



Apple iPhone Technical Description

Models: A3212, A3408, A3409, A3410

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1. Overview

The Apple iPhone is a smartphone with GSM, GPRS, EGPRS, WCDMA, LTE, 5G NR1, IEEE 802.11a/b/g/n/ac/ax, Bluetooth (BT), Global Positioning System (GPS), Near-Field Communication (NFC) and Mobile Satellite Service (MSS) technologies. The rechargeable battery is not user accessible. This device is not user-serviceable and requires special tools to disassemble.

Table 1 - Model Summary

Model	FCC ID	IC ID	B14/29/71	MSS B53/n53	SIM Support	Reference Model
A3212	BCG-E8725A	579C-E8725A	Yes	Yes	eSIM	-
A3408	BCG-E8726A	579C-E8726A	Yes	Yes	eSIM+pSIM	A3212
A3409	BCG-E8727A	579C-E8727A	No	Yes	eSIM+pSIM	
A3410	BCG-E8728A	579C-E8728A	No	No	pSIM+pSIM	

Note:

- All models have the same PCB layout, circuit design, common components, antennas and antenna locations across their respective reference model (Table 1). The cellular modem, Wi-Fi, BT, NFC and MSS transmitters are identical.
- Removal of LTE/NR (B14/29/53/71) and MSS bands is done by de-population of directly related components.

2. Device Features

Table 2 - Device Features

Antennas/Dimensions	Refer to the Antenna Locations document	
Wireless Features	Refer to the separate System Block Diagram, System Electrical Schematics and Wi-Fi/BT/Cellular/MSS Block Diagram.	
Mechanical Design/Controls	Front Face:	Multi-Touch panel, OLED display, front camera, earpiece receiver, microphone
	Left Side:	Ring/silent switch, volume up/down buttons, UICC SIM Slot (For applicable models)
	Top Edge:	N/A
	Right Side:	Sleep/wake/power button.
	Bottom Edge:	Microphones, I/O dock connector (USB-C), speakers.
	Back Housing:	Rear camera, microphone, flashlight.
Included Accessories	Apple USB-C to USB-C Cable	



3. Hardware Specifications

Table 3 - Hardware Specifications

Model	A3212	A3408	A3409	A3410
Dimensions (mm)	71.5 x 146.7 x 7.8 mm			
Display (Inch)	6.06"			
Front Camera	12.2 MP			
Rear Camera	48 MP			
Weight(g)	166.2g	166.8g		
Storage Capacity	128GB, 256GB, 512GB, 1TB			
RAM Size	8 GB			
Battery Specs	4005 mAh			
Operating Temperatures	0° and 35° C (32° to 95° F)			
Storage Temperatures	-20° and 45° C (-4° to 113° F)			

4. Cellular Radio

The cellular radio (U_BB_C, TMRP15C0-C1) provides GSM, GPRS, EGPRS, WCDMA, LTE and 5G radio functions. The device supports LTE Uplink Cat 18, LTE 3GPP Rel-16 (PC2 for B41), 5G NR Rel 16 (PC2 for n41, n77, n78, n79) and VoLTE/VoNR. Where the hardware is capable, refer to Table 1, the product supports LTE with 5GNR1. The device supports intra/inter-band LTE Carrier Aggregation on both downlink/uplinks. For 5GNR1, the device supports inter/intra-band for downlink.

Appendix A covers full Cellular Radio Band matrix support and Appendix C covers ULCA/ENDC Combos.

5. Mobile Satellite Service (MSS)

This device supports Mobile Satellite Service with Tx in the L-Band (1610 – 1626.5 MHz) and Rx in the S-Band (2483.5 – 2500 MHz). Radio Astronomy Zone exclusion requirement is implemented by Geo-fencing in Software. Transmit frequency will be changed based on network direction when the Astronomy site location is detected. Refer to Table 1 for model support.

Table 4 - MSS Features

Mobile Satellite Service (MSS)	
Bands	Tx: L-Band (1610 – 1626.5 MHz) * and Rx: S-Band (2483.5 – 2500 MHz)
Chip	U_BB_C
Antenna	Tx: ANT 1 and ANT 4
Modulation	Tx: 1PRB LTE SC-FDMA, BPSK Rx: $\pi/2$ -BPSK

- *Tx Range depends on Country of Operation.



6. Near-field Communication (NFC)

The NFC radio (NFC_P) operates at 13.56 MHz and supports Reader (PCD) mode and Card Emulation (CE) mode. NFC Antenna is located with ANT2+ANT4. The components used to implement this technology are not user accessible.

Table 5 - NFC Features

Technology	Supported Features	Modulation	Sub Carriers	Rate	Comments
NFC 13.56 MHz	Type A	Manchester	$f_c/16$	106, 212, 424, 848 kbps	ISO14443
	Type B	BPSK	$f_c/16$	106, 212, 424, 848 kbps	ISO14443
	Type F	Manchester	NA	212, 424 kbps	FeliCa JIS:X6319-4
	ISO15693	ASK 1 out of 4, ASK 1 out of 256	$f_c/32$	26.48 kbps, 1.66 kbps	

7. Wireless Power Transfer (WPT)

The device supports an inductive charging system which operates at 127.7 kHz. This device operates only in receiver mode.

8. Wireless Local Area Network (WLAN) and Bluetooth (BT)

The IEEE 802.11a/b/g/n/ac/ax and Bluetooth radio (BCM 4387, U_WLAN_W) is mounted on the main PCB, supported on the same chip. The Wi-Fi/BT transceiver and baseband chip are clocked by 59.97MHz crystal. The device does not support simultaneous transmission on 2.4 GHz and 5 GHz on the uplink. Wi-Fi 2.4 GHz and Bluetooth time-share the same antenna and cannot transmit simultaneously. Bluetooth can simultaneously transmit with IEEE 802.11a/n/ac/ax 5 GHz. The Cellular radio (GSM/EDGE/WCDMA/LTE/FR1) can transmit simultaneously with the Wi-Fi/BT radio. The device has a wireless router (hotspot) function that allows it to share its cellular data connection via 2.4 GHz and 5GHz (Only on non-DFS channels in UNII-1). The device discontinues transmission when there is no information to transmit or operational failure per standard 802.11 protocol. BCM4387 has 2 vendors. All the Wi-Fi/BT radio modules have the same mechanical outline (e.g., the same package dimension and pin-out layout), use the same on-board antenna matching circuit, have an identical antenna structure, and are built and tested to conform to the same specifications and to operate within the same tolerances. Baseline testing was performed on the two variants to determine the worst case on all conducted power and radiated emissions.

A full Wi-Fi Radio Band support matrix is covered by the Product Specifications document; see Appendix A.

Full simultaneous transmit support is covered by the Simultaneous Transmit Policy; see Appendix B.

Table 6 – Wi-Fi Features

Wi-Fi	
STANDARD	2.4 GHz: IEEE 802.11b/g/n (HT20), IEEE 802.11ax (HE20) 5 GHz: IEEE 802.11a/n (HT20, HT40), IEEE 802.11ac (VHT20, VHT40, VHT80), IEEE 802.11ax (HE20, HE40, HE80).
SPECTRUM	2.4, 5 bands. (Channel support may differ based on region)
MODULATION	DSSS, CCK, OFDM.
CHIP	BCM4387 (U_WLAN_W)

The device associates with and is controlled by the access point based on the information elements broadcasted by the access point as defined in 802.11ax:2020.



Table 7 - Regional Wi-Fi 2.4 GHz and 5.0 GHz Supported Frequency Bands

Wi-Fi Support by Region	ISM 2.4 GHz (2400 - 2483.5 MHz)	UNII-1 (5150 - 5250 MHz)	UNII-2A (5250 - 5350 MHz)	UNII-2C (5470 - 5725 MHz)	UNII-3 (5725 - 5850 MHz)
USA ¹ , Canada, Brazil, Hong Kong, Indonesia, Korea, New Zealand, Singapore, Taiwan, Thailand, United Arab Emirates	✓	✓	✓	✓	✓
EU, United Kingdom, Turkey, South Africa	✓	✓	✓	*No CH 144	✓
Australia, Mexico	✓	✓	✓	*No CH 120-128	✓
China	✓	✓	✓	X	✓
Japan	✓	✓	✓	✓	X
Malaysia	✓	✓	✓	*No CH 132-144	✓
✓ = supported, X = not supported, * = Partial Support, all countries not included Notes ¹ The following channels are set for Active/Passive Scanning in the FCC domain: Channels 1 – 11: Active Channels 12 –13: Passive Scanning Channels 36 – 48: Active Channels 52 – 144: Passive Scanning/DFS (Client only) Channels 149 – 165: Active					

Table 8 - IEEE 802.11a/b/g Wi-Fi Modulation Support

IEEE 802.11b		IEEE 802.11a/g	
PHY Data Rate (Mbps)	Modulation	PHY Data Rate (Mbps)	Modulation
1	BPSK	6	BPSK
2	QPSK	9	BPSK
5.5	QPSK-CCK	12	QPSK
11	QPSK-CCK	18	QPSK
-	-	24	16-QAM
-	-	36	16-QAM
-	-	48	64-QAM
-	-	54	64-QAM

