

APPENDIX E: MULTI-TX AND ANTENNA SAR CONSIDERATIONS

E.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D04v01 are applicable to devices with built-in unlicensed transmitters such as 802.11 and Bluetooth devices which may simultaneously transmit with the licensed transmitter

E.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore, simultaneous transmission analysis is required. Per FCC KDB Publication 447498 D04v01 and IEEE 1528-2013 Section 6.3.4.1.2, simultaneous transmission SAR test exclusion may be applied when the sum of the 1g SAR for all the simultaneous transmitting antennas in a specific physical test configuration is ≤ 1.6 W/kg (or 4 W/kg for 10g). The different test positions in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1g or 10g SAR. Alternatively, simultaneous transmission SAR test exclusion may be evaluated using Total Exposure Ratio (TER). The different test positions in an exposure condition may be considered collectively to determine SAR test exclusion according to the TER.

Per FCC KDB Publication 941225 D06v02r01, the devices edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR (“-”).

This device has an open and closed configuration. For the open configuration, the device is enabled with the Qualcomm® Smart Transmit Plus, EFS v24 feature with pre-defined antenna groups (AG0 and AG1). In the closed configuration, the device is enabled with the Qualcomm® Smart Transmit Gen1 feature with only one pre-defined antenna group (AG0). For this model, WWAN/WLAN/BT/NTN radios are managed under Smart Transmit. Non-Smart Transmit radios include NFC and WPT.

When operating in the same antenna group, the compliance under dynamic transmission condition, including all supported simultaneous transmission scenarios, should be assessed and demonstrated in the Part 2 Report during algorithm validation. Therefore, no further simultaneous analysis is needed within an antenna group.

When the device is in the open configuration, all WWAN/WLAN/BT Radios are managed under Smart Transmit and TER for WWAN/WLAN/BT is covered in Part 2 testing. Only external radios outside of WWAN/WLAN/BT (WPT, NFC) require TER analysis with WWAN/WLAN/BT during simultaneous transmissions. NTN transmission is also managed under Smart transmit; however, simultaneous analysis with modes outside of NTN are not evaluated because NTN is the only available radio in satellite mode. When the device is in the closed configuration, Qualcomm Smart Transmit algorithm in WWAN/WLAN/BT directly adds the time-averaged RF exposure from WWAN sub-6/WLAN/BT. Smart Transmit algorithm controls the total RF exposure from all WWAN sub-6/WLAN/BT to not exceed FCC limit. Therefore, simultaneous transmission compliance between WWAN sub-6/WLAN/BT operations is demonstrated in the Part 2 Report during algorithm validation. Simultaneous SAR for WWAN sub-6/WLAN/BT in a DSI is the worst case reported SAR of WWAN sub-6/WLAN/BT.

E.3 Sub6 Antenna Groups in the Open Configurations

The 2nd generation of Smart Transmit (GEN2) operates based on pre-defined antenna groups (AG). Sub6/WLAN/BT Tx antennas in the device are grouped based on the spatial variation of RF exposure distributions, where the RF exposure of one AG is mutually exclusive from other AGs. This is accomplished by demonstrating either of the conditions below for all exposure scenarios:

- Sum of SAR of one antenna from each of the sub6 AGs and the RF exposure from radios outside Smart Transmit is less than regulatory limits. This condition must be demonstrated for all antenna combinations of sub6 AGs.

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(or)

- b) Every antenna from each sub6 AG meets SPLSR criteria (Section 4.3.2(c) in FCC KDB 447498 D04) with every antenna from another sub6 AG. This criteria must be demonstrated for all antenna combinations for each pair of AGs.

This device supports two AGs in open configuration: AG0 and AG1, with AG0 having 3 antennas (A, B, C) and AG1 having 6 antennas (E, F, G, H, I, K). The conditions are verified through the following criteria:

- i) Sum of SAR: Demonstrate that the sum of *max.norm.exp.AG0* and *max.norm.exp.AG1* and the reported normalized SAR values from radios outside Smart Transmit (denoted as *reported.norm.exp.ER*) should be less than the regulatory limit for each supported DSI following the below procedure:
 1. Obtain the worst-case *adjusted SAR* for each antenna group, i.e., maximum *reported SAR* at EFS $P_{limit} + \text{unc}$ (or max of $\{P_{max} + \text{unc}, \text{EFS } P_{limit}\}$ when $\text{EFS } P_{limit} > P_{max}$) out of all supported technologies, frequency bands and antennas in AG0 and AG1, then normalized to the regulatory limit to get the maximum normalized SAR for each antenna group, denoted as: *max.norm.exp.AG0* and *max.norm.exp.AG1*
 2. For external radios outside of Smart Transmit (NFC): Obtain the worst-case RF exposure for each external radio normalized to regulatory limit to get the normalized SAR for each external radio, denoted as: *reported.norm.exp.NFC*
 3. Demonstrate that the sum of these RF exposures meets: $\{max.norm.exp.AG0 + max.norm.exp.AG1 + reported.norm.exp.NFC\} \leq 1$.
- ii) SPLSR or composite exposure distribution criteria: when TER sum of an antenna pair is over the limit for a DSI/exposure position, SPLSR or composite exposure distribution can be done to demonstrate simultaneous transmission compliance.
 1. SPLSR analysis for sub6 antenna pairs: For each antenna, obtain the highest *adjusted SAR* at EFS $P_{limit} + \text{unc}$ (or max of $\{P_{max} + \text{unc}, \text{EFS } P_{limit}\}$ when $\text{EFS } P_{limit} > P_{max}$) out of all supported technologies for each frequency band. Using these values, demonstrate for a given DSI that every antenna from one AG meets SPLSR criteria with every antenna in another AG for all frequency bands. This criterion must be demonstrated for all antenna pair combinations irrespective of supported simultaneous transmission scenarios as given below for each DSI. As it can be seen, these include all combinations of antenna groups, antennas, and frequency bands.
 - If SPLSR criteria evaluation and analysis are needed to determine compliance for a certain DSI configuration, SPLSR is performed by taking the highest reported SAR for each of the supported technologies and bands per antenna, along with the peak SAR locations. Per Qualcomm guidance, only Y-axis coordinates are recorded in the analysis for calculation simplicity (assumes all 0mm of separation on the x-axis). Peak locations are documented in the Highest Report ER and Hotspot Location Section below for each DSI configuration. For bottom AG0, Y_min coordinates represents the worst-case hotspot location that is closest to the top AG1. Similarly, for top AG1, Y_max coordinate represents the worst-case hotspot location that is closest to the bottom AG0
 - The following formula is used to calculate the SPLSR between AG0 and AG1 for each exposure configuration:

