

Exhibit D - U.S. Patent No. 11,159,210 (“210 Patent”)

Accused Products: Samsung’s Wi-Fi 6 (802.11ax) enabled devices, and all versions and variations thereof since the issuance of the asserted patent.

Issued Claim(s)	Public Documentation
[1pre]. A wireless communication terminal, the terminal comprising:	Whether or not the preamble is limiting, each Accused Product practices the claimed “A wireless communication terminal, the terminal”. For example, the Accused Products include “A wireless communication terminal, the 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)
[1a] a communication unit; and [1b] a processor configured to process signals transmitted and received through the communication unit;	The Accused Products include “a communication unit” and “a processor configured to process signals transmitted and received through the communication unit”:

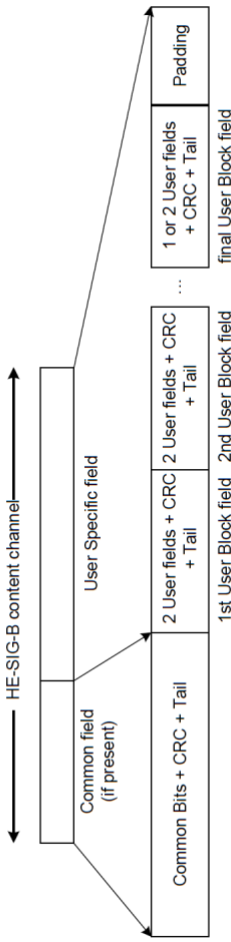
Issued Claim(s)	Public Documentation																					
	Wi-Fi Wi-Fi/Bluetooth System: Qualcomm® FastConnect™ 7800 Peak Speed: 5.8 Gbps Generation: Wi-Fi 7, Wi-Fi 6, Wi-Fi 5, Wi-Fi 4 Standards: 802.11be, 802.11ax, 802.11ac, 802.11n, 802.11g, 802.11b, 802.11a (https://www.qualcomm.com/products/mobile/snapdragon/smartphones/snapdragon-8-series-mobile-platforms/snapdragon-8-gen-3-mobile-platform) In the Accused Products, the processor is configured to “receive, through the communication unit, a high efficiency multi-user PHY protocol data unit (HE MU PPDU).”																					
[1c] wherein the processor is configured to: receive, through the communication unit, a high efficiency multi-user PHY protocol data unit (HE MU PPDU),	27.3.4 HE PPDU formats Four HE PPDU formats are defined: HE SU PPDU, HE MU PPDU, HE ER SU PPDU, and HE TB PPDU. The HE sounding NDP is a variant of the HE SU PPDU and defined in 27.3.17. The HE TB feedback NDP is a variant of the HE TB PPDU and defined in 27.3.18. (IEEE 802.11ax-2021)																					
[1d] wherein a preamble of the HE MU PPDU includes high efficiency signal A field (HE-SIG-A) and high efficiency signal B field (HE-SIG-B), and	In the Accused Products, “a preamble of the HE MU PPDU includes high efficiency signal A field (HE-SIG-A) and high efficiency signal B field (HE-SIG-B).” The format of the HE MU PPDU is defined as in Figure 27-9. This format is used for transmission to one or more users if the PPDU is not a response of a Trigger frame. In the HE MU PPDU, the HE-SIG-A field is not repeated. The HE-SIG-B field is present in this format. <table><tr><td>8 μs</td><td>8 μs</td><td>4 μs</td><td>4 μs</td><td>4 μs</td><td>8 μs</td><td colspan="4">Variable durations per HE-LTF symbol</td></tr><tr><td>L-STF</td><td>L-LTF</td><td>L-SIG</td><td>RL-SIG</td><td>HE-SIG-A</td><td>HE-SIG-B</td><td>HE-STF</td><td>HE-LTF</td><td>...</td><td>HE-LTF</td><td>PE</td></tr></table> Figure 27-9—HE MU PPDU format	8 μs	8 μs	4 μs	4 μs	4 μs	8 μs	Variable durations per HE-LTF symbol				L-STF	L-LTF	L-SIG	RL-SIG	HE-SIG-A	HE-SIG-B	HE-STF	HE-LTF	...	HE-LTF	PE
8 μs	8 μs	4 μs	4 μs	4 μs	8 μs	Variable durations per HE-LTF symbol																
L-STF	L-LTF	L-SIG	RL-SIG	HE-SIG-A	HE-SIG-B	HE-STF	HE-LTF	...	HE-LTF	PE												

Issued Claim(s)	Public Documentation
	(IEEE 802.11ax-2021, § 27.3.4)
[1e] decode the received HE MU PPDU based on information obtained from the preamble,	In the Accused Products, the processor is configured to “decode the received HE MU PPDU based on information obtained from the preamble.” 27.3.11.7 HE-SIG-A field 27.3.11.7.1 General The HE-SIG-A field carries information necessary to interpret HE PPDUs. The integer fields of the HE-SIG-A field are transmitted in unsigned binary format, LSB first, where the LSB is in the lowest numbered bit position. ... 27.3.11.8 HE-SIG-B field 27.3.11.8.1 General The HE-SIG-B field provides the necessary signaling, including the OFDMA and DL MU-MIMO resource allocation information, to allow the STAs to look up the corresponding resources to be used in the HE modulated fields of the PPDU. The integer fields of the HE-SIG-B field are transmitted in unsigned binary format, LSB first, where the LSB is in the lowest numbered bit position. (IEEE 802.11ax-2021)
[1f] wherein when a SIG-B compression field of the HE-SIG-A indicates full bandwidth multi User-Multiple Input Multiple Output (MU-MIMO) transmission, a format of user field(s) included in a user specific field of the HE-SIG-B is identified based on a number of MU-MIMO users indicated by a subfield of the HE-SIG-A.”	In the Accused Products, “when a SIG-B compression field of the HE-SIG-A indicates full bandwidth multi User-Multiple Input Multiple Output (MU-MIMO) transmission, a format of user field(s) included in a user specific field of the HE-SIG-B is identified based on a number of MU-MIMO users indicated by a subfield of the HE-SIG-A.”

Issued Claim(s)	Public Documentation			
SIG-B is identified based on a number of MU-MIMO users indicated by a subfield of the HE-SIG-A,	Table 27-20—HE-SIG-A field of an HE MU PPDU (continued)			
	B18–B21	Number Of HE-SIG-B Symbols Or MU-MIMO Users	4	Description If the HE-SIG-B Compression field is 0, indicates the number of OFDM symbols in the HE-SIG-B field: Set to the number of OFDM symbols in the HE-SIG-B field minus 1 if the number of OFDM symbols in the HE-SIG-B field is less than 16. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is equal to 16 if Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by at least one recipient STA is 0. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is greater than or equal to 16 if the Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by all the recipient STAs are 1 and if the HE-SIG-B-MCS field is set to 0, 1, 2, or 3 regardless of the value of the HE-SIG-B DCM field, or the HE-SIG-B-MCS field is set to 4 and the HE-SIG-B DCM field is set to 1. The exact number of OFDM symbols in the HE-SIG-B field is calculated based on the number of User fields in the HE-SIG-B content channel, which is indicated by the Common field of the HE-SIG-B field in this case. If the HE-SIG-B Compression field is 1, indicates the number of users and is set to the number of users minus 1. If the number of users is greater than 1, then MU-MIMO is used in the HE modulated fields.
B22	HE-SIG-B Compression	1		Set to 0 if the Common field in the HE-SIG-B field is present. Set to 1 if the Common field in the HE-SIG-B field is not present.

