UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

Wilus Institute of Standards and Technology Inc., *Plaintiff*, vs. Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., *Defendants*.	CASE NO. 2:25-cv-00070 **Complaint for Patent Infringement** **JURY DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Wilus Institute of Standards and Technology Inc. ("Wilus") files this complaint against Defendants Samsung Electronics Co., Ltd. ("SEC"), and Samsung Electronics America, Inc. ("SEA") (collectively, "Defendants" or "Samsung"), alleging infringement of U.S. Patent Nos. 10,911,186, 11,716,171, 11,664,926, and 12,004,262. The Accused Products are Wi-Fi 6 (802.11ax) enabled devices used, offered for sale, sold, and/or imported by Defendants in the United States and supplied by Defendants to customers in the United States.

BACKGROUND

1. This complaint arises from Defendants' infringement of the following United States patents owned by Wilus, each of which relate to the "MAC" or "medium access control layer" of wireless communications technology: United States Patent Nos. 10,911,186 ("'186 patent"), 11,716,171 ("'171 patent"), 11,664,926 ("'926 patent"), and 12,004,262 ("'262 patent") (collectively, "Asserted Patents").

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NOTICE OF THE ASSSERTED PATENTS

2. The patented technologies which are the subject of this lawsuit are well known to Defendants.

3. For example, on January 15, 2021 and December 27, 2022, Wilus submitted Letters of Assurance to the IEEE Standards Association Standards Board Patent Committee, stating that Wilus may own, control, or have the ability to license patent claims that might be or become essential patent claims for the IEEE 802.11ax and 802.11 standards. Samsung was a participant in the IEEE task group that developed the 802.11ax standard. On information and belief, Samsung was aware of the Letters of Assurance submitted by Wilus.

4. Samsung Electronics Co., Ltd. submitted its Letter of Assurance concerning the 802.11ax standard on January 14, 2022, a year after Wilus submitted its first Letter of Assurance.

5. As another example, on April 8, 2022, SEC was sent a letter by Sisvel International S.A. ("Sisvel"), acting in its role as a licensing manager of certain patents related to the IEEE Wi-Fi 6 (802.11ax) standard. This letter conveyed Wilus's and Sisvel's belief that Samsung products practiced Wilus patents and required a license to these Wilus patents. The letter contained a list of "patents essential to the 802.11ax standard," which included the '186 patent. The patent applications that resulted in the '171, '926, and '262 patents were pending before the U.S. Patent Office at the time this letter was sent. The letter identified specific Samsung products as examples of products that implement essential features of the Wi-Fi 6 standard. It also contained a link to a brochure that included a table identifying specific sections and figures of the Wi-Fi 6 standard as illustrations of what the essential patents covered in the standard. The letter included an offer to grant a patent license for Wilus patents including the '186 patent to SEC in exchange for royalty payments.

6. As another example, on October 25, 2023, SEC was sent another letter by Sisvel, acting in its role as a licensing manager of certain patents related to the IEEE Wi-Fi 6 (802.11ax) standard. This letter again conveyed Wilus's and Sisvel's belief that Samsung products practiced Wilus patents and required a license to these Wilus patents. The letter contained a list of "SEPs" (standard-essential patents) which included the '186 and '926 patents. The letter identified specific Samsung products as examples of products that implement essential features of the Wi-Fi 6 standard. It also contained a link to a brochure that included a table identifying specific sections and figures of the Wi-Fi 6 standard as illustrations of what the essential patents covered in the standard. The table in the version of the brochure currently available at that link includes this information for each of the '186, '171, '926, and '262 patents. The letter included an offer to grant a patent license for Wilus patents including the '186, '171, '926, and '262 patents to SEC in exchange for royalty payments.

PLAINTIFF WILUS AND THE ASSERTED PATENTS

7. Plaintiff Wilus is a research and development company specializing in the development of new technologies related to wireless communications and multimedia, including Wi-Fi and other wireless protocols. Founded in 2012, Wilus has been at the forefront of research and development in wireless communications for more than a decade. The company is employee-owned, and its team currently consists of 20 engineers and inventors.

8. Since its formation Wilus has made over 700 technical contributions to leading standards bodies that define international standards for technologies including cellular wireless, wireless LAN, and multimedia compression. In particular, Wilus has played a crucial role in the development and standardization of Wi-Fi 6 technologies, contributing significantly to the enhanced speed, efficiency, capabilities, and performance of Wi-Fi 6 networks. Its work is

significant in the context of the standards pertaining to Wi-Fi 6, both in terms of the number of technical contributions and in terms of the importance of those technical contributions to the standards.

9. Wilus is a corporation organized under the laws of South Korea, with its principal place of business at 5F 216 Hwangsaeul-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, 13595 Republic of Korea.

10. Wilus is the owner of all right, title, and interest in U.S. Patent No. 10,911,186, titled "Wireless communication terminal and wireless communication method for multi-user concurrent transmission," and issued February 2, 2021. A copy of the '186 patent is attached as Exhibit 1.

11. Wilus is the owner of all right, title, and interest in U.S. Patent No. 11,716,171, titled "Wireless communication terminal and wireless communication method for multi-user concurrent transmission," and issued August 1, 2023. A copy of the '171 patent is attached as Exhibit 2.

12. Wilus is the owner of all right, title, and interest in U.S. Patent No. 11,664,926, titled "Aggregated-MPDU, method for transmitting response frame thereto, and wireless communication terminal using same," and issued May 30, 2023. A copy of the '926 patent is attached as Exhibit 3.

13. Wilus is the owner of all right, title, and interest in U.S. Patent No. 12,004,262, titled "Wireless communication method using BSS identifier and wireless communication terminal using same," and issued June 4, 2024. A copy of the '262 patent is attached as Exhibit 4.

DEFENDANTS AND THE ACCUSED PRODUCTS

14. On information and belief, Defendant Samsung Electronics Co., Ltd. is a

corporation organized under the laws of South Korea, with its principal place of business at 129, Samsung-Ro, YeongTong-Gu, Suwon-Si, Gyonggi-Do, 443-742, South Korea.

15. On information and belief, Defendant Samsung Electronics America, Inc. is a United States corporation organized under the laws of the State of New York, with its principal place of business at 85 Challenger Road, Ridgefield Park, New Jersey 07660.

16. SEA is a wholly-owned subsidiary of SEC.

17. SEA distributes certain Samsung consumer electronics products, including the Accused Products, in the United States.

18. On information and belief, SEA has corporate offices in the Eastern District of Texas at 6625 Excellence Way, Plano, Texas 75023.

19. SEA may be served with process through its registered agent CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201-3136.

20. The Accused Products are all of Samsung's Wi-Fi 6 (802.11ax) enabled devices, including mobile phones, tablets, laptops, e-readers, cameras, appliances, and wearables, used, offered for sale, sold, and/or imported by Defendants in the United States.

JURISDICTION AND VENUE

21. This action arises under the patent laws of the United States, Title 35 of the United States Code.

22. This Court has original subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

23. This Court has personal jurisdiction over Samsung in this action because Samsung has committed acts of infringement within this District giving rise to this action, has a regular and established place of business in this District, and has established minimum contacts with this forum

such that the exercise of jurisdiction over Samsung would not offend traditional notions of fair play and substantial justice. Samsung, directly and/or through subsidiaries or intermediaries, conducts its business extensively throughout Texas, by shipping, distributing, offering for sale, selling, and advertising its products and/or services in Texas and the Eastern District of Texas, regularly does business or solicit business, engage in other persistent courses of conduct, and/or derives substantial revenue from products and/or services provided to individuals in Texas, and commits acts of infringement of Wilus's patents in this District by, among other things, making, using, importing, offering to sell, and selling products that infringe the asserted patents, including without limitation the Samsung Wi-Fi 6 enabled devices accused of infringement in this case.

24. Samsung, directly and/or through subsidiaries or intermediaries, has purposefully and voluntarily placed one or more products and/or services in the stream of commerce that practice the Asserted Patents with the intention and expectation that they will be purchased and used by consumers in the Eastern District of Texas. These products and/or services have been and continue to be purchased and used in the Eastern District of Texas.

25. Venue as to Samsung is proper in this District under 28 U.S.C. §§ 1391 and 1400(b). Samsung has transacted business in this District and has committed acts of direct and indirect infringement in this District by, among other things, making, using, importing, offering to sell, and selling products that infringe the Asserted Patents.

26. Defendant SEA maintains a regular and established place of business at 1301 East Lookout Drive, Richardson, Texas 75082, 2800 Technology Drive, Suite 200, Plano, Texas 75074, and 6625 Excellence Way, Plano, Texas 75023.

27. Defendant SEC is a foreign corporation. Venue is proper as to a foreign defendant in any district. 28 U.S.C. §§ 1391(c)(3).

28. Further, Samsung has admitted or not contested proper venue in this Judicial District in other patent infringement actions.

COUNT 1 – CLAIM FOR INFRINGEMENT OF THE ’186 PATENT

29. Wilus incorporates by reference each of the allegations in the foregoing paragraphs as if fully set forth herein and further alleges as follows:

30. On February 2, 2021, the United States Patent and Trademark Office issued U.S. Patent No. 10,911,186, titled “Wireless communication terminal and wireless communication method for multi-user concurrent transmission.” Exhibit 1.