Table 9 - IEEE 802.11n Wi-Fi Modulation Support

IEEE 802.11n						
MCS Index	800ns GI			400 ns GI		
	PHY Data Rate (Mbps)		Modulation	PHY Data Rate (Mbps)		Modulation
	HT20	HT40		HT20	HT40	
0	6.5	13.5	BPSK	7.2	15.0	BPSK
1	13.0	27.0	QPSK	14.4	30.0	QPSK
2	19.5	40.5	QPSK	21.7	45.0	QPSK
3	26.0	54.0	16-QAM	28.9	60.0	16-QAM
4	39.0	81.0	16-QAM	43.3	90.0	16-QAM
5	52.0	108.0	64-QAM	57.8	120.0	64-QAM



6	58.5	121.5	64-QAM	65.0	135.0	64-QAM
7	65.0	135.0	64-QAM	72.2	150.0	64-QAM
8	13.0	27.0	BPSK	14.4	30.0	BPSK
9	26.0	54.0	QPSK	28.9	60.0	QPSK
10	39.0	81.0	QPSK	43.3	90.0	QPSK
11	52.0	108.0	16-QAM	57.8	120.0	16-QAM
12	78.0	162.0	16-QAM	86.7	180.0	16-QAM
13	104.0	216.0	64-QAM	115.6	240.0	64-QAM
14	117.0	243.0	64-QAM	130.0	270.0	64-QAM
15	130.0	270.0	64-QAM	144.4	300.0	64-QAM

Table 10 - IEEE 802.11ac Wi-Fi Modulation Support

IEEE 802.11ac								
MCS Index	800 ns				400 ns			
	PHY Data Rate (Mbps)			Modulation	PHY Data Rate (Mbps)			Modulation
	VHT20	VHT40	VHT80		VHT20	VHT40	VHT80	
Nss=1								
0	6.5	13.5	29.3	BPSK	7.2	15.0	32.5	BPSK
1	13.0	27.0	58.5	QPSK	14.4	30.0	65.0	QPSK
2	19.5	40.5	87.8	QPSK	21.7	45.0	97.5	QPSK
3	26.0	54.0	117.0	16-QAM	28.9	60.0	130.0	16-QAM
4	39.0	81.0	175.5	16-QAM	43.3	90.0	195.0	16-QAM
5	52.0	108.0	234.0	64-QAM	57.8	120.0	260.0	64-QAM
6	58.5	121.5	263.3	64-QAM	65.0	135.0	292.5	64-QAM
7	65.0	135.0	292.5	64-QAM	72.2	150.0	325.0	64-QAM
8	78.0	162.0	351.0	256-QAM	86.7	180.0	390.0	256-QAM
9	-	180.0	390.0	256-QAM	-	220.0	433.3	256-QAM
Nss=2								
0	13.0	27.0	58.5	BPSK	14.4	30.0	65.0	BPSK
1	26.0	54.0	117.0	QPSK	28.9	60.0	130.0	QPSK
2	39.0	81.0	175.5	QPSK	43.3	90.0	195.0	QPSK
3	52.0	108.0	234.0	16-QAM	57.8	120.0	260.0	16-QAM
4	78.0	162.0	351.0	16-QAM	86.7	180.0	390.0	16-QAM
5	104.0	216.0	468.0	64-QAM	115.6	240.0	520.0	64-QAM
6	117.0	243.0	536.5	64-QAM	130.0	270.0	585.5	64-QAM
7	130.0	270.0	585.0	64-QAM	144.4	300.0	650.0	64-QAM
8	156.0	324.0	702.0	256-QAM	173.3	360.0	780.0	256-QAM
9	-	360.0	780.0	256-QAM	-	400.0	866.7	256-QAM

Table 11 - IEEE 802.11ax SU Wi-Fi Modulation Support

IEEE 802.11ax SU										
	800 ns GI			1600 ns GI			3200 ns GI			
MCS Index	PHY Data Rate (Mbps)			PHY Data Rate (Mbps)			PHY Data Rate (Mbps)			Modulation
	HE20/ EHT20	HE40/ EHT40	HE80/ EHT80	HE20/ EHT20	HE40/ EHT40	HE80/ EHT80	HE20/ EHT20	HE40/ EHT40	HE80/ EHT80	
Nss=1										
0	8.6	17.2	36	8.1	16.3	34	7.3	14.6	30.6	BPSK
1	17.2	34.4	72.1	16.3	32.5	68.1	14.6	29.3	61.3	QPSK
2	25.8	51.6	108.1	24.4	48.8	102.1	21.9	43.9	91.9	QPSK
3	34.4	68.8	144.1	32.5	65	136.1	29.3	58.5	122.5	16-QAM
4	51.6	103.2	216.2	48.8	97.5	204.2	43.9	87.8	183.8	16-QAM
5	68.8	137.6	288.2	65	130	272.2	58.5	117	245	64-QAM



6	77.4	154.9	324.3	73.1	146.3	306.3	65.8	131.6	275.6	64-QAM
7	86	172.1	360.3	81.3	162.5	340.3	73.1	146.3	306.3	64-QAM
8	103.2	206.5	432.4	97.5	195	408.3	87.8	175.5	367.5	256-QAM
9	114.7	229.4	480.4	108.3	216.7	453.7	97.5	195	408.3	256-QAM
10 ¹	129	258.1	540.4	121.9	243.8	510.4	109.7	219.4	459.4	1024-QAM
11 ¹	143.4	286.8	600.5	135.4	270.8	567.1	121.9	243.8	510.4	1024-QAM
Nss=2										
0	17.2	34.4	72.1	16.3	32.5	68.1	14.6	29.3	61.3	BPSK
1	34.4	68.8	144.1	32.5	65	136.1	29.3	58.5	122.5	QPSK
2	51.6	103.2	216.2	48.8	97.5	204.2	43.9	87.8	183.8	QPSK
3	68.8	137.6	288.2	65	130	272.2	58.5	117	245	16-QAM
4	103.2	206.5	432.4	97.5	195	408.3	87.8	175.5	367.5	16-QAM
5	137.6	275.3	576.5	130	260	544.4	117	234	490	64-QAM
6	154.9	309.7	648.5	146.3	292.5	612.5	131.6	263.3	551.3	64-QAM
7	172.1	344.1	720.6	162.5	325	680.6	146.3	292.5	612.5	64-QAM
8	206.5	412.9	864.7	195	390	816.7	175.5	351	735	256-QAM
9	229.4	458.8	960.8	216.7	433.3	907.4	195	390	816.7	256-QAM
10 ¹	258.1	516.2	1080.9	243.8	487.5	1020.8	219.4	438.8	918.8	1024-QAM
11 ¹	286.8	573.5	1201	270.8	541.7	1134.3	243.8	487.5	1020.8	1024-QAM
Notes										
¹ Only available in 5 GHz										

Table 12 - IEEE 802.11ax Sub-RU 800 ns GI

802.11ax Sub-RU							
	800 ns GI						Modulation
MCS Index	PHY Data Rate (Mbps)						
	26-Tone RU	52-Tone RU	106-Tone RU	242-Tone RU	484-Tone RU	996-Tone RU	
Nss=1							
0	0.9	1.8	3.8	8.6	17.2	36	BPSK
1	1.8	3.5	7.5	17.2	34.4	72.1	QPSK
2	2.6	5.3	11.3	25.8	51.6	108.1	QPSK
3	3.5	7.1	15	34.4	68.8	144.1	16-QAM
4	5.3	10.6	22.5	51.6	103.2	216.2	16-QAM
5	7.1	14.1	30	68.8	137.6	288.2	64-QAM
6	7.9	15.9	33.8	77.4	154.9	324.3	64-QAM
7	8.8	17.6	37.5	86	172.1	360.3	64-QAM
8	10.6	21.2	45	103.2	206.5	432.4	256-QAM
9	11.8	23.5	50	114.7	229.4	480.4	256-QAM
10 ¹	13.2	26.5	56.3	129	258.1	540.4	1024-QAM
11 ¹	14.7	29.4	62.5	143.4	286.8	600.5	1024-QAM
Nss=2							
0	1.8	3.5	7.5	17.2	34.4	72.1	BPSK
1	3.5	7.1	15	34.4	68.8	144.1	QPSK
2	5.3	10.6	22.5	51.6	103.2	216.2	QPSK
3	7.1	14.1	30	68.8	137.6	288.2	16-QAM
4	10.6	21.2	45	103.2	206.5	432.4	16-QAM
5	14.1	28.2	60	137.6	275.3	576.5	64-QAM
6	15.9	31.8	67.5	154.9	309.7	648.5	64-QAM



