

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

NIPPON TELEGRAPH AND
TELEPHONE CORPORATION and
ESSENTIAL WIFI LLC,

Plaintiffs,

v.

MEDIATEK INC. AND
MEDIATEK USA INC.,

Defendants.

C.A. No. 1:20-cv-00632-ADA

JURY TRIAL DEMANDED

PLAINTIFFS' PRELIMINARY INFRINGEMENT CONTENTIONS

Plaintiffs Nippon Telegraph and Telephone Corporation ("NTT") and Essential WiFi, LLC ("EWF") (collectively "Plaintiffs") hereby provide Defendants MediaTek Inc. ("MT") and MediaTek U.S.A. Inc. ("MTUS") (collectively, "MT") with the following Preliminary Infringement Contentions ("PICs") for U.S. Patent No. 7,280,551 ("the '551 Patent"), U.S. Patent No. 7,545,781 ("the '781 Patent"), U.S. Patent No. 7,400,616 ("the '616 Patent"), and U.S. Patent No. 7,242,720 ("the '720 Patent") (collectively, the "Patents in Suit").

The '551 Patent is entitled to a priority date of no later than September 9, 2003. The '781 Patent is entitled to a priority date of no later than July 14, 2003. The '616 Patent is entitled to a priority date of no later than June 18, 2003. The '720 Patent is entitled to a priority date of no later than April 9, 2001.

MT directly infringes and has infringed the Patents in Suit by making, using, importing, selling, and/or offering to sell (and/or has made, used, imported, offered to sell, and/or sold) the Accused Products. Plaintiffs contend that the Accused Products infringe the Patents in Suit because of their compliance with the IEEE standards 802.11n-2009 ("802.11n") and 802.11ac-2013

("802.11ac"). Further, because products complying with 802.11ac implement relevant aspects of the 802.11n standard, infringement is demonstrated primarily with reference to the 802.11n standard. Relevant sections of the 802.11ac standard are addressed where appropriate. Reference is made to earlier standards to the extent they set forth definitions and/or basic principles implemented in both 802.11n and 802.11ac.

The Accused Products include, but are not limited to: the i300 SoM; the i350; Helio products, including the A Series, the G Series, the P Series, and the X Series; RT3062; RT3070; RT3562; RT3573; RT3592; RT3662; RT3883; RT5370; RT5572; RT5592; MT2601 (see subsidiary AIROHA); MT3620; MT5931 (see subsidiary AIROHA); MT5932; MT6570; MT6572; MT6580; MT6582; MT6592; MT6595 MT6731; MT6732; MT6735; MT6737; MT6737T; MT6735; MT6738; MT6739; MT6750; MT6752; MT6753; MT7601E; MT7601U; MT7603E; MT7603U; MT7610E; MT7610U; MT7612E; MT7612U; MT7615; MT7615B; MT7615S; MT7620; MT7620N/A; MT7621; MT7622; MT7623N/A; MT7628; MT7628K/N/A; MT7662E; MT7662U; MT7682; MT7686 (see subsidiary AIROHA); MT7681; MT7687F; MT7668; MT7688A; MT7688K; MT7697; MT7697H; MT7697HD; MT8125; MT8127; MT8135; MT8163; MT8163V/A; MT8163V/B; MT8167A; MT8167B; MT8167S; MT8168; MT8173; MT8173C; MT8175; MT8176; MT8183; MT8321; i300A (MT8362A); i300B (MT8362B); i500 (MT8385); MT8516; MT8516SoM; MT8685; MT8693; MT8735B; MT8735D; MT8735M; MT8735P; MT8766B; MT8768T; MT8783; MT8785; MT8788; VIA VAB-950; as well as various other products that implement the 802.11n and 802.11ac standards.

Further, MT indirectly infringes and has indirectly infringed the Patents in Suit by inducement as MT's customers and/or end users directly infringe the claims listed below by making, using, importing, selling, and/or offering to sell products incorporating and/or

implementing the Accused Products. In addition, MT indirectly infringes and has indirectly infringed the Patents in Suit by inducement as end users of MT's Accused Products, and/or products incorporating and/or implementing the Accused Products, directly infringe by at least using the Accused Products and/or products incorporating and/or implementing the same. MT further indirectly infringes the Patents in Suit by contributing to the infringement by others, including without limitation by MT's customers and/or end users, because MT knew that the combination for which their Accused Products were especially made was both patented and infringing, and that MT's Accused Products have no substantial non-infringing uses.

The PICs illustrate infringement by MT based on the information currently available to Plaintiffs. Plaintiffs note that their investigation is ongoing and that fact discovery has not yet begun in this action. Plaintiffs make these contentions based on public information available and obtained to date, without the benefit of complete discovery related to this litigation from MT or third parties about the Accused Products. Thus, Plaintiffs reserve the right to revise, correct, supplement, and/or clarify these contentions, including the asserted claims or accused products at any time based on information developed in the litigation through discovery or additional factual investigation.

In addition, Plaintiffs reserve the right to assert additional claims to the extent warranted by discovery, including but not limited to information related to MT's testing of its Accused Products and versions and/or prototypes thereof, and MT's communications with customers and/or suppliers, including but not limited to manufacturers of devices incorporating and/or implementing the Accused Products, relating to issues such as compliance with the 802.11n and 802.11ac standards, implementation of aspects of the standards relevant to the subject matter of the Patents

in Suit, and/or conditions and/or circumstances for obtaining or otherwise realizing the benefits or performance results of aspects of the standards relevant to the subject matter of the Patents in Suit.

Furthermore, this Court has not yet construed the meaning of the claims of the Patents in Suit. Accordingly, Plaintiffs reserve all rights to amend, supplement, and/or modify these contentions after the claims have been construed by the Court. Plaintiffs also reserve the right to amend, supplement, and/or modify these contentions based on claim construction arguments or rulings, or non-infringement or invalidity positions that MT may take in litigation. Thus, Plaintiffs provide the PICs subject to these reservations and without waiving their rights to supplement throughout this litigation in response to fact or expert discovery, or at any time consistent with the schedule to be entered in this case, the rules of this Court and/or the Federal Rules.

Without being bound by any particular claim construction at this stage of the litigation, Plaintiffs contend that each element of the asserted claims of the Patents in Suit is literally present in MT's Accused Products. In the event that a claim element is not found to be literally present in MT's Accused Products, such as due to a future claim construction ruling, Plaintiffs further contend that the Accused Products would still infringe under the doctrine of equivalents, and reserve all rights to supplement and/or revise these contentions accordingly.

Dated: August 3, 2020

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CERTIFICATE OF SERVICE

I hereby certify that on August 3, 2020, I caused to be served a true and accurate copy of Plaintiffs' Preliminary Infringement Contentions, by electronic mail on the following:

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Steven R. Daniels

EXHIBIT A

EXHIBIT A: INFRINGEMENT CONTENTIONS FOR U.S. PAT. NO. 7,280,551

	Claims of '551 Patent	Accused Products
	Claim 1	
1	<p>A wireless packet communication method for transmitting a plurality of wireless packets simultaneously by using multiple wireless channels determined to be idle by carrier sense, a single wireless channel determined to be idle and MIMO, or the multiple wireless channels and the MIMO, the method comprising:</p>	<p>To the extent the preamble is construed as limiting, the Accused Products, alone and/or in combination with other components, implement a wireless packet communication method for transmitting a plurality of wireless packets simultaneously by using multiple wireless channels determined to be idle by carrier sense, a single wireless channel determined to be idle and MIMO, or the multiple wireless channels and the MIMO.</p> <p>For example, the 802.11n standard provides a wireless packet communication method for transmitting a plurality of wireless packets simultaneously by using various technologies. For instance, the 802.11n standard provides transmission using Multiple Input Multiple Output (MIMO) technology, and simultaneous transmission using non-MIMO techniques. Thus, for example, a STA may transmit a plurality of wireless packets simultaneously using MIMO techniques, of either 20 MHz or 40 MHz size. <i>See e.g.</i>, excerpts below:</p> <p>“5.2.9 High-throughput (HT) station (STA)</p> <p>...</p> <p>“Some PHY features that distinguish an HT STA from a non-HT STA are referred to as multiple input, multiple output (MIMO) operation; spatial multiplexing (SM); spatial mapping (including transmit beamforming); space-time block coding (STBC); low-density parity check (LDPC) encoding; and antenna selection (ASEL). The allowed PPDU formats are non-HT format, HT-mixed format, and HT-greenfield format. The PPDUs may be transmitted with 20 MHz or 40 MHz bandwidth.”</p> <p><i>See</i> 802.11n-2009 at 5.2.9</p> <p>“The HT PHY is based on the OFDM PHY defined in Clause 17, with extensibility up to four spatial streams, operating in 20 MHz bandwidth. Additionally, transmission using one to four spatial streams is defined for operation in 40 MHz bandwidth. These features are capable of supporting data rates up to 600 Mb/s (four spatial streams, 40 MHz bandwidth).”</p> <p><i>See</i> 802.11n at 20.1.1.</p>

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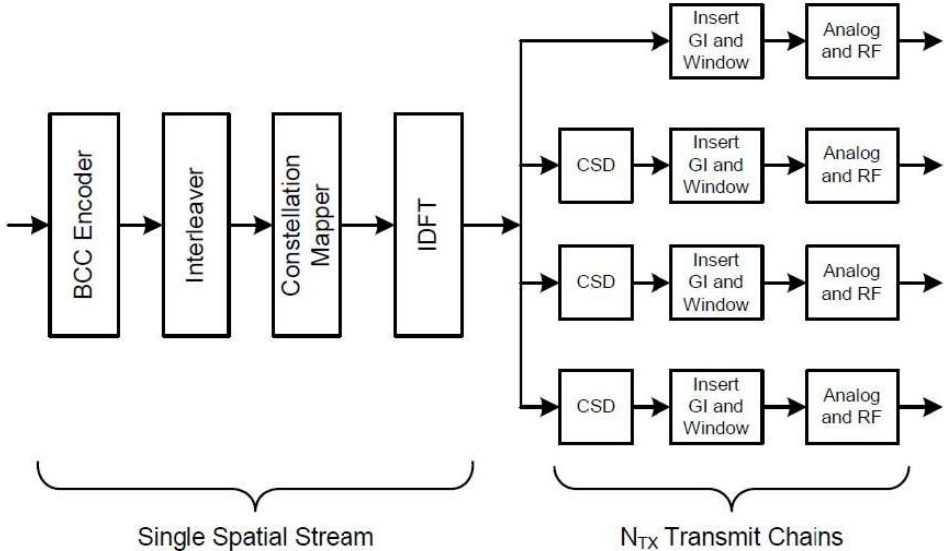
	Claims of '551 Patent	Accused Products
	Claim 1	
		<p>“Figure 20-2 and Figure 20-3 show example transmitter block diagrams. In particular, Figure 20-2 shows the transmitter blocks used to generate the HT-SIG of the HT-mixed format PPDU... Figure 20-3 shows the transmitter blocks used to generate the Data field of the HT-mixed format and HT-greenfield format PPDUs.</p>  <p style="text-align: center;">Figure 20-2—Transmitter block diagram 1</p>