31. The ’186 patent claims devices and methods used to implement the MAC layer of Wi-Fi 6 wireless LANs.

32. Wilus is the owner of the ’186 patent with full rights to pursue recovery of royalties for damages for infringement, including full rights to recover past and future damages.

33. The claims of the ’186 patent were issued by the United States Patent and Trademark Office and are presumed by statute to be valid. They are not directed to abstract ideas and moreover contain inventive concepts sufficient to ensure that the patent amounts to significantly more than a patent on a patent ineligible concept itself. The written description of the ’186 patent describes in technical detail each limitation of the claims, allowing a skilled artisan to understand the scope of the claims and how the nonconventional and non-generic combination of claim limitations is patentably distinct from and improved upon what may have been considered conventional or generic in the art at the time of the invention.

34. Wilus and its predecessors in interest have satisfied the requirements of 35 U.S.C. § 287(a) with respect to the ’186 patent, and Wilus is entitled to damages for Defendants’ past infringement. For example, Sisvel’s letters conveying Wilus’s and Sisvel’s belief that Samsung

products practiced Wilus's '186 patent and offering to license Wilus's patents to Samsung provided Samsung with actual notice of infringement.

35. Defendants have directly infringed (literally and equivalently) and induced and contributed to infringement by others of the '186 patent by, without a license or permission from Wilus: making, using, selling, offering for sale, or importing products that infringe the claims of the '186 patent; and inducing and contributing to infringement by others of the claims of the '186 patent.

36. On information and belief, Defendants use, import, offer for sale, and sell certain infringing products in the United States. The Accused Products are, for example, Wi-Fi 6 (802.11ax) enabled devices, including mobile phones, tablets, laptops, e-readers, cameras, appliances, and wearables, used, offered for sale, sold, and/or imported by Defendants in the United States.

37. The Accused Products satisfy all claim limitations of one or more claims of the '186 Patent. On information and belief, the Accused Products employ, implement, or utilize materially the same Wi-Fi 6 technology, such that facts material to infringement by one Accused Product will be material to all Accused Products. For example, the Accused Products include "A wireless communication terminal, the wireless communication terminal":

Samsung Galaxy S24 Ultra

Featuring Snapdragon 8 Gen 3 for Galaxy.

Introducing Samsung Galaxy S24 Ultra, now with many next-gen AI features and capabilities enabled by Snapdragon 8 Gen 3 for Galaxy. Powered with Galaxy AI, Galaxy S24 Ultra adapts to your passions and behaviors to make a new level of achievement possible. And, with Qualcomm FastConnect 7800 Mobile Connectivity System, you'll get the best possible connection and premium WiFi 7 connectivity.

(https://www.qualcomm.com/snapdragon/device-finder/samsung-galaxy-s24-ultra)

38. The Accused Products include "a transceiver" and "a processor":

Wi-Fi	**Wi-Fi/Bluetooth System:** Qualcomm® FastConnect™ 7800
	Peak Speed: 5.8 Gbps
	Generation: Wi-Fi 7, Wi-Fi 6, Wi-Fi 5, Wi-Fi 4
	Standards: 802.11be, 802.11ax, 802.11ac, 802.11n, 802.11g, 802.11b, 802.11a

(https://www.qualcomm.com/products/mobile/snapdragon/smartphones/snapdragon-8-series-mobile-platforms/snapdragon-8-gen-3-mobile-platform)

39. In the Accused Products, the processor is configured to "receive, through the transceiver, a trigger frame indicating uplink transmission of one or more terminals":

4.3.15a High efficiency (HE) STA

An HE AP sends a Trigger frame to initiate UL MU operation using UL OFDMA or UL MU-MIMO transmissions or a frame containing a TRS Control subfield to initiate UL OFDMA transmissions. The frame initiating these transmissions in the uplink direction is a triggering frame. The triggering frame identifies non-AP STAs participating in UL MU operation and assigns RUs and/or spatial streams to these STAs. Multi-STA BlockAck frames can be used by the AP to acknowledge the frames transmitted by multiple non-AP STAs. The scheduling of these Trigger frames can be set up between a non-AP STA and the AP using TWT operation to save power and reduce collisions.

(IEEE 802.11ax-2021, § 4.3.15a)

9.3.1.22 Trigger frame format

9.3.1.22.1 General

A Trigger frame allocates resources for and solicits one or more HE TB PPDU transmissions. The Trigger frame also carries other information required by the responding STA to send an HE TB PPDU.

(IEEE 802.11ax-2021, § 9.3.1.22)

40. In the Accused Products, the processor is configured such that "the trigger frame includes an association identifier (AID) field":

9.3.1.22 Trigger frame format

9.3.1.22.1 General

MAC header

	Frame Control	Duration	RA	TA	Common Info	User Info List	Padding	FCS
Octets:	2	2	6	6	8 or more	variable	variable	4

Figure 9-64a—Trigger frame format

The User Info List field contains zero or more User Info fields.

The User Info field is defined in Figure 9-64d (User Info field format) for all Trigger frame variants except the NFRP Trigger frame, which is defined in 9.3.1.22.9 (NDP Feedback Report Poll (NFRP) variant).

	B0 B11	B12 B19	B20	B21 B24	B25	B26 B31	B32 B38	B39	
	AID12	RU Allocation	UL FEC Coding Type	UL HE-MCS	UL DCM	SS Allocation/ RA-RU Infor-mation	UL Target RSSI	Reserved	Trigger Dependent User Info
Bits:	12	8	1	4	1	6	7	1	variable

Figure 9-64d—User Info field format

(IEEE 802.11ax-2021, § 9.3.1.22)

41. In the Accused Products, the processor is configured to "perform, through the transceiver, an uplink transmission in response to the trigger frame":

26.5.2 UL MU operation

26.5.2.1 General

UL MU operation allows an AP to solicit simultaneous immediate response frames from one or more non-AP HE STAs. A non-AP HE STA shall follow the rules in this subclause for the transmission of response frames in an HE TB PPDU, unless the Trigger frame is an MU-RTS Trigger frame, in which case the response is a CTS frame sent in a non-HT PPDU (see 26.2.6).

26.5.2.3 Non-AP STA behavior for UL MU operation

26.5.2.3.1 General

A non-AP STA shall not transmit an HE TB PPDU if all of the conditions in 26.5.2.3.2 are satisfied. Otherwise, a non-AP STA shall transmit an HE TB PPDU a SIFS after a received PPDU if all of the following conditions are met:

— The received PPDU contains either a Trigger frame (that is not an MU-RTS variant) with a User Info field addressed to the non-AP STA or a frame addressed to the non-AP STA that contains an TRS Control subfield. A User Info field in the Trigger frame is addressed to a non-AP STA if one of the following conditions are met:

(IEEE 802.11ax-2021, § 26.5.2)

42. In the Accused Products, "the AID field is used to identify whether the trigger frame includes a padding field to which padding is applied":

9.3.1.22 Trigger frame format

9.3.1.22.1 General

Table 9-29h—AID12 subfield encoding

AID12 subfield	Description
0	User Info field allocates one or more contiguous RA-RUs for associated STAs
1–2007	User Info field is addressed to an associated STA whose AID is equal to the value in the AID12 subfield
2008–2044	Reserved
2045	User Info field allocates one or more contiguous RA-RUs for unassociated STAs
2046	Unallocated RU
2047–4094	Reserved
4095	Start of Padding field

(IEEE 802.11ax-2021, § 9.3.1.22)

43. In the Accused Products, "the trigger frame further includes the padding field when the AID field is set to a specific value":

9.3.1.22 Trigger frame format

9.3.1.22.1 General

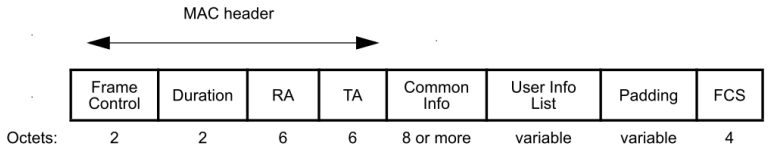

Figure 9-64a—Trigger frame format

Table 9-29h—AID12 subfield encoding

AID12 subfield	Description
0	User Info field allocates one or more contiguous RA-RUs for associated STAs
1–2007	User Info field is addressed to an associated STA whose AID is equal to the value in the AID12 subfield
2008–2044	Reserved
2045	User Info field allocates one or more contiguous RA-RUs for unassociated STAs
2046	Unallocated RU
2047–4094	Reserved
4095	Start of Padding field

> The Padding field is optionally present in a Trigger frame to extend the frame length to give the recipient STAs enough time to prepare a response for transmission a SIFS after the frame is received. The Padding field, if present, is at least two octets in length and is set to all 1s. If the Padding field is present in a Trigger frame, its length is computed as described in 26.5.2.2.3.

(IEEE 802.11ax-2021, § 9.3.1.22)

44. Defendants have also knowingly and intentionally induced and contributed to infringement of the ’186 patent in violation of 35 U.S.C. §§ 271(b) and 271(c). For example, Defendants have had knowledge or were willfully blind to the ’186 patent and the infringing nature of the Accused Products at least because SEC had received the April 8, 2022, letter from Sisvel identifying the ’186 patent as “essential to the 802.11ax standard” and identifying examples of Samsung products that implement essential features of the standard.