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$$SPLSR = \frac{(Max\ SAR\ Top\ Set + Max\ SAR\ Bottom\ Set)^{1.5}}{|Y_{max} - Y_{min}|}$$

E.4 Sub6 Antenna Groups in the Closed Configurations

This device supports only 1 antenna group in the closed configuration and the Smart Transmit algorithm controls the total RF exposure from all WWAN sub-6/WLAN/BT to not exceed the FCC limit. Only simultaneous transmission compliance was evaluated between the worst case reported SAR of WWAN sub-6/WLAN/BT and external radios (NFC, WPT).

E.5 Exposure Ratios

Exposure ratio (ER) for different transmitters is calculated as following:

$$ER_{SAR,n} = \frac{SAR_n}{SAR_{limit}}$$

Where:

- SAR_n is the SAR value for the n -th transmitter/test frequency
- SAR_{limit} is the basic restriction limit that is applicable to the n -th transmitter/test frequency

Compliance with the SAR based RF exposure limits is achieved if $TER_{SAR} \leq 1$. When $TER_{SAR} > 1$, SPLSR is additionally evaluated per below equation:

$$SPLSR = \frac{(ER_j + ER_k)^{1.5}}{R}$$

Where:

- ER_j and ER_k are exposure ratio of transmitter j and k
- R is the distance between transmitter j and k

When SPLSR is ≤ 0.02 for 1g exposure conditions or SPLSR is ≤ 0.013 for 10g exposure conditions simultaneous SAR evaluation is not required.

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E.6 Head (DSI = 1) SAR Antenna Group Analysis

Table E-1
DSI=1 Held-to-ear AG0 Highest Adjusted Ratio to Limit

AG0 Ratio to Limit					
	Configuration	A	B	C	Max
Head	Right Cheek	0.226	0.126	0.098	0.226
	Right Tilt	0.116	0.078	0.070	0.116
	Left Cheek	0.151	0.128	0.204	0.204
	Left Tilt	0.098	0.083	0.041	0.098

Table E-2
DSI=1 Held-to-ear AG1 Highest Adjusted Ratio to Limit

AG1 Ratio to Limit									
	Configuration	E	F	G	H	I	K	MIMO	Max
Head	Right Cheek	0.703	0.868	0.829	0.241	0.559	0.341	0.661	0.868
	Right Tilt	0.302	0.766	0.821	0.160	0.043	0.342	0.769	0.821
	Left Cheek	0.350	0.245	0.357	0.723	0.741	0.392	0.791	0.791
	Left Tilt	0.151	0.281	0.297	0.499	0.097	0.349	0.187	0.499

Table E-3
DSI=1 Held-to-ear AG Verification

Head	Configuration	AG0 Ratio to Limit	AG1 Ratio to Limit	AG0 + AG1 Ratio to Limit
	Right Cheek	0.226	0.868	See Table Below
	Right Tilt	0.116	0.821	0.937
	Left Cheek	0.204	0.791	0.995
	Left Tilt	0.098	0.499	0.597