(IEEE 802.11ax-2021, § 27.3.11.7.2)

If the HE-SIG-B Compression field in the HE-SIG-A field of an HE MU PPDU is 1 (indicating full-bandwidth MU-MIMO transmission) and the Number Of HE-SIG-B Symbols Or MU-MIMO Users field in the HE-SIG-A field of an HE MU PPDU is 0 (indicating 1 user), then the User Specific field in the HE-SIG-B field consists of a single User Block field containing one User field for a non-MU-MIMO allocation as shown in Table 27-28.

Issued Claim(s)	Public Documentation
	(IEEE 802.11ax-2021, § 27.3.11.8.4)
[1g] wherein when the number of MU-MIMO users indicates two or more users, the user specific field of the HE-SIG-B includes user fields for MU-MIMO allocation, and	In the Accused Products, “when the number of MU-MIMO users indicates two or more users, the user specific field of the HE-SIG-B includes user fields for MU-MIMO allocation.” The HE-SIG-B content channel format is shown in Figure 27-26. The HE-SIG-B content channel consists of a Common field, if present, followed by a User Specific field.  Figure 27-26—HE-SIG-B content channel format (IEEE 802.11ax-2021, § 27.3.11.8.2) 27.3.11.8.4 User Specific field If the HE-SIG-B Compression field in the HE-SIG-A field of an HE MU PPDU is 1 (indicating full-bandwidth MU-MIMO transmission) and the Number Of HE-SIG-B Symbols Or MU-MIMO Users field in the HE-SIG-A field of an HE MU PPDU is 0 (indicating 1 user), then the User Specific field in the HE-SIG-B field consists of a single User Block field containing one User field for a non-MU-MIMO allocation as shown in Table 27-28.

Issued Claim(s)	Public Documentation			
	Table 27-27—User Block field			
	Field	Number of fields	Number of bits per field	Description
	User field	N	21	N User fields are present, where $N = 1$ if it is the final User Block field, and if there is only one user in the final User Block field. $N = 2$ otherwise. The User field format for a non-MU-MIMO allocation is defined in Table 27-28. The User field format for a MU-MIMO allocation is defined in Table 27-29.
	CRC	1	4	The CRC is calculated over bits 0 to 20 for a User Block field that contains one User field and bits 0 to 41 for a User Block field that contains two User fields. See 27.3.11.7.3.
	Tail	1	6	Used to terminate the trellis of the convolutional decoder. Set to 0.

Issued Claim(s)	Public Documentation																
	Table 27-29—User field format for MU-MIMO allocation <table><tr><th>Bit</th><th>Subfield</th><th>Number of bits</th><th>Description</th></tr><tr><td>B0–B10</td><td>STA-ID</td><td>11</td><td>Set to a value indicated from TXVECTOR parameter STA_ID (see 26.11.1).</td></tr><tr><td>B11–B14</td><td>Spatial Configuration</td><td>4</td><td>If the STA-ID subfield is not 2046, indicates the number of spatial streams for a user in an MU-MIMO allocation (see Table 27-30). Set to an arbitrary value if the STA-ID subfield is 2046.</td></tr><tr><td>B15–B18</td><td>HE-MCS</td><td>4</td><td>If the STA-ID subfield is not 2046, indicates the modulation and coding scheme: Set to n for HE-MCS n, where $n = 0, 1, 2, \dots, 11$. Values 12-15 are reserved. Set to an arbitrary value if the STA-ID subfield is 2046.</td></tr></table> (IEEE 802.11ax-2021, §, 27.3.11.8.4)	Bit	Subfield	Number of bits	Description	B0–B10	STA-ID	11	Set to a value indicated from TXVECTOR parameter STA_ID (see 26.11.1).	B11–B14	Spatial Configuration	4	If the STA-ID subfield is not 2046, indicates the number of spatial streams for a user in an MU-MIMO allocation (see Table 27-30). Set to an arbitrary value if the STA-ID subfield is 2046.	B15–B18	HE-MCS	4	If the STA-ID subfield is not 2046, indicates the modulation and coding scheme: Set to n for HE-MCS n , where $n = 0, 1, 2, \dots, 11$. Values 12-15 are reserved. Set to an arbitrary value if the STA-ID subfield is 2046.
Bit	Subfield	Number of bits	Description														
B0–B10	STA-ID	11	Set to a value indicated from TXVECTOR parameter STA_ID (see 26.11.1).														
B11–B14	Spatial Configuration	4	If the STA-ID subfield is not 2046, indicates the number of spatial streams for a user in an MU-MIMO allocation (see Table 27-30). Set to an arbitrary value if the STA-ID subfield is 2046.														
B15–B18	HE-MCS	4	If the STA-ID subfield is not 2046, indicates the modulation and coding scheme: Set to n for HE-MCS n , where $n = 0, 1, 2, \dots, 11$. Values 12-15 are reserved. Set to an arbitrary value if the STA-ID subfield is 2046.														
[1h] wherein when the number of MU-MIMO users indicates a single user, the user specific field of the HE-SIG-B includes one user field for non-MU-MIMO allocation.	In the Accused Products, “when the number of MU-MIMO users indicates a single user, the user specific field of the HE-SIG-B includes one user field for non-MU-MIMO allocation.” 27.3.11.8.4 User Specific field If the HE-SIG-B Compression field in the HE-SIG-A field of an HE MU PPDU is 1 (indicating full-bandwidth MU-MIMO transmission) and the Number Of HE-SIG-B Symbols Or MU-MIMO Users field in the HE-SIG-A field of an HE MU PPDU is 0 (indicating 1 user), then the User Specific field in the HE-SIG-B field consists of a single User Block field containing one User field for a non-MU-MIMO allocation as shown in Table 27-28.																

Issued Claim(s)	Public Documentation			
	Table 27-27—User Block field			
	Field	Number of fields	Number of bits per field	Description
	User field	N	21	N User fields are present, where $N = 1$ if it is the final User Block field, and if there is only one user in the final User Block field. $N = 2$ otherwise. The User field format for a non-MU-MIMO allocation is defined in Table 27-28. The User field format for a MU-MIMO allocation is defined in Table 27-29.
	CRC	1	4	The CRC is calculated over bits 0 to 20 for a User Block field that contains one User field and bits 0 to 41 for a User Block field that contains two User fields. See 27.3.11.7.3.
	Tail	1	6	Used to terminate the trellis of the convolutional decoder. Set to 0.