45. Despite this knowledge of the ’186 patent, Defendants have continued to actively encourage and instruct their customers to use and integrate the Accused Products in ways that directly infringe the ’186 patent. Defendants have done so knowing and intending that their customers would commit these infringing acts. Defendants have also continued to make, use, offer for sale, sell, and/or import the Accused Products, despite their knowledge of the ’186 patent, thereby specifically intending for and inducing their customers to infringe the ’186 patent through the customers’ normal and customary use of the Accused Products.

46. On information and belief, the Accused Products contain components that constitute a material part of the ’186 patent invention and that are not a staple article or commodity suitable for substantial noninfringing use. On information and belief, Defendants have sold, offered for sale, and imported into the United States such components knowing they are especially made or especially adapted for use in infringement of the ’186 patent.

47. On information and belief, Defendants’ infringement has and continues to be willful. Defendants, without a good faith belief of invalidity or non-infringement, have known or

have been willfully blind to the fact that making, using, offering to sell, or selling the Accused Products to their customers, infringes the ’186 patent.

48. Defendants have induced, and continue to induce, infringement of the ’186 patent by actively encouraging others (including their customers) to use, offer to sell, sell, and import the Accused Products. On information and belief, these acts include providing information and instructions on the use of the Accused Products; providing information, education, and instructions to their customers; providing the Accused Products to customers; and indemnifying patent infringement within the United States.

49. Samsung and its customers benefit from the use of the inventions claimed in the ’186 patent. On information and belief, these benefits include higher capacity and improved coexistence when using Wi-Fi 6 communications.

50. Wilus has been damaged by Defendants’ willful infringement of the ’186 patent and is entitled to damages as provided for in 35 U.S.C. § 284, including reasonable royalty damages.

COUNT 2 – CLAIM FOR INFRINGEMENT OF THE ’171 PATENT

51. Wilus incorporates by reference each of the allegations in the foregoing paragraphs as if fully set forth herein and further alleges as follows:

52. On August 1, 2023, the United States Patent and Trademark Office issued U.S. Patent No. 11,716,171, titled “Wireless communication terminal and wireless communication method for multi-user concurrent transmission.” Exhibit 2.

53. The ’171 patent claims devices and methods used to implement the MAC layer of Wi-Fi 6 wireless LANs.

54. Wilus is the owner of the ’171 patent with full rights to pursue recovery of royalties for damages for infringement, including full rights to recover past and future damages.

55. The claims of the ’171 patent were issued by the United States Patent and Trademark Office and are presumed by statute to be valid. They are not directed to abstract ideas and moreover contain inventive concepts sufficient to ensure that the patent amounts to significantly more than a patent on a patent ineligible concept itself. The written description of the ’171 patent describes in technical detail each limitation of the claims, allowing a skilled artisan to understand the scope of the claims and how the nonconventional and non-generic combination of claim limitations is patentably distinct from and improved upon what may have been considered conventional or generic in the art at the time of the invention.

56. Wilus and its predecessors in interest have satisfied the requirements of 35 U.S.C. § 287(a) with respect to the ’171 patent, and Wilus is entitled to damages for Defendants’ past infringement. For example, Sisvel’s letters conveying Wilus’s and Sisvel’s belief that Samsung products practiced Wilus’s ’171 patent and offering to license Wilus’s patents to Samsung provided Samsung with actual notice of infringement.

57. Defendants have directly infringed (literally and equivalently) and induced and contributed to infringement by others of the ’171 patent by, without a license or permission from Wilus: making, using, selling, offering for sale, or importing products that infringe the claims of the ’171 patent; and inducing and contributing to infringement by others of the claims of the ’171 patent.

58. On information and belief, Defendants use, import, offer for sale, and sell certain infringing products in the United States. The Accused Products are, for example, Wi-Fi 6 (802.11ax) enabled devices, including mobile phones, tablets, laptops, e-readers, cameras,

appliances, and wearables, used, offered for sale, sold, and/or imported by Defendants in the United States.

59. The Accused Products satisfy all claim limitations of one or more claims of the ’171 Patent. On information and belief, the Accused Products employ, implement, or utilize materially the same Wi-Fi 6 technology, such that facts material to infringement by one Accused Product will be material to all Accused Products. For example, the Accused Products include “A wireless communication terminal, the wireless communication terminal”:

Samsung Galaxy S24 Ultra

Featuring Snapdragon 8 Gen 3 for Galaxy.

Introducing Samsung Galaxy S24 Ultra, now with many next-gen AI features and capabilities enabled by Snapdragon 8 Gen 3 for Galaxy. Powered with Galaxy AI, Galaxy S24 Ultra adapts to your passions and behaviors to make a new level of achievement possible. And, with Qualcomm FastConnect 7800 Mobile Connectivity System, you’ll get the best possible connection and premium WiFi 7 connectivity.

(https://www.qualcomm.com/snapdragon/device-finder/samsung-galaxy-s24-ultra)

60. The Accused Products include “a transceiver” and “a processor”:

Wi-Fi	**Wi-Fi/Bluetooth System:** Qualcomm® FastConnect™ 7800
	Peak Speed: 5.8 Gbps
	Generation: Wi-Fi 7, Wi-Fi 6, Wi-Fi 5, Wi-Fi 4
	Standards: 802.11be, 802.11ax, 802.11ac, 802.11n, 802.11g, 802.11b, 802.11a

(https://www.qualcomm.com/products/mobile/snapdragon/smartphones/snapdragon-8-series-mobile-platforms/snapdragon-8-gen-3-mobile-platform)

61. In the Accused Products, the processor is configured to “receive a frame for allocating resource for uplink (UL) multi-user (MU) transmission to one or more terminals”:

4.3.15a High efficiency (HE) STA

An HE AP sends a Trigger frame to initiate UL MU operation using UL OFDMA or UL MU-MIMO transmissions or a frame containing a TRS Control subfield to initiate UL OFDMA transmissions. The frame initiating these transmissions in the uplink direction is a triggering frame. The triggering frame identifies non-AP STAs participating in UL MU operation and assigns RUs and/or spatial streams to these STAs. Multi-STA BlockAck frames can be used by the AP to acknowledge the frames transmitted by multiple non-AP STAs. The scheduling of these Trigger frames can be set up between a non-AP STA and the AP using TWT operation to save power and reduce collisions.

(IEEE 802.11ax-2021, § 4.3.15a)

9.3.1.22 Trigger frame format

9.3.1.22.1 General

A Trigger frame allocates resources for and solicits one or more HE TB PPDU transmissions. The Trigger frame also carries other information required by the responding STA to send an HE TB PPDU.

(IEEE 802.11ax-2021, § 9.3.1.22)

62. In the Accused Products, the processor is configured such that "the frame includes an association identifier (AID) field and a frame check sequence (FCS) field":

9.3.1.22 Trigger frame format

9.3.1.22.1 General

A Trigger frame allocates resources for and solicits one or more HE TB PPDU transmissions. The Trigger frame also carries other information required by the responding STA to send an HE TB PPDU.

MAC header

	Frame Control	Duration	RA	TA	Common Info	User Info List	Padding	FCS
Octets:	2	2	6	6	8 or more	variable	variable	4

Figure 9-64a—Trigger frame format

The User Info List field contains zero or more User Info fields.

The User Info field is defined in Figure 9-64d (User Info field format) for all Trigger frame variants except the NFRP Trigger frame, which is defined in 9.3.1.22.9 (NDP Feedback Report Poll (NFRP) variant).

	B0 B11	B12 B19	B20	B21 B24	B25	B26 B31	B32 B38	B39	
	AID12	RU Allocation	UL FEC Coding Type	UL HE-MCS	UL DCM	SS Allocation/ RA-RU Infor-mation	UL Target RSSI	Reserved	Trigger Dependent User Info
Bits:	12	8	1	4	1	6	7	1	variable

Figure 9-64d—User Info field format

(IEEE 802.11ax-2021, § 9.3.1.22)

63. In the Accused Products, the processor is configured such that "the AID field is set to a value related to a first padding field, when the first padding field is included in the frame":

9.3.1.22 Trigger frame format

9.3.1.22.1 General

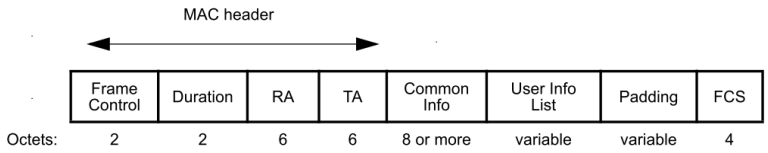

Figure 9-64a—Trigger frame format

Table 9-29h—AID12 subfield encoding

AID12 subfield	Description
0	User Info field allocates one or more contiguous RA-RUs for associated STAs
1–2007	User Info field is addressed to an associated STA whose AID is equal to the value in the AID12 subfield
2008–2044	Reserved
2045	User Info field allocates one or more contiguous RA-RUs for unassociated STAs
2046	Unallocated RU
2047–4094	Reserved
4095	Start of Padding field

The Padding field is optionally present in a Trigger frame to extend the frame length to give the recipient STAs enough time to prepare a response for transmission a SIFS after the frame is received. The Padding field, if present, is at least two octets in length and is set to all 1s. If the Padding field is present in a Trigger frame, its length is computed as described in 26.5.2.2.3 (Padding for a triggering frame).