Right Cheek							
AG0			AG1			AG0 + AG1 Ratio to Limit	SPLSR
Antenna	Ratio to Limit	Position	Antenna	Ratio to Limit	Position		
Ant A	0.226	-66.12	Ant E	0.703	-32.01	0.929	N/A
Ant A	0.226	-66.12	Ant F	0.868	-9.23	1.094	0.02
Ant A	0.226	-66.12	Ant G	0.829	0.85	1.055	0.02
Ant A	0.226	-66.12	Ant H	0.241	-56.56	0.467	N/A
Ant A	0.226	-66.12	Ant I	0.559	-63.45	0.785	N/A
Ant A	0.226	-66.12	Ant K	0.341	0.18	0.567	N/A
Ant A	0.226	-66.12	MIMO	0.661	-4.12	0.887	N/A
Ant B	0.126	-44.35	Ant E	0.703	-32.01	0.829	N/A
Ant B	0.126	-44.35	Ant F	0.868	-9.23	0.994	N/A
Ant B	0.126	-44.35	Ant G	0.829	0.85	0.955	N/A
Ant B	0.126	-44.35	Ant H	0.241	-56.56	0.367	N/A
Ant B	0.126	-44.35	Ant I	0.559	-63.45	0.685	N/A
Ant B	0.126	-44.35	Ant K	0.341	0.18	0.467	N/A
Ant B	0.126	-44.35	MIMO	0.661	-4.12	0.787	N/A
Ant C	0.098	33.66	Ant E	0.703	-32.01	0.801	N/A
Ant C	0.098	33.66	Ant F	0.868	-9.23	0.966	N/A
Ant C	0.098	33.66	Ant G	0.829	0.85	0.927	N/A
Ant C	0.098	33.66	Ant H	0.241	-56.56	0.339	N/A
Ant C	0.098	33.66	Ant I	0.559	-63.45	0.657	N/A
Ant C	0.098	33.66	Ant K	0.341	0.18	0.439	N/A
Ant C	0.098	33.66	MIMO	0.661	-4.12	0.759	N/A

Notes:

1. For all combinations where the TER sum of AG0+AG1 is not greater than 1, there's no further analysis required for compliance demonstration.
2. No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the antenna pairs was not greater than 0.02 per FCC KDB 447498 D04v01. Please see the Highest Report ER and Hotspot Location Section for Y-axis peak locations

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E.7 Open Body (DSI = 0/2) SAR Antenna Group Analysis

Table E-4
DSI=0/2 Open Body AG0 Highest Adjusted Ratio to Limit

AG0 Ratio to Limit					
	Configuration	A	B	C	Max
Body	Back	0.948	0.918	0.543	0.948
	Front	0.607	0.537	0.378	0.607
	Bottom	0.816	0.943	0.214	0.943
	Right	0.520	-	-	0.520
	Left	-	0.246	0.661	0.661

Table E-5
DSI=0/2 Open Body AG1 Highest Adjusted Ratio to Limit

AG1 Ratio to Limit									
	Configuration	E	F	G	H	I	K	MIMO	Max
Body	Back	0.499	0.600	0.466	0.473	0.260	0.410	0.639	0.639
	Front	0.516	0.301	0.649	0.558	0.431	0.377	0.359	0.649
	Top	0.057	0.358	0.618	0.437	0.033	0.497	0.431	0.618
	Right	-	-	-	0.896	0.623	0.029	0.429	0.896
	Left	0.633	0.844	0.290	-	-	-	0.741	0.844

Table E-6
DSI=0/2 Open Body AG Verification

	Configuration	AG0 Ratio to Limit	AG1 Ratio to Limit	AG0 + AG1 Ratio to Limit
Body	Back	0.948	0.639	See Table Below
	Front	0.607	0.649	See Table Below
	Top	-	0.618	0.618
	Bottom	0.943	0.000	0.943
	Right	0.520	0.896	See Table Below
	Left	0.661	0.844	See Table Below

Back							
AG0			AG1			AG0 + AG1 Ratio to Limit	SPLSR
Antenna	Ratio to Limit	Position	Antenna	Ratio to Limit	Position		
Ant A	0.948	86.6	Ant E	0.499	-45.3	1.447	0.01
Ant A	0.948	86.6	Ant F	0.6	-26.2	1.548	0.02
Ant A	0.948	86.6	Ant G	0.466	-84.9	1.414	0.01
Ant A	0.948	86.6	Ant H	0.473	-49.5	1.421	0.01
Ant A	0.948	86.6	Ant I	0.26	-35.2	1.208	0.01
Ant A	0.948	86.6	Ant K	0.41	-80.4	1.358	0.01
Ant A	0.948	86.6	MIMO	0.639	-75.4	1.587	0.01
Ant B	0.918	78.9	Ant E	0.499	-45.3	1.417	0.01
Ant B	0.918	78.9	Ant F	0.6	-26.2	1.518	0.02
Ant B	0.918	78.9	Ant G	0.466	-84.9	1.384	0.01
Ant B	0.918	78.9	Ant H	0.473	-49.5	1.391	0.01
Ant B	0.918	78.9	Ant I	0.26	-35.2	1.178	0.01
Ant B	0.918	78.9	Ant K	0.41	-80.4	1.328	0.01
Ant B	0.918	78.9	MIMO	0.639	-75.4	1.557	0.01
Ant C	0.543	23.0	Ant E	0.499	-45.3	1.042	0.02
Ant C	0.543	23.0	Ant F	0.6	-26.2	1.143	0.02
Ant C	0.543	23.0	Ant G	0.466	-84.9	1.009	0.01
Ant C	0.543	23.0	Ant H	0.473	-49.5	1.016	0.01
Ant C	0.543	23.0	Ant I	0.26	-35.2	0.803	N/A
Ant C	0.543	23.0	Ant K	0.41	-80.4	0.953	N/A
Ant C	0.543	23.0	MIMO	0.639	-75.4	1.182	0.01