Issued Claim(s)	Public Documentation																
	Table 27-28—User field format for non-MU-MIMO allocation <table><tr><th>Bit</th><th>Subfield</th><th>Number of bits</th><th>Description</th></tr><tr><td>B0–B10</td><td>STA-ID</td><td>11</td><td>Set to a value of the TXVECTOR parameter STA_ID (see 26.11.1).</td></tr><tr><td>B11–B13</td><td>NSTS</td><td>3</td><td>If the STA-ID subfield is not 2046, indicates the number of space-time streams and is set to the number of space-time streams minus 1.</td></tr><tr><td>B14</td><td>Beamformed</td><td>1</td><td>Set to an arbitrary value if the STA-ID subfield is 2046. If the STA-ID subfield is not 2046, used in transmit beamforming: Set to 1 if a beamforming steering matrix is applied to the waveform in a non-MU-MIMO allocation. Set to 0 otherwise. Set to an arbitrary value if the STA-ID subfield is 2046.</td></tr></table> (IEEE 802.11ax-2021, § 27.3.11.8.4)	Bit	Subfield	Number of bits	Description	B0–B10	STA-ID	11	Set to a value of the TXVECTOR parameter STA_ID (see 26.11.1).	B11–B13	NSTS	3	If the STA-ID subfield is not 2046, indicates the number of space-time streams and is set to the number of space-time streams minus 1.	B14	Beamformed	1	Set to an arbitrary value if the STA-ID subfield is 2046. If the STA-ID subfield is not 2046, used in transmit beamforming: Set to 1 if a beamforming steering matrix is applied to the waveform in a non-MU-MIMO allocation. Set to 0 otherwise. Set to an arbitrary value if the STA-ID subfield is 2046.
Bit	Subfield	Number of bits	Description														
B0–B10	STA-ID	11	Set to a value of the TXVECTOR parameter STA_ID (see 26.11.1).														
B11–B13	NSTS	3	If the STA-ID subfield is not 2046, indicates the number of space-time streams and is set to the number of space-time streams minus 1.														
B14	Beamformed	1	Set to an arbitrary value if the STA-ID subfield is 2046. If the STA-ID subfield is not 2046, used in transmit beamforming: Set to 1 if a beamforming steering matrix is applied to the waveform in a non-MU-MIMO allocation. Set to 0 otherwise. Set to an arbitrary value if the STA-ID subfield is 2046.														
2. The wireless communication terminal of claim 1, wherein the user field(s) for MU-MIMO allocation includes a spatial configuration field indicating the total number of spatial streams in an MU-MIMO allocation and the number of spatial streams for each terminal in the MU-MIMO allocation, and	In the Accused Products, “the user field(s) for MU-MIMO allocation includes a spatial configuration field indicating the total number of spatial streams in an MU-MIMO allocation and the number of spatial streams for each terminal in the MU-MIMO allocation”:																

Issued Claim(s)

wherein the user field for non-MU-MIMO allocation includes a number of space time streams (NSTS) field.

Public Documentation

IEEE 802.11ax-2021, May 2021

The User field format for an MU-MIMO allocation is defined in Table 27-29.

Table 27-29—User field format for MU-MIMO allocation

Bit	Subfield	Number of bits	Description
B0–B10	STA-ID	11	Set to a value indicated from TXVECTOR parameter STA_ID (see 26.11.1).
B11–B14	Spatial Configuration	4	If the STA-ID subfield is not 2046, indicates the number of spatial streams for a user in an MU-MIMO allocation (see Table 27-30). Set to an arbitrary value if the STA-ID subfield is 2046.
B15–B18	HE-MCS	4	If the STA-ID subfield is not 2046, indicates the modulation and coding scheme: Set to n for HE-MCS n , where $n = 0, 1, 2, \dots, 11$. Values 12–15 are reserved. Set to an arbitrary value if the STA-ID subfield is 2046.
B19	Reserved	1	If the STA-ID subfield is not 2046, reserved and set to 0. Set to an arbitrary value if the STA-ID subfield is 2046.
B20	Coding	1	If the STA-ID subfield is not 2046, indicates whether BCC or LDPC is used: Set to 0 for BCC. Set to 1 for LDPC. Set to an arbitrary value if the STA-ID subfield is 2046.

A User field for an MU-MIMO allocation includes a 4-bit Spatial Configuration subfield that indicates the number of spatial streams for each user and the total number of spatial streams in the MU-MIMO allocation. The subfield shown in Table 27-30 is constructed by using the entries corresponding to the value of number of users (N_{user}) multiplexed using MU-MIMO in an RU.

(IEEE 802.11ax-2021, § 27.3.11.8.4)

Issued Claim(s)	Public Documentation
	In the Accused Products, “the user field for non-MU-MIMO allocation includes a number of space time streams (NSTS) field”:

IEEE 802.11ax-2021, May 2021

Table 27-28—User field format for non-MU-MIMO allocation

Bit	Subfield	Number of bits	Description
B0–B10	STA-ID	11	Set to a value of the TXVECTOR parameter STA_ID (see 26.11.1).
B11–B13	NSTS	3	If the STA-ID subfield is not 2046, indicates the number of space-time streams and is set to the number of space-time streams minus 1. Set to an arbitrary value if the STA-ID subfield is 2046.
B14	Beamformed	1	If the STA-ID subfield is not 2046, used in transmit beamforming: Set to 1 if a beamforming steering matrix is applied to the waveform in a non-MU-MIMO allocation. Set to 0 otherwise. Set to an arbitrary value if the STA-ID subfield is 2046.
B15–B18	HE-MCS	4	If the STA-ID subfield is not 2046, indicates the modulation and coding scheme: Set to n for HE-MCS n , where $n = 0, 1, 2, \dots, 11$. Values 12–15 are reserved. Set to an arbitrary value if the STA-ID subfield is 2046.
B19	DCM	1	If the STA-ID subfield is not 2046, indicates whether DCM is used: Set to 1 to indicate that the payload of the corresponding user of the HE MU PPDU is modulated with DCM for the HE-MCS. Set to 0 to indicate that the payload of the corresponding user of the PPDU is not modulated with DCM for the HE-MCS. Set to an arbitrary value if the STA-ID subfield is 2046.
B20	Coding	1	If the STA-ID subfield is not 2046, indicates whether BCC or LDPC is used: Set to 0 for BCC. Set to 1 for LDPC. Set to an arbitrary value if the STA-ID subfield is 2046.

(IEEE 802.11ax-2021, §, 27.3.11.8.4)

Issued Claim(s)	Public Documentation
3. The wireless communication terminal of claim 1, wherein the user field(s) for non-MU-MIMO allocation is a user field based on orthogonal frequency division multiple access (OFDMA) allocation.	In the Accused Products, “the user field(s) for non-MU-MIMO allocation is a user field based on orthogonal frequency division multiple access (OFDMA) allocation”: IEEE 802.11ax-2021, May 2021 27.3.11.8 HE-SIG-B field 27.3.11.8.1 General The HE-SIG-B field provides the necessary signaling, including the OFDMA and DL MU-MIMO resource allocation information, to allow the STAs to look up the corresponding resources to be used in the HE modulated fields of the PPDU. The integer fields of the HE-SIG-B field are transmitted in unsigned binary format, LSB first, where the LSB is in the lowest numbered bit position. 27.3.11.8.4 User Specific field The User Specific field of an HE-SIG-B content channel consists of zero or more User Block fields followed by padding (if present) as shown in Figure 27-26. Each non-final User Block field is made up of two User fields that contain information for two STAs that is used to decode their payloads. The final User Block field contains information for one or two users depending on the number of users in the HE-SIG-B content channel. If the HE-SIG-B Compression field in the HE-SIG-A field of an HE MU PPDU is 0, then the number of User fields is indicated by the RU Allocation subfields and the Center 26-tone RU subfield in the same HE-SIG-B content channel. If the HE-SIG-B Compression field in the HE-SIG-A field of an HE MU PPDU is 1, then the number of users is indicated by the Number Of HE-SIG-B Symbols Or MU-MIMO Users field in the HE-SIG-A field. If the HE-SIG-B Compression field in the HE-SIG-A field of an HE MU PPDU is 1 (indicating full-bandwidth MU-MIMO transmission) and the Number Of HE-SIG-B Symbols Or MU-MIMO Users field in the HE-SIG-A field of an HE MU PPDU is 0 (indicating 1 user), then the User Specific field in the HE-SIG-B field consists of a single User Block field containing one User field for a non-MU-MIMO allocation as shown in Table 27-28. The contents of the User field differ depending on whether the field addresses a user in a non-MU-MIMO allocation in an RU or a user in an MU-MIMO allocation in an RU. Irrespective of whether the allocation is for a user in a non-MU-MIMO or an MU-MIMO allocation, the size of the User field is the same.