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	Claims of '551 Patent	Accused Products
	Claim 1	
		<p>Figure 20-3—Transmitter block diagram 2</p> <p>See 802.11n at 20.3.3.</p> <p>“3A.34 non-high-throughput (non-HT) duplicate: A transmission format of the physical layer (PHY) that duplicates a 20 MHz non-HT transmission in two adjacent 20 MHz channels and allows a station (STA) in a non-HT basic service set (BSS) on either channel to receive the transmission.” See 802.11n-2009 at 3A.34</p>

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	Claims of '551 Patent	Accused Products
	Claim 1	
		<p>“In the case of the MCS 32 and non-HT duplicate formats, the same data are transmitted over two adjacent 20 MHz channels. In this case, the 40 MHz channel is divided into 128 subcarriers, and the data are transmitted on subcarriers –58 to –6 and 6 to 58.” <i>See</i> 802.11n-2009 at 20.3.7</p> <p>“And furthermore, if the FORMAT field is set to NON_HT and CH_BANDWIDTH indicates NON_HT_CBW40, follow the transmit procedure in Clause 17, except that the signal in Clause 17 is generated simultaneously on each of the upper and lower 20 MHz channels that constitute the 40 MHz channel as defined in 20.3.8 and 20.3.11.11.” <i>See</i> 802.11n-2009 at 20.3.23</p> <p>The 802.11ac standard also provides for transmission of a plurality of wireless packets simultaneously using similar techniques. <i>See e.g.</i>, excerpts below:</p> <p>“22.3.5 VHT modulation and coding scheme (VHT-MCS) The VHT-MCS is a value that determines the modulation and coding used in the Data field of the PPDU. It is a compact representation that is carried in the VHT-SIG-A field for VHT SU PPDUs and in the VHTSIG- B field for VHT MU PPDUs. Rate-dependent parameters for the full set of VHT-MCSs are shown in Table 22-30 to Table 22-61 (in 22.5). These tables give rate-dependent parameters for VHT-MCSs with indices 0 to 9, with number of spatial streams from 1 to 8 and bandwidth options of 20 MHz, 40 MHz, 80 MHz, and either 160 MHz or 80+80 MHz. Equal modulation (EQM) is applied to all streams for a particular user.” <i>See</i> 802.11ac at 22.3.5</p> <p><i>See also</i> 802.11ac at Figs. 22-5-22-10</p> <p>“22.3.11 SU-MIMO and DL-MU-MIMO Beamforming 22.3.11.1 General</p>

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	Claims of '551 Patent	Accused Products
	Claim 1	
		<p>SU-MIMO and DL-MU-MIMO beamforming are techniques used by a STA with multiple antennas (the beamformer) to steer signals using knowledge of the channel to improve throughput. With SU-MIMO beamforming all space-time streams in the transmitted signal are intended for reception at a single STA. With DL-MU-MIMO beamforming, disjoint subsets of the space-time streams are intended for reception at different STAs.” <i>See 802.11ac at 22.3.11</i></p> <p>“non-high-throughput (non-HT) duplicate: A transmission format of the physical layer (PHY) that duplicates a 20 MHz non-HT transmission in two adjacent or more 20 MHz channels and allows a station (STA) in a non-HT basic service set (BSS) on either channel any one of the 20 MHz channels to receive the transmission. A non-HT duplicate format is one of the following:</p> <ol style="list-style-type: none"> 1) 40 MHz non-HT duplicate: A transmission format of the PHY that replicates a 20 MHz non-HT transmission in two adjacent 20 MHz channels. 2) 80 MHz non-HT duplicate: A transmission format of the PHY that replicates a 20 MHz non-HT transmission in four adjacent 20 MHz channels. 3) 160 MHz non-HT duplicate: A transmission format of the PHY that replicates a 20 MHz non-HT transmission in eight adjacent 20 MHz channels. 4) 80+80 MHz non-HT duplicate: A transmission format of the PHY that replicates a 20 MHz non-HT transmission in two frequency segments of four adjacent 20 MHz channels where the two frequency segments of channels are not adjacent.” <p><i>See 802.11ac at 3.2; see also 9.7.10; 22.3.10.12</i></p> <p>“22.1.4 PPDU formats The structure of the PPDU transmitted by a VHT STA is determined by the TXVECTOR parameters as defined in Table 22-1.” <i>See 802.11ac at 22.1.4</i></p>

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Claims of '551 Patent	Accused Products														
Claim 1															
	<div>Table 22-1—TXVECTOR and RXVECTOR parameters</div> <table><tr><th>Parameter</th><th>Condition</th><th>Value</th><th>TXVECTOR</th><th>RXVECTOR</th></tr><tr><td rowspan="2">MCS</td><td>FORMAT is VHT</td><td>Indicates the modulation and coding scheme used in the transmission of the PPDU. Integer: range 0 to 9</td><td>M U</td><td>Y</td></tr><tr><td>Otherwise</td><td>See corresponding entry in Table 20-1</td><td></td><td></td></tr></table> <p>See 802.11ac at Table 22-1; <i>see also</i> 802.11n at Table 20-1.</p> <p>Further, for example, the 802.11n standard provides a variety of channel architectures for transmission, including multiple wireless channels determined to be idle by carrier sense, a single wireless channel determined to be idle and MIMO, or the multiple wireless channels and the MIMO.</p> <p>For example, the 802.11n standard provides a primary and secondary channel, which may be used to transmit 20 MHz data packets, or may be bonded to transmit 40 MHz data packets. <i>See e.g., excerpts below:</i></p> <p>“3.242 primary channel: The common channel of operation for all STAs that are members of the BSS.</p> <p>...</p> <p>3A.61 secondary channel: A 20 MHz channel associated with a primary channel used by HT STAs for the purpose of creating a 40 MHz channel.”</p> <p><i>See 802.11n-2009 at 3.</i></p> <p>“11.14.9 STA CCA sensing in a 20/40 MHz BSS</p>	Parameter	Condition	Value	TXVECTOR	RXVECTOR	MCS	FORMAT is VHT	Indicates the modulation and coding scheme used in the transmission of the PPDU. Integer: range 0 to 9	M U	Y	Otherwise	See corresponding entry in Table 20-1		
Parameter	Condition	Value	TXVECTOR	RXVECTOR											
MCS	FORMAT is VHT	Indicates the modulation and coding scheme used in the transmission of the PPDU. Integer: range 0 to 9	M U	Y											
	Otherwise	See corresponding entry in Table 20-1													

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	Claims of '551 Patent	Accused Products
	Claim 1	
		<p>A STA may transmit a 20 MHz mask PPDU in the primary channel following the rules in 9.9.1.</p> <p>A STA transmitting a 40 MHz mask PPDU that begins a TXOP using EDCA as described in 9.9.1.3 or that is using a PIFS as permitted in 9.2.3.2 shall sense CCA on both the 20 MHz primary channel and the 20 MHz secondary channel before the 40 MHz mask PPDU transmission starts.”</p> <p>“3A.29 modulation and coding scheme 32 (MCS 32) format: A physical layer convergence procedure (PLCP) protocol data unit (PPDU) format of the high-throughput (HT) physical layer (PHY) in which signals in two halves of the occupied channel width contain the same information. This HT PPDU format supports the lowest rate.” <i>See 802.11n-2009 at 3A.29</i></p> <p>“3A.34 non-high-throughput (non-HT) duplicate: A transmission format of the physical layer (PHY) that duplicates a 20 MHz non-HT transmission in two adjacent 20 MHz channels and allows a station (STA) in a non-HT basic service set (BSS) on either channel to receive the transmission.” <i>See 802.11n-2009 at 3A.34</i></p> <p>“In the case of the MCS 32 and non-HT duplicate formats, the same data are transmitted over two adjacent 20 MHz channels. In this case, the 40 MHz channel is divided into 128 subcarriers, and the data are transmitted on subcarriers –58 to –6 and 6 to 58.” <i>See 802.11n-2009 at 20.3.7</i></p> <p>“And furthermore, if the FORMAT field is set to NON_HT and CH_BANDWIDTH indicates NON_HT_CBW40, follow the transmit procedure in Clause 17, except that the signal in Clause 17 is generated simultaneously on each of the upper and lower 20 MHz channels that constitute the 40 MHz channel as defined in 20.3.8 and 20.3.11.11.” <i>See 802.11n-2009 at 20.3.23</i></p>