Front							
AG0			AG1			AG0 + AG1 Ratio to Limit	SPLSR
Antenna	Ratio to Limit	Position	Antenna	Ratio to Limit	Position		
Ant A	0.607	79.0	Ant E	0.516	-48.3	1.123	0.01
Ant A	0.607	79.0	Ant F	0.301	-69.6	0.908	N/A
Ant A	0.607	79.0	Ant G	0.649	-79.3	1.256	0.01
Ant A	0.607	79.0	Ant H	0.558	-40.1	1.165	0.01
Ant A	0.607	79.0	Ant I	0.431	-41.0	1.038	0.01
Ant A	0.607	79.0	Ant K	0.377	-84.0	0.984	N/A
Ant A	0.607	79.0	MIMO	0.359	-43.0	0.966	N/A
Ant B	0.537	82.9	Ant E	0.516	-48.3	1.053	0.01
Ant B	0.537	82.9	Ant F	0.301	-69.6	0.838	N/A
Ant B	0.537	82.9	Ant G	0.649	-79.3	1.186	0.01
Ant B	0.537	82.9	Ant H	0.558	-40.1	1.095	0.01
Ant B	0.537	82.9	Ant I	0.431	-41.0	0.968	N/A
Ant B	0.537	82.9	Ant K	0.377	-84.0	0.914	N/A
Ant B	0.537	82.9	MIMO	0.359	-43.0	0.896	N/A
Ant C	0.378	26.4	Ant E	0.516	-48.3	0.894	N/A
Ant C	0.378	26.4	Ant F	0.301	-69.6	0.679	N/A
Ant C	0.378	26.4	Ant G	0.649	-79.3	1.027	0.01
Ant C	0.378	26.4	Ant H	0.558	-40.1	0.936	N/A
Ant C	0.378	26.4	Ant I	0.431	-41.0	0.809	N/A
Ant C	0.378	26.4	Ant K	0.377	-84.0	0.755	N/A
Ant C	0.378	26.4	MIMO	0.359	-43.0	0.737	N/A

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Right							
AG0			AG1			AG0 + AG1 Ratio to Limit	SPLSR
Antenna	Ratio to Limit	Position	Antenna	Ratio to Limit	Position		
Ant A	0.52	24.8	Ant H	0.896	-43.6	1.416	0.02
Ant A	0.52	24.8	Ant I	0.623	-52.4	1.143	0.02
Ant A	0.52	24.8	Ant K	0.029	-80.2	0.549	N/A
Ant A	0.52	24.8	MIMO	0.429	-42.7	0.949	N/A

Left							
AG0			AG1			AG0 + AG1 Ratio to Limit	SPLSR
Antenna	Ratio to Limit	Position	Antenna	Ratio to Limit	Position		
Ant B	0.246	34.9	Ant E	0.633	-40.4	0.879	N/A
Ant B	0.246	34.9	Ant F	0.844	-56.5	1.09	0.01
Ant B	0.246	34.9	Ant G	0.29	-34.9	0.536	N/A
Ant B	0.246	34.9	MIMO	0.741	-69.6	0.987	N/A
Ant C	0.661	22.6	Ant E	0.633	-40.4	1.294	0.02
Ant C	0.661	22.6	Ant F	0.844	-56.5	1.505	0.02
Ant C	0.661	22.6	Ant G	0.29	-34.9	0.951	N/A
Ant C	0.661	22.6	MIMO	0.741	-69.6	1.402	0.02

Notes:

1. For all combinations where the TER sum of AG0+AG1 is not greater than 1, there's no further analysis required for compliance demonstration.
2. No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the antenna pairs was not greater than 0.02 per FCC KDB 447498 D04v01. Please see the Highest ER and Hotspot Location Section for Y-axis peak locations

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E.8 Closed Body (DSI = 3/4) SAR Antenna Group Analysis

Table E-7
DSI=3/4 Closed Body AG0 Adjusted Ratio to Limit

AG0 Ratio to Limit												
	Configuration	A	B	C	E	F	G	H	I	K	MIMO	Max
Body	Back	0.927	0.949	0.606	0.196	0.046	0.155	0.133	0.074	0.042	0.276	0.949
	Front	0.259	0.298	0.091	0.625	0.574	0.471	0.391	0.366	0.401	0.631	0.631
	Top	-	-	0.061	0.038	-	-	-	0.074	-	0.104	0.104
	Bottom	0.646	0.885	0.081	0.046	0.252	0.653	0.256	0.047	0.406	0.654	0.885
	Right	0.293	-	-	-	-	-	0.800	0.729	0.008	0.682	0.800
	Left	-	0.263	0.712	0.599	0.647	0.346	-	-	-	0.693	0.712

Table E-8
Simultaneous Transmission Scenarios of NFC/WPT (Closed Body)

NFC, WPT				
	Configuration	NFC	WPT	NFC + WPT Ratio to Limit
Body	Back	0.013	0.000	0.013
	Front	0.000	0.000	0.000
	Top	0.000	0.000	0.000
	Bottom	0.000	0.000	0.000
	Right	0.000	0.000	0.000
	Left	0.000	0.000	0.000

Note: Please refer to the WPT report (SN: 1M2602190015-40.A3L) for the WPT exposure ratio values.

Table E-9
Simultaneous Transmission Scenarios of NFC/WPT (Closed Body)

	Configuration	AG0 Ratio to Limit	NFC + WPT Ratio to Limit	AG0 + NFC + WPT Ratio to Limit
Body	Back	0.949	0.013	0.962
	Front	0.631	0.000	0.631
	Top	0.104	0.000	0.104
	Bottom	0.885	0.000	0.885
	Right	0.800	0.000	0.800
	Left	0.712	0.000	0.712

Notes:

- For all combinations where the TER sum of AG0 + NFC + WPT is not greater than 1, there's no further analysis required for compliance demonstration.

