

Appendix A - Claim Chart for US Patent No. 10,462,767 Against Samsung Accused Products

Based on information presently available, Apex Beam Technologies LLC (“Apex Beam”) contends that Defendants Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (collectively, “Samsung”) infringe claims 1-5 and 11-15 (the “Asserted Claims”) of U.S. Patent No. 10,462,767 (the “767 Patent”) through the Accused Products which are manufactured, sold, offered for sale, used, imported into the United States, and/or exported from the United States by Samsung.

The Accused Products comprise all 5G mobile devices made, used, sold, offered for sale, imported into the United States, and/or exported from the United States or otherwise provided, after October 29, 2019. Apex Beam reserves the right to amend this list of Accused Products as discovery progresses.

Samsung directly infringes each of the Asserted Claims by using, importing, testing, selling, offering for sale, importing into the United States, and/or exporting from the United States the Accused Products in violation of 35 U.S.C. § 271(a).

Samsung indirectly infringes the Asserted Claims in violation of 35 U.S.C. § 271(b) by inducing third parties, including its users and/or customers, to directly infringe through their operation and use of the Accused Products. Samsung has knowingly and intentionally induced this direct infringement by, inter alia, (i) selling, offering to sell, importing, exporting, or otherwise providing the Accused Products to third parties with the intent that the Accused Products will be operated and used in a manner that practices the Asserted Claims; and (ii) marketing and advertising the Accused Products. Samsung’s marketing and promotional materials for the Accused Products are found, for example, on Samsung’s website, and on distributor websites on which the Accused Products are made available. For example, Samsung’s website offers customers downloadable User Manuals for the Accused Products that instruct customers to, among other things, use the accused services in the Accused Products. Samsung’s website also offers support to customers, including instruction to, among other things, to operate their devices on 5G networks. On information and belief, Samsung knows that its actions will result in infringement of the Asserted Claims, or subjectively believes that there is a high probability that its actions will result in infringement of the Asserted Claims but has taken deliberate actions to avoid learning these facts.

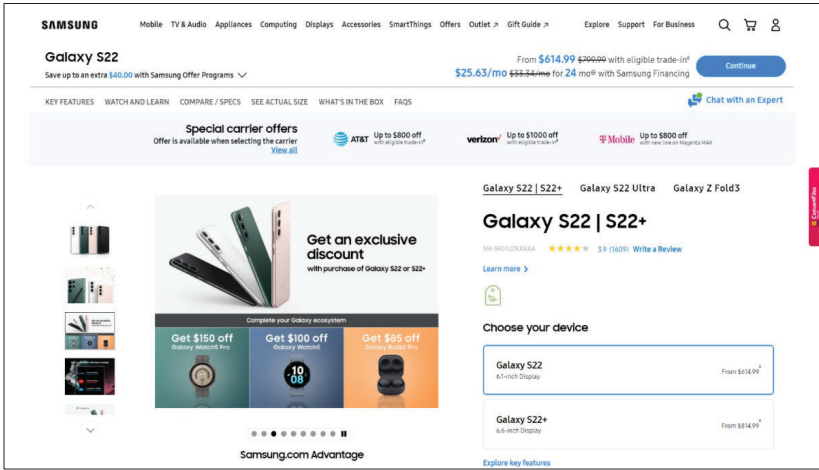
Samsung also contributorily infringes each of the Asserted Claims in violation of 35 U.S.C. § 271(c) by selling, importing, offering for sale, and otherwise providing the Accused Products, which when used directly infringe the Asserted Claims. The Accused Products constitute a material part of the Asserted Claims.

On information and belief, the charted version of the Samsung Galaxy S22 is representative of all versions of the Accused Products as all Samsung 5G devices implement the GSMA 3GPP 5G standards including, but not limited to, the Galaxy A13 5G, Galaxy A22 5G, Galaxy A32 5G, Galaxy A33 5G, Galaxy A42 5G, Galaxy A51 5G, Galaxy A52 5G, Galaxy A52s 5G, Galaxy A53 5G, Galaxy A71 5G, Galaxy A73 5G, Galaxy A90 5G, Galaxy Book Go 5G, Galaxy Book Pro 360 5G, Galaxy F42 5G, Galaxy F52 5G, Galaxy Fold 5G, Galaxy M32 5G, Galaxy M42 5G, Galaxy M52 5G, Galaxy Note 10 5G, Galaxy Note 10+ 5G, Galaxy Note 20 5G, Galaxy Note 20 Ultra 5G, Galaxy Quantum 2, Galaxy S10 5G, Galaxy S20 5G, Galaxy S20 FE 5G, Galaxy S20 Ultra 5G, Galaxy S20 UW, Galaxy S20+ 5G, Galaxy S21 5G, Galaxy S21 Ultra 5G, Galaxy S21+ 5G, Galaxy S22, Galaxy S22 5G, Galaxy S22 Ultra, Galaxy S22+, Galaxy Tab S7 5G, Galaxy Tab S7 FE 5G, Galaxy Tab S7+ 5G, Galaxy Tab S8+ 5G, Galaxy Z Flip 5G, Galaxy Z Flip3 5G, Galaxy Z Flip4, Galaxy Z Fold 2 5G, Galaxy Z Fold3 5G, and the Galaxy Z Fold4 (the “Accused Products”).

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Apex Beam does not concede that any claims of the '767 Patent that are not listed below are not infringed by the identified Accused Products. Moreover, the citations to certain documents and other information below are intended to be exemplary only and in no way foreclose Apex Beam from citing or relying on additional documents, information, source code, and/or testimony at a later time. These contentions are preliminary in nature, and an analysis of Samsung's products, internal documentation, source code, and/or testimony from relevant witnesses may more fully and accurately describe the infringing features of its Accused Products. Accordingly, Apex Beam reserves the right to supplement, correct, modify, and/or amend these contentions once such additional information is made available to Apex Beam. Furthermore, Apex Beam reserves the right to supplement, correct, modify, and/or amend these contentions as discovery in this case progresses; in view of the Court's claim construction order(s); in view of any positions taken by Samsung, including, but not limited to, positions on claim construction, invalidity, and/or non-infringement; and in connection with the preparation and exchange of expert reports.

The contents of every below claim cell on which another claim cell depends are expressly incorporated by reference in that dependent cell, as if set forth in their entirety therein.

Claim	Accused Products
[1P]. A method in User Equipment (UE) for paging, comprising:	Samsung infringes this claim, either directly or indirectly, either literally or under the doctrine of equivalents, as set forth below. For example, Samsung and the Accused Products practice a method in a User Equipment (UE) for paging.  https://www.samsung.com/us/smartphones/galaxy-s22/buy/galaxy-s22-128gb-unlocked-sm-s901uzkaxaa/

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Claim	Accused Products
	Compare / Specs Samsung Galaxy S22 Ultra Samsung Galaxy S22+ Samsung Galaxy S22  Colors Colors Colors Battery 5,000 mAh¹ 4,500 mAh¹ 3,700 mAh¹ Wireless Powershare Yes Yes Yes Storage Options 128GB 256GB 512GB 1TB 128GB 256GB 128GB 256GB Processor Snapdragon 8 Gen 1 Snapdragon 8 Gen 1 Snapdragon 8 Gen 1 RAM Options 8GB 12GB 8GB 8GB S Pen Integrated N/A N/A Cellular & Wireless 5G The latest network technology with the power of 5G.² 5G The latest network technology with the power of 5G.² 5G The latest network technology with the power of 5G.² https://www.samsung.com/us/smartphones/galaxy-s22/buy/galaxy-s22-128gb-unlocked-sm-s901uzkaxaa/

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	Release 15153GPP TS 38.331 V15.3.0 (2018-09) 1 Scope The present document specifies the Radio Resource Control protocol for the radio interface between UE and NG-RAN. The scope of the present document also includes: - the radio related information transported in a transparent container between source gNB and target gNB upon inter gNB handover; - the radio related information transported in a transparent container between a source or target gNB and another system upon inter RAT handover. - the radio related information transported in a transparent container between a source eNB and target gNB during E-UTRA-NR Dual Connectivity. 2 References The following documents contain provisions which, through reference in this text, constitute provisions of the present document. - References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific. - For a specific reference, subsequent revisions do not apply. - For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document <i>in the same Release as the present document</i>. [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications". [2] 3GPP TS 38.300: "NR; Overall description; Stage 2". [3] 3GPP TS 38.321: "NR; Medium Access Control (MAC); Protocol specification".

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	[4] 3GPP TS 38.322: "NR; Radio Link Control (RLC) protocol specification". [5] 3GPP TS 38.323: "NR; Packet Data Convergence Protocol (PDCP) protocol specification". [6] ITU-T Recommendation X.680 (08/2015) "Information Technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation" (Same as the ISO/IEC International Standard 8824-1). [7] ITU-T Recommendation X.681 (08/2015) "Information Technology - Abstract Syntax Notation One (ASN.1): Information object specification" (Same as the ISO/IEC International Standard 8824-2). [8] ITU-T Recommendation X.691 (08/2015) "Information technology - ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)" (Same as the ISO/IEC International Standard 8825-2). [9] 3GPP TS 38.215: "NR; Physical layer measurements". [10] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA) Radio Resource Control (RRC); Protocol Specification". [11] 3GPP TS 33.501: "Security Architecture and Procedures for 5G System". [12] 3GPP TS 38.104: "NR; Base Station (BS) radio transmission and reception". [13] 3GPP TS 38.213: "NR; Physical layer procedures for control".