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	Claims of '551 Patent	Accused Products
	Claim 1	
		<p>The 802.11ac standard also provides for a variety of channel architectures in a manner similar to the 802.11n standard, but further expands the available channels in order to provide for higher throughputs. <i>See e.g.</i>, excerpts below:</p> <p>“non-primary channel: In a 40 MHz, 80 MHz, 160 MHz, or 80+80 MHz very high throughput (VHT) basic service set (BSS), any 20 MHz channel other than the primary 20 MHz channel.</p> <p>...</p> <p>primary 20 MHz channel: In a 40 MHz, 80 MHz, 160 MHz, or 80+80 MHz very high throughput (VHT) basic service set (BSS), the 20 MHz channel that is used to transmit 20 MHz physical layer (PHY) protocol data units (PPDUs). In a VHT BSS, the primary 20 MHz channel is also the primary channel.</p> <p>primary 40 MHz channel: In an 80 MHz, 160 MHz, or 80+80 MHz very high throughput (VHT) basic service set (BSS), the 40 MHz channel that is used to transmit 40 MHz physical layer (PHY) protocol data units (PPDUs).</p> <p>primary 80 MHz channel: In a 160 MHz or 80+80 MHz very high throughput (VHT) basic service set (BSS), the 80 MHz channel that is used to transmit 80 MHz physical layer (PHY) protocol data units (PPDUs).</p> <p>...</p> <p>secondary 20 MHz channel: In a 40 MHz very high throughput (VHT) basic service set (BSS), the 20 MHz channel adjacent to the primary 20 MHz channel that together form the 40 MHz channel of the 40 MHz VHT BSS. In an 80 MHz VHT BSS, the 20 MHz channel adjacent to the primary 20 MHz channel that together form the primary 40 MHz channel of the 80 MHz VHT BSS. In a 160 MHz or 80+80 MHz VHT BSS, the 20 MHz channel adjacent to the primary 20 MHz channel that together form the primary 40 MHz channel of the 160 MHz or 80+80 MHz VHT BSS. In a VHT BSS, the secondary 20 MHz channel is also the secondary channel.</p>

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Claims of '551 Patent	Accused Products										
Claim 1											
	<p>secondary 40 MHz channel: In an 80 MHz very high throughput (VHT) basic service set (BSS), the 40 MHz channel adjacent to the primary 40 MHz channel that together form the 80 MHz channel of the 80 MHz VHT BSS. In a 160 or 80+80 MHz VHT BSS, the 40 MHz channel adjacent to the primary 40 MHz channel that together form the primary 80 MHz channel.</p> <p>secondary 80 MHz channel: In a 160 MHz or 80+80 MHz very high throughput (VHT) basic service set (BSS), the 80 MHz channel not including the primary 20 MHz channel, that together with the primary 80 MHz channel forms the 160 MHz or 80+80 MHz channel of the 160 MHz or 80+80 MHz VHT BSS.” <i>See 802.11ac at 3.2</i></p> <p style="text-align: center;"><u>Table 7-5—The channel-list parameter elements</u></p> <table><tr><th><u>channel-list element</u></th><th><u>Meaning</u></th></tr><tr><td><u>primary</u></td><td><u>For an HT STA that is not a VHT STA, indicates that the primary 20 MHz channel is busy.</u> <u>For a VHT STA, indicates that the primary 20 MHz channel is busy according to the rules specified in 22.3.19.5.3.</u></td></tr><tr><td><u>secondary</u></td><td><u>For an HT STA that is not a VHT STA, indicates that the secondary channel is busy.</u> <u>For a VHT STA, indicates that the secondary 20 MHz channel is busy according to the rules specified in 22.3.19.5.4.</u></td></tr><tr><td><u>secondary40</u></td><td><u>Indicates that the secondary 40 MHz channel is busy according to the rules specified in 22.3.19.5.4.</u></td></tr><tr><td><u>secondary80</u></td><td><u>Indicates that the secondary 80 MHz channel is busy according to the rules specified in 22.3.19.5.4.</u></td></tr></table>	<u>channel-list element</u>	<u>Meaning</u>	<u>primary</u>	<u>For an HT STA that is not a VHT STA, indicates that the primary 20 MHz channel is busy.</u> <u>For a VHT STA, indicates that the primary 20 MHz channel is busy according to the rules specified in 22.3.19.5.3.</u>	<u>secondary</u>	<u>For an HT STA that is not a VHT STA, indicates that the secondary channel is busy.</u> <u>For a VHT STA, indicates that the secondary 20 MHz channel is busy according to the rules specified in 22.3.19.5.4.</u>	<u>secondary40</u>	<u>Indicates that the secondary 40 MHz channel is busy according to the rules specified in 22.3.19.5.4.</u>	<u>secondary80</u>	<u>Indicates that the secondary 80 MHz channel is busy according to the rules specified in 22.3.19.5.4.</u>
<u>channel-list element</u>	<u>Meaning</u>										
<u>primary</u>	<u>For an HT STA that is not a VHT STA, indicates that the primary 20 MHz channel is busy.</u> <u>For a VHT STA, indicates that the primary 20 MHz channel is busy according to the rules specified in 22.3.19.5.3.</u>										
<u>secondary</u>	<u>For an HT STA that is not a VHT STA, indicates that the secondary channel is busy.</u> <u>For a VHT STA, indicates that the secondary 20 MHz channel is busy according to the rules specified in 22.3.19.5.4.</u>										
<u>secondary40</u>	<u>Indicates that the secondary 40 MHz channel is busy according to the rules specified in 22.3.19.5.4.</u>										
<u>secondary80</u>	<u>Indicates that the secondary 80 MHz channel is busy according to the rules specified in 22.3.19.5.4.</u>										

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	Claims of '551 Patent	Accused Products
	Claim 1	
		<div data-bbox="827 305 1583 662"> </div> <p data-bbox="848 691 1562 743"><u>Figure 7-1—The channel-list parameter element for 40 MHz, 80 MHz, and 160 MHz channel width</u></p> <div data-bbox="743 799 1675 1058"> </div> <p data-bbox="802 1088 1604 1117"><u>Figure 7-2—The channel-list parameter element for 80+80 MHz channel width</u></p> <p data-bbox="659 1162 1835 1234">Further, for example, the 802.11n standard provides that a STA uses the wireless channel(s) determined to be idle by carrier sense. <i>See e.g.</i>, excerpts below:</p> <p data-bbox="751 1273 1877 1414">“The fundamental access method of the IEEE 802.11 MAC is a DCF known as <i>carrier sense multiple access with collision avoidance</i> (CSMA/CA). The DCF shall be implemented in all STAs, for use within both IBSS and infrastructure network configurations. For a STA to transmit, it shall sense the medium to determine if another</p>

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	Claims of '551 Patent	Accused Products
	Claim 1	
		<p>STA is transmitting. If the medium is not determined to be busy (see 9.2.1), the transmission may proceed. The CSMA/CA distributed algorithm mandates that a gap of a minimum specified duration exist between contiguous frame sequences. A transmitting STA shall ensure that the medium is idle for this required duration before attempting to transmit.” <i>See</i> 802.11-2007 at 9.1.1</p> <p>“14.3.3.2 CS/CCA procedure The CS/CCA procedure is executed while the receiver is turned on and the STA is not currently receiving or transmitting a packet. The CS/CCA procedure is used for two purposes: to detect the start of a network signal that can be received (CS) and to determine whether the channel is clear prior to transmitting a packet (CCA).” <i>See</i> 802.11-2007 at 14.3.3.2</p> <p>“3.22 clear channel assessment (CCA) function: That logical function in the physical layer (PHY) that determines the current state of use of the wireless medium (WM).” <i>See</i> 802.11-2007 at 3.22</p> <p>“11.14.9 STA CCA sensing in a 20/40 MHz BSS A STA may transmit a 20 MHz mask PPDU in the primary channel following the rules in 9.9.1. A STA transmitting a 40 MHz mask PPDU that begins a TXOP using EDCA as described in 9.9.1.3 or that is using a PIFS as permitted in 9.2.3.2 shall sense CCA on both the 20 MHz primary channel and the 20 MHz secondary channel before the 40 MHz mask PPDU transmission starts.” <i>See</i> 802.11n at 11.14.9</p> <p>The 802.11ac standard similarly provides for determining the idle state of wireless channels using carrier sense, as defined for its channel architecture. Thus, as just one example, transmitting a 40 MHz frame requires both the primary and secondary MHz channels to be idle, as is the case for 802.11n. <i>See e.g.</i>, excerpts below:</p>

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	Claims of '551 Patent	Accused Products										
	Claim 1											
		<p>“22.3.19.5.3 CCA sensitivity for signals occupying the primary 20 MHz channel The PHY shall issue a PHY-CCA.indication(BUSY, {primary}) if one of the conditions listed in Table 22-27 is met in an otherwise idle 20 MHz, 40 MHz, 80 MHz, 160 MHz, or 80+80 MHz operating channel width. With >90% probability, the PHY shall detect the start of a PPDU that occupies at least the primary 20 MHz channel under the conditions listed in Table 22-27 within a period of aCCATime (see 22.4.4) and hold the CCA signal busy (PHY_CCA.indicate(BUSY, channel-list)) for the duration of the PPDU.</p> <p style="text-align: center;">Table 22-27—Conditions for CCA BUSY on the primary 20 MHz</p> <table><tr><th>Operating Channel Width</th><th>Conditions</th></tr><tr><td>20 MHz, 40 MHz, 80 MHz, 160 MHz, or 80+80 MHz</td><td>The start of a 20 MHz NON_HT PPDU in the primary 20 MHz channel as defined in 18.3.10.6. The start of an HT PPDU under the conditions defined in 20.3.21.5. The start of a 20 MHz VHT PPDU in the primary 20 MHz channel at or above −82 dBm.</td></tr><tr><td>40 MHz, 80 MHz, 160 MHz, or 80+80 MHz</td><td>The start of a 40 MHz non-HT duplicate or VHT PPDU in the primary 40 MHz channel at or above −79 dBm. The start of an HT PPDU under the conditions defined in 20.3.21.5.</td></tr><tr><td>80 MHz, 160 MHz, or 80+80 MHz</td><td>The start of an 80 MHz non-HT duplicate or VHT PPDU in the primary 80 MHz channel at or above −76 dBm.</td></tr><tr><td>160 MHz or 80+80 MHz</td><td>The start of a 160 MHz or 80+80 MHz non-HT duplicate or VHT PPDU at or above −73 dBm.</td></tr></table> <p>The receiver shall issue a PHY-CCA.indication(BUSY, {primary}) for any signal that exceeds a threshold equal to 20 dB above the minimum modulation and coding rate sensitivity (−82 + 20 = −62 dBm) in the primary 20 MHz channel within a period of aCCATime after the signal arrives at the receiver's antenna(s); then the receiver shall not issue a PHY-CCA.indication(BUSY,{secondary}), PHYCCA.indication(BUSY,{secondary40}), PHY-</p>	Operating Channel Width	Conditions	20 MHz, 40 MHz, 80 MHz, 160 MHz, or 80+80 MHz	The start of a 20 MHz NON_HT PPDU in the primary 20 MHz channel as defined in 18.3.10.6. The start of an HT PPDU under the conditions defined in 20.3.21.5. The start of a 20 MHz VHT PPDU in the primary 20 MHz channel at or above −82 dBm.	40 MHz, 80 MHz, 160 MHz, or 80+80 MHz	The start of a 40 MHz non-HT duplicate or VHT PPDU in the primary 40 MHz channel at or above −79 dBm. The start of an HT PPDU under the conditions defined in 20.3.21.5.	80 MHz, 160 MHz, or 80+80 MHz	The start of an 80 MHz non-HT duplicate or VHT PPDU in the primary 80 MHz channel at or above −76 dBm.	160 MHz or 80+80 MHz	The start of a 160 MHz or 80+80 MHz non-HT duplicate or VHT PPDU at or above −73 dBm.
Operating Channel Width	Conditions											
20 MHz, 40 MHz, 80 MHz, 160 MHz, or 80+80 MHz	The start of a 20 MHz NON_HT PPDU in the primary 20 MHz channel as defined in 18.3.10.6. The start of an HT PPDU under the conditions defined in 20.3.21.5. The start of a 20 MHz VHT PPDU in the primary 20 MHz channel at or above −82 dBm.											
40 MHz, 80 MHz, 160 MHz, or 80+80 MHz	The start of a 40 MHz non-HT duplicate or VHT PPDU in the primary 40 MHz channel at or above −79 dBm. The start of an HT PPDU under the conditions defined in 20.3.21.5.											
80 MHz, 160 MHz, or 80+80 MHz	The start of an 80 MHz non-HT duplicate or VHT PPDU in the primary 80 MHz channel at or above −76 dBm.											
160 MHz or 80+80 MHz	The start of a 160 MHz or 80+80 MHz non-HT duplicate or VHT PPDU at or above −73 dBm.											