Issued Claim(s)	Public Documentation															
4. The wireless communication terminal of claim 1, wherein the number of MU-MIMO users is indicated by a number of HE-SIG-B symbols field in the HE-SIG-A.	In the Accused Products, “the number of MU-MIMO users is indicated by a number of HE-SIG-B symbols field in the HE-SIG-A”:															
IEEE 802.11ax-2021, May 2021																
Table 27-20—HE-SIG-A field of an HE MU PPDU (continued)																
<table><tr><th>Bit</th><th>Field</th><th>Number of bits</th><th>Description</th></tr><tr><td>B18–B21</td><td>Number Of HE-SIG-B Symbols Or MU-MIMO Users</td><td>4</td><td> If the HE-SIG-B Compression field is 0, indicates the number of OFDM symbols in the HE-SIG-B field: Set to the number of OFDM symbols in the HE-SIG-B field minus 1 if the number of OFDM symbols in the HE-SIG-B field is less than 16. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is equal to 16 if Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by at least one recipient STA is 0. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is greater than or equal to 16 if the Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by all the recipient STAs are 1 and if the HE-SIG-B-MCS field is set to 0, 1, 2, or 3 regardless of the value of the HE-SIG-B DCM field, or the HE-SIG-B-MCS field is set to 4 and the HE-SIG-B DCM field is set to 1. The exact number of OFDM symbols in the HE-SIG-B field is calculated based on the number of User fields in the HE-SIG-B content channel, which is indicated by the Common field of the HE-SIG-B field in this case. If the HE-SIG-B Compression field is 1, indicates the number of users and is set to the number of users minus 1. If the number of users is greater than 1, then MU-MIMO is used in the HE modulated fields. </td></tr><tr><td>B22</td><td>HE-SIG-B Compression</td><td>1</td><td> Set to 0 if the Common field in the HE-SIG-B field is present. Set to 1 if the Common field in the HE-SIG-B field is not present. </td></tr></table>					Bit	Field	Number of bits	Description	B18–B21	Number Of HE-SIG-B Symbols Or MU-MIMO Users	4	If the HE-SIG-B Compression field is 0, indicates the number of OFDM symbols in the HE-SIG-B field: Set to the number of OFDM symbols in the HE-SIG-B field minus 1 if the number of OFDM symbols in the HE-SIG-B field is less than 16. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is equal to 16 if Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by at least one recipient STA is 0. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is greater than or equal to 16 if the Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by all the recipient STAs are 1 and if the HE-SIG-B-MCS field is set to 0, 1, 2, or 3 regardless of the value of the HE-SIG-B DCM field, or the HE-SIG-B-MCS field is set to 4 and the HE-SIG-B DCM field is set to 1. The exact number of OFDM symbols in the HE-SIG-B field is calculated based on the number of User fields in the HE-SIG-B content channel, which is indicated by the Common field of the HE-SIG-B field in this case. If the HE-SIG-B Compression field is 1, indicates the number of users and is set to the number of users minus 1. If the number of users is greater than 1, then MU-MIMO is used in the HE modulated fields.	B22	HE-SIG-B Compression	1	Set to 0 if the Common field in the HE-SIG-B field is present. Set to 1 if the Common field in the HE-SIG-B field is not present.
Bit	Field	Number of bits	Description													
B18–B21	Number Of HE-SIG-B Symbols Or MU-MIMO Users	4	If the HE-SIG-B Compression field is 0, indicates the number of OFDM symbols in the HE-SIG-B field: Set to the number of OFDM symbols in the HE-SIG-B field minus 1 if the number of OFDM symbols in the HE-SIG-B field is less than 16. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is equal to 16 if Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by at least one recipient STA is 0. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is greater than or equal to 16 if the Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by all the recipient STAs are 1 and if the HE-SIG-B-MCS field is set to 0, 1, 2, or 3 regardless of the value of the HE-SIG-B DCM field, or the HE-SIG-B-MCS field is set to 4 and the HE-SIG-B DCM field is set to 1. The exact number of OFDM symbols in the HE-SIG-B field is calculated based on the number of User fields in the HE-SIG-B content channel, which is indicated by the Common field of the HE-SIG-B field in this case. If the HE-SIG-B Compression field is 1, indicates the number of users and is set to the number of users minus 1. If the number of users is greater than 1, then MU-MIMO is used in the HE modulated fields.													
B22	HE-SIG-B Compression	1	Set to 0 if the Common field in the HE-SIG-B field is present. Set to 1 if the Common field in the HE-SIG-B field is not present.													

Issued Claim(s)	Public Documentation
5. The wireless communication terminal of claim 1, wherein the HE-SIG-A includes the SIG-B compression field and the specific subfield, and wherein the SIG-B compression field indicates whether full bandwidth MU-MIMO transmission is used, and when the SIG-B compression field indicates full bandwidth MU-MIMO transmission, the specific subfield indicates the number of MU-MIMO users.	In the Accused Products, “the HE-SIG-A includes the SIG-B compression field and the specific subfield” and “the SIG-B compression field indicates whether full bandwidth MU-MIMO transmission is used”: 27.3.11.8.4 User Specific field If the HE-SIG-B Compression field in the HE-SIG-A field of an HE MU PPDU is 1 (indicating full-bandwidth MU-MIMO transmission) and the Number Of HE-SIG-B Symbols Or MU-MIMO Users field in the HE-SIG-A field of an HE MU PPDU is 0 (indicating 1 user), then the User Specific field in the HE-SIG-B field consists of a single User Block field containing one User field for a non-MU-MIMO allocation as shown in Table 27-28. (IEEE 802.11ax-2021, §, 27.3.11.8.4)

Public Documentation				
Table 27-20—HE-SIG-A field of an HE MU PPDU (continued)				
Bit	Field	Number of bits	Description	
B18–B21	Number Of HE-SIG-B Symbols Or MU-MIMO Users	4	If the HE-SIG-B Compression field is 0, indicates the number of OFDM symbols in the HE-SIG-B field: Set to the number of OFDM symbols in the HE-SIG-B field minus 1 if the number of OFDM symbols in the HE-SIG-B field is less than 16. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is equal to 16 if Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by at least one recipient STA is 0. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is greater than or equal to 16 if the Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by all the recipient STAs are 1 and if the HE-SIG-B-MCS field is set to 0, 1, 2, or 3 regardless of the value of the HE-SIG-B DCM field, or the HE-SIG-B-MCS field is set to 4 and the HE-SIG-B DCM field is set to 1. The exact number of OFDM symbols in the HE-SIG-B field is calculated based on the number of User fields in the HE-SIG-B content channel, which is indicated by the Common field of the HE-SIG-B field in this case. If the HE-SIG-B Compression field is 1, indicates the number of users and is set to the number of users minus 1. If the number of users is greater than 1, then MU-MIMO is used in the HE modulated fields.	
B22	HE-SIG-B Compression	1	Set to 0 if the Common field in the HE-SIG-B field is present. Set to 1 if the Common field in the HE-SIG-B field is not present.	