802.11ax Sub-RU							
	800 ns GI						
MCS Index	PHY Data Rate (Mbps)						Modulation
	26-Tone RU	52-Tone RU	106-Tone RU	242-Tone RU	484-Tone RU	996-Tone RU	
7	17.6	35.3	75	172.1	344.1	720.6	64-QAM
8	21.2	42.4	90	206.5	412.9	864.7	256-QAM
9	23.5	47.1	100	229.4	458.8	960.8	256-QAM
10 ¹	26.5	52.9	112.5	258.1	516.2	1080.9	1024-QAM
11 ¹	29.4	58.8	125	286.8	573.5	1201	1024-QAM
Notes							
¹Only available in 5 GHz							

Table 13 - IEEE 802.11ax Sub-RU 1600 ns GI

802.11ax Sub-RU							
	1600 ns GI						
MCS Index	PHY Data Rate (Mbps)						Modulation
	26-Tone RU	52-Tone RU	106-Tone RU	242-Tone RU	484-Tone RU	996-Tone RU	
Nss=1							
0	0.8	1.7	3.5	8.1	16.3	34	BPSK
1	1.7	3.3	7.1	16.3	32.5	68.1	QPSK
2	2.5	5	10.6	24.4	48.8	102.1	QPSK
3	3.3	6.7	14.2	32.5	65	136.1	16-QAM
4	5	10	21.3	48.8	97.5	204.2	16-QAM
5	6.7	13.3	28.3	65	130	272.2	64-QAM
6	7.5	15	31.9	73.1	146.3	306.3	64-QAM
7	8.3	16.7	35.4	81.3	162.5	340.3	64-QAM
8	10	20	42.5	97.5	195	408.3	256-QAM
9	11.1	22.2	47.2	108.3	216.7	453.7	256-QAM
10 ¹	12.5	25	53.1	121.9	243.8	510.4	1024-QAM
11 ¹	13.9	27.8	59	135.4	270.8	567.1	1024-QAM
Nss=2							
0	1.7	3.3	7.1	16.3	32.5	68.1	BPSK
1	3.3	6.7	14.2	32.5	65	136.1	QPSK
2	5	10	21.3	48.8	97.5	204.2	QPSK
3	6.7	13.3	28.3	65	130	272.2	16-QAM
4	10	20	42.5	97.5	195	408.3	16-QAM
5	13.3	26.7	56.7	130	260	544.4	64-QAM
6	15	30	63.8	146.3	292.5	612.5	64-QAM
7	16.7	33.3	70.8	162.5	325	680.6	64-QAM
8	20	40	85	195	390	816.7	256-QAM
9	22.2	44.4	94.4	216.7	433.3	907.4	256-QAM
10 ¹	25	50	106.3	243.8	487.5	1020.8	1024-QAM
11 ¹	27.8	55.6	118.1	270.8	541.7	1134.3	1024-QAM
Notes							
¹Only available in 5 GHz							



Table 14 - IEEE 802.11ax Sub-RU 3200 ns GI

802.11ax Sub-RU							
3200 ns GI							
MCS Index	PHY Data Rate (Mbps)						Modulation
	26-Tone RU	52-Tone RU	106-Tone RU	242-Tone RU	484-Tone RU	996-Tone RU	
Nss=1							
0	0.8	1.5	3.2	7.3	14.6	30.6	BPSK
1	1.5	3	6.4	14.6	29.3	61.3	QPSK
2	2.3	4.5	9.6	21.9	43.9	91.9	QPSK
3	3	6	12.8	29.3	58.5	122.5	16-QAM
4	4.5	9	19.1	43.9	87.8	183.8	16-QAM
5	6	12	25.5	58.5	117	245	64-QAM
6	6.8	13.5	28.7	65.8	131.6	275.6	64-QAM
7	7.5	15	31.9	73.1	146.3	306.3	64-QAM
8	9	18	38.3	87.8	175.5	367.5	256-QAM
9	10	20	42.5	97.5	195	408.3	256-QAM
10 ¹	11.3	22.5	47.8	109.7	219.4	459.4	1024-QAM
11 ¹	12.5	25	53.1	121.9	243.8	510.4	1024-QAM
Nss=2							
0	1.5	3	6.4	14.6	29.3	61.3	BPSK
1	3	6	12.8	29.3	58.5	122.5	QPSK
2	4.5	9	19.1	43.9	87.8	183.8	QPSK
3	6	12	25.5	58.5	117	245	16-QAM
4	9	18	38.3	87.8	175.5	367.5	16-QAM
5	12	24	51	117	234	490	64-QAM
6	13.5	27	57.4	131.6	263.3	551.3	64-QAM
7	15	30	63.8	146.3	292.5	612.5	64-QAM
8	18	36	76.5	175.5	351	735	256-QAM
9	20	40	85	195	390	816.7	256-QAM
10 ¹	22.5	45	95.6	219.4	438.8	918.8	1024-QAM
11 ¹	25	50	106.3	243.8	487.5	1020.8	1024-QAM
Notes							
¹ Only available in 5 GHz							

8.1. Bluetooth Channel Support

The Bluetooth radio follows the Bluetooth 5.3 LE and EDR standards. A full Bluetooth Radio Band support matrix is covered by the Product Specifications document; see Appendix A.

Table 15 - Bluetooth Features

Bluetooth	
Standard	Bluetooth 5.3 (BDR, EDR and HDR), Bluetooth low energy.
Spectrum	2.4 GHz
Chip	BCM4387 (U_WLAN_W)



Bluetooth	
Modulation	GFSK, $\pi/4$ -Shifted DQPSK, 8DPSK

Table 16 – Bluetooth Modulation Support

Data Rate (Mbps)	Mode	Modulation	Number of Channels
1	BDR	GFSK	79
2	EDR2	$\pi/4$ -Shifted DQPSK	
3	EDR3	8DPSK	
4	HDR4	$\pi/4$ -Shifted DQPSK	73
8	HDR8	$\pi/4$ -Shifted DQPSK	
1	LE1M	GFSK	40
2	LE2M	GFSK	

In the event interference is detected, Adaptive Frequency Hopping mode is supported which allows operation over as few as 20 channels.

This device supports BT beamforming. BT beamforming implements implicit beamforming. It assumes that the channel is reciprocal (propagation condition is identical in both directions). The beamformer doesn't require any sounding packets to be sent. It uses any BT packet received from the beamformee to estimate the propagation channel and compute the beamforming coefficients.

9. Dynamic Frequency Selection (DFS)

This device supports Dynamic Frequency Selection and Transmit Power Control in client mode as defined in IEEE 802.11h specifications. This device is a client without radar detection capability. Future changes to any Apple Operating System used in this device will not change the DFS operational characteristics, in any mode of operation. All regulatory parameters within this device such as transmitter power can only be modified within the Apple factory environment and not by the end user.

10. Airplay

This device supports AirPlay, as well as AirDrop and AirPrint with the only difference in user interface. This mode uses 2.4 GHz, 5 GHz as a client device in Access Point (AP) assisted mode. While using this mode, the transmitter can also be active in any of the supported air interfaces.

AirPlay is an Apple developed feature that lets users wirelessly stream what's on their devices to an HDTV and speakers via Apple TV.

AirPlay will only use DFS channels if:

- both source and sink devices are connected to the same AP, and
- both source and sink devices are Secondary to a DFS Primary on the same DFS channel, and
- the source and sink devices will both comply with the client channel move time and channel closing transmission time requirements when the Primary sends a frequency control command.

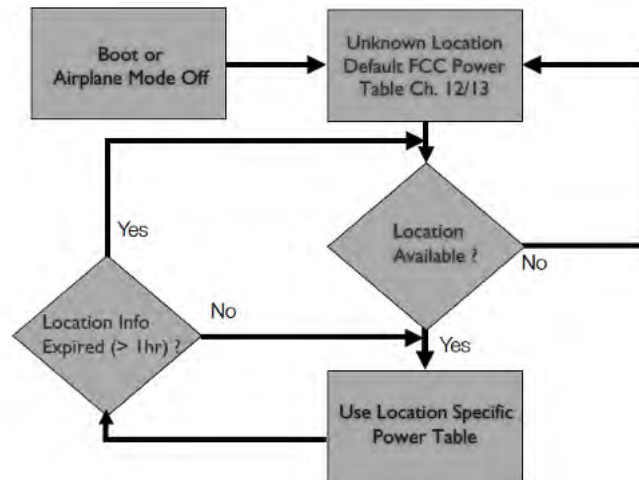
AirPlay also supports direct communication between compatible Apple device and Apple TV on non-DFS channels only.

In this mode, this device does not initiate transmission of any probes or beacons and does not initiate Ad-Hoc operations when not associated with and under the control of a Primary device.

This mode uses the same 802.11 air interface, power levels and power control mechanism as a regular Wi-Fi transmitter. It is not supported when the device is in hotspot operation.

11. Channel 12 – 13 Operation

The operation in channels 12-13 based on geolocation determination as illustrated in the following flowchart.