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	Claims of '551 Patent	Accused Products
	Claim 1	
		<p>CCA.indication(BUSY,{secondary80}), or PHYCCA.indication(IDLE) while the threshold continues to be exceeded.” <i>See 802.11ac at 22.3.19.5.3</i></p> <p>“22.3.19.5.4 CCA sensitivity for signals not occupying the primary 20 MHz channel The PHY shall issue a PHY-CCA.indication(BUSY, {secondary}) if the conditions for issuing PHYCCA.indication(BUSY, {primary}) are not present and one of the following conditions are present in an otherwise idle 40 MHz, 80 MHz, 160 MHz, or 80+80 MHz operating channel width:</p> <ul style="list-style-type: none"> — Any signal within the secondary 20 MHz channel at or above a threshold of –62 dBm within a period of aCCATime after the signal arrives at the receiver’s antenna(s); then the PHY shall not issue a PHY-CCA.indication(BUSY,{secondary40}), PHY-CCA.indication(BUSY,{secondary80}), or PHY-CCA.indication(IDLE) while the threshold continues to be exceeded. — A 20 MHz NON_HT, HT_MF, HT_GF or VHT PPDU detected in the secondary 20 MHz channel at or above –72 dBm with >90% probability within a period aCCAMidTime (see 22.4.4). <p>The PHY shall issue a PHY-CCA.indication(BUSY, {secondary40}) if the conditions for issuing PHYCCA.indication(BUSY, {primary}) and PHY-CCA.indication(BUSY, {secondary}) are not present and one of the following conditions are present in an otherwise idle 80 MHz, 160 MHz, or 80+80 MHz operatingchannel width:</p> <ul style="list-style-type: none"> — Any signal within the secondary 40 MHz channel at or above a threshold of –59 dBm within a period of aCCATime after the signal arrives at the receiver’s antenna(s); then the PHY shall not issue a PHY-CCA.indication(BUSY, {secondary80}) or PHY-CCA.indication(IDLE) while the threshold continues to be exceeded. — A 40 MHz non-HT duplicate, HT_MF, HT_GF or VHT PPDU detected in the secondary 40 MHz channel at or above –72 dBm with >90% probability within a period aCCAMidTime (see 22.4.4).

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	Claims of '551 Patent	Accused Products
	Claim 1	
		<p>— A 20 MHz non-HT, HT_MF, HT_GF or VHT PPDU detected in any 20 MHz sub-channel of the secondary 40 MHz channel at or above –72 dBm with >90% probability within a period aCCAMidTime.</p> <p>The PHY shall issue a PHY-CCA.indication(BUSY, {secondary80}) if the conditions for PHYCCA.indication(BUSY, {primary}), PHY-CCA.indication(BUSY, {secondary}), and PHYCCA.indication(BUSY, {secondary40}) are not present and one of the following conditions are present in an otherwise idle 160 MHz or 80+80 MHz operating channel width:</p> <p>— Any signal within the secondary 80 MHz channel at or above –56 dBm.</p> <p>— An 80 MHz non-HT duplicate or VHT PPDU detected in the secondary 80 MHz channel at or above –69 dBm with >90% probability within a period aCCAMidTime (see 22.4.4).</p> <p>— A 40 MHz non-HT duplicate, HT_MF, HT_GF or VHT PPDU detected in any 40 MHz sub-channel of the secondary 80 MHz channel at or above –72 dBm with >90% probability within a period aCCAMidTime.</p> <p>— A 20 MHz NON_HT, HT_MF, HT_GF or VHT PPDU detected in any 20 MHz sub-channel of the secondary 80 MHz channel at or above –72 dBm with >90% probability within a period aCCAMidTime.”</p> <p><i>See 802.11ac at 22.3.19.5.4</i></p>
1a	setting a mandatory channel that is always used for transmission;	<p>The Accused Products, alone and/or in combination with other components, carry out the step of setting a mandatory channel that is always used for transmission.</p> <p>For example, the 802.11n standard provides a mandatory channel that is always used for transmission, such as in setting a primary channel. <i>See e.g.</i>, excerpts below:</p> <p>“3.242 primary channel: The common channel of operation for all stations (STAs) that are members of the basic service set (BSS).”</p> <p><i>See 802.11n-2009 at 3.242</i></p>

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	Claims of '551 Patent	Accused Products																		
	Claim 1																			
		<p data-bbox="753 272 1892 375">“3A.61 secondary channel: A 20 MHz channel associated with a primary channel used by high-throughput (HT) stations (STAs) for the purpose of creating a 40 MHz channel.” See 802.11n-2009 at 3A.61</p> <div data-bbox="753 412 1604 764"> <p data-bbox="896 428 1467 449">Table 7-27a—Values of the Secondary Channel Offset field</p> <table border="1"> <thead> <tr> <th data-bbox="774 477 884 514">Value</th><th data-bbox="884 477 1178 514">Name</th><th data-bbox="1178 477 1587 514">Description</th></tr> </thead> <tbody> <tr> <td data-bbox="774 514 884 552">0</td><td data-bbox="884 514 1178 552">SCN - no secondary channel</td><td data-bbox="1178 514 1587 552">Indicates that no secondary channel is present.</td></tr> <tr> <td data-bbox="774 552 884 613">1</td><td data-bbox="884 552 1178 613">SCA - secondary channel above</td><td data-bbox="1178 552 1587 613">Indicates that the secondary channel is above the primary channel.</td></tr> <tr> <td data-bbox="774 613 884 651">2</td><td data-bbox="884 613 1178 651"></td><td data-bbox="1178 613 1587 651">Reserved.</td></tr> <tr> <td data-bbox="774 651 884 712">3</td><td data-bbox="884 651 1178 712">SCB - secondary channel below</td><td data-bbox="1178 651 1587 712">Indicates that the secondary channel is below the primary channel.</td></tr> <tr> <td data-bbox="774 712 884 750">4-255</td><td data-bbox="884 712 1178 750"></td><td data-bbox="1178 712 1587 750">Reserved.</td></tr> </tbody> </table> </div> <p data-bbox="753 769 1178 797">See 802.11n-2009 at Table 7-27a</p> <p data-bbox="753 841 1877 1382">“11.14.2 Basic 20/40 MHz BSS functionality An HT AP declares its channel width capability (20 MHz only or 20/40 MHz) in the Supported Channel Width Set subfield of the HT Capabilities element. An HT AP shall set the STA Channel Width field to 1 in frames in which it has set the Secondary Channel Offset field to SCA or SCB. An HT AP shall set the STA Channel Width field to 0 in frames in which it has set the Secondary Channel Offset field to SCN... An HT STA shall not indicate support for 40 MHz unless it supports reception and transmission of 40 MHz PPDU's using all MCSs within the BasicMCSSet and all MCSs that are mandatory for the attached PHY. An HT STA shall not transmit a 20 MHz PPDU containing one or more data MPDU's using the secondary channel of a 20/40 MHz BSSs. The Notify Channel Width Action frame may be used by a non-AP STA to notify another STA that the STA wishes to receive frames in the indicated channel width.” See 802.11n at 11.14.2.</p>	Value	Name	Description	0	SCN - no secondary channel	Indicates that no secondary channel is present.	1	SCA - secondary channel above	Indicates that the secondary channel is above the primary channel.	2		Reserved.	3	SCB - secondary channel below	Indicates that the secondary channel is below the primary channel.	4-255		Reserved.
Value	Name	Description																		
0	SCN - no secondary channel	Indicates that no secondary channel is present.																		
1	SCA - secondary channel above	Indicates that the secondary channel is above the primary channel.																		
2		Reserved.																		
3	SCB - secondary channel below	Indicates that the secondary channel is below the primary channel.																		
4-255		Reserved.																		