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	<table><tr><td>Release 15</td><td>16</td><td>3GPP TS 38.331 V15.3.0 (2018-09)</td></tr><tr><td>[14]</td><td colspan="2">3GPP TS 38.133: "NR; Requirements for support of radio resource management".</td></tr><tr><td>[15]</td><td colspan="2">3GPP TS 38.101: "NR; User Equipment (UE) radio transmission and reception".</td></tr><tr><td>[16]</td><td colspan="2">3GPP TS 38.211: "NR; Physical channels and modulation".</td></tr><tr><td>[17]</td><td colspan="2">3GPP TS 38.212: "NR; Multiplexing and channel coding".</td></tr><tr><td>[18]</td><td colspan="2">ITU-T Recommendation X.683 (08/2015) "Information Technology - Abstract Syntax Notation One (ASN.1): Parameterization of ASN.1 specifications" (Same as the ISO/IEC International Standard 8824-4).</td></tr><tr><td>[19]</td><td colspan="2">3GPP TS 38.214: "NR; Physical layer procedures for data".</td></tr><tr><td>[20]</td><td colspan="2">3GPP TS 38.304: "NR; User Equipment (UE) procedures in Idle mode and RRC Inactive state".</td></tr><tr><td>[21]</td><td colspan="2">3GPP TS 23.003: "Numbering, addressing and identification".</td></tr><tr><td>[22]</td><td colspan="2">3GPP TS 36.101: "E-UTRA; User Equipment (UE) radio transmission and reception".</td></tr><tr><td>[23]</td><td colspan="2">3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".</td></tr><tr><td>[24]</td><td colspan="2">3GPP TS 37.324: "Service Data Adaptation Protocol (SDAP) specification".</td></tr><tr><td>[25]</td><td colspan="2">3GPP TS 22.261: "Service requirements for the 5G System".</td></tr><tr><td>[26]</td><td colspan="2">3GPP TS 38.306: "User Equipment (UE) radio access capabilities".</td></tr><tr><td>[27]</td><td colspan="2">3GPP TS 36.304: "E-UTRA; User Equipment (UE) procedures in idle mode".</td></tr><tr><td>[28]</td><td colspan="2">ATIS 0700041: "WEA 3.0: Device-Based Geo-Fencing".</td></tr><tr><td>[29]</td><td colspan="2">3GPP TS 23.041: "Technical realization of Cell Broadcast Service (CBS)".</td></tr></table> TS38.331 V15.3.0	Release 15	16	3GPP TS 38.331 V15.3.0 (2018-09)	[14]	3GPP TS 38.133: "NR; Requirements for support of radio resource management".		[15]	3GPP TS 38.101: "NR; User Equipment (UE) radio transmission and reception".		[16]	3GPP TS 38.211: "NR; Physical channels and modulation".		[17]	3GPP TS 38.212: "NR; Multiplexing and channel coding".		[18]	ITU-T Recommendation X.683 (08/2015) "Information Technology - Abstract Syntax Notation One (ASN.1): Parameterization of ASN.1 specifications" (Same as the ISO/IEC International Standard 8824-4).		[19]	3GPP TS 38.214: "NR; Physical layer procedures for data".		[20]	3GPP TS 38.304: "NR; User Equipment (UE) procedures in Idle mode and RRC Inactive state".		[21]	3GPP TS 23.003: "Numbering, addressing and identification".		[22]	3GPP TS 36.101: "E-UTRA; User Equipment (UE) radio transmission and reception".		[23]	3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".		[24]	3GPP TS 37.324: "Service Data Adaptation Protocol (SDAP) specification".		[25]	3GPP TS 22.261: "Service requirements for the 5G System".		[26]	3GPP TS 38.306: "User Equipment (UE) radio access capabilities".		[27]	3GPP TS 36.304: "E-UTRA; User Equipment (UE) procedures in idle mode".		[28]	ATIS 0700041: "WEA 3.0: Device-Based Geo-Fencing".		[29]	3GPP TS 23.041: "Technical realization of Cell Broadcast Service (CBS)".	
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	9.2.5 Paging Paging allows the network to reach UEs in RRC_IDLE and in RRC_INACTIVE state through <i>Paging</i> messages, and to notify UEs in RRC_IDLE, RRC_INACTIVE and RRC_CONNECTED state of system information change (see subclause 7.3.3) and ETWS/CMAS indications (see subclause 16.4) through <i>Short Messages</i>. Both <i>Paging</i> messages and <i>Short Messages</i> are addressed with P-RNTI on PDCCH, but while the former is sent on PCCH, the latter is sent over PDCCH directly (see subclause 6.5 of TS 38.331 [12]). TS38.300 V15.5.0 Plaintiff reserves the right to amend or supplement these contentions after the inspection of source code, after the issuance of any claim construction order, and for any other reason as permitted by the Court.
[1A] monitoring a first signaling in X time intervals; and receiving a first radio signal; wherein X is a positive integer;	Samsung infringes this claim, either directly or indirectly, either literally or under the doctrine of equivalents, as set forth below. For example, Samsung and the Accused Products practice monitoring a first signaling in X time intervals; and receiving a first radio signal; wherein X is a positive integer. For example, the Accused Products monitor a first signaling (<i>e.g.</i>, paging DCI, P-RNTI) in X time intervals (<i>e.g.</i>, paging occasion or PDCCH monitoring occasions) and receives a first radio signal (<i>e.g.</i>, paging messages on the paging control channel/PDSCH) wherein X is a positive integer (<i>e.g.</i>, multiple time slots). 7.1 Discontinuous Reception for paging The UE may use Discontinuous Reception (DRX) in RRC_IDLE and RRC_INACTIVE state in order to reduce power consumption. The UE monitors one paging occasion (PO) per DRX cycle. A PO is a set of PDCCH monitoring occasions and can consist of multiple time slots (<i>e.g.</i> subframe or OFDM symbol) where paging DCI can be sent (TS 38.213 [4]). One Paging Frame (PF) is one Radio Frame and may contain one or multiple PO(s) or starting point of a PO. TS38.304 V15.3.0

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	4.2 Downlink Table 4.2-1 specifies the mapping of the downlink transport channels to their corresponding physical channels. Table 4.2-2 specifies the mapping of the downlink control channel information to its corresponding physical channel. Table 4.2-1 <table border="1"> <thead> <tr> <th>TrCH</th><th>Physical Channel</th></tr> </thead> <tbody> <tr> <td>DL-SCH</td><td>PDSCH</td></tr> <tr> <td>BCH</td><td>PBCH</td></tr> <tr> <td>PCH</td><td>PDSCH</td></tr> </tbody> </table> TS38.212 V15.3.0 6.2.2 Logical Channels Different kinds of data transfer services as offered by MAC. Each logical channel type is defined by what type of information is transferred. Logical channels are classified into two groups: Control Channels and Traffic Channels. Control channels are used for the transfer of control plane information only: - Broadcast Control Channel (BCCH): a downlink channel for broadcasting system control information. - Paging Control Channel (PCCH): a downlink channel that carries paging messages. TS38.300 V15.5.0 6.2.3 Mapping to Transport Channels In Downlink, the following connections between logical channels and transport channels exist: - BCCH can be mapped to BCH; - BCCH can be mapped to DL-SCH; - PCCH can be mapped to PCH;	TrCH	Physical Channel	DL-SCH	PDSCH	BCH	PBCH	PCH	PDSCH
TrCH	Physical Channel								
DL-SCH	PDSCH								
BCH	PBCH								
PCH	PDSCH								

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[1B] the first signaling is used for determining scheduling information for the first radio signal; the scheduling information comprises at least one of {occupied time-frequency resource, adopted Modulation Coding Scheme (MCS), subcarrier spacing of subcarriers in occupied frequency domain resource};	Samsung infringes this claim, either directly or indirectly, either literally or under the doctrine of equivalents, as set forth below. For example, Samsung and the Accused Products practice wherein the first signaling is used for determining scheduling information for the first radio signal; the scheduling information comprises at least one of {occupied time-frequency resource, adopted Modulation Coding Scheme (MCS), subcarrier spacing of subcarriers in occupied frequency domain resource}. For example, the Accused Products practice the first signaling (<i>e.g.</i>, paging DCI, P-RNTI) is used for determining scheduling information for the first radio signal; the scheduling information comprises occupied time-frequency resource (<i>e.g.</i>, frequency domain resource assignment; time domain resource assignment) and adopted Modulation Coding Scheme (MCS) (<i>e.g.</i>, modulation and coding scheme). 7.3.1.2.1 Format 1_0 DCI format 1_0 is used for the scheduling of PDSCH in one DL cell.

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	The following information is transmitted by means of the DCI format 1_0 with CRC scrambled by P-RNTI: - Short Messages Indicator – 2 bits according to Table 7.3.1.2.1-1. - Short Messages – 8 bits, according to Subclause x.x of [9, TS38.331]. If only the scheduling information for Paging is carried, this bit field is reserved. - Frequency domain resource assignment – $\lceil \log_2 (N_{RB}^{DL,BWP} (N_{RB}^{DL,BWP} + 1) / 2) \rceil$ bits. If only the short message is carried, this bit field is reserved. - $N_{RB}^{DL,BWP}$ is the size of CORESET 0 - Time domain resource assignment – 4 bits as defined in Subclause 5.1.2.1 of [6, TS38.214]. If only the short message is carried, this bit field is reserved. - VRB-to-PRB mapping – 1 bit according to Table 7.3.1.1.2-33. If only the short message is carried, this bit field is reserved. - Modulation and coding scheme – 5 bits as defined in Subclause 5.1.3 of [6, TS38.214], using Table 5.1.3.1-1. If only the short message is carried, this bit field is reserved. TS38.212 V15.3.0 Plaintiff reserves the right to amend or supplement these contentions after the inspection of source code, after the issuance of any claim construction order, and for any other reason as permitted by the Court.
[1C] the first radio signal carries a paging message; the frequency domain resource used for transmitting the first signaling belongs to a first subband; the first subband comprises a positive integer number of consecutive subcarriers in frequency domain; and	Samsung infringes this claim, either directly or indirectly, either literally or under the doctrine of equivalents, as set forth below. For example, Samsung and the Accused Products practice the first radio signal carries a paging message; the frequency domain resource used for transmitting the first signaling belongs to a first subband; the first subband comprises a positive integer number of consecutive subcarriers in frequency domain. For example, the Accused Products practice the first radio signal (<i>e.g.</i>, paging messages on the paging control channel/PDSCH) carries a paging message.