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E.9 Near Body (DSI = 0/2) SAR Antenna Group Analysis

Per FCC KDB Publication 648474 D04 and consistent with recent FCC interim guidance (April 2025 TCBC Workshop / FCC KDB Publication 447498 landing page), 1-g SAR at 5 mm was used to conservatively represent extremity exposure, therefore, standalone 10g extremity SAR (0 mm) was not required.

For simultaneous transmission with extremity only transmitters (NFC/WPT), WLAN/BT configurations without hotspot (mobile router) support were treated as extremity conditions, and the corresponding SAR values were conservatively combined.

Table E-10
DSI=0/2 Open Body AG0 Highest Adjusted Ratio to Limit

AG0 Ratio to Limit			
	Configuration	BT Ant C	Max
Body	Back	0.499	0.499
	Front	0.349	0.349
	Bottom	0.214	0.214
	Left	0.47	0.47

Table E-11
DSI=0/2 Open Body AG0 Highest Adjusted Ratio to Limit

AG1 Ratio to Limit					
	Configuration	F	I	MIMO	Max
Body	Back	0.424	0.260	0.639	0.639
	Front	0.218	0.431	0.359	0.431
	Top	0.272	0.034	0.431	0.431
	Right	-	0.623	0.429	0.623
	Left	0.844	-	0.741	0.844

Table E-12
Simultaneous Transmission Scenarios of NFC/WPT (Open Body)

NFC, WPT				
	Configuration	NFC	WPT	NFC + WPT Ratio to Limit
Body	Back	0.011	0.000	0.011
	Front	0.000	0.000	0.000
	Top	0.000	0.000	0.000
	Bottom	0.000	0.000	0.000
	Right	0.000	0.000	0.000
	Left	0.000	0.000	0.000

Note: Please refer to the WPT report (SN: 1M2602190015-40.A3L) for the WPT exposure ratio values.

Table E-13
DSI=0/2 Open Body AG Verification

	Configuration	BT Ant C Ratio to Limit	AG1 Ratio to Limit	NFC + WPT Ratio to Limit	BT Ant C + AG1 + NFC + WPT Ratio to Limit
Body	Back	0.499	0.639	0.011	See Table Below
	Front	0.349	0.431	0.000	0.780
	Top	-	0.431	0.000	0.431
	Bottom	0.214	-	0.000	0.214
	Right	-	0.623	0.000	0.623
	Left	0.470	0.844	0.000	See Table Below

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Back											
Bottom Set							Top Set			Top Set + Bottom Set Ratio to Limit	SPLSR
AG0			NFC		WPT		AG1				
Antenna	Ratio to Limit	Position	Ratio to Limit	Position	Ratio to Limit	Position	Antenna	Ratio to Limit	Position		
Ant C	0.499	33.7	0.011	14.7	0.00	18.95	Ant F	0.424	-69.3	0.934	N/A
Ant C	0.499	33.7	0.011	14.7	0.00	18.95	Ant I	0.26	-35.2	0.770	N/A
Ant C	0.499	33.7	0.011	14.7	0.00	18.95	MIMO	0.639	-75.4	1.149	0.01

Left											
Bottom Set							Top Set			Top Set + Bottom Set Ratio to Limit	SPLSR
AG0			NFC		WPT		AG1				
Antenna	Ratio to Limit	Position	Ratio to Limit	Position	Ratio to Limit	Position	Antenna	Ratio to Limit	Position		
Ant C	0.470	30.4	0.000	87.9	0.000	18.95	Ant F	0.844	-70.5	1.31	0.02
Ant C	0.470	30.4	0.000	87.9	0.000	18.95	MIMO	0.741	-69.6	1.21	0.02

Notes:

1. For all combinations where the TER sum of AG0 + AG1 + NFC + WPT is not greater than 1, there's no further analysis required for compliance demonstration.
2. No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the antenna pairs was not greater than 0.02 per FCC KDB 447498 D04v01. Please see the Highest ER and Hotspot Location Section for Y-axis peak locations

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E.10 Highest Report SAR and SAR Hotspot Locations

As a conservative assessment, the distances between Bottom Set and Top Set were determined using the y-axis coordinates of the peak locations only (assumes 0 mm separation on x/z axis)