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	Claims of '551 Patent	Accused Products
	Claim 1	
		<p>“11.14.9 STA CCA sensing in a 20/40 MHz BSS A STA may transmit a 20 MHz mask PPDU in the primary channel following the rules in 9.9.1. A STA transmitting a 40 MHz mask PPDU that begins a TXOP using EDCA as described in 9.9.1.3 or that is using a PIFS as permitted in 9.2.3.2 shall sense CCA on both the 20 MHz primary channel and the 20 MHz secondary channel before the 40 MHz mask PPDU transmission starts.” NOTE—Transmission of PPDU on the secondary channel is also subject to constraints in 11.14.2. ... At the specific slot boundaries (defined in 9.2.10) determined by the STA based on the 20 MHz primary channel CCA, when the transmission begins a TXOP using EDCA (as described in 9.9.1.3), the STA may transmit a pending 40 MHz mask PPDU only if the secondary channel has also been idle during the times the primary channel CCA is performed (defined in 9.2.10) during an interval of a PIFS for the 5 GHz band and DIFS for the 2.4 GHz band immediately preceding the expiration of the backoff counter. If a STA was unable to transmit a 40 MHz mask PPDU because the secondary channel was occupied during this interval, it may take one of the following steps: a) Transmit a 20 MHz mask PPDU on the primary channel. b) Restart the channel access attempt. In this case, the STA shall invoke the backoff procedure as specified in 9.9.1 as though the medium is busy as indicated by either physical or virtual CS and the backoff timer has a value of zero.</p> <p>...When a TXOP is obtained for a 40 MHz PPDU, the STA may transmit 40 MHz PPDU and/or 20 MHz PPDU during the TXOP. When the TXOP is obtained by the exchange of 20 MHz PPDU only in the primary channel, the STA shall not transmit 40 MHz PPDU during the TXOP.” <i>See 802.11n at 11.14.9</i></p>

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	Claims of '551 Patent	Accused Products
	Claim 1	
		<p>The 802.11ac standard similarly provides a mandatory channel that is always used for transmission, such as, for example, in setting a primary 20 MHz channel. <i>See, e.g.</i>, excerpts below:</p> <p style="padding-left: 40px;"><i>See</i> 802.11ac at 20.3.19.5.3-4 (above)</p> <p style="padding-left: 40px;">“9.3.2.6 CTS and DMG CTS procedure</p> <p style="padding-left: 40px;">...</p> <p style="padding-left: 40px;">A STA that receives an RTS frame addressed to it considers the NAV in determining whether to respond with CTS, unless the NAV was set by a frame originating from the STA sending the RTS frame (see 9.19.2.2). In this subclause, “NAV indicates idle” means that the NAV count is 0 or that the NAV count is nonzero but the non-bandwidth signaling TA obtained from the TA field of the RTS frame matches the saved TXOP holder address.</p> <p style="padding-left: 40px;">A VHT STA that is addressed by an RTS frame in a non-HT or non-HT duplicate PPDU that has a bandwidth signaling TA and that has the RXVECTOR parameter DYN_BANDWIDTH_IN_NON_HT equal to Static behaves as follows:</p> <ul style="list-style-type: none"> — If the NAV indicates idle and CCA has been idle for all secondary channels (secondary 20 MHz channel, secondary 40 MHz channel, and secondary 80 MHz channel) in the channel width indicated by the RTS frame’s RXVECTOR parameter CH_BANDWIDTH_IN_NON_HT for a PIFS period prior to the start of the RTS frame, then the STA shall respond with a CTS frame carried in a non-HT or non-HT duplicate PPDU after a SIFS period. The CTS frame’s TXVECTOR parameters CH_BANDWIDTH and CH_BANDWIDTH_IN_NON_HT shall be set to the same value as the RTS frame’s RXVECTOR parameter CH_BANDWIDTH_IN_NON_HT. — Otherwise, the STA shall not respond with a CTS frame.” <p style="padding-left: 40px;"><i>See</i> 802.11ac at 9.3.2.6</p> <p>“9.19.2.3 Obtaining an EDCA TXOP</p>

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Claims of '551 Patent	Accused Products										
Claim 1											
	<p>...</p> <p>When a STA and the BSS, of which the STA is a member, both support multiple channel widths, an EDCA TXOP is obtained based solely on activity of the primary channel. “Idle medium” in this subclause means “idle primary channel.” Likewise “busy medium” means “busy primary channel.” Once an EDCA TXOP has been obtained according to this subclause, further constraints defined in 10.15.9 and 9.19.2.8 might limit the width of transmission during the TXOP or deny the channel access, based on the state of CCA on secondary channel, secondary 40 MHz channel, or secondary 80 MHz channel.</p> <p>See 802.11ac at 9.19.2.3</p> <p>“9.19.2.8 EDCA channel access in a VHT BSS</p> <p>If the MAC receives a PHY-CCA.indication primitive with the channel-list parameter present, the channels considered idle are defined in Table 9-8a.</p> <p>Table 9-8a—Channels indicated idle by the channel-list parameter</p> <table><tr><th>PHY-CCA.indication channel-list element</th><th>Idle channels</th></tr><tr><td>primary</td><td>None</td></tr><tr><td>secondary</td><td>Primary 20 MHz channel</td></tr><tr><td>secondary40</td><td>Primary 20 MHz channel and secondary 20 MHz channel</td></tr><tr><td>secondary80</td><td>Primary 20 MHz channel, secondary 20 MHz channel, and secondary 40 MHz channel</td></tr></table> <p>...If a STA is permitted to begin a TXOP (as defined in 9.19.2.3) and the STA has at least one MSDU pending for transmission for the AC of the permitted TXOP, the STA shall perform exactly one of the following steps:</p> <p>a) Transmit a 160 MHz or 80+80 MHz mask PPDU if the secondary channel, the secondary 40 MHz channel, and the secondary 80 MHz channel were idle during an interval of PIFS immediately preceding the start of the TXOP.</p>	PHY-CCA.indication channel-list element	Idle channels	primary	None	secondary	Primary 20 MHz channel	secondary40	Primary 20 MHz channel and secondary 20 MHz channel	secondary80	Primary 20 MHz channel, secondary 20 MHz channel, and secondary 40 MHz channel
PHY-CCA.indication channel-list element	Idle channels										
primary	None										
secondary	Primary 20 MHz channel										
secondary40	Primary 20 MHz channel and secondary 20 MHz channel										
secondary80	Primary 20 MHz channel, secondary 20 MHz channel, and secondary 40 MHz channel										

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	Claims of '551 Patent	Accused Products
	Claim 1	
		<p>b) Transmit an 80 MHz mask PPDU on the primary 80 MHz channel if both the secondary channel and the secondary 40 MHz channel were idle during an interval of PIFS immediately preceding the start of the TXOP.</p> <p>c) Transmit a 40 MHz mask PPDU on the primary 40 MHz channel if the secondary channel was idle during an interval of PIFS immediately preceding the start of the TXOP.</p> <p>d) Transmit a 20 MHz mask PPDU on the primary 20 MHz channel.</p> <p>e) Restart the channel access attempt by invoking the backoff procedure as specified in 9.19.2 as though the medium is busy on the primary channel as indicated by either physical or virtual CS and the backoff timer has a value of 0.”</p> <p><i>See 802.11ac at 9.19.2.8</i></p>
1b	transmitting the wireless packets by using a wireless channel/wireless channels that includes/include the mandatory channel, only when the mandatory channel is idle.	<p>The Accused Products, alone and/or in combination with other components, carry out the step of transmitting the wireless packets by using a wireless channel/wireless channels that includes/include the mandatory channel, only when the mandatory channel is idle.</p> <p>For example, consistent with 802.11n, the Accused Products, alone and/or in combination with other components, may transmit wireless packets using the primary channel, both the primary and secondary channels, or a bonded channel that includes the primary channel. Alternatively, without being bound by any claim construction, a bonded channel is comprised of two channels including the primary channel. <i>See, e.g.,</i> excerpts below:</p> <p>“An HT STA shall not transmit a 20 MHz PPDU containing one or more data MPDUs using the secondary channel of a 20/40 MHz BSSs.” <i>See 802.11n at 11.14.2</i></p> <p>“When more than one channel is in use for the BSS, the Channel Utilization field value is calculated only for the primary channel. “ <i>See 802.11n at 7.3.2.28</i></p> <p>“11.14.9 STA CCA sensing in a 20/40 MHz BSS</p>

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	Claims of '551 Patent	Accused Products
	Claim 1	
		<p>A STA may transmit a 20 MHz mask PPDU in the primary channel following the rules in 9.9.1.</p> <p>A STA transmitting a 40 MHz mask PPDU that begins a TXOP using EDCA as described in 9.9.1.3 or that is using a PIFS as permitted in 9.2.3.2 shall sense CCA on both the 20 MHz primary channel and the 20 MHz secondary channel before the 40 MHz mask PPDU transmission starts.”...</p> <p>At the specific slot boundaries (defined in 9.2.10) determined by the STA based on the 20 MHz primary channel CCA, when the transmission begins a TXOP using EDCA (as described in 9.9.1.3), the STA may transmit a pending 40 MHz mask PPDU only if the secondary channel has also been idle during the times the primary channel CCA is performed (defined in 9.2.10) during an interval of a PIFS for the 5 GHz band and DIFS for the 2.4 GHz band immediately preceding the expiration of the backoff counter. If a STA was unable to transmit a 40 MHz mask PPDU because the secondary channel was occupied during this interval, it may take one of the following steps:</p> <ul style="list-style-type: none"> a) Transmit a 20 MHz mask PPDU on the primary channel. b) Restart the channel access attempt. In this case, the STA shall invoke the backoff procedure as specified in 9.9.1 as though the medium is busy as indicated by either physical or virtual CS and the backoff timer has a value of zero. <p>...When a TXOP is obtained for a 40 MHz PPDU, the STA may transmit 40 MHz PPDUs and/or 20 MHz PPDUs during the TXOP. When the TXOP is obtained by the exchange of 20 MHz PPDUs only in the primary channel, the STA shall not transmit 40 MHz PPDUs during the TXOP.”</p> <p><i>See 802.11n at 11.14.9</i></p> <p>“In the case of the MCS 32 and non-HT duplicate formats, the same data are transmitted over two adjacent 20 MHz channels. In this case, the 40 MHz channel is divided into 128 subcarriers, and the data are transmitted on subcarriers –58 to –6 and 6 to 58.”</p> <p><i>See 802.11n-2009 at 20.3.7</i></p>