The device uses GNSS, MCC/MNC to detect the geolocation. In the absence of GNSS or MCC/MNC information, the device uses Wi-Fi MAC address based geolocation detection described below:

The device performs a Wi-Fi scan for visible Wi-Fi MAC addresses. Apple maintains a crowd-sourced database of Wi-Fi access point locations, indexed by MAC address. Visible MAC addresses are queried from Apple's location servers or may already be resident in a local cache on the device. Locations are calculated by combining information from the visible MAC addresses scanned and the Wi-Fi AP location information provided by Apple servers. The location information is accurate 99.9% of the time with accuracy better than 10 km.

The location information is re-checked when:

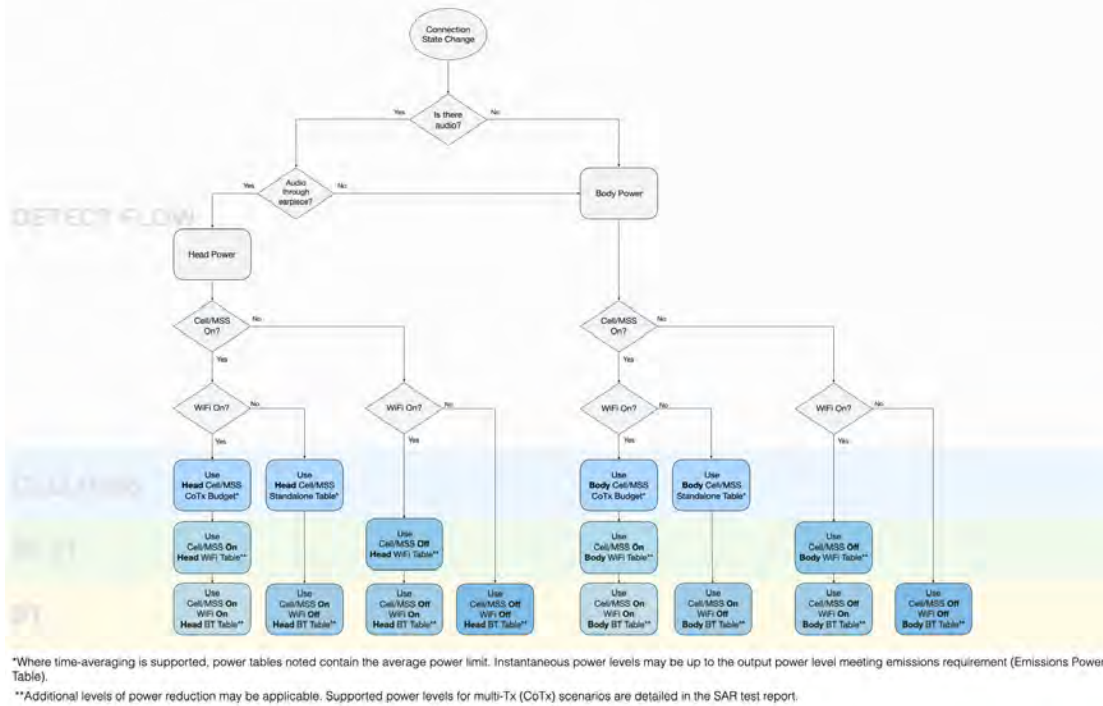
1. The device is switched On
2. When Airplane mode is turned Off
3. Every 1 hour, if the device is operating with a previously identified location

802.11d is not used for location determination. The device is tested and verified that it uses MAC address-based geolocation for the location determination. In the absence of geo location, the device uses FCC compliant power.

12. Power Control Settings

The setting of power levels for the cellular, Wi-Fi and Bluetooth are summarized below.

- The cellular power depends on whether there is a voice call routed to the earpiece (receiver).
- The Wi-Fi/Bluetooth power setting depends on the status of other active transmitters The flowchart below depicts the power setting algorithm.



The resulting power table is hard-coded and not configurable or overridable by the user or the network.

13. GNSS

The device supports GNSS Positioning Data Rx only.
The GPS Rx Signal is processed by GPS LNA's (FL_ANT2_C), (U_L5LNA_C) and GPS filters before reaching to RF Transceiver (TMQU16C0-P1).

Table 17 - GNSS Features

STANDARD	GPS, AGPS, Galileo, GLONASS, BeiDou, QZSS, NavIC (Standard support varies based on country)
SPECTRUM	L1-C, E1, B1-C, L1OF, L5-Q, E5a, B2a, B1I

14. Time Averaged SAR (TAS)/Dynamic SAR Averaging (DSA)*

This device incorporates RF Exposure time-averaging for cellular/MSS technologies. This algorithm controls the instantaneous Tx power for cellular/MSS technologies and maintains compliance of the time-averaged power over the applicable regulatory time window. In certain cases, RF Exposure consumption, and thus maximum uplink transmit power, may be capped to values lower than P_{max} depending on the duty cycle of operation. Dynamic budget sharing is supported for this device. The total exposure ratio (TER) is calculated and tracked over time to maintain total device compliance.

This device utilizes a time averaged power control mechanism that ensures total power across all WLAN transmitters does not exceed applicable regulatory limits. Transmit duration and power are tracked individually for each transmitter and averaged over the previous 60 seconds. Each of these contributions is then aggregated together to derive an overall system utilization ratio, which represents the total time averaged WLAN system energy contribution relative to its regulatory limit. The correction factor has been applied for 360s to 60s (BCM4387) as per Regulatory domain. Bluetooth transmissions are not time averaged.

* These features will be enabled only in the country it is supported.



Appendix A. Product Specifications

Table 18 - Product Specifications

Wireless Technology	Band	FCC	IC	Air Interfaces	Uplink Modulation
GSM UL: 236.8kbps, DL: 296kbps	EGSM900			GPRS, EGPRS, MS Class 10	GMSK, 8PSK
	DCS1800				
	GSM850	✓	✓		
	PCS1900	✓	✓		
WCDMA UL: 5.76Mbps, DL: 42.2 Mbps	1			Rel99, HSDPA Rel-5, CAT 10; HSUPA Rel-6, CAT 6; HSPA+ Rel-7, CAT 14	QPSK, 16QAM, 64QAM
	2	✓	✓		
	4	✓	✓		
	5	✓	✓		
	6				
	8				
LTE FDD Rel-16 UL Cat 18 UL: 211Mbps DL: 2Gbps	1			5/10/15/20 MHz	QPSK, 16QAM, 64QAM, 256QAM
	2	✓	✓	1.4/3/5/10/15/20 MHz	
	3			1.4/3/5/10/15/20 MHz	
	4	✓	✓	1.4/3/5/10/15/20 MHz	
	5	✓	✓	1.4/3/5/10 MHz	
	7	✓	✓	5/10/15/20 MHz	
	8			1.4/3/5/10 MHz	
	12	✓	✓	1.4/3/5/10 MHz	
	13	✓	✓	5/10 MHz	
	14	✓	✓	5/10 MHz	
	17	✓	✓	5/10 MHz	
	18			5/10/15 MHz	
	19			5/10/15 MHz	
	20			5/10/15/20 MHz	
	25	✓	✓	1.4/3/5/10/15/20 MHz	
	26	✓		1.4/3/5/10/15 MHz (15MHz not supported for FCC)	
	28			3/5/10/15/20 MHz	
	29 (DL)			3/5/10MHz	
	30	✓	✓	5/10MHz	
	32			5/10/15/20 MHz	
LTE TDD Rel-16 UL Cat 18 UL: 211Mbps DL: 2Gbps	66	✓	✓	1.4/3/5/10/15/20 MHz	
	71	✓	✓	5/10/15/20 MHz	
	34			5/10/15 MHz	
	38		✓	5/10/15/20 MHz	
	39			5/10/15/20 MHz	
	40			5/10/15/20 MHz	
	41	✓ PC2	✓	5/10/15/20 MHz	
	42			5/10/15/20 MHz	
	XGP			5/10/15/20 MHz	
	48	✓		5/10/15/20 MHz	
	53	✓	✓	1.4/3/5/10 MHz	
FR1 FDD Bands Rel-16 UL: 250Mbps DL: 900Mbps	n1			5/10/15/20/25/30/40 MHz	
	n2	✓	✓	5/10/15/20 MHz	
	n3			5/10/15/20/25/30/35/40 MHz	
	n5	✓	✓	5/10/15/20 MHz	
	n7	✓	✓	5/10/15/20/25/30/35/40 MHz	
	n8			5/10/15/20 MHz	
	n12	✓	✓	5/10/15 MHz	
	n14	✓	✓	5/10 MHz	
	n20			5/10/15/20 MHz	
	n25	✓	✓	5/10/15/20/25/30/35/40 MHz	



