

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 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. 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:

- a) 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.

(or)

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- 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). 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 $P_{limit} + unc$ (or max of $\{P_{max} + unc, EFS P_{limit}\}$ when $EFS P_{limit} > P_{max}$) 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 $P_{limit} + unc$ (or max of $\{P_{max} + unc, EFS P_{limit}\}$ when $EFS P_{limit} > P_{max}$) 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	0.269	0.224	0.076	0.269
	Right Tilt	0.124	0.103	0.058	0.124
	Left Cheek	0.164	0.202	0.144	0.202
	Left Tilt	0.106	0.158	0.031	0.158

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

AG1 Ratio to Limit								
	Configuration	E	F	G	H	I	MIMO	Max
Head	Right Cheek	0.664	0.868	0.958	0.169	0.533	0.661	0.958
	Right Tilt	0.256	0.766	0.821	0.160	0.043	0.769	0.821
	Left Cheek	0.308	0.245	0.357	0.615	0.741	0.791	0.791
	Left Tilt	0.143	0.281	0.297	0.499	0.097	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	0.269	0.958	See Table Below
	Right Tilt	0.124	0.821	0.945
	Left Cheek	0.202	0.791	0.993
	Left Tilt	0.158	0.499	0.657

Right Cheek							
AG0			AG1			AG0 + AG1 Ratio to Limit	SPLSR
Antenna	Ratio to Limit	Position	Antenna	Ratio to Limit	Position		
Ant A	0.269	-69.4	Ant E	0.664	-31.9	0.933	N/A
Ant A	0.269	-69.4	Ant F	0.868	-1.1	1.137	0.02
Ant A	0.269	-69.4	Ant G	0.958	4.1	1.227	0.02
Ant A	0.269	-69.4	Ant H	0.169	-43.6	0.438	N/A
Ant A	0.269	-69.4	Ant I	0.533	-63.5	0.802	N/A
Ant A	0.269	-69.4	MIMO	0.661	-4.1	0.93	N/A
Ant B	0.224	-71.7	Ant E	0.664	-31.9	0.888	N/A
Ant B	0.224	-71.7	Ant F	0.868	-1.1	1.092	0.02
Ant B	0.224	-71.7	Ant G	0.958	4.1	1.182	0.02
Ant B	0.224	-71.7	Ant H	0.169	-43.6	0.393	N/A
Ant B	0.224	-71.7	Ant I	0.533	-63.5	0.757	N/A
Ant B	0.224	-71.7	MIMO	0.661	-4.1	0.885	N/A
Ant C	0.076	-50.9	Ant E	0.664	-31.9	0.74	N/A
Ant C	0.076	-50.9	Ant F	0.868	-1.1	0.944	N/A
Ant C	0.076	-50.9	Ant G	0.958	4.1	1.034	0.02
Ant C	0.076	-50.9	Ant H	0.169	-43.6	0.245	N/A
Ant C	0.076	-50.9	Ant I	0.533	-63.5	0.609	N/A
Ant C	0.076	-50.9	MIMO	0.661	-4.1	0.737	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 SPLSR 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	0.977	0.918	0.559	0.977
	Front	0.523	0.537	0.349	0.537
	Bottom	0.816	0.943	0.214	0.943
	Right	0.393	-	-	0.393
	Left	-	0.241	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	MIMO	Max
Body	Back	0.508	0.424	0.413	0.569	0.260	0.639	0.639
	Front	0.516	0.218	0.613	0.546	0.431	0.359	0.613
	Top	0.060	0.272	0.624	0.431	0.033	0.431	0.624
	Right	-	-	-	0.819	0.623	0.429	0.819
	Left	0.665	0.844	0.145	-	-	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	0.977	0.639	See Table Below
	Front	0.537	0.613	See Table Below
	Top	-	0.624	0.624
	Bottom	0.943	-	0.943
	Right	0.393	0.819	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	0.977	87.3	Ant E	0.508	-43.7	1.485	0.01
Ant A	0.977	87.3	Ant F	0.424	-69.3	1.401	0.01
Ant A	0.977	87.3	Ant G	0.413	-83.9	1.39	0.01
Ant A	0.977	87.3	Ant H	0.569	-56.9	1.546	0.01
Ant A	0.977	87.3	Ant I	0.26	-35.2	1.237	0.01
Ant A	0.977	87.3	MIMO	0.639	-75.4	1.616	0.01
Ant B	0.918	78.9	Ant E	0.508	-43.7	1.426	0.01
Ant B	0.918	78.9	Ant F	0.424	-69.3	1.342	0.01
Ant B	0.918	78.9	Ant G	0.413	-83.9	1.331	0.01
Ant B	0.918	78.9	Ant H	0.569	-56.9	1.487	0.01
Ant B	0.918	78.9	Ant I	0.26	-35.2	1.178	0.01
Ant B	0.918	78.9	MIMO	0.639	-75.4	1.557	0.01
Ant C	0.559	33.4	Ant E	0.508	-43.7	1.067	0.01
Ant C	0.559	33.4	Ant F	0.424	-69.3	0.983	N/A
Ant C	0.559	33.4	Ant G	0.413	-83.9	0.972	N/A
Ant C	0.559	33.4	Ant H	0.569	-56.9	1.128	0.01
Ant C	0.559	33.4	Ant I	0.26	-35.2	0.819	N/A
Ant C	0.559	33.4	MIMO	0.639	-75.4	1.198	0.01