(IEEE 802.11ax-2021, §, 27.3.11.7.2)

Issued Claim(s)	Public Documentation
	In the Accused Products, “when the SIG-B compression field indicates full bandwidth MU-MIMO transmission, the specific subfield indicates the number of MU-MIMO users”: 27.3.11.8.4 User Specific field If the HE-SIG-B Compression field in the HE-SIG-A field of an HE MU PPDU is 1 (indicating full-bandwidth MU-MIMO transmission) and the Number Of HE-SIG-B Symbols Or MU-MIMO Users field in the HE-SIG-A field of an HE MU PPDU is 0 (indicating 1 user), then the User Specific field in the HE-SIG-B field consists of a single User Block field containing one User field for a non-MU-MIMO allocation as shown in Table 27-28. (IEEE 802.11ax-2021, §, 27.3.11.8.4)

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Table 27-20—HE-SIG-A field of an HE MU PPDU (continued)

Bit	Field	Number of bits	Description
B18–B21	Number Of HE-SIG-B Symbols Or MU-MIMO Users	4	If the HE-SIG-B Compression field is 0, indicates the number of OFDM symbols in the HE-SIG-B field: Set to the number of OFDM symbols in the HE-SIG-B field minus 1 if the number of OFDM symbols in the HE-SIG-B field is less than 16. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is equal to 16 if Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by at least one recipient STA is 0. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is greater than or equal to 16 if the Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by all the recipient STAs are 1 and if the HE-SIG-B-MCS field is set to 0, 1, 2, or 3 regardless of the value of the HE-SIG-B DCM field, or the HE-SIG-B-MCS field is set to 4 and the HE-SIG-B DCM field is set to 1. The exact number of OFDM symbols in the HE-SIG-B field is calculated based on the number of User fields in the HE-SIG-B content channel, which is indicated by the Common field of the HE-SIG-B field in this case. If the HE-SIG-B Compression field is 1, indicates the number of users and is set to the number of users minus 1. If the number of users is greater than 1, then MU-MIMO is used in the HE modulated fields.
B22	HE-SIG-B Compression	1	Set to 0 if the Common field in the HE-SIG-B field is present. Set to 1 if the Common field in the HE-SIG-B field is not present.

(IEEE 802.11ax-2021, §, 27.3.11.7.2)

Issued Claim(s)

Issued Claim(s)	Public Documentation
[6pre]. 6. A wireless communication method of a wireless communication terminal, the method comprising:	Whether or not the preamble is limiting, each Accused Product practices the claimed “A wireless communication terminal, the terminal”. For example, the Accused Products include “A wireless communication terminal, the 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)
[6a] receiving a high efficiency multi-user PHY protocol data unit (HE MU PPDU),	In the Accused Products, the method includes “receiving a high efficiency multi-user PHY protocol data unit (HE MU PPDU).” 27.3.4 HE PPDU formats Four HE PPDU formats are defined: HE SU PPDU, HE MU PPDU, HE ER SU PPDU, and HE TB PPDU. The HE sounding NDP is a variant of the HE SU PPDU and defined in 27.3.17. The HE TB feedback NDP is a variant of the HE TB PPDU and defined in 27.3.18. (IEEE 802.11ax-2021)

Issued Claim(s)	Public Documentation
[6b] wherein a preamble of the HE MU PPDU includes high efficiency signal A field (HE-SIG-A) and high efficiency signal B field (HE-SIG-B); and	In the Accused Products, “a preamble of the HE MU PPDU includes high efficiency signal A field (HE-SIG-A) and high efficiency signal B field (HE-SIG-B).” The format of the HE MU PPDU is defined as in Figure 27-9. This format is used for transmission to one or more users if the PPDU is not a response of a Trigger frame. In the HE MU PPDU, the HE-SIG-A field is not repeated. The HE-SIG-B field is present in this format. Figure 27-9—HE MU PPDU format (IEEE 802.11ax-2021, § 27.3.4)
[6c] decode the received HE MU PPDU based on information obtained from the preamble,	In the Accused Products, “decode the received HE MU PPDU based on information obtained from the preamble.” 27.3.11.7 HE-SIG-A field 27.3.11.7.1 General The HE-SIG-A field carries information necessary to interpret HE PPDUs. The integer fields of the HE-SIG-A field are transmitted in unsigned binary format, LSB first, where the LSB is in the lowest numbered bit position. ...

Issued Claim(s)	Public Documentation
	27.3.11.8 HE-SIG-B field 27.3.11.8.1 General The HE-SIG-B field provides the necessary signaling, including the OFDMA and DL MU-MIMO resource allocation information, to allow the STAs to look up the corresponding resources to be used in the HE modulated fields of the PPDU. The integer fields of the HE-SIG-B field are transmitted in unsigned binary format, LSB first, where the LSB is in the lowest numbered bit position. (IEEE 802.11ax-2021)
[6d] wherein when a SIG-B compression field of the HE-SIG-A indicates full bandwidth multi User-Multiple Input Multiple Output (MU-MIMO) transmission, a format of user field(s) included in a user specific field of the HE-SIG-B is identified based on a number of MU-MIMO users indicated by a subfield of the HE-SIG-A,	In the Accused Products, “when a SIG-B compression field of the HE-SIG-A indicates full bandwidth multi User-Multiple Input Multiple Output (MU-MIMO) transmission, a format of user field(s) included in a user specific field of the HE-SIG-B is identified based on a number of MU-MIMO users indicated by a subfield of the HE-SIG-A.”

Public Documentation

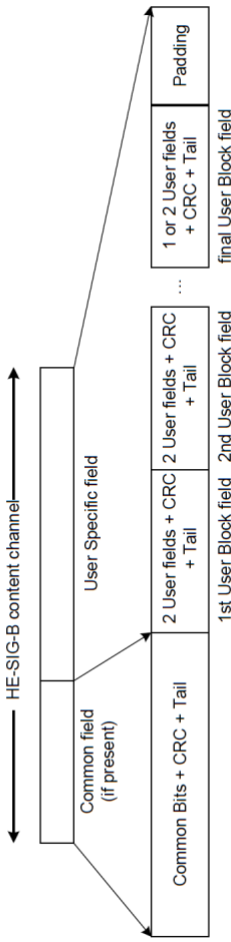
Table 27-20—HE-SIG-A field of an HE MU PPDU (continued)

Bit	Field	Number of bits	Description
B18–B21	Number Of HE-SIG-B Symbols Or MU-MIMO Users	4	If the HE-SIG-B Compression field is 0, indicates the number of OFDM symbols in the HE-SIG-B field: Set to the number of OFDM symbols in the HE-SIG-B field minus 1 if the number of OFDM symbols in the HE-SIG-B field is less than 16. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is equal to 16 if Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by at least one recipient STA is 0. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is greater than or equal to 16 if the Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by all the recipient STAs are 1 and if the HE-SIG-B-MCS field is set to 0, 1, 2, or 3 regardless of the value of the HE-SIG-B DCM field, or the HE-SIG-B-MCS field is set to 4 and the HE-SIG-B DCM field is set to 1. The exact number of OFDM symbols in the HE-SIG-B field is calculated based on the number of User fields in the HE-SIG-B content channel, which is indicated by the Common field of the HE-SIG-B field in this case. If the HE-SIG-B Compression field is 1, indicates the number of users and is set to the number of users minus 1. If the number of users is greater than 1, then MU-MIMO is used in the HE modulated fields.
B22	HE-SIG-B Compression	1	Set to 0 if the Common field in the HE-SIG-B field is present. Set to 1 if the Common field in the HE-SIG-B field is not present.

(IEEE 802.11ax-2021, § 27.3.11.7.2)

If the HE-SIG-B Compression field in the HE-SIG-A field of an HE MU PPDU is 1 (indicating full-bandwidth MU-MIMO transmission) and the Number Of HE-SIG-B Symbols Or MU-MIMO Users field in the HE-SIG-A field of an HE MU PPDU is 0 (indicating 1 user), then the User Specific field in the HE-SIG-B field consists of a single User Block field containing one User field for a non-MU-MIMO allocation as shown in Table 27-28.