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	Claim 1	
		<p>Further, for example, the 802.11n standard provides that transmission occurs when the mandatory channel, in this case the primary channel, is idle. <i>See, e.g.</i>, excerpts below:</p> <p>“14.3.3.2 CS/CCA procedure The CS/CCA procedure is executed while the receiver is turned on and the STA is not currently receiving or transmitting a packet. The CS/CCA procedure is used for two purposes: to detect the start of a network signal that can be received (CS) and to determine whether the channel is clear prior to transmitting a packet (CCA).” <i>See</i> 802.11-2007 at 14.3.3.2</p> <p>“For a STA to transmit, it shall sense the medium to determine if another STA is transmitting. If the medium is not determined to be busy (see 9.2.1), the transmission may proceed. The CSMA/CA distributed algorithm mandates that a gap of a minimum specified duration exist between contiguous frame sequences. A transmitting STA shall ensure that the medium is idle for this required duration before attempting to transmit. If the medium is determined to be busy, the STA shall defer until the end of the current transmission.” <i>See</i> 802.11-2007 at 9.1.1</p> <p>“The STATE parameter can be one of two values: BUSY or IDLE. The parameter value is BUSY if the channel(s) assessment by the PHY determines that the channel is not available. Otherwise, the value of the parameter is IDLE.” <i>See</i> 802.11n at 12.3.5.10.2</p> <p>“11.14.9 STA CCA sensing in a 20/40 MHz BSS A STA may transmit a 20 MHz mask PPDU in the primary channel following the rules in 9.9.1. A STA transmitting a 40 MHz mask PPDU that begins a TXOP using EDCA as described in 9.9.1.3 or that is using a PIFS as permitted in 9.2.3.2 shall sense CCA on both the 20 MHz primary channel and the 20 MHz secondary channel before the 40 MHz mask PPDU transmission starts.</p>

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	Claims of '551 Patent	Accused Products
	Claim 1	
		<p>NOTE—Transmission of PPDU on the secondary channel is also subject to constraints in 11.14.2.</p> <p>...</p> <p>At the specific slot boundaries (defined in 9.2.10) determined by the STA based on the 20 MHz primary channel CCA, when the transmission begins a TXOP using EDCA (as described in 9.9.1.3), the STA may transmit a pending 40 MHz mask PPDU only if the secondary channel has also been idle during the times the primary channel CCA is performed (defined in 9.2.10) during an interval of a PIFS for the 5 GHz band and DIFS for the 2.4 GHz band immediately preceding the expiration of the backoff counter. If a STA was unable to transmit a 40 MHz mask PPDU because the secondary channel was occupied during this interval, it may take one of the following steps:</p> <ul style="list-style-type: none"> a) Transmit a 20 MHz mask PPDU on the primary channel. b) Restart the channel access attempt. In this case, the STA shall invoke the backoff procedure as specified in 9.9.1 as though the medium is busy as indicated by either physical or virtual CS and the backoff timer has a value of zero. <p>... When a TXOP is obtained for a 40 MHz PPDU, the STA may transmit 40 MHz PPDU and/or 20 MHz PPDU during the TXOP. When the TXOP is obtained by the exchange of 20 MHz PPDU only in the primary channel, the STA shall not transmit 40 MHz PPDU during the TXOP.”</p> <p><i>See</i> 802.11n at 11.14.9</p> <p>The 802.11ac standard similarly provides for transmission when, for example, the primary 20 MHz channel is idle. <i>See, e.g.,</i> excerpts below:</p> <p>“9.3.2.6 CTS and DMG CTS procedure</p> <p>...</p> <p>A STA that receives an RTS frame addressed to it considers the NAV in determining whether to respond with CTS, unless the NAV was set by a frame originating from the STA sending the RTS frame (see 9.19.2.2). In this subclause, “NAV indicates idle”</p>

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	Claims of '551 Patent	Accused Products
	Claim 1	
		<p>means that the NAV count is 0 or that the NAV count is nonzero but the non-bandwidth signaling TA obtained from the TA field of the RTS frame matches the saved TXOP holder address.</p> <p>A VHT STA that is addressed by an RTS frame in a non-HT or non-HT duplicate PPDU that has a bandwidth signaling TA and that has the RXVECTOR parameter DYN_BANDWIDTH_IN_NON_HT equal to Static behaves as follows:</p> <ul style="list-style-type: none"> — If the NAV indicates idle and CCA has been idle for all secondary channels (secondary 20 MHz channel, secondary 40 MHz channel, and secondary 80 MHz channel) in the channel width indicated by the RTS frame's RXVECTOR parameter CH_BANDWIDTH_IN_NON_HT for a PIFS period prior to the start of the RTS frame, then the STA shall respond with a CTS frame carried in a non-HT or non-HT duplicate PPDU after a SIFS period. The CTS frame's TXVECTOR parameters CH_BANDWIDTH and CH_BANDWIDTH_IN_NON_HT shall be set to the same value as the RTS frame's RXVECTOR parameter CH_BANDWIDTH_IN_NON_HT. — Otherwise, the STA shall not respond with a CTS frame." <p><i>See 802.11ac at 9.3.2.6</i></p> <p>"9.19.2.3 Obtaining an EDCA TXOP</p> <p>...</p> <p>When a STA and the BSS, of which the STA is a member, both support multiple channel widths, an EDCA TXOP is obtained based solely on activity of the primary channel. "Idle medium" in this subclause means "idle primary channel." Likewise "busy medium" means "busy primary channel." Once an EDCA TXOP has been obtained according to this subclause, further constraints defined in 10.15.9 and 9.19.2.8 might limit the width of transmission during the TXOP or deny the channel access, based on the state of CCA on secondary channel, secondary 40 MHz channel, or secondary 80 MHz channel.</p> <p><i>See 802.11ac at 9.19.2.3</i></p>

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Claims of '551 Patent	Accused Products										
Claim 1	<p>“9.19.2.8 EDCA channel access in a VHT BSS</p> <p>If the MAC receives a PHY-CCA.indication primitive with the channel-list parameter present, the channels considered idle are defined in Table 9-8a.</p> <p>Table 9-8a—Channels indicated idle by the channel-list parameter</p> <table><tr><th>PHY-CCA.indication channel-list element</th><th>Idle channels</th></tr><tr><td>primary</td><td>None</td></tr><tr><td>secondary</td><td>Primary 20 MHz channel</td></tr><tr><td>secondary40</td><td>Primary 20 MHz channel and secondary 20 MHz channel</td></tr><tr><td>secondary80</td><td>Primary 20 MHz channel, secondary 20 MHz channel, and secondary 40 MHz channel</td></tr></table> <p>...If a STA is permitted to begin a TXOP (as defined in 9.19.2.3) and the STA has at least one MSDU pending for transmission for the AC of the permitted TXOP, the STA shall perform exactly one of the following steps:</p> <ul style="list-style-type: none">a) Transmit a 160 MHz or 80+80 MHz mask PPDU if the secondary channel, the secondary 40 MHz channel, and the secondary 80 MHz channel were idle during an interval of PIFS immediately preceding the start of the TXOP.b) Transmit an 80 MHz mask PPDU on the primary 80 MHz channel if both the secondary channel and the secondary 40 MHz channel were idle during an interval of PIFS immediately preceding the start of the TXOP.c) Transmit a 40 MHz mask PPDU on the primary 40 MHz channel if the secondary channel was idle during an interval of PIFS immediately preceding the start of the TXOP.d) Transmit a 20 MHz mask PPDU on the primary 20 MHz channel.e) Restart the channel access attempt by invoking the backoff procedure as specified in 9.19.2 as though the medium is busy on the primary channel as indicated by either physical or virtual CS and the backoff timer has a value of 0.” <p>See 802.11ac at 9.19.2.8</p>	PHY-CCA.indication channel-list element	Idle channels	primary	None	secondary	Primary 20 MHz channel	secondary40	Primary 20 MHz channel and secondary 20 MHz channel	secondary80	Primary 20 MHz channel, secondary 20 MHz channel, and secondary 40 MHz channel
PHY-CCA.indication channel-list element	Idle channels										
primary	None										
secondary	Primary 20 MHz channel										
secondary40	Primary 20 MHz channel and secondary 20 MHz channel										
secondary80	Primary 20 MHz channel, secondary 20 MHz channel, and secondary 40 MHz channel										

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	Claims of '551 Patent	Accused Products
	Claim 2	
2	A wireless packet communication method for transmitting a plurality of wireless packets simultaneously by using multiple wireless channels determined to be idle by carrier sense, a single wireless channel determined to be idle and MIMO, or the multiple wireless channels and the MIMO, the method comprising:	To the extent the preamble is construed to be limiting, the Accused Products, alone and/or in combination with other components, implement a wireless packet communication method for transmitting a plurality of wireless packets simultaneously by using multiple wireless channels determined to be idle by carrier sense, a single wireless channel determined to be idle and MIMO, or the multiple wireless channels and the MIMO, for reasons similar to those addressed with respect to claim 1.
2a	distinguishing an STA A from an STA B, the STA A for which a mandatory channel is set, the STA B for which no mandatory channel is set, the mandatory channel being always used for transmission; and	<p>The Accused Products, alone and/or in combination with other components, further distinguish a STA A from a STA B, the STA A for which a mandatory channel is set, the STA B for which no mandatory channel is set, the mandatory channel being always used for transmission.</p> <p>For example, the 802.11n standard distinguishes between 802.11n STAs from legacy STAs (“non-HT STAs”). Legacy STAs do not have a mandatory channel set for transmission. <i>See, e.g.,</i> excerpts below:</p> <p>“9.13.3 Protection mechanisms for transmissions of HT PPDU</p> <p>9.13.3.1 General</p> <p>Transmissions of HT PPDU, referred to as HT transmissions, are protected if there are other STAs present that cannot interpret HT transmissions correctly. The HT Protection and Nongreenfield HT STAs Present fields in the HT Operation element within Beacon and Probe Response frames are used to indicate the protection requirements for HT transmissions.</p>

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	Claims of '551 Patent	Accused Products
	Claim 2	
		<p>The HT Protection field may be set to no protection mode only if the following are true:</p> <ul style="list-style-type: none"> — All STAs detected (by any means) in the primary or the secondary channel are HT STAs, and — All STAs that are known by the transmitting STA to be a member of this BSS are either <ul style="list-style-type: none"> — 20/40 MHz HT STAs in a 20/40 MHz BSS, or — 20 MHz HT STAs in a 20 MHz BSS. <p>...The HT Protection field may be set to 20 MHz protection mode only if the following are true:</p> <ul style="list-style-type: none"> — All STAs detected (by any means) in the primary channel and all STAs detected (by any means) in the secondary channel are HT STAs and all STAs that are members of this BSS are HT STAs, and — This BSS is a 20/40 MHz BSS, and — There is at least one 20 MHz HT STA associated with this BSS. <p>The HT Protection field is set to non-HT mixed mode otherwise.</p> <p>„, When the HT Protection field is set to non-HT mixed mode, HT transmissions shall be protected. The type of protection required depends on the type of transmission as well as the type of the non-HT STAs that are present in the BSS. Protection requirements that apply when the HT Protection field is set to non-HT mixed mode are described in Table 9-7.” <i>See</i> 802.11n at 9.13.3</p> <p>The 802.11ac standard provides for similar functionality. <i>See, e.g.,</i> 9.7.9; 9.7.10; 9.12.4</p>
2b	when wireless packets are addressed to said STA A,	The Accused Products, alone and/or in combination with other components, further implement the step of transmitting wireless packets to STA A by using a wireless channel a wireless