(IEEE 802.11ax-2021, § 9.3.1.22)

64. In the Accused Products, the processor is configured such that "the first padding field is used to adjust a length of the frame":

9.3.1.22 Trigger frame format

9.3.1.22.1 General

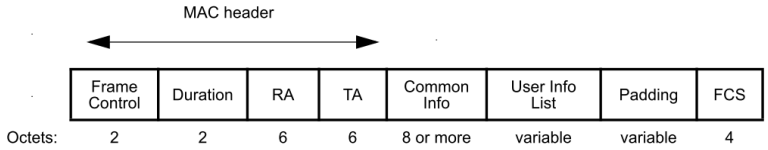

Figure 9-64a—Trigger frame format

Table 9-29h—AID12 subfield encoding

AID12 subfield	Description
0	User Info field allocates one or more contiguous RA-RUs for associated STAs
1–2007	User Info field is addressed to an associated STA whose AID is equal to the value in the AID12 subfield
2008–2044	Reserved
2045	User Info field allocates one or more contiguous RA-RUs for unassociated STAs
2046	Unallocated RU
2047–4094	Reserved
4095	Start of Padding field

The Padding field is optionally present in a Trigger frame to extend the frame length to give the recipient STAs enough time to prepare a response for transmission a SIFS after the frame is received. The Padding field, if present, is at least two octets in length and is set to all 1s. If the Padding field is present in a Trigger frame, its length is computed as described in 26.5.2.2.3 (Padding for a triggering frame).

(IEEE 802.11ax-2021, § 9.3.1.22)

65. In the Accused Products, the processor is configured such that "the first padding field is related to a preparation of a response frame for the frame":

9.3.1.22 Trigger frame format

9.3.1.22.1 General

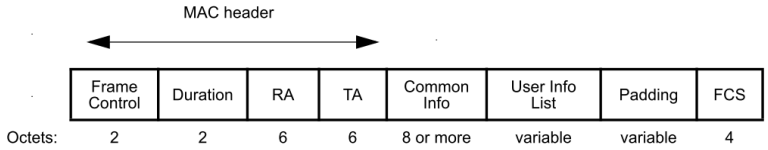

Figure 9-64a—Trigger frame format

Table 9-29h—AID12 subfield encoding

AID12 subfield	Description
0	User Info field allocates one or more contiguous RA-RUs for associated STAs
1–2007	User Info field is addressed to an associated STA whose AID is equal to the value in the AID12 subfield
2008–2044	Reserved
2045	User Info field allocates one or more contiguous RA-RUs for unassociated STAs
2046	Unallocated RU
2047–4094	Reserved
4095	Start of Padding field

The Padding field is optionally present in a Trigger frame to extend the frame length to give the recipient STAs enough time to prepare a response for transmission a SIFS after the frame is received. The Padding field, if present, is at least two octets in length and is set to all 1s. If the Padding field is present in a Trigger frame, its length is computed as described in 26.5.2.2.3 (Padding for a triggering frame).

(IEEE 802.11ax-2021, § 9.3.1.22)

66. In the Accused Products, the processor is configured to "transmit the response frame in response to the frame":

26.5.2 UL MU operation

26.5.2.1 General

UL MU operation allows an AP to solicit simultaneous immediate response frames from one or more non-AP HE STAs. A non-AP HE STA shall follow the rules in this subclause for the transmission of response frames in an HE TB PPDU, unless the Trigger frame is an MU-RTS Trigger frame, in which case the response is a CTS frame sent in a non-HT PPDU (see 26.2.6).

26.5.2.3 Non-AP STA behavior for UL MU operation

26.5.2.3.1 General

A non-AP STA shall not transmit an HE TB PPDU if all of the conditions in 26.5.2.3.2 are satisfied. Otherwise, a non-AP STA shall transmit an HE TB PPDU a SIFS after a received PPDU if all of the following conditions are met:

— The received PPDU contains either a Trigger frame (that is not an MU-RTS variant) with a User Info field addressed to the non-AP STA or a frame addressed to the non-AP STA that contains an TRS Control subfield. A User Info field in the Trigger frame is addressed to a non-AP STA if one of the following conditions are met:

(IEEE 802.11ax-2021, § 26.5.2)

67. Defendants have also knowingly and intentionally induced and contributed to infringement of the '171 patent in violation of 35 U.S.C. §§ 271(b) and 271(c). For example, Defendants have had knowledge or were willfully blind to the '171 patent and the infringing nature

of the Accused Products at least because SEC had received the October 25, 2023, letter from Sisvel providing a link to Sisvel's Patent Brochure, the current version of which identifies the '171 patent as essential to the 802.11ax standard.

68. Despite this knowledge of the '171 patent, Defendants have continued to actively encourage and instruct their customers to use and integrate the Accused Products in ways that directly infringe the '171 patent. Defendants have done so knowing and intending that their customers would commit these infringing acts. Defendants have also continued to make, use, offer for sale, sell, and/or import the Accused Products, despite their knowledge of the '171 patent, thereby specifically intending for and inducing their customers to infringe the '171 patent through the customers' normal and customary use of the Accused Products.

69. On information and belief, the Accused Products contain components that constitute a material part of the '171 patent invention and that are not a staple article or commodity suitable for substantial noninfringing use. On information and belief, Defendants have sold, offered for sale, and imported into the United States such components knowing they are especially made or especially adapted for use in infringement of the '171 patent.

70. On information and belief, Defendants' infringement has and continues to be willful. Defendants, without a good faith belief of invalidity or non-infringement, have known or have been willfully blind to the fact that making, using, offering to sell, or selling the Accused Products to their customers, infringes the '171 patent.

71. Defendants have induced, and continue to induce, infringement of the '171 patent by actively encouraging others (including their customers) to use, offer to sell, sell, and import the Accused Products. On information and belief, these acts include providing information and instructions on the use of the Accused Products; providing information, education, and instructions

to their customers; providing the Accused Products to customers; and indemnifying patent infringement within the United States.

72. Samsung and its customers benefit from the use of the inventions claimed in the ’171 patent. On information and belief, these benefits include higher capacity and improved coexistence when using Wi-Fi 6 communications.

73. Wilus has been damaged by Defendants’ willful infringement of the ’171 patent and is entitled to damages as provided for in 35 U.S.C. § 284, including reasonable royalty damages.

COUNT 3 – CLAIM FOR INFRINGEMENT OF THE ’926 PATENT

74. Wilus incorporates by reference each of the allegations in the foregoing paragraphs as if fully set forth herein and further alleges as follows:

75. On May 30, 2023, the United States Patent and Trademark Office issued U.S. Patent No. 11,664,926, titled “Aggregated-MPDU, method for transmitting response frame thereto, and wireless communication terminal using same.” Exhibit 3.

76. The ’926 patent claims devices and methods used to implement the MAC layer of Wi-Fi 6 wireless LANs.

77. Wilus is the owner of the ’926 patent with full rights to pursue recovery of royalties for damages for infringement, including full rights to recover past and future damages.

78. The claims of the ’926 patent were issued by the United States Patent and Trademark Office and are presumed by statute to be valid. They are not directed to abstract ideas and moreover contain inventive concepts sufficient to ensure that the patent amounts to significantly more than a patent on a patent ineligible concept itself. The written description of the ’926 patent describes in technical detail each limitation of the claims, allowing a skilled artisan to

understand the scope of the claims and how the nonconventional and non-generic combination of claim limitations is patentably distinct from and improved upon what may have been considered conventional or generic in the art at the time of the invention.

79. Wilus and its predecessors in interest have satisfied the requirements of 35 U.S.C. § 287(a) with respect to the ’926 patent, and Wilus is entitled to damages for Defendants’ past infringement. For example, Sisvel’s letters conveying Wilus’s and Sisvel’s belief that Samsung products practiced Wilus’s ’926 patent and offering to license Wilus’s patents to Samsung provided Samsung with actual notice of infringement.

80. Defendants have directly infringed (literally and equivalently) and induced and contributed to infringement by others of the ’926 patent by, without a license or permission from Wilus: making, using, selling, offering for sale, or importing products that infringe the claims of the ’926 patent; and inducing and contributing to infringement by others of the claims of the ’926 patent.

81. On information and belief, Defendants use, import, offer for sale, and sell certain infringing products in the United States. The Accused Products are, for example, Wi-Fi 6 (802.11ax) enabled devices, including mobile phones, tablets, laptops, e-readers, cameras, appliances, and wearables, used, offered for sale, sold, and/or imported by Defendants in the United States.

82. The Accused Products satisfy all claim limitations of one or more claims of the ’926 Patent. On information and belief, the Accused Products employ, implement, or utilize materially the same Wi-Fi 6 technology, such that facts material to infringement by one Accused Product will be material to all Accused Products. For example, the Accused Products include “A wireless communication terminal”:

Samsung Galaxy S24 Ultra

Featuring Snapdragon 8 Gen 3 for Galaxy.

Introducing Samsung Galaxy S24 Ultra, now with many next-gen AI features and capabilities enabled by Snapdragon 8 Gen 3 for Galaxy. Powered with Galaxy AI, Galaxy S24 Ultra adapts to your passions and behaviors to make a new level of achievement possible. And, with Qualcomm FastConnect 7800 Mobile Connectivity System, you'll get the best possible connection and premium WiFi 7 connectivity.