	n26	✓		5/10/15/20 MHz	Pi/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM
	n28			5/10/15/20/30 MHz	
	n29 (DL)			5/10 MHz	
	n30	✓	✓	5/10 MHz	
	n66	✓	✓	5/10/15/20/25/30/35/40 MHz	
	n70	✓		5/10/15 MHz	
	n71	✓	✓	5/10/15/20 MHz	
	n75 (DL)			5/10/15/20/25/30 MHz	
	n76 (DL)			5 MHz	
FR1 TDD Bands Rel-16 UL: 500Mbps DL: 4.2Gbps	n38		✓	10/15/20/30/40 MHz	
	n40			10/15/20/30/40/50/60/70/80/90/100 MHz	
	n41	✓ PC2	✓	10/15/20/30/40/50/60/70/80/90/100 MHz	
	n48	✓		10/15/20/30/40 MHz	
	n53	✓	✓	10 MHz	
	n77	✓ PC2	✓	10/15/20/30/40/50/60/70/80/90/100 MHz	
	n78		✓ PC2	10/15/20/30/40/50/60/70/80/90/100 MHz	
	n79 PC2			40/50/60/80/100 MHz	
WLAN	2.4 GHz	✓	✓	2412 – 2472 MHz 802.11 b/g 802.11n HT20 802.11ax HE20	DSSS, CCK, OFDM
	5 GHz	✓	✓	5150 – 5850 MHz: 802.11a, 802.11n (HT20, HT40) 802.11ac (VHT20, VHT40, VHT80) 802.11ax (HE20, HE40, HE80)	
BT	2.4 GHz	✓	✓	2402 – 2480 MHz (HDR: 2404 – 2476 MHz) HDR4: 2MHz and HDR8: 4MHz	DQPSK, 8DPSK, GFSK.
BLE	2.4 GHz	✓	✓	1M (2402 – 2480MHz) 2M (2404 – 2478MHz)	
NFC	13.56 MHz	✓	✓	13.56 MHz, Type A, B, F, ISO15693	BPSK, Manchester, ASK
MSS	1.6 GHz	✓	✓	L-Band (Tx), S-Band (Rx)	BPSK
GNSS	L1, L5	✓	✓	AGPS, GPS, BeiDou, GLONASS, Galileo, QZSS, NavIC	-

Notes:

- 1) n77 FCC: (3450 – 3550 and 3700 – 3980 MHz).
- 2) n77 ISED: Supported BW up to 80 MHz. Range RSS192: 3450 – 3900 MHz, RSS198: 3900 – 3980MHz.
- 3) B14/29/71 supported on A3212 and A3408.
- 4) B53/n53 not supported on A3410.



Appendix B. Simultaneous Transmit Policy

Table 19 – Simultaneous Transmit Policy Overview

Config	Wi-Fi 2.4G	Wi-Fi 5.0G	BT 2.4G
1	✓ ¹	-	-
2	-	✓ ¹	✓ ²

✓ Mode: SISO
✓¹ Mode: MIMO
✓² Mode: Tx-BF

- Notes:
- Cell on/off does not change simultaneous Tx policy.
 - Wi-Fi 2.4/BT 2.4GHz cannot transmit simultaneously.
 - Wi-Fi 2.4/5GHz cannot transmit simultaneously.



Appendix C. ULCA/ENDC Combos

Table 20 - Intra-Band Contiguous

E-UTRA CA Configuration	E-UTRA Band	Allowed Channel BW per Carrier (MHz)		Max Aggregated BW
		1 st Carrier	2 nd Carrier	
CA_7C	Band 7	15	15	40 MHz
		20	20	
		10	20	
		15	15,20	
		20	10,15,20	
		15	10,15	
		20	15,20	
CA_41C	Band 41	10	20	40 MHz
		15	15,20	
		20	10,15,20	
		5,10	20	
		15	15,20	
		20	5,10,15,20	
		10	15,20	
		15	10,15,20	
		20	10,15,20	
		10	20	
		20	20	
CA_38C	Band 38	15	15	40 MHz
		20	20	
CA_39C	Band 39	5,10,15	20	35 MHz
		20	5,10,15	
CA_40C	Band 40	10	20	40 MHz
		15	15	
		20	10,20	
		10,15	20	
		15	15	
		20	10,15,20	
CA_3C	Band 3	5,10,15	20	40 MHz
		20	5,10,15,20	
CA_5B	Band 5	5,10	10	20 MHz
		10	5	
		5	3	8 MHz
		3	5	
CA_8B	Band 8	5,10	10	20 MHz
		10	5	
CA_42C	Band 42	5,10,15,20	20	40 MHz
		20	5,10,15	
		10,15,20	20	
		20	10,15	
CA_48C	Band 48	5,10,15,20	20	40 MHz



E-UTRA CA Configuration	E-UTRA Band	Allowed Channel BW per Carrier (MHz)		Max Aggregated BW
		1 st Carrier	2 nd Carrier	
		20	20	

Table 21 - Inter-Band Contiguous

E-UTRA CA Configuration	E-UTRA Band	Bandwidth						Max Aggregated BW
		1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
CA_1A-5A	1				Yes			20
	5				Yes			
	1			Yes	Yes	Yes	Yes	30
	5			Yes	Yes			
CA_1A-8A	1			Yes	Yes	Yes	Yes	30
	8			Yes	Yes			
	1			Yes	Yes			20
	8			Yes	Yes			
	1			Yes	Yes	Yes	Yes	30
	8		Yes	Yes	Yes			
CA_1A-18A	1			Yes	Yes	Yes	Yes	35
	18			Yes	Yes	Yes		
	1			Yes	Yes			20
	18			Yes	Yes			
CA_1A-19A	1			Yes	Yes	Yes	Yes	35
	19			Yes	Yes	Yes		
CA_1A-20A	1			Yes	Yes	Yes	Yes	40
	20			Yes	Yes	Yes	Yes	
CA_1A-26A	1			Yes	Yes	Yes	Yes	35
	26			Yes	Yes	Yes		
	1			Yes	Yes			20
	26			Yes	Yes			
CA_1A-28A	1			Yes	Yes	Yes	Yes	40
	28			Yes	Yes	Yes	Yes	
	1			Yes	Yes			20
	28			Yes	Yes			
CA_1A-42A	1			Yes	Yes	Yes	Yes	40
	42			Yes	Yes	Yes	Yes	
CA_2A-5A	2			Yes	Yes	Yes	Yes	30
	5			Yes	Yes			
	2			Yes	Yes			20
	5			Yes	Yes			
CA_2A-12A	2			Yes	Yes	Yes	Yes	30
	12			Yes	Yes			
	2			Yes	Yes	Yes	Yes	30
	12		Yes	Yes	Yes			
	2			Yes	Yes			20



E-UTRA CA Configuration	E-UTRA Band	Bandwidth						Max Aggregated BW
		1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
	12			Yes	Yes			
CA_2A-13A	2			Yes	Yes	Yes	Yes	30
	13				Yes			
	2			Yes	Yes			20
	13				Yes			
CA_3A-5A	3				Yes	Yes	Yes	30
	5			Yes	Yes			
	3				Yes			20
	5			Yes	Yes			
	3			Yes	Yes	Yes	Yes	30
	5			Yes	Yes			
	3			Yes	Yes	Yes	Yes	30
	5		Yes	Yes	Yes			
	3		Yes	Yes	Yes			20
	5		Yes	Yes	Yes			
CA_3A-8A	3				Yes	Yes	Yes	30
	8			Yes	Yes			
	3				Yes			20
	8			Yes	Yes			
	3			Yes	Yes	Yes	Yes	30
	8		Yes	Yes	Yes			
	3			Yes	Yes	Yes	Yes	30
	8			Yes	Yes			
CA_3A-18A	3			Yes	Yes	Yes	Yes	35
	18			Yes	Yes	Yes		
CA_3A-19A	3			Yes	Yes	Yes	Yes	35
	19			Yes	Yes	Yes		
CA_3A-20A	3			Yes	Yes	Yes	Yes	30
	20			Yes	Yes			
	3			Yes	Yes	Yes	Yes	40
	20			Yes	Yes	Yes	Yes	
CA_3A-26A	3			Yes	Yes	Yes	Yes	35
	26			Yes	Yes	Yes		
	3			Yes	Yes			20
	26			Yes	Yes			
CA_3A-28A	3			Yes	Yes	Yes	Yes	40
	28			Yes	Yes	Yes	Yes	
	3		Yes	Yes	Yes	Yes	Yes	40
	28			Yes	Yes	Yes	Yes	
CA_3A-42A	3			Yes	Yes	Yes	Yes	40
	42			Yes	Yes	Yes	Yes	
CA_4A-5A	4			Yes	Yes			20
	5			Yes	Yes			
	4			Yes	Yes	Yes	Yes	30
	5			Yes	Yes			