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	Claims of '551 Patent	Accused Products
	Claim 2	
	transmitting the wireless packets to said STA A by using a wireless channel/wireless channels that includes/include the mandatory channel, only when the mandatory channel is idle; and	<p>channel/wireless channels that includes/include the mandatory channel, only when the mandatory channel is idle, when wireless packets are addressed to STA A.</p> <p>For example, the Accused Products, alone and/or in combination with other components, implement this step for reasons similar to those addressed for claim 1.</p>
2c	when wireless packets are addressed to said STA B, transmitting the wireless packets to said STA B by using idle wireless channel(s).	<p>The Accused Products, alone and/or in combination with other components, further implement the step of transmitting the wireless packets to STA B by using idle wireless channel(s) when wireless packets are addressed to STA B.</p> <p>For example, the 802.11n standard provides for transmission to legacy STAs (“non-HT STAs”) in a manner consistent with their operation. Transmission to a legacy STA uses idle wireless channel(s). <i>See, e.g.</i>, excerpts below:</p> <p>“In the HT-mixed format, to ensure compatibility with non-HT STAs, specific non-HT fields are defined so that they can be received by non-HT STAs compliant with Clause 17 or Clause 19 followed by the fields specific to HT STAs.” <i>See</i> 802.11n at 20.3.9.1</p> <p>“20.3.9.2 HT-mixed format preamble In HT-mixed format frames, the preamble has fields that support compatibility with Clause 17 and Clause 19 STAs and fields that support HT operation. The non-HT portion of the HT-mixed format preamble enables detection of the PPDU and acquisition of carrier frequency and timing by both HT STAs and STAs that are compliant with Clause 17 or Clause 19. The non-HT portion of the HT-mixed format preamble contains the SIGNAL field (L-SIG) defined in Clause 17 and is thus decodable by STAs compliant with Clause 17 and Clause 19 as well as HT STAs.</p>

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	Claims of '551 Patent	Accused Products
	Claim 2	
		<p>The HT portion of the HT-mixed format preamble enables estimation of the MIMO channel to support demodulation of the data portion of the frame by HT STAs. The HT portion of the HT-mixed format preamble also contains the HT-SIG field that supports HT operation.” <i>See</i> 802.11n at 20.3.9.2</p> <p>“9.6.2 Non-HT basic rate calculation This subclause defines how to convert an HT MCS to a non-HT basic rate for the purpose of determining the rate of the response frame. It consists of two steps as follows: a) Use the modulation and coding rate determined from the HT MCS (defined in 20.6) to a non-HT reference rate by lookup into Table 9-2a.1 In the case of an MCS with UEQM, the modulation of stream 1 is used. b) The non-HT basic rate is the highest rate in the BSSBasicRateSet that is less than or equal to this non-HT reference rate.” <i>See</i> 802.11n at 9.6.2</p> <p>The 802.11ac standard provides for similar functionality. <i>See, e.g.,</i> 9.7.9; 9.7.10; 9.12.4</p>

	Claims of '551 Patent	Accused Products
	Claim 3	
3	The wireless packet communication method according to claim 1 or 2, wherein	The Accused Products, alone and/or in combination with other components, implement a wireless packet communication method such as that set out in claim 1.
3a	the plurality of wireless packets transmitted simultaneously are set to have a same or equivalent packet time	The Accused Products, alone and/or in combination with other components, further provide that the plurality of wireless packets transmitted simultaneously are set to have a same or equivalent packet time length.

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	Claims of '551 Patent	Accused Products
	Claim 3	
	<p>length that corresponds to a packet size or a transmission time.</p>	<p>For example, the 802.11n standard provides for space-time coding, which involves transmitting the same wireless packets, which have the same or equivalent packet time length, on multiple data streams. <i>See, e.g.</i>, excerpts below:</p> <p>“5.2.9 High-throughput (HT) station (STA) ... “Some PHY features that distinguish an HT STA from a non-HT STA are referred to as multiple input, multiple output (MIMO) operation; spatial multiplexing (SM); spatial mapping (including transmit beamforming); space-time block coding (STBC); low-density parity check (LDPC) encoding; and antenna selection (ASEL). The allowed PPDU formats are non-HT format, HT-mixed format, and HT-greenfield format. The PPDUs may be transmitted with 20 MHz or 40 MHz bandwidth.” <i>See</i> 802.11n at 5.2.9</p> <p>“20.3.11.8.1 Space-time block coding (STBC) This subclause defines a set of optional robust transmission formats that are applicable only when N_{sts} is greater than N_{ss}. In this case, spatial streams N_{ss} are mapped to N_{sts} space-time streams, which are mapped to N_{tx} transmit chains. These formats are based on STBC. When the use of STBC is indicated in the STBC field of the HT-SIG, a symbol operation shall occur between the constellation mapper and the spatial mapper (see Figure 20-3) as defined in this subclause.” <i>See</i> 802.11n at 20.3.11.8.1</p> <p><i>See also</i>, O'Reilly 802.11n: A Survival Guide, at 37.</p> <p>Further, as another example, the 802.11n standard provides for transmitting the same wireless packets, which have the same or equivalent packet time length, on adjacent 20 MHz channels, such as in MCS 32 and non-HT duplicate formats. <i>See, e.g.</i>, excerpts below:</p>

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	Claims of '551 Patent	Accused Products
	Claim 3	
		<p>“In the case of the MCS 32 and non-HT duplicate formats, the same data are transmitted over two adjacent 20 MHz channels. In this case, the 40 MHz channel is divided into 128 subcarriers, and the data are transmitted on subcarriers –58 to –6 and 6 to 58.” <i>See</i> 802.11n-2009 at 20.3.7</p> <p>The 802.11ac standard provides for similar functionality as addressed above. <i>See, e.g.</i>, excerpts below:</p> <p>“22.3.5 VHT modulation and coding scheme (VHT-MCS) The VHT-MCS is a value that determines the modulation and coding used in the Data field of the PPDU. It is a compact representation that is carried in the VHT-SIG-A field for VHT SU PPDUs and in the VHTSIG- B field for VHT MU PPDUs. Rate-dependent parameters for the full set of VHT-MCSs are shown in Table 22-30 to Table 22-61 (in 22.5). These tables give rate-dependent parameters for VHT-MCSs with indices 0 to 9, with number of spatial streams from 1 to 8 and bandwidth options of 20 MHz, 40 MHz, 80 MHz, and either 160 MHz or 80+80 MHz. Equal modulation (EQM) is applied to all streams for a particular user.” <i>See</i> 802.11ac at 22.3.5</p> <p>“9.15 STBC operation ... A STA that has not set the Tx STBC subfield to 1 in the HT Capabilities element shall not transmit HT PPDUs with a TXVECTOR parameter STBC set to a nonzero value. A STA that has not set the Tx STBC subfield to 1 in the VHT Capabilities element shall not transmit VHT SU PPDUs with a TXVECTOR parameter STBC set to a nonzero value. A STA shall not send a HT PPDU with the TXVECTOR parameter STBC set to a nonzero value to a recipient STA unless the recipient STA has indicated in the Rx STBC field of its HT Capabilities element that it supports the reception of PPDUs using STBC with a number of spatial streams equal to or greater than the number of spatial streams in the HT PPDU. A STA shall not send a VHT PPDU with the TXVECTOR parameter</p>

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	Claims of '551 Patent	Accused Products
	Claim 3	
		<p>STBC set to a nonzero value to a recipient STA unless the recipient STA has indicated in the Rx STBC field of its VHT Capabilities element that it supports the reception of PPDU's using STBC with a number of spatial streams equal to or greater than the number of spatial streams in the VHT PPDU.” <i>See 802.11ac at 9.15</i></p> <p>“non-high-throughput (non-HT) duplicate: A transmission format of the physical layer (PHY) that duplicates a 20 MHz non-HT transmission in two adjacent or more 20 MHz channels and allows a station (STA) in a non-HT basic service set (BSS) on either channel any one of the 20 MHz channels to receive the transmission. A non-HT duplicate format is one of the following:</p> <ol style="list-style-type: none"> 1) 40 MHz non-HT duplicate: A transmission format of the PHY that replicates a 20 MHz non-HT transmission in two adjacent 20 MHz channels. 2) 80 MHz non-HT duplicate: A transmission format of the PHY that replicates a 20 MHz non-HT transmission in four adjacent 20 MHz channels. 3) 160 MHz non-HT duplicate: A transmission format of the PHY that replicates a 20 MHz non-HT transmission in eight adjacent 20 MHz channels. 4) 80+80 MHz non-HT duplicate: A transmission format of the PHY that replicates a 20 MHz non-HT transmission in two frequency segments of four adjacent 20 MHz channels where the two frequency segments of channels are not adjacent.” <p><i>See 802.11ac at 3.2; see also 9.7.10; 22.3.10.12</i></p> <p>“22.1.4 PPDU formats The structure of the PPDU transmitted by a VHT STA is determined by the TXVECTOR parameters as defined in Table 22-1.” <i>See 802.11ac at 22.1.4</i></p>

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Claims of '551 Patent		Accused Products																		
Claim 3																				
		Table 22-1—TXVECTOR and RXVECTOR parameters																		
		<table><tr><th>Parameter</th><th>Condition</th><th>Value</th><th>TXVECTOR</th><th>RXVECTOR</th></tr><tr><td rowspan="2">MCS</td><td>FORMAT is VHT</td><td>Indicates the modulation and coding scheme used in the transmission of the PPDU. Integer: range 0 to 9</td><td>M U</td><td>Y</td></tr><tr><td>Otherwise</td><td colspan="3">See corresponding entry in Table 20-1</td></tr></table>					Parameter	Condition	Value	TXVECTOR	RXVECTOR	MCS	FORMAT is VHT	Indicates the modulation and coding scheme used in the transmission of the PPDU. Integer: range 0 to 9	M U	Y	Otherwise	See corresponding entry in Table 20-1		
Parameter	Condition	Value	TXVECTOR	RXVECTOR																
MCS	FORMAT is VHT	Indicates the modulation and coding scheme used in the transmission of the PPDU. Integer: range 0 to 9	M U	Y																
	Otherwise	See corresponding entry in Table 20-1																		
		See 802.11ac at Table 22-1; <i>see also</i> 802.11n at Table 20-1.																		