(https://www.qualcomm.com/snapdragon/device-finder/samsung-galaxy-s24-ultra)

83. The Accused Products include "a processor" and "a communication unit":

Wi-Fi	**Wi-Fi/Bluetooth System:** Qualcomm® FastConnect™ 7800
	Peak Speed: 5.8 Gbps
	Generation: Wi-Fi 7, Wi-Fi 6, Wi-Fi 5, Wi-Fi 4
	Standards: 802.11be, 802.11ax, 802.11ac, 802.11n, 802.11g, 802.11b, 802.11a

(https://www.qualcomm.com/products/mobile/snapdragon/smartphones/snapdragon-8-series-mobile-platforms/snapdragon-8-gen-3-mobile-platform)

84. In the Accused Products, the processor is configured to "receive a PPDU (physical layer protocol data unit) including an A-MPDU (Aggregate-MAC Protocol Data Unit) in which one or more MPDUs (MAC Protocol Data Units) are aggregated":

26.4.4.2 Responding to an HE SU PPDU or HE ER SU PPDU with an SU PPDU

An HE STA that receives an HE SU PPDU or HE ER SU PPDU carrying an A-MPDU that includes MPDUs, solicits acknowledgment, and does not include a triggering frame shall respond using an SU PPDU as follows:

(IEEE 802.11ax-2021, § 26.4.4.2)

9.7 Aggregate MPDU (A-MPDU)

9.7.1 A-MPDU format

An A-MPDU consists of a sequence of one or more A-MPDU subframes and a variable amount of EOF padding as shown in Figure 9-971.

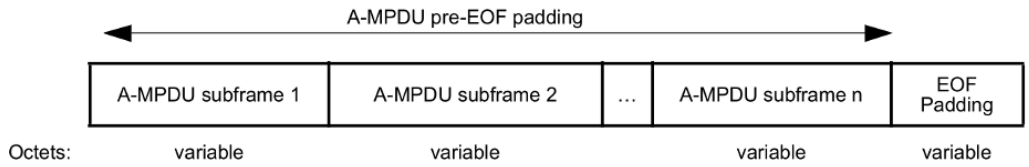

Figure 9-971—A-MPDU format

The structure of the A-MPDU subframe is shown in Figure 9-973. Each A-MPDU subframe consists of an MPDU delimiter optionally followed by an MPDU. Each nonfinal A-MPDU subframe in an A-MPDU has padding octets appended to make the subframe a multiple of 4 octets in length. The content of these octets is unspecified.

(IEEE 802.11ax-2021, § 9.7)

85. In the Accused Products, "the A-MPDU includes Ack policy information related to a block Ack for the one or more MPDUs, and one or more subframes":

9.7 Aggregate MPDU (A-MPDU)

9.7.1 A-MPDU format

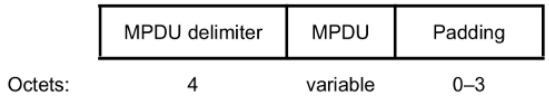

Figure 9-973—A-MPDU subframe format

The structure of the MPDU delimiter when transmitted by a non-DMG STA is defined in Figure 9-974. The structure of the MPDU Delimiter field when transmitted by a DMG STA is shown in Figure 9-975.

9.7.3 A-MPDU contents

All of the MPDUs within an A-MPDU are addressed to the same RA. All QoS Data frames within an A-MPDU that have a TID for which an HT-immediate block ack agreement exists have the same value for the Ack Policy Indicator subfield of the QoS Control field.

(IEEE 802.11ax-2021, § 9.7)

9.2.4.5 QoS Control field

Table 9-10—QoS Control field

Applicable frame (sub)types	Bits 0–3	Bit 4	Bits 5–6	Bit 7	Bits 8	Bit 9	Bit 10	Bits 11–15
QoS CF-Poll and QoS CF-Ack +CF-Poll frames sent by HC	TID	EOSP	Ack Policy Indicator	Reserved	TXOP Limit			
QoS Data +CF-Poll and QoS Data +CF-Ack +CF-Poll frames sent by HC	TID	EOSP	Ack Policy Indicator	A-MSDU Present	TXOP Limit			
QoS Data and QoS Data +CF-Ack frames sent by HC	TID	EOSP	Ack Policy Indicator	A-MSDU Present	AP PS Buffer State			
QoS Null frames sent by HC	TID	EOSP	Ack Policy Indicator	Reserved	AP PS Buffer State			

(IEEE 802.11ax-2021, § 9.2.4.5)

86. In the Accused Products, "each of the one or more subframes includes MPDU identifier information and an MPDU of the one or more MPDUs":

9.7 Aggregate MPDU (A-MPDU)

9.7.1 A-MPDU format

	MPDU delimiter	MPDU	Padding
Octets:	4	variable	0–3

Figure 9-973—A-MPDU subframe format

The structure of the MPDU delimiter when transmitted by a non-DMG STA is defined in Figure 9-974. The structure of the MPDU Delimiter field when transmitted by a DMG STA is shown in Figure 9-975.

(IEEE 802.11ax-2021, § 9.7)

87. In the Accused Products, "the MPDU identifier information includes an end of frame (EOF) field and a length field":

9.7.1 A-MPDU format

Table 9-527— MPDU delimiter fields (non-DMG)

Field	Size (bits)	Description
EOF/Tag	1	End of frame indication if the MPDU Length field is 0. Set to 1 in an A-MPDU subframe that has 0 in the MPDU Length field and that is used to pad the A-MPDU in a VHT or HE PPDU as described in 10.12.6. Set to 1 in the MPDU delimiter of an S-MPDU as described in 10.12.7. Tagged/untagged indication if the MPDU Length field is nonzero. Set to 1 in an MPDU delimiter preceding a QoS Data frame or Management frame soliciting an Ack frame or Per AID TID Info field with the Ack Type field set to 1 in a Multi-STA BlockAck frame in a response that is contained in an ack-enabled multi-TID A-MPDU as described in 26.6.3.4 and ack-enabled single-TID A-MPDU as described in 26.6.3.2. Set to 0 otherwise.
Reserved	1	
MPDU Length	14	Length of the MPDU in octets. Set to 0 if no MPDU is present. An A-MPDU subframe with 0 in the MPDU Length field is used as defined in 10.12.3 to meet the minimum MPDU start spacing requirement and also to pad the A-MPDU to fill the available octets in a VHT or HE PPDU as defined in 10.12.6.
CRC	8	8-bit CRC of the preceding 16 bits (see 9.7.2).
Delimiter Signature	8	Pattern that may be used to detect an MPDU delimiter when scanning for an MPDU delimiter. The unique pattern is 0x4E, which is the ASCII value of the character 'N' ~~(see NOTE)~~.
~~NOTE—The ASCII value of the character 'N' was chosen as the unique pattern for the value in the Delimiter Signature field.~~		

(IEEE 802.11ax-2021, § 9.7.1)

88. In the Accused Products, the processor is configured to "transmit a response frame in response to the PPDU":

26.4.4 Per-PPDU acknowledgment selection rules

26.4.4.1 General

A STA that transmits a PPDU can solicit different immediate responses for frames contained in the PPDU by using the Ack Policy Indicator subfield of QoS Data or QoS Null frames, the type of the frame, PPDU format, number of TIDs in the A-MPDU, and the EOF/Tag field setting of the A-MPDU delimiter.

26.4.4.2 Responding to an HE SU PPDU or HE ER SU PPDU with an SU PPDU

An HE STA that receives an HE SU PPDU or HE ER SU PPDU carrying an A-MPDU that includes MPDUs, solicits acknowledgment, and does not include a triggering frame shall respond using an SU PPDU as follows:

a) If the A-MPDU includes only one MPDU and the MPDU is a tagged MPDU that either is a QoS Data frame or QoS Null frame with Normal Ack ack policy or is a Management frame that solicits acknowledgment, then the STA shall respond with an Ack frame.

b) If the A-MPDU includes only one MPDU and the MPDU is an EOF MPD that is a PS-Poll frame, the STA shall respond with an Ack frame or a QoS Data frame.

c) If the HE STA supports ack-enabled aggregation by setting the Ack-Enabled Aggregation Support subfield in the HE MAC Capabilities Information field to 1, and if the A-MPDU includes more than one MPDU, only one of which solicits acknowledgment and the MPDU that solicits acknowledgment is a tagged MPDU that either is a QoS Data frame or a QoS Null frame with Normal Ack ack policy or is a Management frame that solicits acknowledgment, then the HE STA shall respond with an Ack frame.

d) If the A-MPDU does not include a tagged MPDU but does include one or more untagged MPDUs that are QoS Data frames belonging to the same block ack agreement and with the Ack Policy Indicator subfield equal to Implicit BAR for at least one MPDU, then the STA shall respond with a Compressed BlockAck frame as defined in 10.25.6.5. Alternatively, if all the MPDUs carried in the eliciting A-MPDU were received, the STA may respond with a Multi-STA BlockAck frame with Ack Type field set to 1 and the TID field set to 14 as defined in 26.4.2 if the originator of the A-MPDU has indicated support for the all ack context by setting the All Ack Support subfield in the HE MAC Capabilities Information field to 1.

e) If the HE STA supports ack-enabled aggregation by setting the Ack-Enabled Aggregation Support subfield in the HE MAC Capabilities Information field to 1, and if the A-MPDU includes a Management frame that solicits an acknowledgment and includes one or more QoS Data frames with Normal Ack or Implicit BAR ack policy, then the STA shall respond with a Multi-STA BlockAck frame as defined in 26.4.2.

f) If the HE STA supports multi-TID aggregation and if the A-MPDU includes two or more QoS Data frames with Implicit BAR ack policy and belonging to more than one block ack agreement, then the STA shall respond with a Multi-STA BlockAck frame as defined in 26.4.2.