Issued Claim(s)

Issued Claim(s)	Public Documentation
	(IEEE 802.11ax-2021, § 27.3.11.8.4)
[6e] wherein when the number of MU-MIMO users indicates two or more users, the user specific field of the HE-SIG-B includes user fields for MU-MIMO allocation, and	In the Accused Products, “when the number of MU-MIMO users indicates two or more users, the user specific field of the HE-SIG-B includes user fields for MU-MIMO allocation.” The HE-SIG-B content channel format is shown in Figure 27-26. The HE-SIG-B content channel consists of a Common field, if present, followed by a User Specific field.  Figure 27-26—HE-SIG-B content channel format (IEEE 802.11ax-2021, § 27.3.11.8.2) 27.3.11.8.4 User Specific field If the HE-SIG-B Compression field in the HE-SIG-A field of an HE MU PPDU is 1 (indicating full-bandwidth MU-MIMO transmission) and the Number Of HE-SIG-B Symbols Or MU-MIMO Users field in the HE-SIG-A field of an HE MU PPDU is 0 (indicating 1 user), then the User Specific field in the HE-SIG-B field consists of a single User Block field containing one User field for a non-MU-MIMO allocation as shown in Table 27-28.

Issued Claim(s)	Public Documentation																				
	<table><tr><th colspan="4">Table 27-27—User Block field</th></tr><tr><th>Field</th><th>Number of fields</th><th>Number of bits per field</th><th>Description</th></tr><tr><td>User field</td><td>N</td><td>21</td><td> N User fields are present, where N = 1 if it is the final User Block field, and if there is only one user in the final User Block field. N = 2 otherwise. The User field format for a non-MU-MIMO allocation is defined in Table 27-28. The User field format for a MU-MIMO allocation is defined in Table 27-29. </td></tr><tr><td>CRC</td><td>1</td><td>4</td><td>The CRC is calculated over bits 0 to 20 for a User Block field that contains one User field and bits 0 to 41 for a User Block field that contains two User fields. See 27.3.11.7.3.</td></tr><tr><td>Tail</td><td>1</td><td>6</td><td>Used to terminate the trellis of the convolutional decoder. Set to 0.</td></tr></table>	Table 27-27—User Block field				Field	Number of fields	Number of bits per field	Description	User field	N	21	N User fields are present, where N = 1 if it is the final User Block field, and if there is only one user in the final User Block field. N = 2 otherwise. The User field format for a non-MU-MIMO allocation is defined in Table 27-28. The User field format for a MU-MIMO allocation is defined in Table 27-29.	CRC	1	4	The CRC is calculated over bits 0 to 20 for a User Block field that contains one User field and bits 0 to 41 for a User Block field that contains two User fields. See 27.3.11.7.3.	Tail	1	6	Used to terminate the trellis of the convolutional decoder. Set to 0.
Table 27-27—User Block field																					
Field	Number of fields	Number of bits per field	Description																		
User field	N	21	N User fields are present, where N = 1 if it is the final User Block field, and if there is only one user in the final User Block field. N = 2 otherwise. The User field format for a non-MU-MIMO allocation is defined in Table 27-28. The User field format for a MU-MIMO allocation is defined in Table 27-29.																		
CRC	1	4	The CRC is calculated over bits 0 to 20 for a User Block field that contains one User field and bits 0 to 41 for a User Block field that contains two User fields. See 27.3.11.7.3.																		
Tail	1	6	Used to terminate the trellis of the convolutional decoder. Set to 0.																		

Issued Claim(s)	Public Documentation																
	Table 27-29—User field format for MU-MIMO allocation <table><tr><th>Bit</th><th>Subfield</th><th>Number of bits</th><th>Description</th></tr><tr><td>B0–B10</td><td>STA-ID</td><td>11</td><td>Set to a value indicated from TXVECTOR parameter STA_ID (see 26.11.1).</td></tr><tr><td>B11–B14</td><td>Spatial Configuration</td><td>4</td><td>If the STA-ID subfield is not 2046, indicates the number of spatial streams for a user in an MU-MIMO allocation (see Table 27-30). Set to an arbitrary value if the STA-ID subfield is 2046.</td></tr><tr><td>B15–B18</td><td>HE-MCS</td><td>4</td><td>If the STA-ID subfield is not 2046, indicates the modulation and coding scheme: Set to n for HE-MCS n, where $n = 0, 1, 2, \dots, 11$. Values 12-15 are reserved. Set to an arbitrary value if the STA-ID subfield is 2046.</td></tr></table> (IEEE 802.11ax-2021, §, 27.3.11.8.4) In the Accused Products, “when the number of MU-MIMO users indicates a single user, the user specific field of the HE-SIG-B includes one user field for non-MU-MIMO allocation.” 27.3.11.8.4 User Specific field If the HE-SIG-B Compression field in the HE-SIG-A field of an HE MU PPDU is 1 (indicating full-bandwidth MU-MIMO transmission) and the Number Of HE-SIG-B Symbols Or MU-MIMO Users field in the HE-SIG-A field of an HE MU PPDU is 0 (indicating 1 user), then the User Specific field in the HE-SIG-B field consists of a single User Block field containing one User field for a non-MU-MIMO allocation as shown in Table 27-28.	Bit	Subfield	Number of bits	Description	B0–B10	STA-ID	11	Set to a value indicated from TXVECTOR parameter STA_ID (see 26.11.1).	B11–B14	Spatial Configuration	4	If the STA-ID subfield is not 2046, indicates the number of spatial streams for a user in an MU-MIMO allocation (see Table 27-30). Set to an arbitrary value if the STA-ID subfield is 2046.	B15–B18	HE-MCS	4	If the STA-ID subfield is not 2046, indicates the modulation and coding scheme: Set to n for HE-MCS n , where $n = 0, 1, 2, \dots, 11$. Values 12-15 are reserved. Set to an arbitrary value if the STA-ID subfield is 2046.
Bit	Subfield	Number of bits	Description														
B0–B10	STA-ID	11	Set to a value indicated from TXVECTOR parameter STA_ID (see 26.11.1).														
B11–B14	Spatial Configuration	4	If the STA-ID subfield is not 2046, indicates the number of spatial streams for a user in an MU-MIMO allocation (see Table 27-30). Set to an arbitrary value if the STA-ID subfield is 2046.														
B15–B18	HE-MCS	4	If the STA-ID subfield is not 2046, indicates the modulation and coding scheme: Set to n for HE-MCS n , where $n = 0, 1, 2, \dots, 11$. Values 12-15 are reserved. Set to an arbitrary value if the STA-ID subfield is 2046.														
[6f] wherein when the number of MU-MIMO users indicates a single user, the user specific field of the HE-SIG-B includes one user field for non-MU-MIMO allocation.																	

Issued Claim(s)	Public Documentation			
	Table 27-27—User Block field			
	Field	Number of fields	Number of bits per field	Description
	User field	N	21	N User fields are present, where $N = 1$ if it is the final User Block field, and if there is only one user in the final User Block field. $N = 2$ otherwise. The User field format for a non-MU-MIMO allocation is defined in Table 27-28. The User field format for a MU-MIMO allocation is defined in Table 27-29.
	CRC	1	4	The CRC is calculated over bits 0 to 20 for a User Block field that contains one User field and bits 0 to 41 for a User Block field that contains two User fields. See 27.3.11.7.3.
	Tail	1	6	Used to terminate the trellis of the convolutional decoder. Set to 0.