	Claims of '551 Patent	Accused Products
	Claim 4	
4	The wireless packet communication method according to claim 1 or 2, further comprising	The Accused Products, alone and/or in combination with other components, implement a wireless packet communication method such as that set out in claim 1.
4a	simultaneously transmitting wireless packets selectively using the multiple wireless channels or the MIMO in accordance with a number of pieces of data or a number of MIMOs that depends on a channel condition.	<p>The Accused Products, alone and/or in combination with other components, further implement the step of simultaneously transmitting wireless packets selectively using the multiple wireless channels or the MIMO in accordance with a number of pieces of data or a number of MIMOs that depends on a channel condition.</p> <p>For example, the Accused Products, alone and/or in combination with other components, provide for transmitting a plurality of packets simultaneously using multiple wireless channels, such as, for instance, in the case of MCS 32 and non-HT duplicate formats. <i>See, e.g.</i>, 802.11n at 20.3.7; 802.11ac at 802.11ac at 3.2, 22.1.4</p>

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	Claims of '551 Patent	Accused Products
	Claim 4	
		<p>Further, the Accused Products, alone and/or in combination with other components, provide for MIMO methods of transmitting wireless packets using, for example, multiple spatial streams or transmit chains. <i>See, e.g.</i>, 802.11n at 20.1.1; 802.11ac at 22.3.5, Figs. 22-5-22-10.</p> <p>Further, for example, the number of spatial streams or transmit chains used depends on, <i>e.g.</i>, physical factors and other aspects of channel conditions. Thus, the Accused Products, alone and/or in combination with other components, perform the step of selectively using MIMO at least in accordance with a number of MIMOs that depends on a channel condition. <i>See, e.g.</i> excerpts below:</p> <p style="padding-left: 40px;">“As a result, a calculation of the condition for the estimated channel matrix provides an important indication of whether of the MIMO channel under consideration can be spatially multiplexed... The rank of this matrix is the number of singular values not equal to zero. The rank of the channel matrix is thus an indicator of how many data streams can be spatially multiplexed on the MIMO channel.” Source: https://cdn.rohde-schwarz.com/pws/dl_downloads/dl_application/application_notes/1sp18/1SP18_10e.pdf;</p> <p style="padding-left: 40px;">“It is important to note that the device may choose to not use all antennas, instead constructing fewer spatial streams depending on the transmission environment.” Source: https://halberdbastion.com/resources/wireless/mimo</p> <p style="padding-left: 40px;">“9.17 Sounding PPDU A sounding PPDU is a PPDU for which the SOUNDING parameter of the corresponding RXVECTOR or TXVECTOR has the value SOUNDING. Sounding PPDU are transmitted by STAs to enable the receiving STAs to estimate the channel between the transmitting STA and the receiving STA.” <i>See</i> 802.11n at 9.17</p> <p style="padding-left: 40px;">“9.18 Link adaptation 9.18.1 Introduction</p>

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	Claims of '551 Patent	Accused Products
	Claim 4	
		<p>To fully exploit MIMO channel variations and transmit beamforming on a MIMO link, a STA can request that another STA provide MIMO channel sounding and MFB. Link adaptation may be supported by immediate response or delayed response as described below. Unsolicited MFB is also possible.” <i>See</i> 802.11n at 9.18</p> <p>“9.18.2 Link adaptation using the HT Control field A STA that supports link adaptation using the HT Control field shall set the MCS Feedback field of the HT Extended Capabilities field to Unsolicited or Both, depending on its specific MFB capability, in HT Capabilities elements that it transmits. MRQs shall not be sent to STAs that have not advertised support for link adaptation. A STA whose most recently transmitted MCS Feedback field of the HT Extended capabilities field of the HT Capabilities element is set to Unsolicited or Both may transmit unsolicited MFB in any frame that contains a +HTC field. ... On receipt of a +HTC frame with the MRQ subfield set to 1, an MFB responder initiates computation of the MCS estimate based on the associated sounding PPDU and labels the result of this computation with the MSI value. ... When computing the MCS estimate for an MFB requester whose Tx MCS Set Defined field is set to 1, the number of spatial streams corresponding to the recommended MCS shall not exceed the limit indicated by the Tx Maximum Number Spatial Streams Supported field. The MFB responder shall not recommend an MCS corresponding to UEQM unless the MFB requester supports such modulation, as indicated by the Tx Unequal Modulation Supported bit in the Supported MCS Set field.” <i>See</i> 802.11n at 9.18.2</p> <p>The 802.11ac standard provides for similar functionality. <i>See, e.g.,</i> 802.11ac at 9.28</p>

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	Claims of '551 Patent	Accused Products
	Claim 5	
5	A wireless packet communication apparatus for transmitting a plurality of wireless packets simultaneously by using multiple wireless channels determined to be idle by carrier sense, a single wireless channel determined to be idle and MIMO, or the multiple wireless channels and the MIMO, the apparatus comprising	<p>To the extent the preamble is construed as limiting, the Accused Products, alone and/or in combination with other components, comprise a wireless communication apparatus.</p> <p>Further, the Accused Products, alone and/or in combination with other components, are capable of transmitting a plurality of wireless packets simultaneously by using multiple wireless channels determined to be idle by carrier sense, a single wireless channel determined to be idle and MIMO, or the multiple wireless channels and the MIMO, for at least the reasons addressed with respect to claim 1.</p>

	Claims of '551 Patent	Accused Products
	Claim 6	
6	A wireless packet communication apparatus for transmitting a plurality of wireless packets simultaneously by using	<p>To the extent the preamble is construed as limiting, the Accused Products, alone and/or in combination with other components, comprise a wireless communication apparatus.</p> <p>Further, the Accused Products, alone and/or in combination with other components, are capable of transmitting a plurality of wireless packets simultaneously by using multiple wireless channels determined to be idle by carrier sense, a single wireless channel determined to be idle</p>

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	Claims of '551 Patent	Accused Products
	Claim 6	
	multiple wireless channels determined to be idle by carrier sense, a single wireless channel determined to be idle and MIMO, or the multiple wireless channels and the MIMO, the apparatus comprising	and MIMO, or the multiple wireless channels and the MIMO, for at least the reasons addressed with respect to claim 1.
	a unit distinguishing an STA A from an STA B and determining destinations of the wireless packets so as to transmit wireless packets addressed to said STA A only when said mandatory channel is idle by using a wireless channel or wireless channels that includes/include a mandatory channel, and to transmit wireless packets addressed to said STA B by using idle wireless channel or channels, the mandatory channel being always used for transmission,	<p>As discussed with respect to claim 2, the Accused Products, alone and/or in combination with other components, implement the steps of distinguishing an STA A from an STA B and determining destinations of the wireless packets so as to transmit wireless packets addressed to said STA A only when said mandatory channel is idle by using a wireless channel or wireless channels that includes/include a mandatory channel, and to transmit wireless packets addressed to said STA B by using idle wireless channel or channels, the mandatory channel being always used for transmission, the STA A for which the mandatory channel is set, the STA B for which no mandatory channel is set.</p> <p>Therefore, the Accused Products, alone and/or in combination with other components, comprise a unit for performing these steps.</p>

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	Claims of '551 Patent	Accused Products
	Claim 6	
	the STA A for which the mandatory channel is set, the STA B for which no mandatory channel is set.	

	Claims of '551 Patent	Accused Products
	Claim 7	
7	The wireless packet communication apparatus according to claim 5 or 6, wherein	The Accused Products, alone and/or in combination with other components, comprise a wireless packet communication apparatus in accordance to at least claim 5.
7a	the plurality of wireless packets transmitted simultaneously are set to have a same or equivalent packet time length that corresponds to a packet size or a transmission time.	The Accused Products, alone and/or in combination with other components, further provide a plurality of wireless packets transmitted simultaneously that have a same or equivalent packet time length for at least the reasons addressed with respect to claim 3.

	Claims of '551 Patent	Accused Products
	Claim 8	
8	The wireless packet communication apparatus according to claim 5 or 6, further comprising:	The Accused Products, alone and/or in combination with other components, comprise a wireless packet communication apparatus in accordance to at least claim 5.

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	Claims of '551 Patent	Accused Products
	Claim 8	
8a	a unit simultaneously transmitting wireless packets selectively using the multiple wireless channels or the MIMO in accordance with a number of pieces of data or a number of MIMOs that depends on a channel condition.	The Accused Products, alone and/or in combination with other components, further comprise a unit for simultaneously transmitting wireless packets selectively using the multiple wireless channels or the MIMO in accordance with a number of pieces of data or a number of MIMOs that depends on a channel condition, at least because the Accused Products, alone and/or in combination with other components, implement the method addressed in claim 4.
		References: [1] IEEE 802.11n-2009 “Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications, Amendment 5: Enhancements for Higher Throughput”. IEEE-SA. 29 October 2009, doi:10.1109/IEEESTD.2009.5307322. ISBN 978-0-7381-6046-7. (“802.11n-2009”) [2] IEEE 802.11-2007 “Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications”, IEEE Std 802.11-2007, June 12 2007 (“802.11-2007”) [3] IEEE 802.11ac-2013 “Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment 4: Enhancements for Very High Throughput for Operation in Bands below 6 GHz”, December 18 2013, DOI: 10.1109/IEEESTD.2013.6687187. ISBN: 978-0-7381-8860-7. (“801.11ac”)

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	Claim 8	
		<p>[4] Gast, Matthew, "802.11n: A Survival Guide," O'Reilly Media 2012 ("O'Reilly 802.11n: A Survival Guide")</p> <p><i>Other cited sources as indicated above</i></p>