Table E-14
DSI = 1 Head Right Cheek Peak Y Coordinates

Antenna Group	Antenna	Mode/Band	ER	Y-Coord
AG0	A	GSM 850	0.179	-75.7
AG1	E	GSM 850	0.565	-30.0
AG0	B	GSM 1900	0.069	-77.1
AG0	A	UMTS 850	0.158	-71.7
AG1	E	UMTS 850	0.455	-26.0
AG0	B	UMTS 1750	0.084	-74.0
AG0	B	UMTS 1900	0.084	-74.8
AG0	A	LTE Band 71	0.160	-66.1
AG1	E	LTE Band 71	0.646	-24.2
AG0	A	LTE Band 12	0.142	-68.4
AG1	E	LTE Band 12	0.561	-25.5
AG0	A	LTE Band 13	0.192	-69.4
AG1	E	LTE Band 13	0.664	-27.9
AG0	A	LTE Band 14	0.173	-68.4
AG1	E	LTE Band 14	0.703	-29.1
AG0	A	LTE Band 26	0.139	-70.7
AG1	E	LTE Band 26	0.655	-32.0
AG0	B	LTE Band 66	0.088	-73.8
AG1	H	LTE Band 66	0.169	-2.4
AG0	B	LTE Band 25	0.086	-74.9
AG1	H	LTE Band 25	0.139	-5.6
AG0	B	LTE Band 30	0.092	-74.8
AG1	H	LTE Band 30	0.139	-31.6
AG0	B	LTE Band 7	0.097	-74.1
AG1	H	LTE Band 7	0.163	-36.8
AG0	B	LTE Band 41	0.056	-74.7
AG1	H	LTE Band 41	0.113	-43.6
AG1	F	LTE Band 48	0.321	-9.1
AG0	A	NR Band n71	0.153	-70.5
AG1	E	NR Band n71	0.525	-25.0
AG0	A	NR Band n12	0.205	-71.7
AG1	E	NR Band n12	0.595	-28.0
AG0	A	NR Band n14	0.226	-71.7
AG1	E	NR Band n14	0.408	-28.0
AG0	A	NR Band n26	0.208	-75.5
AG1	E	NR Band n26	0.609	-30.0
AG0	B	NR Band n70	0.022	-44.4
AG1	H	NR Band n70	0.099	-3.9
AG0	B	NR Band n66	0.126	-70.7
AG1	H	NR Band n66	0.139	-3.8
AG0	B	NR Band n25	0.079	-77.3
AG1	H	NR Band n25	0.104	-4.2
AG0	B	NR Band n30	0.052	-72.5
AG1	H	NR Band n30	0.116	-42.4
AG0	B	NR Band n7	0.071	-70.2
AG1	H	NR Band n7	0.153	-35.0
AG0	B	NR Band n41	0.073	-80.8
AG0	C	NR Band n41	0.098	-50.0
AG1	G	NR Band n41	0.434	1.7
AG1	H	NR Band n41	0.172	-44.6
AG0	C	NR Band n48	0.000	26.2
AG1	F	NR Band n48	0.275	-9.2
AG1	H	NR Band n48	0.153	-56.5
AG1	K	NR Band n48	0.121	0.2
AG0	C	NR Band n77	0.000	33.7
AG1	F	NR Band n77	0.297	-6.8
AG1	H	NR Band n77	0.241	-56.6
AG1	K	NR Band n77	0.341	3.8
AG0	C	2.4 GHz WIFI	0.025	-53.1
AG1	G	2.4 GHz WIFI	0.829	5.3
AG1	F	5 GHz WIFI	0.599	2.6
AG1	I	5 GHz WIFI	0.294	-62.0
AG1	MIMO	5 GHz WIFI	0.544	1.6
AG1	F	6 GHz WIFI	0.868	-1.1
AG1	I	6 GHz WIFI	0.559	-63.5
AG1	MIMO	6 GHz WIFI	0.661	-4.1
AG0	C	2.4 GHz Bluetooth	0.014	-56.5
AG1	G	2.4 GHz Bluetooth	0.537	0.8
AG1	H	NR Band n38	0.108	-44.3

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Table E-15
DSI=0/2 Body Back Side Peak Y Coordinates

Antenna Group	Antenna	Mode/Band	ER	Y-Coord
AG0	A	GSM 850	0.916	88.4
AG1	E	GSM 850	0.499	-48.5
AG0	B	GSM 1900	0.918	84.1
AG0	A	UMTS 850	0.944	86.7
AG1	E	UMTS 850	0.423	-45.3
AG0	B	UMTS 1750	0.656	84.1
AG0	B	UMTS 1900	0.826	84.1
AG0	A	LTE Band 71	0.718	87.0
AG1	E	LTE Band 71	0.404	-49.6
AG0	A	LTE Band 12	0.708	87.8
AG1	E	LTE Band 12	0.293	-48.1
AG0	A	LTE Band 13	0.855	87.3
AG1	E	LTE Band 13	0.481	-45.9
AG0	A	LTE Band 14	0.843	87.3
AG1	E	LTE Band 14	0.318	-46.5
AG0	A	LTE Band 26	0.707	87.3
AG1	E	LTE Band 26	0.172	-45.9
AG0	B	LTE Band 66	0.706	89.7
AG1	H	LTE Band 66	0.473	-75.2
AG0	B	LTE Band 25	0.808	84.9
AG1	H	LTE Band 25	0.446	-56.9
AG0	B	LTE Band 30	0.840	79.8
AG1	H	LTE Band 30	0.193	-49.5
AG0	B	LTE Band 7	0.626	82.3
AG1	H	LTE Band 7	0.241	-51.2
AG0	B	LTE Band 41	0.804	78.9
AG1	H	LTE Band 41	0.213	-80.3
AG1	F	LTE Band 48	0.309	-57.9
AG0	A	NR Band n71	0.746	86.6
AG1	E	NR Band n71	0.362	-46.9
AG0	A	NR Band n12	0.817	88.9
AG1	E	NR Band n12	0.454	-47.5
AG0	A	NR Band n14	0.943	87.4
AG1	E	NR Band n14	0.226	-46.9
AG0	A	NR Band n26	0.948	88.2
AG1	E	NR Band n26	0.256	-46.9
AG0	B	NR Band n70	0.560	88.1
AG1	H	NR Band n70	0.346	-72.6
AG0	B	NR Band n66	0.388	89.7
AG1	H	NR Band n66	0.441	-70.4
AG0	B	NR Band n25	0.855	86.5
AG1	H	NR Band n25	0.369	-72.6
AG0	B	NR Band n30	0.479	88.1
AG1	H	NR Band n30	0.181	-50.6
AG0	B	NR Band n7	0.779	83.2
AG1	H	NR Band n7	0.357	-53.1
AG0	B	NR Band n41	0.906	82.5
AG0	C	NR Band n41	0.543	28.3
AG1	G	NR Band n41	0.328	-84.9
AG1	H	NR Band n41	0.243	-79.1
AG0	C	NR Band n48	0.372	24.1
AG1	F	NR Band n48	0.499	-26.2
AG1	H	NR Band n48	0.363	-57.1
AG1	K	NR Band n48	0.146	-80.4
AG0	C	NR Band n77	0.464	23.0
AG1	F	NR Band n77	0.600	-56.7
AG1	H	NR Band n77	0.243	-53.4
AG1	K	NR Band n77	0.410	-87.0
AG0	C	2.4 GHz WIFI	0.460	25.1
AG1	G	2.4 GHz WIFI	0.466	-88.0
AG1	F	5 GHz WIFI	0.424	-69.3
AG1	I	5 GHz WIFI	0.260	-35.2
AG1	MIMO	5 GHz WIFI	0.639	-75.4
AG1	F	6 GHz WIFI	0.026	-74.3
AG1	I	6 GHz WIFI	0.027	-55.2
AG1	MIMO	6 GHz WIFI	0.114	-76.3
AG0	C	2.4 GHz Bluetooth	0.499	33.7
AG1	G	2.4 GHz Bluetooth	0.250	-86.5
N/A	NFC	NFC	0.011	18.7
N/A	WPT	WPT	0.000	18.95