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	6.2.2 Logical Channels Different kinds of data transfer services as offered by MAC. Each logical channel type is defined by what type of information is transferred. Logical channels are classified into two groups: Control Channels and Traffic Channels. Control channels are used for the transfer of control plane information only: - Broadcast Control Channel (BCCH): a downlink channel for broadcasting system control information. - Paging Control Channel (PCCH): a downlink channel that carries paging messages. TS38.300 V15.5.0 9.2.5 Paging Paging allows the network to reach UEs in RRC_IDLE and in RRC_INACTIVE state through <i>Paging</i> messages, and to notify UEs in RRC_IDLE, RRC_INACTIVE and RRC_CONNECTED state of system information change (see subclause 7.3.3) and ETWS/CMAS indications (see subclause 16.4) through <i>Short Messages</i>. Both <i>Paging</i> messages and <i>Short Messages</i> are addressed with P-RNTI on PDCCH, but while the former is sent on PCCH, the latter is sent over PDCCH directly (see subclause 6.5 of TS 38.331 [12]). TS38.300 V15.5.0 For example, the frequency domain resource used for transmitting the first signaling (<i>e.g.</i>, PDSCH, PDCCH) belongs to a first subband (<i>e.g.</i>, bandwidth part). The bandwidth part (BWP) comprises of a set of Physical Resource Blocks (PRBs) which are measured from a reference resource block termed as Common Resource Block. As each of the Physical Resource Blocks comprises 12 subcarriers, the BWP comprises of a positive integer number of consecutive subcarriers in frequency domain.

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	4.4.5 Bandwidth part A bandwidth part is a subset of contiguous common resource blocks defined in subclause 4.4.4.3 for a given numerology μ_i in bandwidth part i on a given carrier. The starting position $N_{\text{BWP},i}^{\text{start},\mu}$ and the number of resource blocks $N_{\text{BWP},i}^{\text{size},\mu}$ in a bandwidth part shall fulfil $N_{\text{grid},x}^{\text{start},\mu} \leq N_{\text{BWP},i}^{\text{start},\mu} < N_{\text{grid},x}^{\text{start},\mu} + N_{\text{grid},x}^{\text{size},\mu}$ and $N_{\text{grid},x}^{\text{start},\mu} < N_{\text{BWP},i}^{\text{size},\mu} + N_{\text{BWP},i}^{\text{start},\mu} \leq N_{\text{grid},x}^{\text{start},\mu} + N_{\text{grid},x}^{\text{size},\mu}$, respectively. Configuration of a bandwidth part is described in clause 12 of [5, TS 38.213]. A UE can be configured with up to four bandwidth parts in the downlink with a single downlink bandwidth part being active at a given time. The UE is not expected to receive PDSCH, PDCCCH, or CSI-RS (except for RRM) outside an active bandwidth part. 4.4.4 Resource blocks 4.4.4.1 General A resource block is defined as $N_{\text{sc}}^{\text{RB}} = 12$ consecutive subcarriers in the frequency domain. 4.2 Numerologies Multiple OFDM numerologies are supported as given by Table 4.2-1 where μ and the cyclic prefix for a bandwidth part are obtained from the higher-layer parameter <i>subcarrierSpacing</i> and <i>cyclicPrefix</i>, respectively. Table 4.2-1: Supported transmission numerologies. <table><tr><th>μ</th><th>$\Delta f = 2^\mu \cdot 15$ [kHz]</th><th>Cyclic prefix</th></tr><tr><td>0</td><td>15</td><td>Normal</td></tr><tr><td>1</td><td>30</td><td>Normal</td></tr><tr><td>2</td><td>60</td><td>Normal, Extended</td></tr><tr><td>3</td><td>120</td><td>Normal</td></tr><tr><td>4</td><td>240</td><td>Normal</td></tr></table>	μ	$\Delta f = 2^\mu \cdot 15$ [kHz]	Cyclic prefix	0	15	Normal	1	30	Normal	2	60	Normal, Extended	3	120	Normal	4	240	Normal
μ	$\Delta f = 2^\mu \cdot 15$ [kHz]	Cyclic prefix																	
0	15	Normal																	
1	30	Normal																	
2	60	Normal, Extended																	
3	120	Normal																	
4	240	Normal																	

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	4.4.3 Resource elements Each element in the resource grid for antenna port p and subcarrier spacing configuration μ is called a resource element and is uniquely identified by $(k,l)_{p,\mu}$ where k is the index in the frequency domain and l refers to the symbol position in the time domain relative to some reference point. Resource element $(k,l)_{p,\mu}$ corresponds to a physical resource and the complex value $a_{k,l}^{(p,\mu)}$. When there is no risk for confusion, or no particular antenna port or subcarrier spacing is specified, the indices p and μ may be dropped, resulting in $a_{k,l}^{(p)}$ or $a_{k,l}$. 4.4.4.3 Common resource blocks Common resource blocks are numbered from 0 and upwards in the frequency domain for subcarrier spacing configuration μ. The center of subcarrier 0 of common resource block 0 for subcarrier spacing configuration μ coincides with 'point A'. The relation between the common resource block number n_{CRB}^{μ} in the frequency domain and resource elements $(k,$ for subcarrier spacing configuration μ is given by $n_{\text{CRB}}^{\mu} = \left\lfloor \frac{k}{N_{\text{sc}}^{\text{RB}}} \right\rfloor$ where k is defined relative to point A such that $k = 0$ corresponds to the subcarrier centered around point A. 4.4.4.4 Physical resource blocks Physical resource blocks are defined within a bandwidth part and numbered from 0 to $N_{\text{BWP},i}^{\text{size}} - 1$ where i is the number of the bandwidth part. The relation between the physical resource block n_{PRB} in bandwidth part i and the common resource block n_{CRB} is given by $n_{\text{CRB}} = n_{\text{PRB}} + N_{\text{BWP},i}^{\text{start}}$ TS38.211 V15.2.0

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Claim	Accused Products
	12 Bandwidth part operation If the UE is configured with a SCG, the UE shall apply the procedures described in this clause for both MCG and SCG - When the procedures are applied for MCG, the terms 'secondary cell', 'secondary cells' , 'serving cell', 'serving cells' in this clause refer to secondary cell, secondary cells, serving cell, serving cells belonging to the MCG respectively. - When the procedures are applied for SCG, the terms 'secondary cell', 'secondary cells', 'serving cell', 'serving cells' in this clause refer to secondary cell, secondary cells (not including <u>PSCell</u>), serving cell, serving cells belonging to the SCG respectively. The term 'primary cell' in this clause refers to the <u>PSCell</u> of the SCG. A UE configured for operation in bandwidth parts (BWPs) of a serving cell, is configured by higher layers for the serving cell a set of at most four bandwidth parts (BWPs) for receptions by the UE (DL BWP set) in a DL bandwidth by parameter <i>BWP-Downlink</i> and a set of at most four BWPs for transmissions by the UE (UL BWP set) in an UL bandwidth by parameter <i>BWP-Uplink</i>. TS38.213 V15.3.0

Appendix A - Claim Chart for US Patent No. 10,462,767 Against Samsung Accused Products

Claim	Accused Products						
	– BWP The <i>BWP</i> IE is used to configure a bandwidth part as defined in 38.211, section 4.2.2. For each serving cell the network configures at least an initial bandwidth part comprising of at least a downlink bandwidth part and one (if the serving cell is configured with an uplink) or two (if using supplementary uplink (SUL)) uplink bandwidth parts. Furthermore, the network may configure additional uplink and downlink bandwidth parts for a serving cell. The bandwidth part configuration is split into uplink and downlink parameters and into common and dedicated parameters. Common parameters (in BWP-UplinkCommon and BWP-DownlinkCommon) are "cell specific" and the network ensures the necessary alignment with corresponding parameters of other UEs. The common parameters of the initial bandwidth part of the PCell are also provided via system information. For all other serving cells, the network provides the common parameters via dedicated signalling. BWP information element <pre>-- ASN1START -- TAG-BANDWIDTH-PART-START BWP ::= SEQUENCE { locationAndBandwidth INTEGER (0..37949), subcarrierSpacing ENUMERATED { extended }, cyclicPrefix OPTIONAL -- Need R } -- TAG-BANDWIDTH-PART-STOP -- ASN1STOP</pre> BWP field descriptions <table border="1"> <tr> <td>cyclicPrefix</td> <td>Indicates whether to use the extended cyclic prefix for this bandwidth part. If not set, the UE uses the normal cyclic prefix. Normal CP is supported for all numerologies and slot formats. Extended CP is supported only for 60 kHz subcarrier spacing. (see 38.211, section 4.2.2)</td> </tr> <tr> <td>locationAndBandwidth</td> <td>Frequency domain location and bandwidth of this bandwidth part. The value of the field shall be interpreted as resource indicator value (RIV) as defined TS 38.214 with assumptions as described in TS 38.213, section 12, i.e. setting $N_{BW}^{size}=275$. The first PRB is a PRB determined by subcarrierSpacing of this BWP and offsetToCarrier (configured in SCS-SpecificCarrier contained within FrequencyInfoDL / FrequencyInfoUL) corresponding to this subcarrier spacing. In case of TDD, a BWP-pair (UL BWP and DL BWP with the same bwp-Id) must have the same center frequency (see 38.213, section 12)</td> </tr> <tr> <td>subcarrierSpacing</td> <td>Subcarrier spacing to be used in this BWP for all channels and reference signals unless explicitly configured elsewhere. Corresponds to subcarrier spacing according to 38.211, Table 4.2-1. The value kHz15 corresponds to $\mu=0$, kHz30 to $\mu=1$, and so on. Only the values 15, 30, or 60 kHz (<6GHz), and 60 or 120 kHz (>6GHz) are applicable. For the initial DL BWP this field has the same value as the field subCarrierSpacingCommon in MIB of the same serving cell.</td> </tr> </table> TS38.331 V15.3.0	cyclicPrefix	Indicates whether to use the extended cyclic prefix for this bandwidth part. If not set, the UE uses the normal cyclic prefix. Normal CP is supported for all numerologies and slot formats. Extended CP is supported only for 60 kHz subcarrier spacing. (see 38.211, section 4.2.2)	locationAndBandwidth	Frequency domain location and bandwidth of this bandwidth part. The value of the field shall be interpreted as resource indicator value (RIV) as defined TS 38.214 with assumptions as described in TS 38.213, section 12, i.e. setting $N_{BW}^{size}=275$. The first PRB is a PRB determined by subcarrierSpacing of this BWP and offsetToCarrier (configured in SCS-SpecificCarrier contained within FrequencyInfoDL / FrequencyInfoUL) corresponding to this subcarrier spacing. In case of TDD, a BWP-pair (UL BWP and DL BWP with the same bwp-Id) must have the same center frequency (see 38.213, section 12)	subcarrierSpacing	Subcarrier spacing to be used in this BWP for all channels and reference signals unless explicitly configured elsewhere. Corresponds to subcarrier spacing according to 38.211, Table 4.2-1. The value kHz15 corresponds to $\mu=0$, kHz30 to $\mu=1$, and so on. Only the values 15, 30, or 60 kHz (<6GHz), and 60 or 120 kHz (>6GHz) are applicable. For the initial DL BWP this field has the same value as the field subCarrierSpacingCommon in MIB of the same serving cell.
cyclicPrefix	Indicates whether to use the extended cyclic prefix for this bandwidth part. If not set, the UE uses the normal cyclic prefix. Normal CP is supported for all numerologies and slot formats. Extended CP is supported only for 60 kHz subcarrier spacing. (see 38.211, section 4.2.2)						
locationAndBandwidth	Frequency domain location and bandwidth of this bandwidth part. The value of the field shall be interpreted as resource indicator value (RIV) as defined TS 38.214 with assumptions as described in TS 38.213, section 12, i.e. setting $N_{BW}^{size}=275$. The first PRB is a PRB determined by subcarrierSpacing of this BWP and offsetToCarrier (configured in SCS-SpecificCarrier contained within FrequencyInfoDL / FrequencyInfoUL) corresponding to this subcarrier spacing. In case of TDD, a BWP-pair (UL BWP and DL BWP with the same bwp-Id) must have the same center frequency (see 38.213, section 12)						
subcarrierSpacing	Subcarrier spacing to be used in this BWP for all channels and reference signals unless explicitly configured elsewhere. Corresponds to subcarrier spacing according to 38.211, Table 4.2-1. The value kHz15 corresponds to $\mu=0$, kHz30 to $\mu=1$, and so on. Only the values 15, 30, or 60 kHz (<6GHz), and 60 or 120 kHz (>6GHz) are applicable. For the initial DL BWP this field has the same value as the field subCarrierSpacingCommon in MIB of the same serving cell.						