Issued Claim(s)	Public Documentation																
	Table 27-28—User field format for non-MU-MIMO allocation <table><tr><th>Bit</th><th>Subfield</th><th>Number of bits</th><th>Description</th></tr><tr><td>B0–B10</td><td>STA-ID</td><td>11</td><td>Set to a value of the TXVECTOR parameter STA_ID (see 26.11.1).</td></tr><tr><td>B11–B13</td><td>NSTS</td><td>3</td><td>If the STA-ID subfield is not 2046, indicates the number of space-time streams and is set to the number of space-time streams minus 1. Set to an arbitrary value if the STA-ID subfield is 2046.</td></tr><tr><td>B14</td><td>Beamformed</td><td>1</td><td>If the STA-ID subfield is not 2046, used in transmit beamforming: Set to 1 if a beamforming steering matrix is applied to the waveform in a non-MU-MIMO allocation. Set to 0 otherwise. Set to an arbitrary value if the STA-ID subfield is 2046.</td></tr></table> (IEEE 802.11ax-2021, § 27.3.11.8.4)	Bit	Subfield	Number of bits	Description	B0–B10	STA-ID	11	Set to a value of the TXVECTOR parameter STA_ID (see 26.11.1).	B11–B13	NSTS	3	If the STA-ID subfield is not 2046, indicates the number of space-time streams and is set to the number of space-time streams minus 1. Set to an arbitrary value if the STA-ID subfield is 2046.	B14	Beamformed	1	If the STA-ID subfield is not 2046, used in transmit beamforming: Set to 1 if a beamforming steering matrix is applied to the waveform in a non-MU-MIMO allocation. Set to 0 otherwise. Set to an arbitrary value if the STA-ID subfield is 2046.
Bit	Subfield	Number of bits	Description														
B0–B10	STA-ID	11	Set to a value of the TXVECTOR parameter STA_ID (see 26.11.1).														
B11–B13	NSTS	3	If the STA-ID subfield is not 2046, indicates the number of space-time streams and is set to the number of space-time streams minus 1. Set to an arbitrary value if the STA-ID subfield is 2046.														
B14	Beamformed	1	If the STA-ID subfield is not 2046, used in transmit beamforming: Set to 1 if a beamforming steering matrix is applied to the waveform in a non-MU-MIMO allocation. Set to 0 otherwise. Set to an arbitrary value if the STA-ID subfield is 2046.														
7. The wireless communication method of claim 6, wherein the user field(s) for MU-MIMO allocation includes a spatial configuration field indicating the total number of spatial streams in an MU-MIMO allocation and the number of spatial streams for each terminal in the MU-MIMO allocation, and	In the Accused Products, “the user field(s) for MU-MIMO allocation includes a spatial configuration field indicating the total number of spatial streams in an MU-MIMO allocation and the number of spatial streams for each terminal in the MU-MIMO allocation”:																

Issued Claim(s)	Public Documentation																								
wherein the user field for non-MU-MIMO allocation includes a number of space time streams (NSTS) field.	IEEE 802.11ax-2021, May 2021 The User field format for an MU-MIMO allocation is defined in Table 27-29. Table 27-29—User field format for MU-MIMO allocation <table><tr><th>Bit</th><th>Subfield</th><th>Number of bits</th><th>Description</th></tr><tr><td>B0–B10</td><td>STA-ID</td><td>11</td><td>Set to a value indicated from TXVECTOR parameter STA_ID (see 26.11.1).</td></tr><tr><td>B11–B14</td><td>Spatial Configuration</td><td>4</td><td>If the STA-ID subfield is not 2046, indicates the number of spatial streams for a user in an MU-MIMO allocation (see Table 27-30). Set to an arbitrary value if the STA-ID subfield is 2046.</td></tr><tr><td>B15–B18</td><td>HE-MCS</td><td>4</td><td>If the STA-ID subfield is not 2046, indicates the modulation and coding scheme: Set to n for HE-MCS n, where $n = 0, 1, 2, \dots, 11$. Values 12-15 are reserved. Set to an arbitrary value if the STA-ID subfield is 2046.</td></tr><tr><td>B19</td><td>Reserved</td><td>1</td><td>If the STA-ID subfield is not 2046, reserved and set to 0. Set to an arbitrary value if the STA-ID subfield is 2046.</td></tr><tr><td>B20</td><td>Coding</td><td>1</td><td>If the STA-ID subfield is not 2046, indicates whether BCC or LDPC is used: Set to 0 for BCC. Set to 1 for LDPC. Set to an arbitrary value if the STA-ID subfield is 2046.</td></tr></table> A User field for an MU-MIMO allocation includes a 4-bit Spatial Configuration subfield that indicates the number of spatial streams for each user and the total number of spatial streams in the MU-MIMO allocation. The subfield shown in Table 27-30 is constructed by using the entries corresponding to the value of number of users (N_{user}) multiplexed using MU-MIMO in an RU. (IEEE 802.11ax-2021, § 27.3.11.8.4)	Bit	Subfield	Number of bits	Description	B0–B10	STA-ID	11	Set to a value indicated from TXVECTOR parameter STA_ID (see 26.11.1).	B11–B14	Spatial Configuration	4	If the STA-ID subfield is not 2046, indicates the number of spatial streams for a user in an MU-MIMO allocation (see Table 27-30). Set to an arbitrary value if the STA-ID subfield is 2046.	B15–B18	HE-MCS	4	If the STA-ID subfield is not 2046, indicates the modulation and coding scheme: Set to n for HE-MCS n , where $n = 0, 1, 2, \dots, 11$. Values 12-15 are reserved. Set to an arbitrary value if the STA-ID subfield is 2046.	B19	Reserved	1	If the STA-ID subfield is not 2046, reserved and set to 0. Set to an arbitrary value if the STA-ID subfield is 2046.	B20	Coding	1	If the STA-ID subfield is not 2046, indicates whether BCC or LDPC is used: Set to 0 for BCC. Set to 1 for LDPC. Set to an arbitrary value if the STA-ID subfield is 2046.
Bit	Subfield	Number of bits	Description																						
B0–B10	STA-ID	11	Set to a value indicated from TXVECTOR parameter STA_ID (see 26.11.1).																						
B11–B14	Spatial Configuration	4	If the STA-ID subfield is not 2046, indicates the number of spatial streams for a user in an MU-MIMO allocation (see Table 27-30). Set to an arbitrary value if the STA-ID subfield is 2046.																						
B15–B18	HE-MCS	4	If the STA-ID subfield is not 2046, indicates the modulation and coding scheme: Set to n for HE-MCS n , where $n = 0, 1, 2, \dots, 11$. Values 12-15 are reserved. Set to an arbitrary value if the STA-ID subfield is 2046.																						
B19	Reserved	1	If the STA-ID subfield is not 2046, reserved and set to 0. Set to an arbitrary value if the STA-ID subfield is 2046.																						
B20	Coding	1	If the STA-ID subfield is not 2046, indicates whether BCC or LDPC is used: Set to 0 for BCC. Set to 1 for LDPC. Set to an arbitrary value if the STA-ID subfield is 2046.																						

Issued Claim(s)	Public Documentation
	In the Accused Products, “the user field for non-MU-MIMO allocation includes a number of space time streams (NSTS) field”:

IEEE 802.11ax-2021, May 2021

Table 27-28—User field format for non-MU-MIMO allocation

Bit	Subfield	Number of bits	Description
B0–B10	STA-ID	11	Set to a value of the TXVECTOR parameter STA_ID (see 26.11.1).
B11–B13	NSTS	3	If the STA-ID subfield is not 2046, indicates the number of space-time streams and is set to the number of space-time streams minus 1. Set to an arbitrary value if the STA-ID subfield is 2046.
B14	Beamformed	1	If the STA-ID subfield is not 2046, used in transmit beamforming: Set to 1 if a beamforming steering matrix is applied to the waveform in a non-MU-MIMO allocation. Set to 0 otherwise.
B15–B18	HE-MCS	4	Set to an arbitrary value if the STA-ID subfield is 2046. If the STA-ID subfield is not 2046, indicates the modulation and coding scheme: Set to n for HE-MCS n , where $n = 0, 1, 2, \dots, 11$. Values 12–15 are reserved.
B19	DCM	1	Set to an arbitrary value if the STA-ID subfield is 2046. If the STA-ID subfield is not 2046, indicates whether DCM is used: Set to 1 to indicate that the payload of the corresponding user of the HE MU PPDU is modulated with DCM for the HE-MCS. Set to 0 to indicate that the payload of the corresponding user of the PPDU is not modulated with DCM for the HE-MCS.
B20	Coding	1	Set to an arbitrary value if the STA-ID subfield is 2046. If the STA-ID subfield is not 2046, indicates whether BCC or LDPC is used: Set to 0 for BCC. Set to 1 for LDPC.