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Table E-16
DSI=0/2 Body Front Side Peak Y Coordinates

Antenna Group	Antenna	Mode/Band	ER	Y-Coord
AG0	A	GSM 850	0.431	91.0
AG1	E	GSM 850	0.516	-48.3
AG0	B	GSM 1900	0.537	85.7
AG0	A	UMTS 850	0.509	79.0
AG1	E	UMTS 850	0.408	-49.5
AG0	B	UMTS 1750	0.415	85.8
AG0	B	UMTS 1900	0.453	86.3
AG0	A	LTE Band 71	0.403	91.1
AG1	E	LTE Band 71	0.400	-57.1
AG0	A	LTE Band 12	0.434	91.2
AG1	E	LTE Band 12	0.288	-53.4
AG0	A	LTE Band 13	0.479	91.1
AG1	E	LTE Band 13	0.472	-51.3
AG0	A	LTE Band 14	0.498	91.1
AG1	E	LTE Band 14	0.363	-51.3
AG0	A	LTE Band 26	0.391	91.1
AG1	E	LTE Band 26	0.170	-49.3
AG0	B	LTE Band 66	0.396	88.2
AG1	H	LTE Band 66	0.408	-72.3
AG0	B	LTE Band 25	0.411	86.8
AG1	H	LTE Band 25	0.270	-79.8
AG0	B	LTE Band 30	0.401	82.9
AG1	H	LTE Band 30	0.246	-50.1
AG0	B	LTE Band 7	0.329	84.9
AG1	H	LTE Band 7	0.271	-54.8
AG0	B	LTE Band 41	0.431	85.5
AG1	H	LTE Band 41	0.196	-75.3
AG1	F	LTE Band 48	0.301	-69.6
AG0	A	NR Band n71	0.448	90.2
AG1	E	NR Band n71	0.369	-55.2
AG0	A	NR Band n12	0.529	89.3
AG1	E	NR Band n12	0.474	-54.2
AG0	A	NR Band n14	0.607	90.2
AG1	E	NR Band n14	0.245	-50.3
AG0	A	NR Band n26	0.581	91.1
AG1	E	NR Band n26	0.269	-49.2
AG0	B	NR Band n70	0.331	90.3
AG1	H	NR Band n70	0.124	-70.3
AG0	B	NR Band n66	0.236	92.3
AG1	H	NR Band n66	0.386	-74.4
AG0	B	NR Band n25	0.438	88.4
AG1	H	NR Band n25	0.278	-73.4
AG0	B	NR Band n30	0.263	95.3
AG1	H	NR Band n30	0.094	-40.1
AG0	B	NR Band n7	0.366	85.1
AG1	H	NR Band n7	0.558	-55.1
AG0	B	NR Band n41	0.333	85.8
AG0	C	NR Band n41	0.378	28.7
AG1	G	NR Band n41	0.308	-81.6
AG1	H	NR Band n41	0.269	-75.4
AG0	C	NR Band n48	0.089	28.7
AG1	F	NR Band n48	0.110	-76.0
AG1	H	NR Band n48	0.271	-58.5
AG1	K	NR Band n48	0.162	-84.0
AG0	C	NR Band n77	0.294	26.4
AG1	F	NR Band n77	0.182	-74.6
AG1	H	NR Band n77	0.153	-55.0
AG1	K	NR Band n77	0.377	-86.8
AG0	C	2.4 GHz WIFI	0.329	34.4
AG1	G	2.4 GHz WIFI	0.506	-80.5
AG1	F	5 GHz WIFI	0.218	-72.5
AG1	I	5 GHz WIFI	0.431	-41.7
AG1	MIMO	5 GHz WIFI	0.359	-43.0
AG1	F	6 GHz WIFI	0.047	-75.8
AG1	I	6 GHz WIFI	0.023	-41.0
AG1	MIMO	6 GHz WIFI	0.218	-76.0
AG0	C	2.4 GHz Bluetooth	0.349	32.0
AG1	G	2.4 GHz Bluetooth	0.649	-79.3