Appendix A - Claim Chart for US Patent No. 10,462,767 Against Samsung Accused Products

Claim	Accused Products
	5.15 Bandwidth Part (BWP) operation In addition to clause 12 of TS 38.213 [6], this subclause specifies requirements on BWP operation. A Serving Cell may be configured with one or multiple BWPs, and the maximum number of BWP per Serving Cell is specified in TS 38.213 [6]. The BWP switching for a Serving Cell is used to activate an inactive BWP and deactivate an active BWP at a time. The BWP switching is controlled by the PDCCH indicating a downlink assignment or an uplink grant, by the <i>bw- InactivityTimer</i>, by RRC signalling, or by the MAC entity itself upon initiation of Random Access procedure. Upon RRC (re-)configuration of <i>firstActiveDownlinkBWP-Id</i> and/or <i>firstActiveUplinkBWP-Id</i> for SpCell or activation of an SCell, the DL BWP and/or UL BWP indicated by <i>firstActiveDownlinkBWP-Id</i> and/or <i>firstActiveUplinkBWP-Id</i> respectively (as specified in TS 38.331 [5]) is active without receiving PDCCH indicating a downlink assignment or an uplink grant. The active BWP for a Serving Cell is indicated by either RRC or PDCCH (as specified in TS 38.213 [6]). For unpaired spectrum, a DL BWP is paired with a UL BWP, and BWP switching is common for both UL and DL. TS38.321 V15.3.0

Appendix A - Claim Chart for US Patent No. 10,462,767 Against Samsung Accused Products

Claim	Accused Products																																																																	
	5.3 UE channel bandwidth 5.3.1 General The UE channel bandwidth supports a single NR RF carrier in the uplink or downlink at the UE. From a BS perspective, different UE channel bandwidths may be supported within the same spectrum for transmitting to and receiving from UEs connected to the BS. Transmission of multiple carriers to the same UE (CA) or multiple carriers to different UEs within the BS channel bandwidth can be supported. From a UE perspective, the UE is configured with one or more BWP / carriers, each with its own UE channel bandwidth. The UE does not need to be aware of the BS channel bandwidth or how the BS allocates bandwidth to different UEs. The placement of the UE channel bandwidth for each UE carrier is flexible but can only be completely within the BS channel bandwidth. 5.3.2 Maximum transmission bandwidth configuration The maximum transmission bandwidth configuration N_{RB} for each UE channel bandwidth and subcarrier spacing is specified in Table 5.3.2-1. Table 5.3.2-1: Maximum transmission bandwidth configuration N_{RB} <table><tr><th>SCS (kHz)</th><th>5MHz</th><th>10MHz</th><th>15MHz</th><th>20 MHz</th><th>25 MHz</th><th>30 MHz</th><th>40 MHz</th><th>50MHz</th><th>60 MHz</th><th>80 MHz</th><th>90 MHz</th><th>100 MHz</th></tr><tr><td></td><td>N_{RB}</td><td>N_{RB}</td><td>N_{RB}</td><td>N_{RB}</td><td>N_{RB}</td><td>N_{RB}</td><td>N_{RB}</td><td>N_{RB}</td><td>N_{RB}</td><td>N_{RB}</td><td>N_{RB}</td><td>N_{RB}</td></tr><tr><td>15</td><td>25</td><td>52</td><td>79</td><td>106</td><td>133</td><td>160</td><td>216</td><td>270</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td></tr><tr><td>30</td><td>11</td><td>24</td><td>38</td><td>51</td><td>65</td><td>78</td><td>106</td><td>133</td><td>162</td><td>217</td><td>245</td><td>273</td></tr><tr><td>60</td><td>N/A</td><td>11</td><td>18</td><td>24</td><td>31</td><td>38</td><td>51</td><td>65</td><td>79</td><td>107</td><td>121</td><td>135</td></tr></table>	SCS (kHz)	5MHz	10MHz	15MHz	20 MHz	25 MHz	30 MHz	40 MHz	50MHz	60 MHz	80 MHz	90 MHz	100 MHz		N_{RB}	N_{RB}	N_{RB}	N_{RB}	N_{RB}	N_{RB}	N_{RB}	N_{RB}	N_{RB}	N_{RB}	N_{RB}	N_{RB}	15	25	52	79	106	133	160	216	270	N/A	N/A	N/A	N/A	30	11	24	38	51	65	78	106	133	162	217	245	273	60	N/A	11	18	24	31	38	51	65	79	107	121	135
SCS (kHz)	5MHz	10MHz	15MHz	20 MHz	25 MHz	30 MHz	40 MHz	50MHz	60 MHz	80 MHz	90 MHz	100 MHz																																																						
	N_{RB}	N_{RB}	N_{RB}	N_{RB}	N_{RB}	N_{RB}	N_{RB}	N_{RB}	N_{RB}	N_{RB}	N_{RB}	N_{RB}																																																						
15	25	52	79	106	133	160	216	270	N/A	N/A	N/A	N/A																																																						
30	11	24	38	51	65	78	106	133	162	217	245	273																																																						
60	N/A	11	18	24	31	38	51	65	79	107	121	135																																																						

TS38.101 V15.3.0

TS38.101 V15.3.0

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Claim	Accused Products
	5.1.2.2.2 Downlink resource allocation type 1 In downlink resource allocation of type 1, the resource block assignment information indicates to a scheduled UE a set of contiguously allocated non-interleaved or interleaved virtual resource blocks within the active bandwidth part of size N_{BWP}^{size} PRBs except for the case when DCI format 1_0 is decoded in any common search space in which case the size of CORESET 0 shall be used. A downlink type 1 resource allocation field consists of a resource indication value (RIV) corresponding to a starting virtual resource block (RB_{start}) and a length in terms of contiguously allocated resource blocks L_{RBs}. The resource indication value is defined by if $(L_{RBs} - 1) \leq \lfloor N_{BWP}^{size} / 2 \rfloor$ then $RIV = N_{BWP}^{size} (L_{RBs} - 1) + RB_{start}$ else $RIV = N_{BWP}^{size} (N_{BWP}^{size} - L_{RBs} + 1) + (N_{BWP}^{size} - 1 - RB_{start})$ where $L_{RBs} \geq 1$ and shall not exceed $N_{BWP}^{size} - RB_{start}$. TS38.214 V15.3.0 Plaintiff reserves the right to amend or supplement these contentions after the inspection of source code, after the issuance of any claim construction order, and for any other reason as permitted by the Court.
[1D] at least one of {location of the first subband in frequency domain, subcarrier spacing of subcarriers included in the first subband} is used for determining the X time intervals.	Samsung infringes this claim, either directly or indirectly, either literally or under the doctrine of equivalents, as set forth below. For example, Samsung and the Accused Products practice at least one of {location of the first subband in frequency domain, subcarrier spacing of subcarriers included in the first subband} is used for determining the X time intervals. For example, the location of the first subband in frequency domain (e.g., pdcch-ConfigSIB1) and subcarrier spacing of subcarriers (e.g., subcarrierSpacingCommon) included in the first subband (e.g., BWP) are used for determining X time intervals (e.g., firstPDCCH-MonitoringOccasionOfPO).