(IEEE 802.11ax-2021, § 26.4.4)

89. In the Accused Products, "a type of the response frame is determined as one of an Ack frame, a compressed BlockAck frame, and a multi-STA BlockAck frame according to a combination of a type of the MPDU determined by the EOF field and the length field, and the Ack policy information":

9.7.1 A-MPDU format

Table 9-527— MPDU delimiter fields (non-DMG)

Field	Size (bits)	Description
EOF/Tag	1	End of frame indication if the MPDU Length field is 0. Set to 1 in an A-MPDU subframe that has 0 in the MPDU Length field and that is used to pad the A-MPDU in a VHT or HE PPDU as described in 10.12.6. Set to 1 in the MPDU delimiter of an S-MPDU as described in 10.12.7. Tagged/untagged indication if the MPDU Length field is nonzero. Set to 1 in an MPDU delimiter preceding a QoS Data frame or Management frame soliciting an Ack frame or Per AID TID Info field with the Ack Type field set to 1 in a Multi-STA BlockAck frame in a response that is contained in an ack-enabled multi-TID A-MPDU as described in 26.6.3.4 and ack-enabled single-TID A-MPDU as described in 26.6.3.2. Set to 0 otherwise.
Reserved	1	
MPDU Length	14	Length of the MPDU in octets. Set to 0 if no MPDU is present. An A-MPDU subframe with 0 in the MPDU Length field is used as defined in 10.12.3 to meet the minimum MPDU start spacing requirement and also to pad the A-MPDU to fill the available octets in a VHT or HE PPDU as defined in 10.12.6.
CRC	8	8-bit CRC of the preceding 16 bits (see 9.7.2).
Delimiter Signature	8	Pattern that may be used to detect an MPDU delimiter when scanning for an MPDU delimiter. The unique pattern is 0x4E, which is the ASCII value of the character 'N' ~~(see NOTE)~~.
~~NOTE—The ASCII value of the character 'N' was chosen as the unique pattern for the value in the Delimiter Signature field.~~		

(IEEE 802.11ax-2021, § 9.7.1)

3.2 Definitions specific to IEEE 802.11

tagged media access control (MAC) protocol data unit (MPDU) (tagged MPDU): An MPDU carried in an aggregate MPDU (A-MPDU) subframe that has the EOF/Tag field in the MPDU delimiter set to 1.

untagged medium access control (MAC) protocol data unit (MPDU) (untagged MPDU): An MPDU carried in an aggregate MPDU (A-MPDU) subframe that has the EOF/Tag field in the MPDU delimiter set to 0.

(IEEE 802.11ax-2021, § 3.2)

26.4.4.2 Responding to an HE SU PPDU or HE ER SU PPDU with an SU PPDU

An HE STA that receives an HE SU PPDU or HE ER SU PPDU carrying an A-MPDU that includes MPDUs, solicits acknowledgment, and does not include a triggering frame shall respond using an SU PPDU as follows:

a) If the A-MPDU includes only one MPDU and the MPDU is a tagged MPDU that either is a QoS Data frame or QoS Null frame with Normal Ack ack policy or is a Management frame that solicits acknowledgment, then the STA shall respond with an Ack frame.

b) If the A-MPDU includes only one MPDU and the MPDU is an EOF MPD that is a PS-Poll frame, the STA shall respond with an Ack frame or a QoS Data frame.

c) If the HE STA supports ack-enabled aggregation by setting the Ack-Enabled Aggregation Support subfield in the HE MAC Capabilities Information field to 1, and if the A-MPDU includes more than one MPDU, only one of which solicits acknowledgment and the MPDU that solicits acknowledgment is a tagged MPDU that either is a QoS Data frame or a QoS Null frame with Normal Ack ack policy or is a Management frame that solicits acknowledgment, then the HE STA shall respond with an Ack frame.

d) If the A-MPDU does not include a tagged MPDU but does include one or more untagged MPDUs that are QoS Data frames belonging to the same block ack agreement and with the Ack Policy Indicator subfield equal to Implicit BAR for at least one MPDU, then the STA shall respond with a Compressed BlockAck frame as defined in 10.25.6.5. Alternatively, if all the MPDUs carried in the eliciting A-MPDU were received, the STA may respond with a Multi-STA BlockAck frame with Ack Type field set to 1 and the TID field set to 14 as defined in 26.4.2 if the originator of the A-MPDU has indicated support for the all ack context by setting the All Ack Support subfield in the HE MAC Capabilities Information field to 1.

e) If the HE STA supports ack-enabled aggregation by setting the Ack-Enabled Aggregation Support subfield in the HE MAC Capabilities Information field to 1, and if the A-MPDU includes a Management frame that solicits an acknowledgment and includes one or more QoS Data frames with Normal Ack or Implicit BAR ack policy, then the STA shall respond with a Multi-STA BlockAck frame as defined in 26.4.2.

f) If the HE STA supports multi-TID aggregation and if the A-MPDU includes two or more QoS Data frames with Implicit BAR ack policy and belonging to more than one block ack agreement, then the STA shall respond with a Multi-STA BlockAck frame as defined in 26.4.2.

(IEEE 802.11ax-2021, § 26.4.4.2)

90. In the Accused Products, "the compressed BlockAck frame is used to transmit a response to the one or more MPDUs corresponding to one TID, when the one or more MPDUs correspond to the one TID among an one or more TIDs (traffic IDs)":

9.3.1.8.2 Compressed BlockAck variant

The TID_INFO subfield of the BA Control field of the Compressed BlockAck frame contains the TID for which this BlockAck frame is sent.

The Block Ack Bitmap subfield of the BA Information field of the Compressed BlockAck frame is used to indicate the received status of up to 64 entries, where each entry represents an MSDU or an A-MSDU. Each bit that is equal to 1 in the compressed Block Ack Bitmap field acknowledges the reception of a single MSDU or A-MSDU in the order of sequence number, with the first bit of the Block Ack Bitmap field corresponding to the MSDU or A-MSDU with the sequence number that matches the Starting Sequence Number subfield of the Block Ack Starting Sequence Control subfield.

(IEEE 802.11ax-2021, § 9.3.1.8.2)

26.4.4.3 Responding to an HE MU PPDU with an SU PPDU

An HE STA that receives an HE MU PPDU with an A-MPDU that contains MPDUs that solicit acknowledgment and that does not include a triggering frame shall respond using an SU PPDU as follows:

a) If the A-MPDU carries only one MPDU and the MPDU is a tagged MPDU that is either a QoS Data frame or QoS Null frame with Normal Ack ack policy, then the STA shall respond with an Ack frame.

b) If the HE STA supports ack-enabled aggregation by setting the Ack-Enabled Aggregation Support subfield in the HE MAC Capabilities Information field to 1, and if the A-MPDU includes more than one MPDU, only one of which solicits acknowledgment and the MPDU that solicits acknowledgment is a tagged MPDU that is a QoS Data frame or a QoS Null frame with Normal Ack ack policy, then the HE STA shall respond with an Ack frame.

c) If the A-MPDU does not include a tagged MPDU but does include one or more untagged MPDUs that are QoS Data frames belonging to the same block ack agreement and with the Ack Policy Indicator subfield equal to Implicit BAR for at least one MPDU, then the STA shall respond with a Compressed BlockAck frame as defined in 10.25.6.5. Alternatively, if all the MPDUs carried in the eliciting A-MPDU were received, the STA may respond with a Multi-STA BlockAck frame with the Ack Type set to 1 and the TID field set to 14 as defined in 26.4.2 if the originator of the A-MPDU has indicated support for the all ack context by setting the All Ack Support subfield in the HE MAC Capabilities Information field to 1.

d) If the HE STA supports multi-TID aggregation and if the A-MPDU includes two or more QoS Data frames with Implicit BAR ack policy addressed to it and belonging to more than one block ack agreement, then the STA shall respond with a Multi-STA BlockAck frame as defined in 26.4.2.

(IEEE 802.11ax-2021, § 26.4.4.3)

91. Defendants have also knowingly and intentionally induced and contributed to infringement of the ’926 patent in violation of 35 U.S.C. §§ 271(b) and 271(c). For example, Defendants have had knowledge or were willfully blind to the ’926 patent and the infringing nature of the Accused Products at least because SEC had received the October 25, 2023, letter from Sisvel identifying the ’926 patent as an “SEP” and identifying examples of Samsung products that implement essential features of the standard.

92. Despite this knowledge of the ’926 patent, Defendants have continued to actively encourage and instruct their customers to use and integrate the Accused Products in ways that directly infringe the ’926 patent. Defendants have done so knowing and intending that their customers would commit these infringing acts. Defendants have also continued to make, use, offer for sale, sell, and/or import the Accused Products, despite their knowledge of the ’926 patent,

thereby specifically intending for and inducing their customers to infringe the ’926 patent through the customers’ normal and customary use of the Accused Products.