E-UTRA CA Configuration	E-UTRA Band	Bandwidth						Max Aggregated BW
		1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
CA_4A-12A	4	Yes	Yes	Yes	Yes			20
	12			Yes	Yes			
	4	Yes	Yes	Yes	Yes	Yes	Yes	30
	12			Yes	Yes			
	4			Yes	Yes	Yes	Yes	30
	12		Yes	Yes	Yes			
	4			Yes	Yes			20
	12			Yes	Yes			
	4			Yes	Yes	Yes	Yes	30
	12			Yes	Yes			
	4			Yes	Yes	Yes		20
	12			Yes				
CA_4A-13A	4			Yes	Yes	Yes	Yes	30
	13				Yes			
	4			Yes	Yes			20
	13				Yes			
CA_5A-7A	5	Yes	Yes	Yes	Yes			30
	7				Yes	Yes	Yes	
	5			Yes	Yes			30
	7				Yes	Yes	Yes	
CA_5A-30A	5			Yes	Yes			20
	30			Yes	Yes			
CA_5A-66A	5			Yes	Yes			30
	66			Yes	Yes	Yes	Yes	
CA_7A-8A	7				Yes	Yes	Yes	30
	8		Yes	Yes	Yes			
	7				Yes	Yes	Yes	30
	8			Yes	Yes			
	7			Yes	Yes	Yes	Yes	30
	8			Yes	Yes			
CA_7A-20A	7				Yes	Yes	Yes	30
	20			Yes	Yes			
	7				Yes	Yes	Yes	40
	20			Yes	Yes	Yes	Yes	
CA_7A-28A	7			Yes	Yes	Yes	Yes	35
	28			Yes	Yes	Yes		
	7			Yes	Yes	Yes	Yes	40
	28			Yes	Yes	Yes	Yes	
CA_12A-30A	12			Yes	Yes			20
	30			Yes	Yes			
CA_12A-66A	12			Yes	Yes			20
	66	Yes	Yes	Yes	Yes			
	12			Yes	Yes			30
	66	Yes	Yes	Yes	Yes	Yes	Yes	



E-UTRA CA Configuration	E-UTRA Band	Bandwidth						Max Aggregated BW
		1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
	12		Yes	Yes	Yes			30
	66			Yes	Yes	Yes	Yes	
	12			Yes	Yes			20
	66			Yes	Yes			
	12			Yes	Yes			30
	66			Yes	Yes	Yes	Yes	
	12			Yes				20
	66			Yes	Yes	Yes		
CA_13A-66A	13			Yes	Yes			30
	66			Yes	Yes	Yes	Yes	
CA_14A_30A	14			Yes	Yes			20
	30			Yes	Yes			
CA_14A_66A	14			Yes	Yes			30
	66			Yes	Yes	Yes	Yes	
CA_41A-42A	41				Yes	Yes	Yes	40
	42				Yes	Yes	Yes	
CA_2A_14A	2			Yes	Yes	Yes	Yes	30
	14			Yes	Yes			
CA_4A_28A	4			Yes	Yes	Yes	Yes	40
	28			Yes	Yes	Yes	Yes	

Table 22 - ENDC FR1 Inter-Band Contiguous

E-UTRA CA Configuration	E-UTRA Band	Bandwidth													
		SCS kHz	5 MHz	10 MHz	15 MHz	20 MHz	25 MHz	30 MHz	40 MHz	50 MHz	60 MHz	70 MHz	80 MHz	90 MHz	100 MHz
DC_12A_n25A	12A		Yes	Yes											
	n25A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
DC_12A_n2A	12A		Yes	Yes											
	n2A	15	Yes	Yes	Yes	Yes									
DC_12A_n30A	12A		Yes	Yes											
	n30A	15	Yes	Yes											
DC_12A_n38A	12		Yes	Yes											
	n38A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
		30				Yes		Yes	Yes						
DC_12A_n7A	12A		Yes	Yes											
	n7A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
DC_12A_n77A	12A		Yes	Yes											
	n77A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
		30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DC_12A_n78A	12A		Yes	Yes											
	n78A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
		30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DC_12A_n66A	12A		Yes	Yes											



E-UTRA CA Configuration	E-UTRA Band	Bandwidth													
		SCS kHz	5 MHz	10 MHz	15 MHz	20 MHz	25 MHz	30 MHz	40 MHz	50 MHz	60 MHz	70 MHz	80 MHz	90 MHz	100 MHz
DC13A-n2A	n66A	15	Yes	Yes	Yes	Yes		Yes	Yes						
	13A		Yes	Yes											
DC_13A_n48A	n48A	15	Yes	Yes	Yes	Yes			Yes	Yes					
	13A	30		Yes		Yes			Yes						
DC_13A_n66A	n66A	15	Yes	Yes	Yes	Yes		Yes	Yes						
	13A		Yes	Yes											
DC_13A_n77A	n77A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
	13A	30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DC_13A_n78A	n78A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
	13A	30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DC_14A_n2A	n2A	15	Yes	Yes	Yes	Yes									
	14A		Yes	Yes											
DC_14A_n30A	n30A	15	Yes	Yes											
	14A		Yes	Yes											
DC_14A_n66A	n66A	15	Yes	Yes	Yes	Yes		Yes	Yes						
	14A		Yes	Yes											
DC_14A_n77A	n77A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
	13A	30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DC_18A_n3A	n3A	15	Yes	Yes	Yes	Yes	Yes	Yes							
	18A		Yes	Yes	Yes										
DC_18A_n77A	n77A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
	13A	30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DC_18A_n78A	n78A	15				Yes			Yes	Yes					
	13A	30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_19A_n1A	n1A	15	Yes	Yes	Yes	Yes		Yes	Yes						
	19A														
DC_19A_n78A	n78A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
	13A	30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DC_19A_n79A	n79A	15							Yes	Yes					
	13A	30							Yes	Yes	Yes		Yes		Yes
DC_1A_n3A	n3A	15	Yes	Yes	Yes	Yes	Yes	Yes							
	1A		Yes	Yes	Yes	Yes									
DC_1A_n7A	n7A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
	1A														
DC_1A_n20A	1A		Yes	Yes	Yes	Yes									



E-UTRA CA Configuration	E-UTRA Band	Bandwidth													
		SCS kHz	5 MHz	10 MHz	15 MHz	20 MHz	25 MHz	30 MHz	40 MHz	50 MHz	60 MHz	70 MHz	80 MHz	90 MHz	100 MHz
DC_1A_n28A	n20A	15	Yes	Yes	Yes	Yes									
	1A		Yes	Yes	Yes	Yes									
DC_1A_n38A	28A	15	Yes	Yes	Yes	Yes		Yes							
	1A		Yes	Yes	Yes	Yes									
	n38A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
DC_1A_n5A	30				Yes		Yes	Yes							
	1A		Yes	Yes	Yes	Yes									
DC_1A_n40A	n5A	15	Yes	Yes	Yes	Yes									
	1A		Yes	Yes	Yes	Yes									
	n40A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
DC_1A_n41A	30				Yes		Yes	Yes	Yes	Yes	Yes		Yes		
	1A		Yes	Yes	Yes	Yes									
	n41A	15		Yes	Yes	Yes		Yes	Yes	Yes					
DC_1A_n71A	30				Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
	1A		Yes	Yes	Yes	Yes									
	n71A	15	Yes	Yes	Yes	Yes									
DC_1A_n77A	30		Yes	Yes	Yes	Yes									
	1A		Yes	Yes	Yes	Yes									
	n77A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
DC_1A_n78A	30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	1A		Yes	Yes	Yes	Yes									
	n78A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
DC_1A_n79A	30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	1A		Yes	Yes	Yes	Yes									
	n79A	15						Yes	Yes	Yes					
DC_1A_n8A	30				Yes		Yes	Yes	Yes	Yes	Yes		Yes		Yes
	1A		Yes	Yes	Yes	Yes									
DC_20A_n1A	n8A	15	Yes	Yes	Yes	Yes									
	20A		Yes	Yes	Yes	Yes									
DC_20A_n38A	n1A	15	Yes	Yes	Yes	Yes		Yes	Yes						
	20A		Yes	Yes	Yes	Yes									
	n38A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
DC_20A_n3A	30				Yes		Yes	Yes							
	20A		Yes	Yes	Yes	Yes									
DC_20A_n41A	n3A	15	Yes	Yes	Yes	Yes	Yes	Yes							
	20A		Yes	Yes	Yes	Yes									
	n41A	15		Yes	Yes	Yes		Yes	Yes	Yes					
DC_20A_n78A	30				Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
	20A		Yes	Yes	Yes	Yes									
	n78A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
DC_20A_n7A	30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	20A		Yes	Yes	Yes	Yes									
DC_25A_n41A	n7A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
	25A		Yes	Yes	Yes	Yes									