Appendix A - Claim Chart for US Patent No. 10,462,767 Against Samsung Accused Products

Claim	Accused Products																		
	7.1 Discontinuous Reception for paging The PDCCH monitoring occasions for paging are determined according to <i>pagingSearchSpace</i> as specified in TS 38.213 [4] and <i>firstPDCCH-MonitoringOccasionOfPO</i> if configured as specified in TS 38.331 [3]. When <i>SearchSpaceId</i> = 0 is configured for <i>pagingSearchSpace</i>, the PDCCH monitoring occasions for paging are same as for RMSI as defined in clause 13 in TS 38.213 [4]. When <i>SearchSpaceId</i> = 0 is configured for <i>pagingSearchSpace</i>, <i>Ns</i> is either 1 or 2. For <i>Ns</i> = 1, there is only one PO which starts from the first PDCCH monitoring occasion for paging in the PF. For <i>Ns</i> = 2, PO is either in the first half frame (<i>i_s</i> = 0) or the second half frame (<i>i_s</i> = 1) of the PF. When <i>SearchSpaceId</i> other than 0 is configured for <i>pagingSearchSpace</i>, the UE monitors the (<i>i_s</i> + 1)th PO. A PO is a set of 'S' consecutive PDCCH monitoring occasions where 'S' is the number of actual transmitted SSBs determined according to <i>ssb-PositionsInBurst</i> in <i>SIB1</i>. The Kth PDCCH monitoring occasion for paging in the PO corresponds to the Kth transmitted SSB. The PDCCH monitoring occasions for paging which do not overlap with UL symbols (determined according to <i>tdd-UL-DL-ConfigurationCommon</i>) are sequentially numbered from zero starting from the first PDCCH monitoring occasion for paging in the PF. When <i>firstPDCCH-MonitoringOccasionOfPO</i> is present, the starting PDCCH monitoring occasion number of (<i>i_s</i> + 1)th PO is the (<i>i_s</i> + 1)th value of the <i>firstPDCCH-MonitoringOccasionOfPO</i> parameter; otherwise, it is equal to <i>i_s</i> * S. TS38.304 V15.3.0 6.3.2 Radio resource control information elements <table> <tr> <td><i>firstPDCCH-MonitoringOccasionOfPO</i></td><td>CHOICE {</td></tr> <tr> <td><i>sCS15KHzZoneT</i></td><td>SEQUENCE (SIZE (1..4)) OF INTEGER (0..139),</td></tr> <tr> <td><i>sCS30KHzZoneT-SCS15KHzhalfT</i></td><td>SEQUENCE (SIZE (1..4)) OF INTEGER (0..279),</td></tr> <tr> <td><i>sCS60KHzZoneT-SCS30KHzhalfT-SCS15KHzquarterT</i></td><td>SEQUENCE (SIZE (1..4)) OF INTEGER (0..559),</td></tr> <tr> <td><i>sCS120KHzZoneT-SCS60KHzhalfT-SCS30KHzquarterT-SCS15KHzZoneEighthT</i></td><td>SEQUENCE (SIZE (1..4)) OF INTEGER (0..1119),</td></tr> <tr> <td><i>sCS120KHzhalfT-SCS60KHzquarterT-SCS30KHzZoneEighthT-SCS15KHzZoneSixteenthT</i></td><td>SEQUENCE (SIZE (1..4)) OF INTEGER (0..2239),</td></tr> <tr> <td><i>sCS120KHzquarterT-SCS60KHzZoneEighthT-SCS30KHzZoneSixteenthT</i></td><td>SEQUENCE (SIZE (1..4)) OF INTEGER (0..4479),</td></tr> <tr> <td><i>sCS120KHzZoneEighthT-SCS60KHzZoneSixteenthT</i></td><td>SEQUENCE (SIZE (1..4)) OF INTEGER (0..8959),</td></tr> <tr> <td><i>sCS120KHzZoneSixteenthT</i></td><td>SEQUENCE (SIZE (1..4)) OF INTEGER (0..17919)</td></tr> </table> TS38.331 V15.3.0 For example, in identifying the time interval of a subband, the subcarrier spacing information is sufficient to determine the time interval. The standard include a disclosure that the subcarrier spacing information provided by μ can be used to derive subband location (e.g., BWP) with respect to a common resource block (e.g., CRB0).	<i>firstPDCCH-MonitoringOccasionOfPO</i>	CHOICE {	<i>sCS15KHzZoneT</i>	SEQUENCE (SIZE (1..4)) OF INTEGER (0..139),	<i>sCS30KHzZoneT-SCS15KHzhalfT</i>	SEQUENCE (SIZE (1..4)) OF INTEGER (0..279),	<i>sCS60KHzZoneT-SCS30KHzhalfT-SCS15KHzquarterT</i>	SEQUENCE (SIZE (1..4)) OF INTEGER (0..559),	<i>sCS120KHzZoneT-SCS60KHzhalfT-SCS30KHzquarterT-SCS15KHzZoneEighthT</i>	SEQUENCE (SIZE (1..4)) OF INTEGER (0..1119),	<i>sCS120KHzhalfT-SCS60KHzquarterT-SCS30KHzZoneEighthT-SCS15KHzZoneSixteenthT</i>	SEQUENCE (SIZE (1..4)) OF INTEGER (0..2239),	<i>sCS120KHzquarterT-SCS60KHzZoneEighthT-SCS30KHzZoneSixteenthT</i>	SEQUENCE (SIZE (1..4)) OF INTEGER (0..4479),	<i>sCS120KHzZoneEighthT-SCS60KHzZoneSixteenthT</i>	SEQUENCE (SIZE (1..4)) OF INTEGER (0..8959),	<i>sCS120KHzZoneSixteenthT</i>	SEQUENCE (SIZE (1..4)) OF INTEGER (0..17919)
<i>firstPDCCH-MonitoringOccasionOfPO</i>	CHOICE {																		
<i>sCS15KHzZoneT</i>	SEQUENCE (SIZE (1..4)) OF INTEGER (0..139),																		
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	https://www.sharetechnote.com/html/5G/5G_ResourceGrid.html; https://www.rfwireless-world.com/5G/5G-NR-Resource-Grid-vs-Resource-Block-vs-Resource-Element.html For example, subcarrier spacing information (e.g., subcarrierSpacingCommon) is already included in the MIB information element (such as the second radio signal) and can be transmitted from network to UE in BCH/BCCH channel (such as the claimed second radio signal). 6.2.2 Message definitions – MIB The <i>MIB</i> includes the system information transmitted on BCH. Signalling radio bearer: N/A RLC-SAP: TM Logical channel: BCCH Direction: Network to UE MIB <pre> -- ASN1START -- TAG-MIB-START MIB ::= SEQUENCE { systemFrameNumber BIT STRING (SIZE (6)), subCarrierSpacingCommon ENUMERATED (scs15or60, scs30or120), ssb-SubcarrierOffset INTEGER (0..15), dmrs-TypeA-Position ENUMERATED (pos2, pos3), pdccch-ConfigSIB1 PDCCCH-ConfigSIB1, cellBarred ENUMERATED (barred, notBarred), intraFreqReselection ENUMERATED (allowed, notAllowed), spare BIT STRING (SIZE (1)) } -- TAG-MIB-STOP -- ASN1STOP </pre>