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Table E-17
DSI=0/2 Body Right Edge Peak Y Coordinates

Antenna Group	Antenna	Mode/Band	ER	Y-Coord
AG0	A	GSM 850	0.295	38.2
AG0	A	UMTS 850	0.351	33.8
AG0	A	LTE Band 71	0.466	24.9
AG0	A	LTE Band 12	0.343	32.0
AG0	A	LTE Band 13	0.384	32.7
AG0	A	LTE Band 14	0.391	32.7
AG0	A	LTE Band 26	0.293	34.9
AG1	H	LTE Band 66	0.896	-53.4
AG1	H	LTE Band 25	0.805	-51.3
AG1	H	LTE Band 30	0.403	-58.6
AG1	H	LTE Band 7	0.827	-43.6
AG1	H	LTE Band 41	0.431	-64.7
AG0	A	NR Band n71	0.520	24.8
AG0	A	NR Band n12	0.441	32.6
AG0	A	NR Band n14	0.507	37.1
AG0	A	NR Band n26	0.457	37.1
AG1	H	NR Band n70	0.530	-60.5
AG1	H	NR Band n66	0.726	-43.8
AG1	H	NR Band n25	0.644	-55.4
AG1	H	NR Band n30	0.380	-59.5
AG1	H	NR Band n7	0.841	-52.4
AG1	H	NR Band n41	0.596	-64.7
AG1	H	NR Band n48	0.750	-57.5
AG1	K	NR Band n48	0.009	-83.6
AG1	H	NR Band n77	0.714	-59.6
AG1	K	NR Band n77	0.029	-80.2
AG1	I	5 GHz WIFI	0.623	-66.7
AG1	MIMO	5 GHz WIFI	0.429	-42.7
AG1	I	6 GHz WIFI	0.067	-52.4
AG1	MIMO	6 GHz WIFI	0.113	-56.5

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Table E-18
DSI=0/2 Body Left Edge Peak Y Coordinates

Antenna Group	Antenna	Mode/Band	ER	Y-Coord
AG1	E	GSM 850	0.624	-40.4
AG0	B	GSM 1900	0.212	78.4
AG1	E	UMTS 850	0.480	-42.7
AG0	B	UMTS 1750	0.246	67.7
AG0	B	UMTS 1900	0.241	73.8
AG1	E	LTE Band 71	0.598	-41.6
AG1	E	LTE Band 12	0.447	-41.6
AG1	E	LTE Band 13	0.633	-41.5
AG1	E	LTE Band 14	0.592	-42.7
AG1	E	LTE Band 26	0.331	-42.7
AG0	B	LTE Band 66	0.241	74.5
AG0	B	LTE Band 25	0.235	44.9
AG0	B	LTE Band 30	0.071	82.8
AG0	B	LTE Band 7	0.148	37.2
AG0	B	LTE Band 41	0.124	38.2
AG1	F	LTE Band 48	0.637	-56.5
AG1	E	NR Band n71	0.633	-42.7
AG1	E	NR Band n12	0.589	-41.6
AG1	E	NR Band n14	0.404	-41.6
AG1	E	NR Band n26	0.440	-40.6
AG0	B	NR Band n70	0.162	81.1
AG0	B	NR Band n66	0.101	81.4
AG0	B	NR Band n25	0.214	79.0
AG0	B	NR Band n30	0.083	41.6
AG0	B	NR Band n7	0.209	34.9
AG0	B	NR Band n41	0.196	34.9
AG0	C	NR Band n41	0.457	26.9
AG1	G	NR Band n41	0.168	-34.9
AG0	C	NR Band n48	0.591	22.6
AG1	F	NR Band n48	0.778	-58.5
AG0	C	NR Band n77	0.636	23.7
AG1	F	NR Band n77	0.472	-66.7
AG0	C	2.4 GHz WIFI	0.661	36.2
AG1	G	2.4 GHz WIFI	0.209	-49.3
AG1	F	5 GHz WIFI	0.844	-70.5
AG1	MIMO	5 GHz WIFI	0.741	-72.6
AG1	F	6 GHz WIFI	0.112	-76.8
AG1	MIMO	6 GHz WIFI	0.179	-69.6
AG0	C	2.4 GHz Bluetooth	0.470	30.4
AG1	G	2.4 GHz Bluetooth	0.290	-39.3
N/A	NFC	NFC	0.000	87.9
N/A	WPT	WPT	0.000	18.95

E.11 Conclusion

The above numerical summed TER results and SPLSR for all the combinations of antenna groups are sufficient to show that AG0 is mutually exclusive from AG1 and that TER is <1. TER simultaneous transmission cases will not exceed the SAR limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D04v01 and IEEE 1528- 2013 Section 6.3.4.1.

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