E-UTRA CA Configuration	E-UTRA Band	Bandwidth													
		SCS kHz	5 MHz	10 MHz	15 MHz	20 MHz	25 MHz	30 MHz	40 MHz	50 MHz	60 MHz	70 MHz	80 MHz	90 MHz	100 MHz
	n41A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
	26A		Yes	Yes	Yes										
DC_26A_n41A	n41A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_28A_n1A	28A		Yes	Yes	Yes	Yes									
	n1A	15	Yes	Yes	Yes	Yes		Yes	Yes						
DC_28A_n3A	28A		Yes	Yes	Yes	Yes									
	n3A	15	Yes	Yes	Yes	Yes	Yes	Yes							
DC_28A_n40A	28A		Yes	Yes	Yes	Yes									
	n40A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
		30				Yes		Yes	Yes	Yes	Yes		Yes		
DC_28A_n41A	28A		Yes	Yes	Yes	Yes									
	n41A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_28A_n66A	28A		Yes	Yes	Yes	Yes									
	n66A	15	Yes	Yes	Yes	Yes		Yes	Yes						
DC_28A_n77A	28A		Yes	Yes	Yes	Yes									
	n77A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
		30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DC_28A_n78A	28A		Yes	Yes	Yes	Yes									
	n78A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
		30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DC_28A_n79A	28A		Yes	Yes	Yes	Yes									
	n79A	15							Yes	Yes					
		30								Yes	Yes	Yes		Yes	
DC_28A_n7A	28A		Yes	Yes	Yes	Yes									
	n7A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
DC_2A_n12A	2A		Yes	Yes	Yes	Yes									
	n12A	15	Yes	Yes	Yes										
DC_2A_n14A	2A		Yes	Yes	Yes	Yes									
	n14A	15	Yes	Yes											
		30		Yes											
DC_2A_n38A	28A		Yes	Yes	Yes	Yes									
	n38A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
		30				Yes		Yes	Yes						
DC_2A_n41A	2A		Yes	Yes	Yes	Yes									
	n41A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_2A_n5A	2A		Yes	Yes	Yes	Yes									
	n5A	15	Yes	Yes	Yes	Yes									
DC_2A_n48A	2A		Yes	Yes	Yes	Yes									
	n48A	15	Yes	Yes	Yes	Yes			Yes	Yes					
		30		Yes		Yes				Yes					



E-UTRA CA Configuration	E-UTRA Band	Bandwidth													
		SCS kHz	5 MHz	10 MHz	15 MHz	20 MHz	25 MHz	30 MHz	40 MHz	50 MHz	60 MHz	70 MHz	80 MHz	90 MHz	100 MHz
DC_2A_n66A	2A		Yes	Yes	Yes	Yes									
	n66A	15	Yes	Yes	Yes	Yes		Yes	Yes						
DC_2A_n71A	2A		Yes	Yes	Yes	Yes									
	n71A	15	Yes	Yes	Yes	Yes									
		30		Yes	Yes	Yes									
DC_2A_n77A	2A		Yes	Yes	Yes	Yes									
	n77A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
		30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DC_2A_n78A	2A		Yes	Yes	Yes	Yes									
	n78A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_30A_n5A	30A		Yes	Yes											
	n5A	15	Yes	Yes	Yes	Yes									
DC_30A_n12A	30A		Yes	Yes											
	n12A	15	Yes	Yes	Yes										
DC_30A_n14A	30A		Yes	Yes											
	n14A	15	Yes	Yes											
		30		Yes											
DC_30A_n66A	30A		Yes	Yes											
	n66A	15	Yes	Yes	Yes	Yes		Yes	Yes						
DC_30A_n77A	30A		Yes	Yes											
	n77A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
		30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DC_38A_n3A	38A		Yes	Yes	Yes	Yes									
	n3A	15	Yes	Yes	Yes	Yes	Yes	Yes							
DC_38A_n78A	38A		Yes	Yes	Yes	Yes									
	n78A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_39A_n41A	39A		Yes	Yes	Yes	Yes									
	n41A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_39A_n79A	39A		Yes	Yes	Yes	Yes									
	n79A	15							Yes	Yes					
		30							Yes	Yes	Yes		Yes		Yes
DC_3A_n1A	3A		Yes	Yes	Yes	Yes									
	n1A	15	Yes	Yes	Yes	Yes		Yes	Yes						
DC_3A_n20A	3A		Yes	Yes	Yes	Yes									
	n20A	15	Yes	Yes	Yes	Yes									
DC_3A_n28A	3A		Yes	Yes	Yes	Yes									
	n28A	15	Yes	Yes	Yes	Yes		Yes							
DC_3A_n38A	3A		Yes	Yes	Yes	Yes									
	n38A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
		30				Yes		Yes	Yes						
DC_3A_n40A	3A		Yes	Yes	Yes	Yes									



E-UTRA CA Configuration	E-UTRA Band	Bandwidth													
		SCS kHz	5 MHz	10 MHz	15 MHz	20 MHz	25 MHz	30 MHz	40 MHz	50 MHz	60 MHz	70 MHz	80 MHz	90 MHz	100 MHz
	n40A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
DC_3A_n41A	3A	30				Yes		Yes	Yes	Yes	Yes		Yes		
		3A		Yes	Yes	Yes	Yes								
	n41A	15				Yes			Yes	Yes					
DC_3A_n5A	3A	30				Yes			Yes	Yes	Yes		Yes	Yes	
		3A		Yes	Yes	Yes	Yes								
	n5A	15	Yes	Yes	Yes	Yes									
DC_3A_n7A	3A		Yes	Yes	Yes	Yes									
	n7A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
DC_3A_n77A	3A		Yes	Yes	Yes	Yes									
	n77A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
		30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DC_3A_n78A	3A		Yes	Yes	Yes	Yes									
	n78A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_3A_n79A	3A		Yes	Yes	Yes	Yes									
	n79A	15							Yes	Yes					
		30								Yes	Yes	Yes		Yes	Yes
DC_3A_n8A	3A		Yes	Yes	Yes	Yes									
	n8A	15	Yes	Yes	Yes	Yes									
DC_3A_n71A	3A		Yes	Yes	Yes	Yes									
	n71A	15	Yes	Yes	Yes	Yes									
		30		Yes	Yes	Yes									
DC_4A_n38A	4A		Yes	Yes	Yes	Yes									
	n38A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
		30				Yes		Yes	Yes						
DC_4A_n41A	4A		Yes	Yes	Yes	Yes									
	n41A	15				Yes			Yes	Yes					
		30				Yes				Yes	Yes	Yes		Yes	Yes
DC_4A_n78A	4A		Yes	Yes	Yes	Yes									
	n78A	15				Yes			Yes	Yes					
		30				Yes				Yes	Yes	Yes		Yes	Yes
DC_40A_n1A	40A		Yes	Yes	Yes	Yes									
	n1A	15	Yes	Yes	Yes	Yes		Yes	Yes						
DC_40A_n41A	40A		Yes	Yes	Yes	Yes									
	n41A	15				Yes			Yes	Yes					
		30				Yes				Yes	Yes	Yes		Yes	Yes
DC_40A_n3A	40A		Yes	Yes	Yes	Yes									
	n3A	15	Yes	Yes	Yes	Yes	Yes	Yes							
DC_40A_n5A	40A		Yes	Yes	Yes	Yes									
	n5A	15	Yes	Yes	Yes	Yes									
DC_40A_n8A	40A		Yes	Yes	Yes	Yes									
	n8A	15	Yes	Yes	Yes	Yes									
DC_40A_n28A	40A		Yes	Yes	Yes	Yes									



E-UTRA CA Configuration	E-UTRA Band	Bandwidth													
		SCS kHz	5 MHz	10 MHz	15 MHz	20 MHz	25 MHz	30 MHz	40 MHz	50 MHz	60 MHz	70 MHz	80 MHz	90 MHz	100 MHz
	n28A	15	Yes	Yes	Yes	Yes		Yes							
DC_40A_n78A	40A		Yes	Yes	Yes	Yes									
	n78A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_40A_n79A	40A		Yes	Yes	Yes	Yes									
	n79A	15							Yes	Yes					
		30							Yes	Yes	Yes		Yes		Yes
DC_41A_n3A	41A		Yes	Yes	Yes	Yes									
	n3A	15	Yes	Yes	Yes	Yes	Yes	Yes							
DC_41A_n41A	41A		Yes	Yes	Yes	Yes									
	n41A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_41A_n77A	41A		Yes	Yes	Yes	Yes									
	n77A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
		30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DC_41A_n78A	41A		Yes	Yes	Yes	Yes									
	n78A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_41A_n79A	41A		Yes	Yes	Yes	Yes									
	n79A	15							Yes	Yes					
		30							Yes	Yes	Yes		Yes		Yes
DC_42A_n3A	42A		Yes	Yes	Yes	Yes									
	n3A	15	Yes	Yes	Yes	Yes	Yes	Yes							
DC_42A_n28A	42A		Yes	Yes	Yes	Yes									
	n28A	15	Yes	Yes	Yes	Yes		Yes							
DC_48A_n2A	48A		Yes	Yes	Yes	Yes									
	n2A	15	Yes	Yes	Yes	Yes									
DC_48A_n5A	48A		Yes	Yes	Yes	Yes									
	n5A	15	Yes	Yes	Yes	Yes									
DC_48A_n25A	48A		Yes	Yes	Yes	Yes									
	n25A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
DC_48A_n66A	48A		Yes	Yes	Yes	Yes									
	n66A	15	Yes	Yes	Yes	Yes		Yes	Yes						
DC_48A_n12A	48A		Yes	Yes	Yes	Yes									
	n12A	15	Yes	Yes	Yes										
DC_48A_n53A	48A		Yes	Yes	Yes	Yes									
	n53A	15	Yes												
		30	Yes												
DC_48A_n71A	48A		Yes	Yes	Yes	Yes									
	n71A	15	Yes	Yes	Yes	Yes									
		30		Yes	Yes	Yes									
DC_5A_n1A	5A		Yes	Yes											
	n1A	15	Yes	Yes	Yes	Yes		Yes	Yes						
DC_5A_n3A	5A		Yes	Yes											