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Claim	Accused Products										
	<table><tr><th>MIB field descriptions</th></tr><tr><td>cellBarred barred means the cell is barred, as defined in TS 38.304 [20].</td></tr><tr><td>dmrs-TypeA-Position Position of (first) DM-RS for downlink (see 38.211, section 7.4.1.1.1) and uplink (see 38.211, section 6.4.1.1.3).</td></tr><tr><td>intraFreqReselection Controls cell selection/reselection to intra-frequency cells when the highest ranked cell is barred, or treated as barred by the UE, as specified in TS 38.304 [20].</td></tr><tr><td>pdccch-ConfigSIB1 See TS 38.213 [13]. Determines a common <i>ControlResourceSet</i> (CORESET) a common search space and necessary PDCCH parameters. If the field <i>ssb-SubcarrierOffset</i> indicates that <i>SIB1</i> is not present, the field <i>pdccch-ConfigSIB1</i> indicate the frequency positions where the UE may find SS/PBCH block with <i>SIB1</i> or the frequency range where the network does not provide SS/PBCH block with <i>SIB1</i> (see TS 38.213 [13], section 13).</td></tr><tr><td>ssb-SubcarrierOffset Corresponds to k_{SSB} (see TS 38.213 [13]), which is the frequency domain offset between SSB and the overall resource block grid in number of subcarriers. (See 38.211). The value range of this field may be extended by an additional most significant bit encoded within PBCH as specified in 38.213 [13]. This field may indicate that this beam does not provide <i>SIB1</i> and that there is hence no common CORESET (see TS 38.213 [13], section 13). In this case, the field <i>pdccch-ConfigSIB1</i> may indicate the frequency positions where the UE may (not) find a SS/PBCH with a control resource set and search space for <i>SIB1</i> (see 38.213 [13], section 13).</td></tr><tr><td>subCarrierSpacingCommon Subcarrier spacing for <i>SIB1</i>, Msg.2/4 for initial access and broadcast SI-messages. If the UE acquires this MIB on a carrier frequency <6GHz, the value <i>scs15or60</i> corresponds to 15 KHz and the value <i>scs30or120</i> corresponds to 30 kHz. If the UE acquires this MIB on a carrier frequency >6GHz, the value <i>scs15or60</i> corresponds to 60 KHz and the value <i>scs30or120</i> corresponds to 120 kHz.</td></tr><tr><td>systemFrameNumber The 6 most significant bit (MSB) of the 10-bit System Frame Number. The 4 LSB of the SFN are conveyed in the PBCH transport block as part of channel coding (i.e. outside the MIB encoding).</td></tr></table> TS38.331 V15.3.0 The BWP information element comprises: 1) locationAndBandwidth; and 2) subcarrier spacing. <table><tr><td>6.3.2 Radio resource control information elements</td></tr><tr><td> — <i>BWP</i> The <i>BWP</i> IE is used to configure a bandwidth part as defined in 38.211, section 4.2.2. </td></tr></table>	MIB field descriptions	cellBarred barred means the cell is barred, as defined in TS 38.304 [20].	dmrs-TypeA-Position Position of (first) DM-RS for downlink (see 38.211, section 7.4.1.1.1) and uplink (see 38.211, section 6.4.1.1.3).	intraFreqReselection Controls cell selection/reselection to intra-frequency cells when the highest ranked cell is barred, or treated as barred by the UE, as specified in TS 38.304 [20].	pdccch-ConfigSIB1 See TS 38.213 [13]. Determines a common <i>ControlResourceSet</i> (CORESET) a common search space and necessary PDCCH parameters. If the field <i>ssb-SubcarrierOffset</i> indicates that <i>SIB1</i> is not present, the field <i>pdccch-ConfigSIB1</i> indicate the frequency positions where the UE may find SS/PBCH block with <i>SIB1</i> or the frequency range where the network does not provide SS/PBCH block with <i>SIB1</i> (see TS 38.213 [13], section 13).	ssb-SubcarrierOffset Corresponds to k_{SSB} (see TS 38.213 [13]), which is the frequency domain offset between SSB and the overall resource block grid in number of subcarriers. (See 38.211). The value range of this field may be extended by an additional most significant bit encoded within PBCH as specified in 38.213 [13]. This field may indicate that this beam does not provide <i>SIB1</i> and that there is hence no common CORESET (see TS 38.213 [13], section 13). In this case, the field <i>pdccch-ConfigSIB1</i> may indicate the frequency positions where the UE may (not) find a SS/PBCH with a control resource set and search space for <i>SIB1</i> (see 38.213 [13], section 13).	subCarrierSpacingCommon Subcarrier spacing for <i>SIB1</i> , Msg.2/4 for initial access and broadcast SI-messages. If the UE acquires this MIB on a carrier frequency <6GHz, the value <i>scs15or60</i> corresponds to 15 KHz and the value <i>scs30or120</i> corresponds to 30 kHz. If the UE acquires this MIB on a carrier frequency >6GHz, the value <i>scs15or60</i> corresponds to 60 KHz and the value <i>scs30or120</i> corresponds to 120 kHz.	systemFrameNumber The 6 most significant bit (MSB) of the 10-bit System Frame Number. The 4 LSB of the SFN are conveyed in the PBCH transport block as part of channel coding (i.e. outside the MIB encoding).	6.3.2 Radio resource control information elements	— <i>BWP</i> The <i>BWP</i> IE is used to configure a bandwidth part as defined in 38.211, section 4.2.2.
MIB field descriptions											
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intraFreqReselection Controls cell selection/reselection to intra-frequency cells when the highest ranked cell is barred, or treated as barred by the UE, as specified in TS 38.304 [20].											
pdccch-ConfigSIB1 See TS 38.213 [13]. Determines a common <i>ControlResourceSet</i> (CORESET) a common search space and necessary PDCCH parameters. If the field <i>ssb-SubcarrierOffset</i> indicates that <i>SIB1</i> is not present, the field <i>pdccch-ConfigSIB1</i> indicate the frequency positions where the UE may find SS/PBCH block with <i>SIB1</i> or the frequency range where the network does not provide SS/PBCH block with <i>SIB1</i> (see TS 38.213 [13], section 13).											
ssb-SubcarrierOffset Corresponds to k_{SSB} (see TS 38.213 [13]), which is the frequency domain offset between SSB and the overall resource block grid in number of subcarriers. (See 38.211). The value range of this field may be extended by an additional most significant bit encoded within PBCH as specified in 38.213 [13]. This field may indicate that this beam does not provide <i>SIB1</i> and that there is hence no common CORESET (see TS 38.213 [13], section 13). In this case, the field <i>pdccch-ConfigSIB1</i> may indicate the frequency positions where the UE may (not) find a SS/PBCH with a control resource set and search space for <i>SIB1</i> (see 38.213 [13], section 13).											
subCarrierSpacingCommon Subcarrier spacing for <i>SIB1</i> , Msg.2/4 for initial access and broadcast SI-messages. If the UE acquires this MIB on a carrier frequency <6GHz, the value <i>scs15or60</i> corresponds to 15 KHz and the value <i>scs30or120</i> corresponds to 30 kHz. If the UE acquires this MIB on a carrier frequency >6GHz, the value <i>scs15or60</i> corresponds to 60 KHz and the value <i>scs30or120</i> corresponds to 120 kHz.											
systemFrameNumber The 6 most significant bit (MSB) of the 10-bit System Frame Number. The 4 LSB of the SFN are conveyed in the PBCH transport block as part of channel coding (i.e. outside the MIB encoding).											
6.3.2 Radio resource control information elements											
— <i>BWP</i> The <i>BWP</i> IE is used to configure a bandwidth part as defined in 38.211, section 4.2.2.											

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Claim	Accused Products				
	For each serving cell the network configures at least an initial bandwidth part comprising of at least a downlink bandwidth part and one (if the serving cell is configured with an uplink) or two (if using supplementary uplink (SUL)) uplink bandwidth parts. Furthermore, the network may configure additional uplink and downlink bandwidth parts for a serving cell. The bandwidth part configuration is split into uplink and downlink parameters and into common and dedicated parameters. Common parameters (in BWP-UplinkCommon and BWP-DownlinkCommon) are "cell specific" and the network ensures the necessary alignment with corresponding parameters of other UEs. The common parameters of the initial bandwidth part of the PCell are also provided via system information. For all other serving cells, the network provides the common parameters via dedicated signalling. BWP information element <pre>-- ASN1START -- TAG-BANDWIDTH-PART-START BWP ::= locationAndBandwidth SEQUENCE { INTEGER (0..37949), SubcarrierSpacing, cyclicPrefix ENUMERATED { extended } } -- TAG-BANDWIDTH-PART-STOP -- ASN1STOP</pre><table><thead><tr><th>BWP field descriptions</th></tr></thead><tbody><tr><td>cyclicPrefix Indicates whether to use the extended cyclic prefix for this bandwidth part. If not set, the UE uses the normal cyclic prefix. Normal CP is supported for all numerologies and slot formats. Extended CP is supported only for 60 kHz subcarrier spacing. (see 38.211, section 4.2.2)</td></tr><tr><td>locationAndBandwidth Frequency domain location and bandwidth of this bandwidth part. The value of the field shall be interpreted as resource indicator value (RIV) as defined TS 38.214 with assumptions as described in TS 38.213, section 12, i.e. setting $N_{BWP}^{size}=275$. The first PRB is a PRB determined by subcarrierSpacing of this BWP and offsetToCarrier (configured in SCS-SpecificCarrier contained within FrequencyInfoDL / FrequencyInfoUL) corresponding to this subcarrier spacing. In case of TDD, a BWP-pair (UL BWP and DL BWP with the same bwp-Id) must have the same center frequency (see 38.213, section 12)</td></tr><tr><td>subcarrierSpacing Subcarrier spacing to be used in this BWP for all channels and reference signals unless explicitly configured elsewhere. Corresponds to subcarrier spacing according to 38.211, Table 4.2-1. The value kHz15 corresponds to $\mu=0$, kHz30 to $\mu=1$, and so on. Only the values 15, 30, or 60 kHz (<6GHz), and 60 or 120 kHz (>6GHz) are applicable. For the initial DL BWP this field has the same value as the field subCarrierSpacingCommon in MIB of the same serving cell.</td></tr></tbody></table>	BWP field descriptions	cyclicPrefix Indicates whether to use the extended cyclic prefix for this bandwidth part. If not set, the UE uses the normal cyclic prefix. Normal CP is supported for all numerologies and slot formats. Extended CP is supported only for 60 kHz subcarrier spacing. (see 38.211, section 4.2.2)	locationAndBandwidth Frequency domain location and bandwidth of this bandwidth part. The value of the field shall be interpreted as resource indicator value (RIV) as defined TS 38.214 with assumptions as described in TS 38.213, section 12, i.e. setting $N_{BWP}^{size}=275$. The first PRB is a PRB determined by subcarrierSpacing of this BWP and offsetToCarrier (configured in SCS-SpecificCarrier contained within FrequencyInfoDL / FrequencyInfoUL) corresponding to this subcarrier spacing. In case of TDD, a BWP-pair (UL BWP and DL BWP with the same bwp-Id) must have the same center frequency (see 38.213, section 12)	subcarrierSpacing Subcarrier spacing to be used in this BWP for all channels and reference signals unless explicitly configured elsewhere. Corresponds to subcarrier spacing according to 38.211, Table 4.2-1. The value kHz15 corresponds to $\mu=0$, kHz30 to $\mu=1$, and so on. Only the values 15, 30, or 60 kHz (<6GHz), and 60 or 120 kHz (>6GHz) are applicable. For the initial DL BWP this field has the same value as the field subCarrierSpacingCommon in MIB of the same serving cell.
BWP field descriptions					
cyclicPrefix Indicates whether to use the extended cyclic prefix for this bandwidth part. If not set, the UE uses the normal cyclic prefix. Normal CP is supported for all numerologies and slot formats. Extended CP is supported only for 60 kHz subcarrier spacing. (see 38.211, section 4.2.2)					
locationAndBandwidth Frequency domain location and bandwidth of this bandwidth part. The value of the field shall be interpreted as resource indicator value (RIV) as defined TS 38.214 with assumptions as described in TS 38.213, section 12, i.e. setting $N_{BWP}^{size}=275$. The first PRB is a PRB determined by subcarrierSpacing of this BWP and offsetToCarrier (configured in SCS-SpecificCarrier contained within FrequencyInfoDL / FrequencyInfoUL) corresponding to this subcarrier spacing. In case of TDD, a BWP-pair (UL BWP and DL BWP with the same bwp-Id) must have the same center frequency (see 38.213, section 12)					
subcarrierSpacing Subcarrier spacing to be used in this BWP for all channels and reference signals unless explicitly configured elsewhere. Corresponds to subcarrier spacing according to 38.211, Table 4.2-1. The value kHz15 corresponds to $\mu=0$, kHz30 to $\mu=1$, and so on. Only the values 15, 30, or 60 kHz (<6GHz), and 60 or 120 kHz (>6GHz) are applicable. For the initial DL BWP this field has the same value as the field subCarrierSpacingCommon in MIB of the same serving cell.					
2. The method according to claim 1, wherein any one of the X time intervals belongs to a first time window in time domain; the time length of the first time window is predefined; the first time window is divided into Y time intervals;	TS38.331 V15.3.0 Plaintiff reserves the right to amend or supplement these contentions after the inspection of source code, after the issuance of any claim construction order, and for any other reason as permitted by the Court. Samsung infringes this claim, either directly or indirectly, either literally or under the doctrine of equivalents, as set forth below. For example, Samsung and the Accused Products practice wherein any one of the X time intervals belongs to a first time window in time domain; the time length of the first time window is predefined; the first time window is divided into Y time intervals; the X time intervals are X time intervals of the Y time intervals, Y being a positive integer not smaller than X; the subcarrier spacing of subcarriers included in the first subband is used for determining Y; and a feature ID of a monitor of the first signaling is used for determining the X time intervals in the Y time intervals. See claim 1 above.				