93. On information and belief, the Accused Products contain components that constitute a material part of the ’926 patent invention and that are not a staple article or commodity suitable for substantial noninfringing use. On information and belief, Defendants have sold, offered for sale, and imported into the United States such components knowing they are especially made or especially adapted for use in infringement of the ’926 patent.

94. On information and belief, Defendants’ infringement has and continues to be willful. Defendants, without a good faith belief of invalidity or non-infringement, have known or have been willfully blind to the fact that making, using, offering to sell, or selling the Accused Products to their customers, infringes the ’926 patent.

95. Defendants have induced, and continue to induce, infringement of the ’926 patent by actively encouraging others (including their customers) to use, offer to sell, sell, and import the Accused Products. On information and belief, these acts include providing information and instructions on the use of the Accused Products; providing information, education, and instructions to their customers; providing the Accused Products to customers; and indemnifying patent infringement within the United States.

96. Samsung and its customers benefit from the use of the inventions claimed in the ’926 patent. On information and belief, these benefits include faster throughput and higher capacity when using Wi-Fi 6 communications.

97. Wilus has been damaged by Defendants’ willful infringement of the ’926 patent and is entitled to damages as provided for in 35 U.S.C. § 284, including reasonable royalty damages.

COUNT 4 – CLAIM FOR INFRINGEMENT OF THE ’262 PATENT

98. Wilus incorporates by reference each of the allegations in the foregoing paragraphs as if fully set forth herein and further alleges as follows:

99. On June 4, 2024, the United States Patent and Trademark Office issued U.S. Patent No. 12,004,262, titled “Wireless communication method using BSS identifier and wireless communication terminal using same.” Exhibit 4.

100. The ’262 patent claims devices and methods used to implement the MAC layer of Wi-Fi 6 wireless LANs.

101. Wilus is the owner of the ’262 patent with full rights to pursue recovery of royalties for damages for infringement, including full rights to recover past and future damages.

102. The claims of the ’262 patent were issued by the United States Patent and Trademark Office and are presumed by statute to be valid. They are not directed to abstract ideas and moreover contain inventive concepts sufficient to ensure that the patent amounts to significantly more than a patent on a patent ineligible concept itself. The written description of the ’262 patent describes in technical detail each limitation of the claims, allowing a skilled artisan to understand the scope of the claims and how the nonconventional and non-generic combination of claim limitations is patentably distinct from and improved upon what may have been considered conventional or generic in the art at the time of the invention.

103. Wilus and its predecessors in interest have satisfied the requirements of 35 U.S.C. § 287(a) with respect to the ’262 patent, and Wilus is entitled to damages for Defendants’ past infringement. For example, Sisvel’s letters conveying Wilus’s and Sisvel’s belief that Samsung products practiced Wilus’s ’262 patent and offering to license Wilus’s patents to Samsung provided Samsung with actual notice of infringement.

104. Defendants have directly infringed (literally and equivalently) and induced and contributed to infringement by others of the ’262 patent by, without a license or permission from Wilus: making, using, selling, offering for sale, or importing products that infringe the claims of the ’262 patent; and inducing and contributing to infringement by others of the claims of the ’262 patent.

105. On information and belief, Defendants use, import, offer for sale, and sell certain infringing products in the United States. The Accused Products are, for example, Wi-Fi 6 (802.11ax) enabled devices, including mobile phones, tablets, laptops, e-readers, cameras, appliances, and wearables, used, offered for sale, sold, and/or imported by Defendants in the United States.

106. The Accused Products satisfy all claim limitations of one or more claims of the ’262 Patent. On information and belief, the Accused Products employ, implement, or utilize materially the same Wi-Fi 6 technology, such that facts material to infringement by one Accused Product will be material to all Accused Products. For example, the Accused Products include “A wireless communication terminal wirelessly communicating with a base wireless communication terminal”:

Samsung Galaxy S24 Ultra

Featuring Snapdragon 8 Gen 3 for Galaxy.

Introducing Samsung Galaxy S24 Ultra, now with many next-gen AI features and capabilities enabled by Snapdragon 8 Gen 3 for Galaxy. Powered with Galaxy AI, Galaxy S24 Ultra adapts to your passions and behaviors to make a new level of achievement possible. And, with Qualcomm FastConnect 7800 Mobile Connectivity System, you’ll get the best possible connection and premium WiFi 7 connectivity.

(https://www.qualcomm.com/snapdragon/device-finder/samsung-galaxy-s24-ultra)

107. The Accused Products include "a transceiver configured to transmit and receive wireless signals" and "a processor configured to process the wireless signals":

Wi-Fi	**Wi-Fi/Bluetooth System:** Qualcomm® FastConnect™ 7800
	Peak Speed: 5.8 Gbps
	Generation: Wi-Fi 7, Wi-Fi 6, Wi-Fi 5, Wi-Fi 4
	Standards: 802.11be, 802.11ax, 802.11ac, 802.11n, 802.11g, 802.11b, 802.11a

(https://www.qualcomm.com/products/mobile/snapdragon/smartphones/snapdragon-8-series-mobile-platforms/snapdragon-8-gen-3-mobile-platform)

108. In the Accused Products, the processor is configured to "receive a physical layer protocol data unit (PPDU) including a trigger frame for triggering transmission to the base wireless communication terminal, wherein the trigger frame indicates a resource unit (RU) which is allocated to the wireless communication terminal":

26.5.2.3 Non-AP STA behavior for UL MU operation
26.5.2.3.1 General
…
A non-AP STA shall not transmit an HE TB PPDU if all of the conditions in 26.5.2.3.2 are satisfied. Otherwise, a non-AP STA shall transmit an HE TB PPDU a SIFS after a received PPDU if all of the following conditions are met:
— The received PPDU contains either a Trigger frame (that is not an MU-RTS variant) with a User Info field addressed to the non-AP STA or a frame addressed to the non-AP STA that contains an TRS Control subfield. A User Info field in the Trigger frame is addressed to a non-AP STA if one of the following conditions are met:

26.5.2.3.3 TXVECTOR parameters for HE TB PPDU response to Trigger frame
…
A non-AP STA transmitting an HE TB PPDU in response to a Trigger frame that is not an MU-RTS Trigger frame shall set the TXVECTOR parameters as follows (subject to, in the case of an NFRP Trigger frame, the exceptions given in 26.5.7.2):
…
— The BSS_COLOR parameter is set as follows:
• If the Trigger frame was received in an HE PPDU, then set to the value of the RXVECTOR parameter BSS_COLOR of the HE PPDU.
• If the Trigger frame was received in a non-HE PPDU, then set to the value of the active BSS color as defined in 26.11.4.

(IEEE 802.11ax-2021, § 26.5.2.3)

9.3.1.22 Trigger frame format
9.3.1.22.1 General

A Trigger frame allocates resources for and solicits one or more HE TB PPDU transmissions. The Trigger frame also carries other information required by the responding STA to send an HE TB PPDU.

…

The AID12 subfield in the User Info field is encoded as defined in Table 9-29h:

Table 9-29h—AID12 subfield encoding

AID12 subfield	Description
0	User Info field allocates one or more contiguous RA-RUs for associated STAs
1–2007	User Info field is addressed to an associated STA whose AID is equal to the value in the AID12 subfield
2008–2044	Reserved
2045	User Info field allocates one or more contiguous RA-RUs for unassociated STAs
2046	Unallocated RU
2047–4094	Reserved
4095	Start of Padding field

…

The RU Allocation subfield along with the UL BW subfield in the Common Info field identifies the size and the location of the RU. If the UL BW subfield indicates 20 MHz, 40 MHz, or 80 MHz PPDU, then B0 of the RU Allocation subfield is set to 0. If the UL BW subfield indicates 80+80 MHz or 160 MHz, then B0 of the RU Allocation subfield is set to 0 to indicate that the RU allocation applies to the primary 80 MHz channel and set to 1 to indicate that the RU allocation applies to the secondary 80 MHz channel. The mapping of B7–B1 of the RU Allocation subfield for a Trigger frame that is not an MU-RTS Trigger frame is defined in Table 9-29i. See 9.3.1.22.5 for the encoding of the RU Allocation subfield in an MU-RTS Trigger frame.

(IEEE 802.11ax-2021, § 9.3.1.22)

109. In the Accused Products, the processor is configured such that "when a format of the PPDU including the trigger frame is a PPDU format in which at least one of physical layer signaling fields including a field for indicating a Basic Service Set (BSS) color is included, set a value of a BSS color to be indicated by a trigger-based PPDU based on the BSS color indicated by the field":

26.5.2.3.3 TXVECTOR parameters for HE TB PPDU response to Trigger frame

A non-AP STA transmitting an HE TB PPDU in response to a Trigger frame that is not an MU-RTS Trigger frame shall set the TXVECTOR parameters as follows (subject to, in the case of an NFRP Trigger frame, the exceptions given in 26.5.7.2):

- The FORMAT parameter is set to HE_TB.
- The TRIGGER_METHOD parameter is set to TRIGGER_FRAME.
- The TXOP_DURATION parameter is set as defined in 26.11.5.
- The BSS_COLOR parameter is set as follows:
  - If the Trigger frame was received in an HE PPDU, then set to the value of the RXVECTOR parameter BSS_COLOR of the HE PPDU.
  - If the Trigger frame was received in a non-HE PPDU, then set to the value of the active BSS color as defined in 26.11.4.