(IEEE 802.11ax-2021, §, 27.3.11.8.4)

Issued Claim(s)	Public Documentation
8. The wireless communication method of claim 6, wherein the user field(s) for non-MU-MIMO allocation is a user field based on orthogonal frequency division multiple access (OFDMA) allocation.	In the Accused Products, “the user field(s) for non-MU-MIMO allocation is a user field based on orthogonal frequency division multiple access (OFDMA) allocation”: IEEE 802.11ax-2021, May 2021 27.3.11.8 HE-SIG-B field 27.3.11.8.1 General The HE-SIG-B field provides the necessary signaling, including the OFDMA and DL MU-MIMO resource allocation information, to allow the STAs to look up the corresponding resources to be used in the HE modulated fields of the PPDU. The integer fields of the HE-SIG-B field are transmitted in unsigned binary format, LSB first, where the LSB is in the lowest numbered bit position. 27.3.11.8.4 User Specific field The User Specific field of an HE-SIG-B content channel consists of zero or more User Block fields followed by padding (if present) as shown in Figure 27-26. Each non-final User Block field is made up of two User fields that contain information for two STAs that is used to decode their payloads. The final User Block field contains information for one or two users depending on the number of users in the HE-SIG-B content channel. If the HE-SIG-B Compression field in the HE-SIG-A field of an HE MU PPDU is 0, then the number of User fields is indicated by the RU Allocation subfields and the Center 26-tone RU subfield in the same HE-SIG-B content channel. If the HE-SIG-B Compression field in the HE-SIG-A field of an HE MU PPDU is 1, then the number of users is indicated by the Number Of HE-SIG-B Symbols Or MU-MIMO Users field in the HE-SIG-A field. If the HE-SIG-B Compression field in the HE-SIG-A field of an HE MU PPDU is 1 (indicating full-bandwidth MU-MIMO transmission) and the Number Of HE-SIG-B Symbols Or MU-MIMO Users field in the HE-SIG-A field of an HE MU PPDU is 0 (indicating 1 user), then the User Specific field in the HE-SIG-B field consists of a single User Block field containing one User field for a non-MU-MIMO allocation as shown in Table 27-28. The contents of the User field differ depending on whether the field addresses a user in a non-MU-MIMO allocation in an RU or a user in an MU-MIMO allocation in an RU. Irrespective of whether the allocation is for a user in a non-MU-MIMO or an MU-MIMO allocation, the size of the User field is the same.

Issued Claim(s)	Public Documentation															
9. The wireless communication method of claim 6, wherein the number of MU-MIMO users is indicated by a number of HE-SIG-B symbols field in the HE-SIG-A.	In the Accused Products, “the number of MU-MIMO users is indicated by a number of HE-SIG-B symbols field in the HE-SIG-A”:															
IEEE 802.11ax-2021, May 2021																
Table 27-20—HE-SIG-A field of an HE MU PPDU (continued)																
<table><tr><th>Bit</th><th>Field</th><th>Number of bits</th><th>Description</th></tr><tr><td>B18-B21</td><td>Number Of HE-SIG-B Symbols Or MU-MIMO Users</td><td>4</td><td> If the HE-SIG-B Compression field is 0, indicates the number of OFDM symbols in the HE-SIG-B field: Set to the number of OFDM symbols in the HE-SIG-B field minus 1 if the number of OFDM symbols in the HE-SIG-B field is less than 16. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is equal to 16 if Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by at least one recipient STA is 0. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is greater than or equal to 16 if the Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by all the recipient STAs are 1 and if the HE-SIG-B-MCS field is set to 0, 1, 2, or 3 regardless of the value of the HE-SIG-B DCM field, or the HE-SIG-B-MCS field is set to 4 and the HE-SIG-B DCM field is set to 1. The exact number of OFDM symbols in the HE-SIG-B field is calculated based on the number of User fields in the HE-SIG-B content channel, which is indicated by the Common field of the HE-SIG-B field in this case. </td></tr><tr><td>B22</td><td>HE-SIG-B Compression</td><td>1</td><td> If the HE-SIG-B Compression field is 1, indicates the number of users and is set to the number of users minus 1. If the number of users is greater than 1, then MU-MIMO is used in the HE modulated fields. Set to 0 if the Common field in the HE-SIG-B field is present. Set to 1 if the Common field in the HE-SIG-B field is not present. </td></tr></table>					Bit	Field	Number of bits	Description	B18-B21	Number Of HE-SIG-B Symbols Or MU-MIMO Users	4	If the HE-SIG-B Compression field is 0, indicates the number of OFDM symbols in the HE-SIG-B field: Set to the number of OFDM symbols in the HE-SIG-B field minus 1 if the number of OFDM symbols in the HE-SIG-B field is less than 16. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is equal to 16 if Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by at least one recipient STA is 0. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is greater than or equal to 16 if the Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by all the recipient STAs are 1 and if the HE-SIG-B-MCS field is set to 0, 1, 2, or 3 regardless of the value of the HE-SIG-B DCM field, or the HE-SIG-B-MCS field is set to 4 and the HE-SIG-B DCM field is set to 1. The exact number of OFDM symbols in the HE-SIG-B field is calculated based on the number of User fields in the HE-SIG-B content channel, which is indicated by the Common field of the HE-SIG-B field in this case.	B22	HE-SIG-B Compression	1	If the HE-SIG-B Compression field is 1, indicates the number of users and is set to the number of users minus 1. If the number of users is greater than 1, then MU-MIMO is used in the HE modulated fields. Set to 0 if the Common field in the HE-SIG-B field is present. Set to 1 if the Common field in the HE-SIG-B field is not present.
Bit	Field	Number of bits	Description													
B18-B21	Number Of HE-SIG-B Symbols Or MU-MIMO Users	4	If the HE-SIG-B Compression field is 0, indicates the number of OFDM symbols in the HE-SIG-B field: Set to the number of OFDM symbols in the HE-SIG-B field minus 1 if the number of OFDM symbols in the HE-SIG-B field is less than 16. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is equal to 16 if Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by at least one recipient STA is 0. Set to 15 to indicate that the number of OFDM symbols in the HE-SIG-B field is greater than or equal to 16 if the Longer Than 16 HE-SIG-B OFDM Symbols Support subfield in the HE Capabilities element transmitted by all the recipient STAs are 1 and if the HE-SIG-B-MCS field is set to 0, 1, 2, or 3 regardless of the value of the HE-SIG-B DCM field, or the HE-SIG-B-MCS field is set to 4 and the HE-SIG-B DCM field is set to 1. The exact number of OFDM symbols in the HE-SIG-B field is calculated based on the number of User fields in the HE-SIG-B content channel, which is indicated by the Common field of the HE-SIG-B field in this case.													
B22	HE-SIG-B Compression	1	If the HE-SIG-B Compression field is 1, indicates the number of users and is set to the number of users minus 1. If the number of users is greater than 1, then MU-MIMO is used in the HE modulated fields. Set to 0 if the Common field in the HE-SIG-B field is present. Set to 1 if the Common field in the HE-SIG-B field is not present.													