E-UTRA CA Configuration	E-UTRA Band	Bandwidth													
		SCS kHz	5 MHz	10 MHz	15 MHz	20 MHz	25 MHz	30 MHz	40 MHz	50 MHz	60 MHz	70 MHz	80 MHz	90 MHz	100 MHz
DC_5A_n2A	n3A	15	Yes	Yes	Yes	Yes	Yes	Yes							
	5A		Yes	Yes											
DC_5A_n30A	n2A	15	Yes	Yes	Yes	Yes									
	5A		Yes	Yes											
DC_5A_n38A	n30A	15	Yes	Yes											
	5A		Yes	Yes											
	n38A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
DC_5A_n48A		30			Yes		Yes	Yes							
	5A		Yes	Yes											
	n48A	15	Yes	Yes	Yes	Yes			Yes	Yes					
DC_5A_n77A		30		Yes		Yes			Yes						
	5A		Yes	Yes											
	n77A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
DC_5A_n66A		30			Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	5A		Yes	Yes											
	n66A	15	Yes	Yes	Yes	Yes		Yes	Yes						
DC_5A_n78A	5A		Yes	Yes											
	n78A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_5A_n40A	5A		Yes	Yes											
	n40A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
		30				Yes		Yes	Yes	Yes	Yes		Yes		
DC_5A_n7A	5A		Yes	Yes											
	n7A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
DC_66A_n2A	66A		Yes	Yes	Yes	Yes									
	n2A	15	Yes	Yes	Yes	Yes									
DC_66A_n5A	66A		Yes	Yes	Yes	Yes									
	n5A	15	Yes	Yes	Yes	Yes									
DC_66A_n7A	66A		Yes	Yes	Yes	Yes									
	n7A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
DC_66A_n12A	66A		Yes	Yes	Yes	Yes									
	n12A	15	Yes	Yes	Yes										
DC_66A_n14A	66A														
	n14A	15	Yes	Yes											
DC_66A_n25A	66A		Yes	Yes	Yes	Yes									
	n25A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
DC_66A_n28A	66A		Yes	Yes	Yes	Yes									
	n28A	15	Yes	Yes	Yes	Yes		Yes							
DC_66A_n30A	66A		Yes	Yes	Yes	Yes									
	n30A	15	Yes	Yes											
DC_66A_n38A	66A		Yes	Yes	Yes	Yes									
	n38A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
		30				Yes		Yes	Yes						
DC_66A_n41A	66A		Yes	Yes	Yes	Yes									



E-UTRA CA Configuration	E-UTRA Band	Bandwidth													
		SCS kHz	5 MHz	10 MHz	15 MHz	20 MHz	25 MHz	30 MHz	40 MHz	50 MHz	60 MHz	70 MHz	80 MHz	90 MHz	100 MHz
	n41A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_66A_n48A	66A		Yes	Yes	Yes	Yes									
	n48A	15	Yes	Yes	Yes	Yes			Yes	Yes					
		30		Yes		Yes			Yes						
DC_66A_n71A	66A		Yes	Yes	Yes	Yes									
	n71A	15	Yes	Yes	Yes	Yes									
		30		Yes	Yes	Yes									
DC_66A_n77A	66A		Yes	Yes	Yes	Yes									
	n77A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
		30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DC_66A_n78A	66A		Yes	Yes	Yes	Yes									
	n78A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_7A_n1A	7A		Yes	Yes	Yes	Yes									
	n1A	15	Yes	Yes	Yes	Yes		Yes	Yes						
DC_7A_n3A	7A		Yes	Yes	Yes	Yes									
	n3A	15	Yes	Yes	Yes	Yes	Yes	Yes							
DC_7A_n20A	7A		Yes	Yes	Yes	Yes									
	n20A	15	Yes	Yes	Yes	Yes									
DC_7A_n28A	7A		Yes	Yes	Yes	Yes									
	n28A	15	Yes	Yes	Yes	Yes		Yes							
DC_7A_n5A	7A		Yes	Yes	Yes	Yes									
	n5A	15	Yes	Yes	Yes	Yes									
DC_7A_n66A	7A		Yes	Yes	Yes	Yes									
	n66A	15	Yes	Yes	Yes	Yes		Yes	Yes						
DC_7A_n71A	7A		Yes	Yes	Yes	Yes									
	n71A	15	Yes	Yes	Yes	Yes									
		30		Yes	Yes	Yes									
DC_7A_n78A	7A		Yes	Yes	Yes	Yes									
	n78A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_7A_n77A	7A		Yes	Yes	Yes	Yes									
	n77A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
		30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DC_7A_n79A	7A		Yes	Yes	Yes	Yes									
	n79A	15							Yes	Yes					
		30							Yes	Yes	Yes		Yes		Yes
DC_7A_n8A	7A		Yes	Yes	Yes	Yes									
	n8A	15	Yes	Yes	Yes	Yes									
DC_8A_n1A	8A		Yes	Yes											
	n1A	15	Yes	Yes	Yes	Yes		Yes	Yes						
DC_8A_n3A	8A		Yes	Yes											
	n3A	15	Yes	Yes	Yes	Yes	Yes	Yes							



E-UTRA CA Configuration	E-UTRA Band	Bandwidth													
		SCS kHz	5 MHz	10 MHz	15 MHz	20 MHz	25 MHz	30 MHz	40 MHz	50 MHz	60 MHz	70 MHz	80 MHz	90 MHz	100 MHz
DC_8A_n7A	8A		Yes	Yes											
	n7A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
DC_8A_n41A	8A		Yes	Yes											
	n41A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_8A_n77A	8A		Yes	Yes											
	n77A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
		30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DC_8A_n78A	8A		Yes	Yes											
	n78A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_8A_n79A	8A		Yes	Yes											
	n79A	15							Yes	Yes					
		30							Yes	Yes	Yes		Yes		Yes
DC_71A_n66A	71 A		Yes	Yes	Yes	Yes									
	n66A	15	Yes	Yes	Yes	Yes		Yes	Yes						
DC_71A_n38A	71 A		Yes	Yes	Yes	Yes									
	n38A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
		30				Yes		Yes	Yes						
DC_71A_n77A	71 A		Yes	Yes	Yes	Yes									
	n77A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
		30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DC_71A_n78A	71 A		Yes	Yes	Yes	Yes									
	n78A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_8A_n40A	8A		Yes	Yes											
	n40A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
		30				Yes		Yes	Yes	Yes	Yes		Yes		
DC_20A_n40A	20A		Yes	Yes	Yes	Yes									
	n40A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
		30				Yes		Yes	Yes	Yes	Yes		Yes		
DC_8A_n38A	8A		Yes	Yes											
	n38A	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
		30				Yes		Yes	Yes						
DC_25A_n78A	25A		Yes	Yes	Yes	Yes									
	n78A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_28A_n2A	28A		Yes	Yes	Yes	Yes									
	n2A	15	Yes	Yes	Yes	Yes									
DC_38A_n28A	38A		Yes	Yes	Yes	Yes									
	n28A	15	Yes	Yes	Yes	Yes		Yes							
DC_12A_n41A	12A		Yes	Yes											
	n41A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes



E-UTRA CA Configuration	E-UTRA Band	Bandwidth													
		SCS kHz	5 MHz	10 MHz	15 MHz	20 MHz	25 MHz	30 MHz	40 MHz	50 MHz	60 MHz	70 MHz	80 MHz	90 MHz	100 MHz
DC_38A_n1A	38A		Yes	Yes	Yes	Yes									
	n1A	15	Yes	Yes	Yes	Yes		Yes	Yes						
DC_42A_n1A	42A		Yes	Yes	Yes	Yes									
	n1A	15	Yes	Yes	Yes	Yes		Yes	Yes						
DC_5A_n41A	5A		Yes	Yes											
	n41A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_11A_n78A	11A		Yes	Yes											
	n78A	15				Yes			Yes	Yes					
		30				Yes			Yes	Yes	Yes		Yes	Yes	Yes
DC_25A_n77A	25A		Yes	Yes	Yes	Yes									
	n77A	15		Yes	Yes	Yes	Yes	Yes	Yes	Yes					
		30				Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes