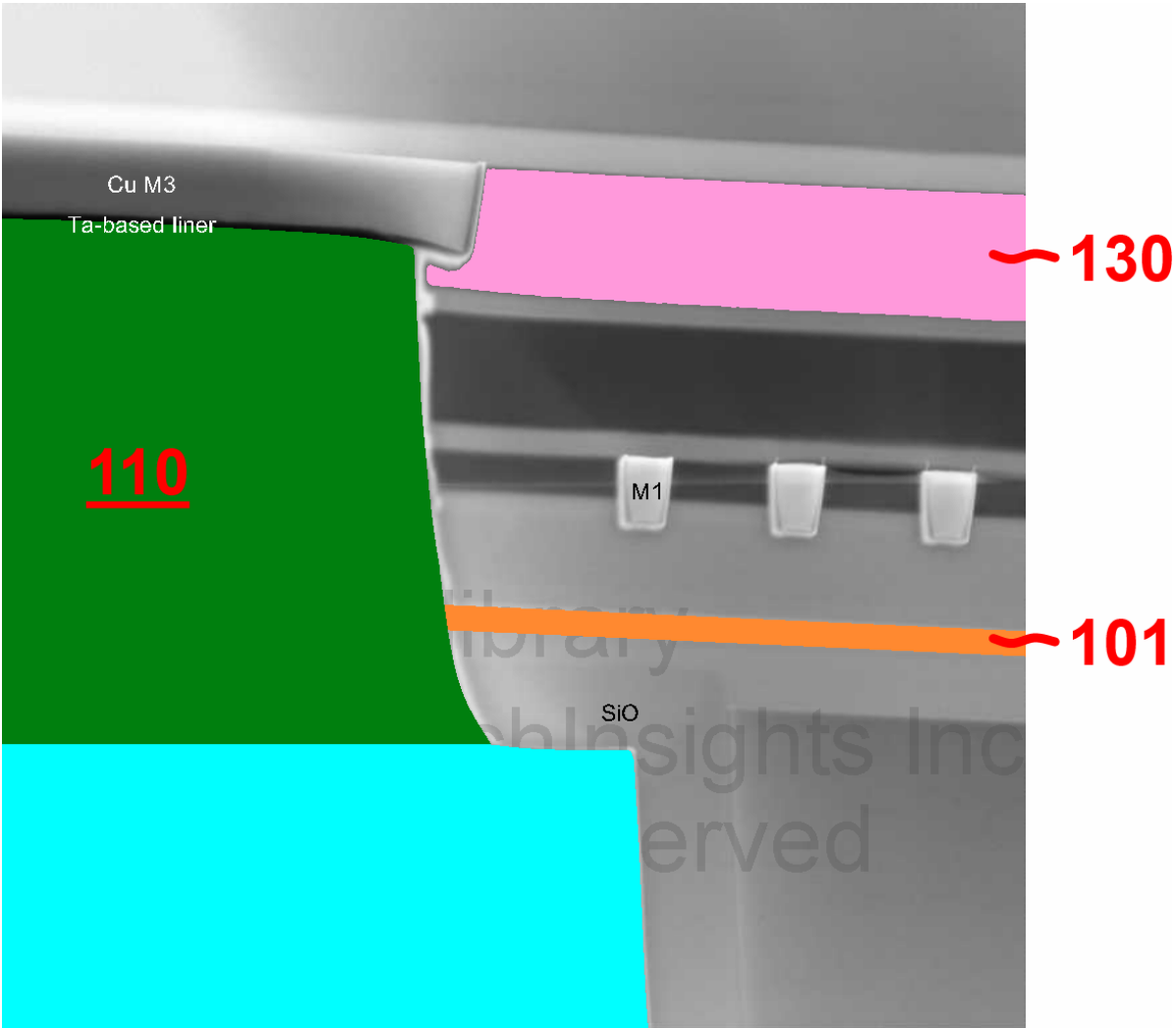
A first via (green, labeled 110) penetrates pre-metal dielectric 101 and the CIS substrate and is connected to second via 230.



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Element 1f: “a first interlayer dielectric on the pre-metal dielectric including the first via;”

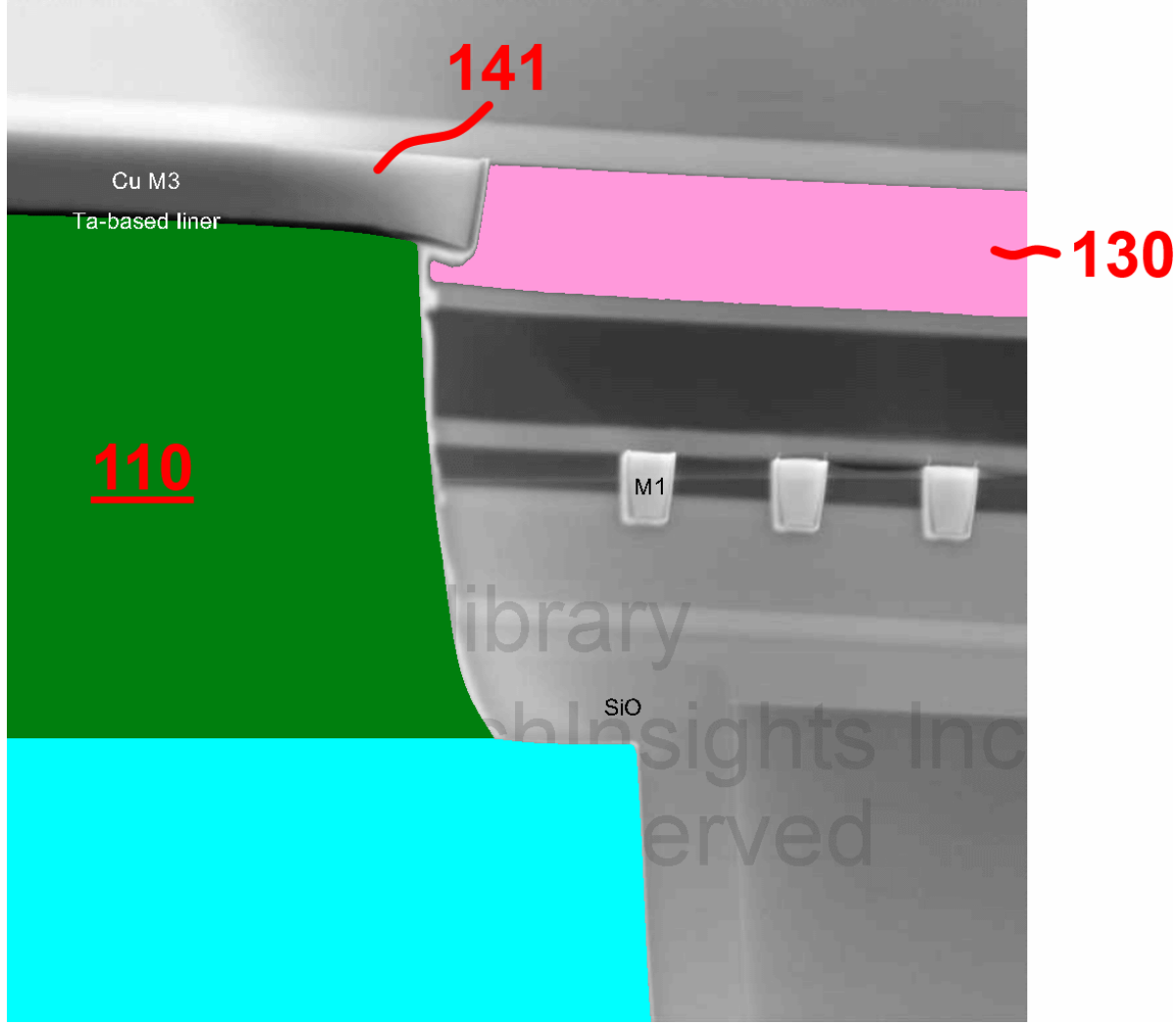
A first interlayer dielectric (pink, labeled 130) is on pre-metal dielectric 101 including first via 110.



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Element 1g: “a first metal interconnection on the first interlayer dielectric and connected to the first via and the unit pixel;”

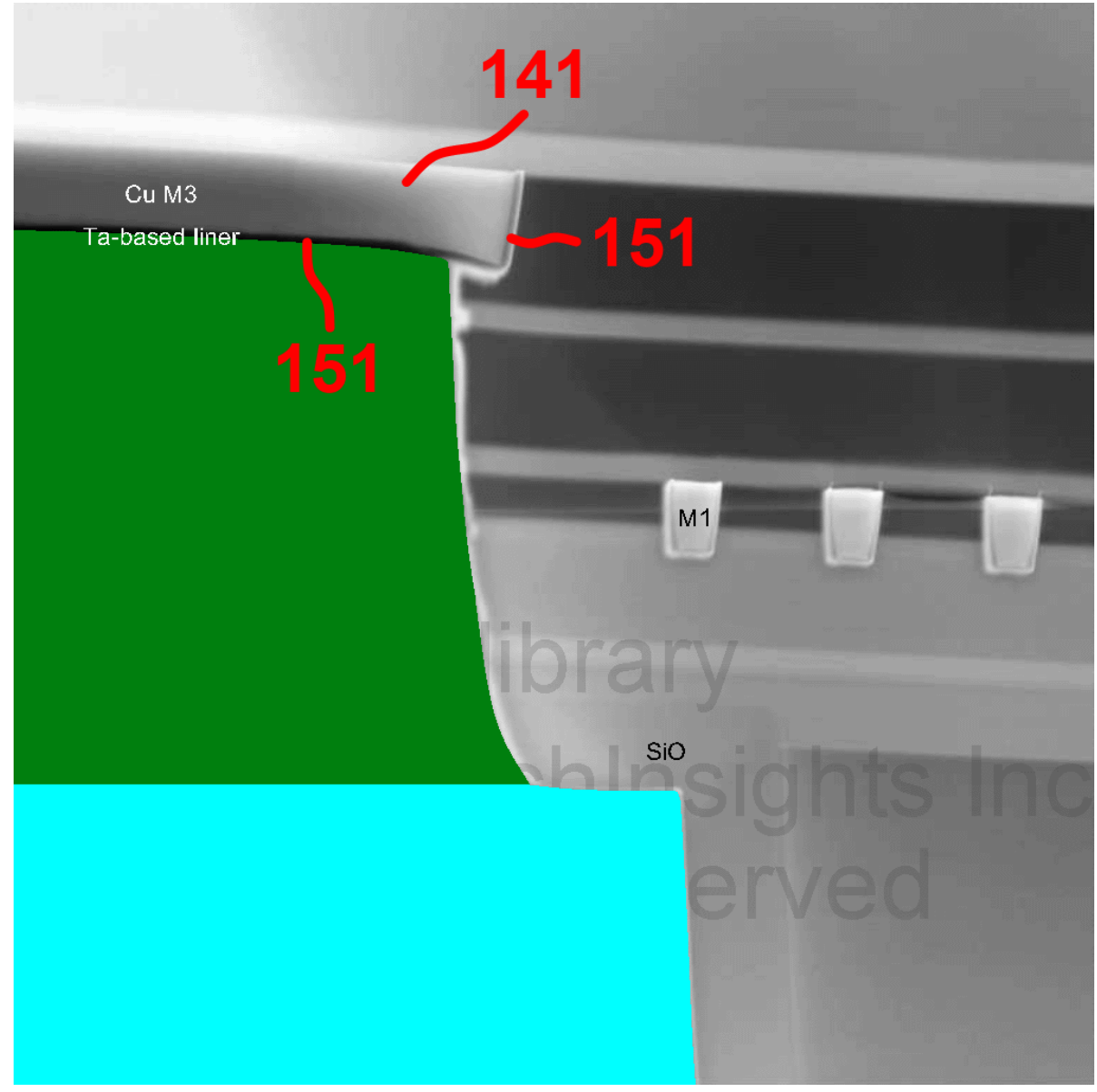
A first metal interconnection (141) is on first interlayer dielectric 130 and is connected to first via 110. First metal interconnection 141 is also connected to a unit pixel.



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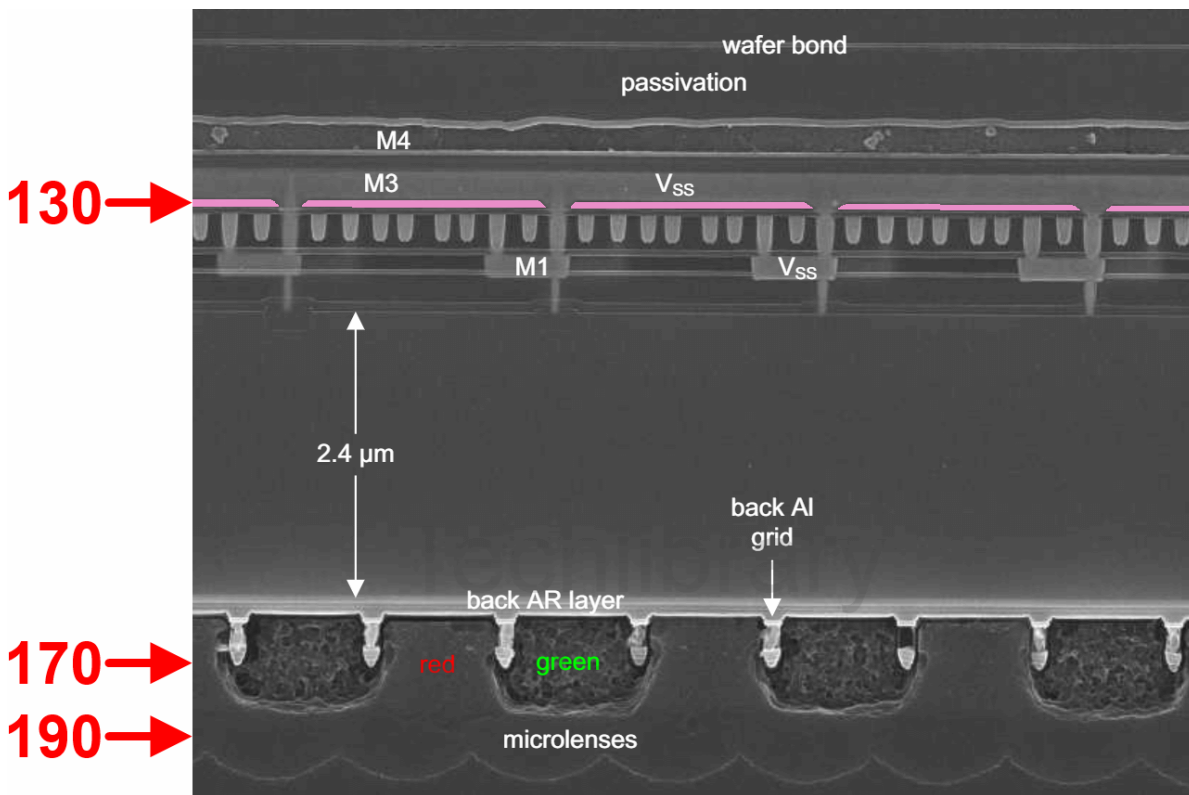
Element 1h: “a conductive barrier layer on the first metal interconnection; and”

A conductive barrier layer (151) is on first metal interconnection 141.



Element 1i: “a color filter and a microlens on the first interlayer dielectric on the unit pixel.”

A color filter layer (170) for the unit pixels is on first interlayer dielectric 130. A microlens layer (190) for the unit pixels is also on first interlayer dielectric 130.



67. On information and belief, the remaining '366 Patent Infringing Products infringe representative claim 1 of the '366 Patent in the same manner.

68. Defendant indirectly infringes the '366 Patent.

69. Defendant has and continues to indirectly infringe one or more claims of the '366 Patent by knowingly and intentionally inducing others to directly infringe, either literally or under the doctrine of equivalents, by making, using, offering to sell, selling and/or importing into the United States infringing products that incorporate and/or use the '366 Patent Infringing Products. Defendant induces direct infringement of the '366 Patent by customers, importers, sellers, resellers, and/or end users of the '366 Patent Infringing Products. On information and belief,

1 the direct infringers include, for example, Microsoft Corporation⁴⁹, Dell
2 Technologies, Inc.⁵⁰, Tesla, Inc.⁵¹, Lenovo Group Ltd.⁵², Qualcomm Incorporated (or
3 alternatively Qualcomm Technologies, Inc.)⁵³, Nokia Corporation⁵⁴, ASUSTeK
4 Computer Inc.⁵⁵, Motorola Mobility LLC⁵⁶, BLU Products Inc.⁵⁷, Arlo
5 Technologies, Inc.⁵⁸, Ring LLC⁵⁹, HTC Corporation⁶⁰, Leopard Imaging Inc.⁶¹,
6 Reolink Innovation Limited⁶², VisionMeta⁶³, Huawei, Xiaomi, TCL, Gionee,
7 OnePlus, Guangdong Oppo Mobile Telecommunications Corp., Ltd.⁶⁴, Honor,
8 Tecno, Qmobile, Allview, Shenzhen Qingzheng Electronic Information Technology
9

10 ⁴⁹ <https://electronics360.globalspec.com/article/15250/teardown-microsoft-surface-pro-x>

11 ⁵⁰ <https://www.ovt.com/press-releases/dell-selects-omnivisions-ov02c-for-the-most-superior-1080p-webcam-performance-in-next-generation-latitude-laptops/>

12 ⁵¹ <https://teslatap.com/undocumented/>

13 ⁵² <https://www.kimovil.com/en/where-to-buy-lenovo-legion-y70#sec-camera>

14 ⁵³ <https://www.roadtovr.com/htc-vive-lenovo-standalone-headsets-based-qualcomm-reference-design-components-detailed/>

15 ⁵⁴ <https://nokiamob.net/2023/04/27/nokia-xr21-5g-coming-after-all-not-xr30/>

16 ⁵⁵ <https://www.engadget.com/2017-08-17-asus-zenfone-4-pro-selfie-max-dual-camera.html>

17 ⁵⁶ <https://www.kimovil.com/en/list-smartphones-by-lens-model/omnivision-ov50a>

18 ⁵⁷ <https://www.deviceranks.com/en/phone/4786/blu-pure-xl>

19 ⁵⁸ <https://www.burglaryalarmsystem.com/product-news/disassemble-teardown-netgear-arlo-battery-powered-wifi-cameras-security-system.html>

20 ⁵⁹ <https://www.ovt.com/press-releases/omnivision-provides-ring-producer-of-the-worlds-first-battery-operated-wireless-video-doorbell-with-hd-video-recording-and-streaming-capabilities/>

21 ⁶⁰ <https://www.techinsights.com/products/ddt-2206-805>

22 ⁶¹ <https://leopardimaging.com/product/csi-2-mipi-modules-i-pex/csi-2-mipi-modules/rolling-shutter-mipi-cameras/2mp-os02c10/li-os02c10-mipi-cs/>

23 ⁶² <https://www.techinsights.com/products/pkg-2201-804>

24 ⁶³ <https://www.visionmeta.com/product/11m-icatch-v39m-3-axis-anti-shake-eis-gimbal-camera-module-for-drone/>

25 ⁶⁴ https://www.gsmarena.com/oppo_reno10-review-2600p5.php

1 Co., Ltd.⁶⁵, Xinga Digital Electronic (Shenzhen) Co., Ltd.⁶⁶, Shenzhen ChuangMu
2 Technology Co., Ltd.⁶⁷, Kai Lap Technologies Group Ltd.⁶⁸, Shanghai Belite
3 Technology Co., Ltd.⁶⁹, and Defendant's subsidiary OmniVision Electronics, Inc.

4 70. Defendant had actual knowledge of the '366 Patent and that the '366
5 Patent Infringing Products infringe that patent at least as of November 1, 2023.

6 Accordingly, at least as of that date, Defendant was on notice, knew and/or should
7 have known that its actions induced direct infringement by third parties.

8 Accordingly, at least as of that date, Defendant induced infringement by third party
9 direct infringers and should have known that its actions would induce actual
10 infringement.

11 71. Additionally, at the very least Defendant had actual knowledge of the
12 '366 Patent and its infringement of the same as of the date of this Complaint.

13 72. Defendant induced infringement by others with the intent to cause
14 infringing acts by others or, in the alternative, with the belief that there was a high
15 probability that others infringe the '366 Patent, but while at best, remaining willfully
16 blind to the infringement.

17 73. On information and belief, Defendant advertises the '366 Patent
18 Infringing Products, publishes specifications and promotional literature encouraging
19 customers to implement and incorporate the '366 Patent Infringing Products into
20 end user products, creates and/or distributes user manuals for the '366 Patent
21 Infringing Products that provide instructions and/or encourage infringing use, and
22 _____

23 ⁶⁵ <https://www.qz-uav.com/Upload/en/editor/file/20230311/1678482632263687.jpg>

24 ⁶⁶ https://www.alibaba.com/product-detail/XINGA-XG23-12MP-OS12D40-FF-MF_1600442097661.html

25 ⁶⁷ <http://www.camera-module.com/product/hdrcameramodule/2mp-120db-hdr-camera-module-omnivision-os02c10.html>

26 ⁶⁸ <http://japanese.kailaptech.com/Product.aspx?id=2043&l1=1413>

27 ⁶⁹ https://www.alibaba.com/product-detail/2MP-OS02C10-USB-Camera-Module-1080P_1600558712606.html

1 offers support and/or technical assistances to its customers that provide instructions
2 on and/or encourage infringing use.

3 74. Defendant encourages and facilitates its customers to infringe the '366
4 Patent by promoting the '366 Patent Infringing Products, for example, on
5 Defendant's website.

6 75. Defendant's customers that incorporate the '366 Patent Infringing
7 Products into other products (e.g., smartphones, vehicles, security cameras, lap tops,
8 virtual reality (VR) and augmented reality (AR) headsets and eye glasses, medical
9 imaging, optical inspection systems, other machine vision applications, etc.) as well
10 as the end users of those products, each directly infringe the Asserted Patents
11 pursuant to OmniVision's instructions and advertisements.

12 76. Defendant's customers that incorporate the '366 Patent Infringing
13 Products into other products (e.g., smartphones, vehicles, etc.) as well as the end
14 users of those products, each directly infringe the Asserted Patents pursuant to
15 OmniVision's instructions and advertisements.

16 **PRAYER FOR RELIEF**

17 WHEREFORE, VisionX requests entry of judgment in its favor and against
18 Defendant as follows:

- 19 a) A declaration that Defendant has directly infringed one or more claims
20 of the Asserted Patents, either literally or under the doctrine of
21 equivalents;
- 22 b) A declaration that Defendant has induced infringement and/or are
23 inducing infringement of one or more claims of the Asserted Patents,
24 either literally or under the doctrine of equivalents;
- 25 c) An award of damages pursuant to 35 U.S.C. § 284 adequate to
26 compensate VisionX for Defendant's infringement of the Asserted
27 Patents in an amount according to proof at trial (together with
28 prejudgment and post-judgment interest), but no less than a reasonable

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- royalty;
- d) Injunctive relief against further infringement of the Asserted Patents;
- e) An award of costs and expenses pursuant to 35 U.S.C. § 284 or as otherwise permitted by law; and
- f) Such other and further relief, whether legal, equitable, or otherwise, to which VisionX may be entitled or which this Court may order.

Dated: November 2, 2023

ONE LLP

By: */s/ Peter R. Afrasiabi*

Peter R. Afrasiabi

Joseph K. Liu

Attorneys for Plaintiff,

VisionX Technologies, LLC

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JURY DEMAND

VisionX hereby demands a trial by jury on all issues so triable.

Dated: November 2, 2023

ONE LLP

By: /s/ Peter R. Afrasiabi

Peter R. Afrasiabi

Joseph K. Liu

Attorneys for Plaintiff,

VisionX Technologies, LLC