27.2.2 TXVECTOR and RXVECTOR parameters

The parameters in Table 27-1 are defined as part of the TXVECTOR parameter list in the PHY-TXSTART.request primitive and/or as part of the RXVECTOR parameter list in the PHY-RXSTART.indication and PHY-RXEND.indication primitives.

Table 27-1—TXVECTOR and RXVECTOR parameters

BSS_COLOR	FORMAT is HE_SU, HE_MU, HE_ER_SU, or HE_TB	Set to a value in the range 0 to 63 (see 26.11).	Y	Y
	Otherwise	Not present	N	N

(IEEE 802.11ax-2021, §§ 26.5.2.3.3, 27.2.2)

110. In the Accused Products, the processor is configured such that "when the format of the PPDU including the trigger frame is a PPDU format in which any physical layer signaling field including the field for indicating the BSS color is not included, set the value of the BSS color to be indicated by the trigger-based PPDU according to an active BSS color of the wireless communication terminal":

26.5.2.3.3 TXVECTOR parameters for HE TB PPDU response to Trigger frame

A non-AP STA transmitting an HE TB PPDU in response to a Trigger frame that is not an MU-RTS Trigger frame shall set the TXVECTOR parameters as follows (subject to, in the case of an NFRP Trigger frame, the exceptions given in 26.5.7.2):

— The FORMAT parameter is set to HE_TB.
— The TRIGGER_METHOD parameter is set to TRIGGER_FRAME.
— The TXOP_DURATION parameter is set as defined in 26.11.5.
— The BSS_COLOR parameter is set as follows:
  — If the Trigger frame was received in an HE PPDU, then set to the value of the RXVECTOR parameter BSS_COLOR of the HE PPDU.
  — If the Trigger frame was received in a non-HE PPDU, then set to the value of the active BSS color as defined in 26.11.4.

27.2.2 TXVECTOR and RXVECTOR parameters

The parameters in Table 27-1 are defined as part of the TXVECTOR parameter list in the PHY-TXSTART.request primitive and/or as part of the RXVECTOR parameter list in the PHY-RXSTART.indication and PHY-RXEND.indication primitives.

Table 27-1—TXVECTOR and RXVECTOR parameters

BSS_COLOR	FORMAT is HE_SU, HE_MU, HE_ER_SU, or HE_TB	Set to a value in the range 0 to 63 (see 26.11).	Y	Y
	Otherwise	Not present	N	N

(IEEE 802.11ax-2021, §§ 26.5.2.3.3, 27.2.2)

111. In the Accused Products, the processor is configured to "transmit the trigger-based PPDU based on the trigger frame":

26.5.2.3.3 TXVECTOR parameters for HE TB PPDU response to Trigger frame

…

A non-AP STA transmitting an HE TB PPDU in response to a Trigger frame that is not an MU-RTS Trigger frame shall set the TXVECTOR parameters as follows (subject to, in the case of an NFRP Trigger frame, the exceptions given in 26.5.7.2):

…

— The BSS_COLOR parameter is set as follows:
• If the Trigger frame was received in an HE PPDU, then set to the value of the RXVECTOR parameter BSS_COLOR of the HE PPDU.
• If the Trigger frame was received in a non-HE PPDU, then set to the value of the active BSS color as defined in 26.11.4.

(IEEE 802.11ax-2021, § 26.5.2.3.3)

112. In the Accused Products, the processor is configured such that "the active BSS color is a BSS color actually used by the wireless communication terminal and set by an Operation element":

> **26.11.4 BSS_COLOR**
> …
> The active BSS color is one of the following:
> — The value of the BSS Color field in the most recently received HE Operation element if an HE STA receives an HE Operation element from a peer HE STA.
> — The value of the New BSS Color field in the most recently received BSS Color Change Announcement element if an HE STA receives a BSS Color Change Announcement element from a peer HE STA and the BSS color change TBTT has passed (see 26.17.3.4).
>
> **26.17.3.4 Selecting and advertising a new BSS color**
>
> An HE STA that transmits an HE Operation element shall select a BSS color as defined in 26.17.3.2 for its BSS. An HE AP may change the BSS color under certain conditions, for example, if it detects that an OBSS is using the same color. An HE AP shall announce an upcoming BSS color change using the BSS Color Change Announcement element. A non-AP HE STA shall not transmit a BSS Color Change Announcement element.

(IEEE 802.11ax-2021, §§ 26.11.4, 26.17.3.4)

113. In the Accused Products, the processor is configured such that "when the wireless communication terminal receives information on a BSS color change from the base wireless communication terminal and a BSS color change time point indicated by the information on the BSS color change is reached, the active BSS color is set to a value of a BSS color indicated by the information on the BSS color change":

26.11.4 BSS_COLOR

…

The active BSS color is one of the following:

— The value of the BSS Color field in the most recently received HE Operation element if an HE STA receives an HE Operation element from a peer HE STA.

— The value of the New BSS Color field in the most recently received BSS Color Change Announcement element if an HE STA receives a BSS Color Change Announcement element from a peer HE STA and the BSS color change TBTT has passed (see 26.17.3.4).

26.17.3.4 Selecting and advertising a new BSS color

An HE STA that transmits an HE Operation element shall select a BSS color as defined in 26.17.3.2 for its BSS. An HE AP may change the BSS color under certain conditions, for example, if it detects that an OBSS is using the same color. An HE AP shall announce an upcoming BSS color change using the BSS Color Change Announcement element. A non-AP HE STA shall not transmit a BSS Color Change Announcement element.

(IEEE 802.11ax-2021, §§ 26.11.4, 26.17.3.4)

114. In the Accused Products, the processor is configured such that "the BSS color is one of identifiers identifying a BSS":

26.17.3 BSS color
26.17.3.1 General

BSS color identifies a BSS and assists a STA receiving a PPDU that carries BSS color in identifying the BSS from which the PPDU originates so that the STA can use the channel access rules in 26.10, reduce power consumption as described in 26.14.1, or update its NAV as described in 26.2.4.

(IEEE 802.11ax-2021, § 26.17.3)

115. Defendants have also knowingly and intentionally induced and contributed to infringement of the '262 patent in violation of 35 U.S.C. §§ 271(b) and 271(c). For example, Defendants have had knowledge or were willfully blind to the '262 patent and the infringing nature of the Accused Products at least because SEC had received the October 25, 2023, letter from Sisvel providing a link to Sisvel's Patent Brochure, the current version of which identifies the '262 patent as essential to the 802.11ax standard.

116. Despite this knowledge of the ’262 patent, Defendants have continued to actively encourage and instruct their customers to use and integrate the Accused Products in ways that directly infringe the ’262 patent. Defendants have done so knowing and intending that their customers would commit these infringing acts. Defendants have also continued to make, use, offer for sale, sell, and/or import the Accused Products, despite their knowledge of the ’262 patent, thereby specifically intending for and inducing their customers to infringe the ’262 patent through the customers’ normal and customary use of the Accused Products.

117. On information and belief, the Accused Products contain components that constitute a material part of the ’262 patent invention and that are not a staple article or commodity suitable for substantial noninfringing use. On information and belief, Defendants have sold, offered for sale, and imported into the United States such components knowing they are especially made or especially adapted for use in infringement of the ’262 patent.

118. On information and belief, Defendants’ infringement has and continues to be willful. Defendants, without a good faith belief of invalidity or non-infringement, have known or have been willfully blind to the fact that making, using, offering to sell, or selling the Accused Products to their customers, infringes the ’262 patent.

119. Defendants have induced, and continue to induce, infringement of the ’262 patent by actively encouraging others (including their customers) to use, offer to sell, sell, and import the Accused Products. On information and belief, these acts include providing information and instructions on the use of the Accused Products; providing information, education, and instructions to their customers; providing the Accused Products to customers; and indemnifying patent infringement within the United States.

120. Samsung and its customers benefit from the use of the inventions claimed in the ’262 patent. On information and belief, these benefits include higher capacity and improved coexistence when using Wi-Fi 6 communications.

121. Wilus has been damaged by Defendants’ willful infringement of the ’262 patent and is entitled to damages as provided for in 35 U.S.C. § 284, including reasonable royalty damages.

JURY DEMAND

122. Wilus demands a jury trial pursuant to Federal Rule of Civil Procedure 38.

RELIEF REQUESTED

Wilus prays for the following relief:

A. A judgment in favor of Wilus that Defendants have infringed the Asserted Patents, and that the Asserted Patents are valid and enforceable;

B. A judgment and order requiring Defendants to pay Wilus past and future damages arising out of Defendants’ infringement of the Asserted Patents in an amount no less than a reasonable royalty, costs, expenses, and pre- and post-judgment interest for its infringement of the Asserted Patents, as provided under 35 U.S.C. § 284;

C. A permanent injunction prohibiting Defendants from further acts of infringement of the Asserted Patents;

D. A judgment and order requiring Defendants to provide an accounting and to pay supplemental damages to Wilus, including, without limitation, pre-judgment and post-judgment interest;

E. A judgement that Defendants’ infringement is willful and enhanced damages and fees as a result of that willfulness under 35 U.S.C. § 284;

F. A finding that this case is exceptional under 35 U.S.C. § 285, and an award of Wilus's reasonable attorney's fees and costs; and

G. Any and all other relief to which Wilus may be entitled.

Dated: January 23, 2025

Respectfully submitted,

/s/ Marc Fenster

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