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Claim	Accused Products
the X time intervals are X time intervals of the Y time intervals, Y being a positive integer not smaller than X; the subcarrier spacing of subcarriers included in the first subband is used for determining Y; and a feature ID of a monitor of the first signaling is used for determining the X time intervals in the Y time intervals.	For example, any one of the X time intervals (<i>e.g.</i>, paging occasion (PO)) belongs to a first time window (<i>e.g.</i>, paging frame (PF)) in time domain. The time length of the first time window is predefined (<i>e.g.</i>, one radio frame). The first time window is divided into Y time intervals. The X time intervals are X time intervals of the Y time intervals (<i>e.g.</i>, one paging frame may contain one or multiple paging occasions). Y being a positive integer not smaller than X. The subcarrier spacing of subcarriers included in the first subband (<i>e.g.</i>, μ) is used for determining Y (<i>e.g.</i>, Ns). A feature ID of a monitor of the first signaling (<i>e.g.</i>, UE_ID) is used for determining the X time intervals in the Y time intervals (<i>e.g.</i>, paging occasions in the paging frames). 7.1 Discontinuous Reception for paging The UE may use Discontinuous Reception (DRX) in RRC_IDLE and RRC_INACTIVE state in order to reduce power consumption. The UE monitors one paging occasion (PO) per DRX cycle. A PO is a set of PDCCH monitoring occasions and can consist of multiple time slots (<i>e.g.</i> subframe or OFDM symbol) where paging DCI can be sent (TS 38.213 [4]). One Paging Frame (PF) is one Radio Frame and may contain one or multiple PO(s) or starting point of a PO.

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Claim	Accused Products																								
	Index (i_s), indicating the index of the PO is determined by: $i_s = \text{floor}(\text{UE_ID}/N) \bmod N_s$ The PDCCH monitoring occasions for paging are determined according to <i>pagingSearchSpace</i> as specified in TS 38.213 [4] and <i>firstPDCCH-MonitoringOccasionOfPO</i> if configured as specified in TS 38.331 [3]. When <i>SearchSpaceId</i> = 0 is configured for <i>pagingSearchSpace</i>, the PDCCH monitoring occasions for paging are same as for RMSI as defined in clause 13 in TS 38.213 [4]. When <i>SearchSpaceId</i> = 0 is configured for <i>pagingSearchSpace</i>, N_s is either 1 or 2. For $N_s = 1$, there is only one PO which starts from the first PDCCH monitoring occasion for paging in the PF. For $N_s = 2$, PO is either in the first half frame ($i_s = 0$) or the second half frame ($i_s = 1$) of the PF. When <i>SearchSpaceId</i> other than 0 is configured for <i>pagingSearchSpace</i>, the UE monitors the $(i_s + 1)^{\text{th}}$ PO. A PO is a set of 'S' consecutive PDCCH monitoring occasions where 'S' is the number of actual transmitted SSBs determined according to <i>ssb-PositionsInBurst</i> in <i>SIB1</i>. The K^{th} PDCCH monitoring occasion for paging in the PO corresponds to the K^{th} transmitted SSB. The PDCCH monitoring occasions for paging which do not overlap with UL symbols (determined according to <i>tdd-UL-DL-ConfigurationCommon</i>) are sequentially numbered from zero starting from the first PDCCH monitoring occasion for paging in the PF. When <i>firstPDCCH-MonitoringOccasionOfPO</i> is present, the starting PDCCH monitoring occasion number of $(i_s + 1)^{\text{th}}$ PO is the $(i_s + 1)^{\text{th}}$ value of the <i>firstPDCCH-MonitoringOccasionOfPO</i> parameter; otherwise, it is equal to $i_s * S$. TS38.304 V15.3.0 4.3.2 Slots Table 4.3.2-1: Number of OFDM symbols per slot, slots per frame, and slots per subframe for normal cyclic prefix. <table><tr><th>μ</th><th>$N_{\text{slot}}^{\text{slot}}^{\text{slot}}$</th><th>$N_{\text{slot}}^{\text{frame}, \mu}$</th><th>$N_{\text{slot}}^{\text{subframe}, \mu}$</th></tr><tr><td>0</td><td>14</td><td>10</td><td>1</td></tr><tr><td>1</td><td>14</td><td>20</td><td>2</td></tr><tr><td>2</td><td>14</td><td>40</td><td>4</td></tr><tr><td>3</td><td>14</td><td>80</td><td>8</td></tr><tr><td>4</td><td>14</td><td>160</td><td>16</td></tr></table> TS38.211 V15.3.0	μ	$N_{\text{slot}}^{\text{slot}}^{\text{slot}}$	$N_{\text{slot}}^{\text{frame}, \mu}$	$N_{\text{slot}}^{\text{subframe}, \mu}$	0	14	10	1	1	14	20	2	2	14	40	4	3	14	80	8	4	14	160	16
μ	$N_{\text{slot}}^{\text{slot}}^{\text{slot}}$	$N_{\text{slot}}^{\text{frame}, \mu}$	$N_{\text{slot}}^{\text{subframe}, \mu}$																						
0	14	10	1																						
1	14	20	2																						
2	14	40	4																						
3	14	80	8																						
4	14	160	16																						

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	Plaintiff reserves the right to amend or supplement these contentions after the inspection of source code, after the issuance of any claim construction order, and for any other reason as permitted by the Court.
3. The method according to claim 2, wherein the first time window belongs to one of Z time windows, Z being an integer greater than 1; Z is predefined, or Z is configurable; any two of the Z time windows have an equal time length; and the feature ID of the monitor of the first signaling is used for determining the first time window in the Z time windows.	Samsung infringes this claim, either directly or indirectly, either literally or under the doctrine of equivalents, as set forth below. For example, Samsung and the Accused Products practice wherein the first time window belongs to one of Z time windows, Z being an integer greater than 1; Z is predefined, or Z is configurable; any two of the Z time windows have an equal time length; and the feature ID of the monitor of the first signaling is used for determining the first time window in the Z time windows. See claims 1 and 2 above. For example, the first time window (<i>e.g.</i>, paging frame (PF)) belongs to one of Z time windows (<i>e.g.</i>, DRX cycle of the UE), Z being an integer greater than 1. Z is configurable (<i>e.g.</i>, T configured by RRC or upper layers and broadcast in system information; defaultPagingCycle). Any two of the Z time windows have an equal time length (<i>e.g.</i>, rf32 – 32 radio frame). The feature ID of the monitor of the first signaling (<i>e.g.</i>, UE_ID) is used for determining the first time window (<i>e.g.</i>, subframe number (SFN); PF_offset) in the Z time windows. 7.1 Discontinuous Reception for paging SFN for the PF is determined by: $(SFN + PF_offset) \bmod T = (T \div N) * (UE_ID \bmod N)$ The following parameters are used for the calculation of PF and i_s above: T: DRX cycle of the UE (T is determined by the shortest of the UE specific DRX value, if configured by RRC or upper layers, and a default DRX value broadcast in system information. If UE specific DRX is not configured by RRC or by upper layers, the default value is applied). N: number of total paging frames in T Ns: number of paging occasions for a PF PF_offset: offset used for PF determination TS38.304 V15.3.0

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Claim	Accused Products						
	6.3.2 Radio resource control information elements DownlinkConfigCommonSIB information element <pre> -- ASN1START -- TAG-DOWNLINK-CONFIG-COMMON-SIB-START DownlinkConfigCommonSIB ::= SEQUENCE { frequencyInfoDL FrequencyInfoDL-SIB, initialDownlinkBWP BWP-DownlinkCommon, bccch-Config BCCCH-Config, pcch-Config PCCH-Config, ... } BCCCH-Config ::= SEQUENCE { modificationPeriodCoeff ENUMERATED {n2, n4, n8, n16}, ... } PCCH-Config ::= SEQUENCE { defaultPagingCycle PagingCycle, nAndPagingFrameOffset CHOICE { oneT NULL, halfT INTEGER (0..1), quarterT INTEGER (0..3), oneEighthT INTEGER (0..7), oneSixteenthT INTEGER (0..15) } }, </pre> PCCH-Config field descriptions <table> <tr> <td>defaultPagingCycle</td> <td>Default paging cycle, used to derive 'T' in TS 38.304 [20]. Value rf32 corresponds to 32 radio frames, rf64 corresponds to 64 radio frames and so on.</td> </tr> <tr> <td>nAndPagingFrameOffset</td> <td>Used to derive the number of total paging frames in T (corresponding to parameter N in TS 38.304 [20]) and paging frame offset (corresponding to parameter PF_offset in TS 38.304 [20]).</td> </tr> <tr> <td>ns</td> <td>Number of paging occasions in paging frame</td> </tr> </table> TS38.331 V15.3.0 Plaintiff reserves the right to amend or supplement these contentions after the inspection of source code, after the issuance of any claim construction order, and for any other reason as permitted by the Court.	defaultPagingCycle	Default paging cycle, used to derive 'T' in TS 38.304 [20]. Value rf32 corresponds to 32 radio frames, rf64 corresponds to 64 radio frames and so on.	nAndPagingFrameOffset	Used to derive the number of total paging frames in T (corresponding to parameter N in TS 38.304 [20]) and paging frame offset (corresponding to parameter PF_offset in TS 38.304 [20]).	ns	Number of paging occasions in paging frame
defaultPagingCycle	Default paging cycle, used to derive 'T' in TS 38.304 [20]. Value rf32 corresponds to 32 radio frames, rf64 corresponds to 64 radio frames and so on.						
nAndPagingFrameOffset	Used to derive the number of total paging frames in T (corresponding to parameter N in TS 38.304 [20]) and paging frame offset (corresponding to parameter PF_offset in TS 38.304 [20]).						
ns	Number of paging occasions in paging frame						
4. The method according to claim 1, further comprising: receiving a second radio signal; wherein the second radio	Samsung infringes this claim, either directly or indirectly, either literally or under the doctrine of equivalents, as set forth below. For example, Samsung and the Accused Products practice receiving a second radio signal; wherein the second radio of {location of the first subband in frequency domain, subcarrier spacing of subcarriers included in the first subband}.						

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Claim	Accused Products
signal is used for determining at least one of {location of the first subband in frequency domain, subcarrier spacing of subcarriers included in the first subband}.	See claim 1 above. For example, the Accused Products receive a second radio signal (e.g., PBCH). For example, the second radio signal is used for determining the location of the first subband in frequency domain (e.g., MIB that carries the SIB1) and subcarrier spacing of subcarriers included in the first subband (e.g., subcarrierSpacingCommon). 5.2.5.5 Reception of SIB1 The Master Information Block (MIB) on PBCH provides the UE with parameters (e.g. CORESET#0 configuration) for monitoring of PDCCH for scheduling PDSCH that carries the System Information Block 1 (SIB1). PBCH may also TS38.300 V15.5.0 6.2.2 Message definitions MIB <pre> -- ASN1START -- TAG-MIB-START MIB ::= systemFrameNumber BIT STRING (SIZE (6)), subCarrierSpacingCommon ENUMERATED {scs15or60, scs30or120}, ssb-SubcarrierOffset INTEGER (0..15), dmrs-TypeA-Position ENUMERATED {pos2, pos3}, pdcch-ConfigSIB1 PDCCH-ConfigSIB1, cellBarred ENUMERATED {barred, notBarred}, intraFreqReselection ENUMERATED {allowed, notAllowed}, spare BIT STRING (SIZE (1)) } -- TAG-MIB-STOP -- ASN1STOP </pre> TS38.331 V15.3.0

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Claim	Accused Products
	6.3.2 Radio resource control information elements ControlResourceSetZero The IE <i>ControlResourceSetZero</i> is used to configure CORESET#0 of the initial BWP (see TS 38.213 [13], section 13). ControlResourceSetZero information element <pre>-- ASN1START -- TAG-CONTROLRESOURCESETZERO-START ControlResourceSetZero ::= INTEGER (0..15) -- TAG-CONTROLRESOURCESETZERO-STOP -- ASN1STOP</pre> TS38.331 V15.3.0 13 UE procdure for monitoring Type0-PDCCH common search space The offset in Tables 13-1 through 13-10 is defined with respect to the subcarrier spacing of the control resource set for Type0-PDCCH common search space, provided by higher layer parameter <i>subCarrierSpacingCommon</i>, from the smallest RB index of the control resource set for Type0-PDCCH common search space to the smallest RB index of the common RB overlapping with the first RB of the corresponding SS/PBCH block. In Tables 13-7, 13-8, and 13-10 k_{SSB} is defined in [4, TS 38.211].

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Claim	Accused Products																																																																																					
	Table 13-1: Set of resource blocks and slot symbols of control resource set for Type0-PDCCH search space when {SS/PBCH block, PDCCH} subcarrier spacing is {15, 15} kHz for frequency bands with minimum channel bandwidth 5 MHz or 10 MHz <table><tr><th>Index</th><th>SS/PBCH block and control resource set multiplexing pattern</th><th>Number of RBs $N_{RB}^{CORESET}$</th><th>Number of Symbols $N_{sym}^{CORESET}$</th><th>Offset (RBs)</th></tr><tr><td>0</td><td>1</td><td>24</td><td>2</td><td>0</td></tr><tr><td>1</td><td>1</td><td>24</td><td>2</td><td>2</td></tr><tr><td>2</td><td>1</td><td>24</td><td>2</td><td>4</td></tr><tr><td>3</td><td>1</td><td>24</td><td>3</td><td>0</td></tr><tr><td>4</td><td>1</td><td>24</td><td>3</td><td>2</td></tr><tr><td>5</td><td>1</td><td>24</td><td>3</td><td>4</td></tr><tr><td>6</td><td>1</td><td>48</td><td>1</td><td>12</td></tr><tr><td>7</td><td>1</td><td>48</td><td>1</td><td>16</td></tr><tr><td>8</td><td>1</td><td>48</td><td>2</td><td>12</td></tr><tr><td>9</td><td>1</td><td>48</td><td>2</td><td>16</td></tr><tr><td>10</td><td>1</td><td>48</td><td>3</td><td>12</td></tr><tr><td>11</td><td>1</td><td>48</td><td>3</td><td>16</td></tr><tr><td>12</td><td>1</td><td>96</td><td>1</td><td>38</td></tr><tr><td>13</td><td>1</td><td>96</td><td>2</td><td>38</td></tr><tr><td>14</td><td>1</td><td>96</td><td>3</td><td>38</td></tr><tr><td>15</td><td colspan="4">Reserved</td></tr></table> TS38.213 V15.3.0 Plaintiff reserves the right to amend or supplement these contentions after the inspection of source code, after the issuance of any claim construction order, and for any other reason as permitted by the Court.	Index	SS/PBCH block and control resource set multiplexing pattern	Number of RBs $N_{RB}^{CORESET}$	Number of Symbols $N_{sym}^{CORESET}$	Offset (RBs)	0	1	24	2	0	1	1	24	2	2	2	1	24	2	4	3	1	24	3	0	4	1	24	3	2	5	1	24	3	4	6	1	48	1	12	7	1	48	1	16	8	1	48	2	12	9	1	48	2	16	10	1	48	3	12	11	1	48	3	16	12	1	96	1	38	13	1	96	2	38	14	1	96	3	38	15	Reserved			
Index	SS/PBCH block and control resource set multiplexing pattern	Number of RBs $N_{RB}^{CORESET}$	Number of Symbols $N_{sym}^{CORESET}$	Offset (RBs)																																																																																		
0	1	24	2	0																																																																																		
1	1	24	2	2																																																																																		
2	1	24	2	4																																																																																		
3	1	24	3	0																																																																																		
4	1	24	3	2																																																																																		
5	1	24	3	4																																																																																		
6	1	48	1	12																																																																																		
7	1	48	1	16																																																																																		
8	1	48	2	12																																																																																		
9	1	48	2	16																																																																																		
10	1	48	3	12																																																																																		
11	1	48	3	16																																																																																		
12	1	96	1	38																																																																																		
13	1	96	2	38																																																																																		
14	1	96	3	38																																																																																		
15	Reserved																																																																																					
5. The method according to claim 1, further comprising: receiving a second signaling; wherein the second signaling is used for determining Q subbands, Q being a positive integer; the first subband belongs to one of the Q subbands; any one of the	See claims 1 and 2.																																																																																					

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Claim	Accused Products
Q subbands comprises a positive integer number of consecutive subcarriers; and the feature ID of the monitor of the first signaling is used for determining the first subband in the Q subbands.	
[11P] A UE for paging, comprising:	<i>See element [1P].</i>
[11A] a first receiver module, to monitor a first signaling in X time intervals; and a second receiver module, to receive a first radio signal; wherein X is a positive integer;	<i>See element [1A].</i>
[11B] the first signaling is used for determining scheduling information for the first radio signal; the scheduling information comprises at least one of {occupied time-frequency resource, adopted MCS, subcarrier spacing of subcarriers in occupied frequency domain resource};	<i>See element [1B].</i>
[11C] the first radio signal carries a paging message; the frequency domain resource used for transmitting the first signaling belongs to a first subband; the first subband comprises a positive integer number of consecutive subcarriers in frequency domain; and	<i>See element [1C].</i>
[11D] at least one of {location of the first subband in frequency domain, subcarrier spacing of subcarriers included in the first subband} is used for determining the X time intervals.	<i>See element [1D].</i>

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Claim	Accused Products
12. The UE according to claim 11, wherein any one of the X time intervals belongs to a first time window in time domain; the time length of the first time window is predefined; the first time window is divided into Y time intervals; the X time intervals are X time intervals of the Y time intervals, Y being a positive integer not smaller than X; the subcarrier spacing of subcarriers included in the first subband is used for determining Y; and a feature ID of a monitor of the first signaling is used for determining the X time intervals in the Y time intervals.	<i>See Claim 2.</i>
13. The UE according to claim 12, wherein the first time window belongs to one of Z time windows, Z being an integer greater than 1; Z is predefined, or Z is configurable; any two of the Z time windows have an equal time length; and the feature ID of the monitor of the first signaling is used for determining the first time window in the Z time windows.	<i>See Claim 3.</i>
14. The UE according to claim 11, wherein the first receiver module further receives a second radio signal; the second radio signal is for determining at least one of {location of the first subband in frequency domain, subcarrier spacing of subcarriers included in the first subband}.	<i>See Claim 4.</i>

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Claim	Accused Products
15. The UE according to claim 11, wherein the first receiver module further receives a second signaling; the second signaling is for determining Q subbands, Q being a positive integer; the first subband belongs to one of the Q subbands; any one of the Q subbands comprises a positive integer number of consecutive subcarriers; and the feature ID of the monitor of the first signaling is used for determining the first subband in the Q subbands.	<i>See Claim 5.</i>