Front							
AG0			AG1			AG0 + AG1 Ratio to Limit	SPLSR
Antenna	Ratio to Limit	Position	Antenna	Ratio to Limit	Position		
Ant A	0.523	79.0	Ant E	0.516	-48.3	1.039	0.01
Ant A	0.523	79.0	Ant F	0.218	-72.5	0.741	N/A
Ant A	0.523	79.0	Ant G	0.613	-84.0	1.136	0.01
Ant A	0.523	79.0	Ant H	0.546	-73.4	1.069	0.01
Ant A	0.523	79.0	Ant I	0.431	-41.0	0.954	N/A
Ant A	0.523	79.0	MIMO	0.359	-43.0	0.882	N/A
Ant B	0.537	85.5	Ant E	0.516	-48.3	1.053	0.01
Ant B	0.537	85.5	Ant F	0.218	-72.5	0.755	N/A
Ant B	0.537	85.5	Ant G	0.613	-84.0	1.15	0.01
Ant B	0.537	85.5	Ant H	0.546	-73.4	1.083	0.01
Ant B	0.537	85.5	Ant I	0.431	-41.0	0.968	N/A
Ant B	0.537	85.5	MIMO	0.359	-43.0	0.896	N/A
Ant C	0.349	32.0	Ant E	0.516	-48.3	0.865	N/A
Ant C	0.349	32.0	Ant F	0.218	-72.5	0.567	N/A
Ant C	0.349	32.0	Ant G	0.613	-84.0	0.962	N/A
Ant C	0.349	32.0	Ant H	0.546	-73.4	0.895	N/A
Ant C	0.349	32.0	Ant I	0.431	-41.0	0.78	N/A
Ant C	0.349	32.0	MIMO	0.359	-43.0	0.708	N/A

Right							
AG0			AG1			AG0 + AG1 Ratio to Limit	SPLSR
Antenna	Ratio to Limit	Position	Antenna	Ratio to Limit	Position		
Ant A	0.393	32.0	Ant H	0.819	-43.8	1.212	0.02
Ant A	0.393	32.0	Ant I	0.623	-52.4	1.016	0.01
Ant A	0.393	32.0	MIMO	0.429	-42.7	0.822	N/A

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Left							
AG0			AG1			AG0 + AG1 Ratio to Limit	SPLSR
Antenna	Ratio to Limit	Position	Antenna	Ratio to Limit	Position		
Ant B	0.241	34.9	Ant E	0.665	-40.4	0.906	N/A
Ant B	0.241	34.9	Ant F	0.844	-70.5	1.085	0.01
Ant B	0.241	34.9	Ant G	0.145	-60.4	0.386	N/A
Ant B	0.241	34.9	MIMO	0.741	-69.6	0.982	N/A
Ant C	0.661	30.4	Ant E	0.665	-40.4	1.326	0.02
Ant C	0.661	30.4	Ant F	0.844	-70.5	1.505	0.02
Ant C	0.661	30.4	Ant G	0.145	-60.4	0.806	N/A
Ant C	0.661	30.4	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 AGO Adjusted Ratio to Limit

AGO Ratio to Limit											
	Configuration	A	B	C	E	F	G	H	I	MIMO	Max
Body	Back	0.951	0.957	0.489	0.196	0.424	0.133	0.083	0.074	0.679	0.957
	Front	0.144	0.078	0.043	0.625	0.616	0.396	0.468	0.613	0.631	0.631
	Top	-	-	0.009	0.038	0.272	-	-	0.074	0.104	0.272
	Bottom	0.764	0.841	0.081	0.046	0.181	0.619	0.256	0.047	0.791	0.841
	Right	0.441	-	-	-	-	-	0.531	0.729	0.682	0.729
	Left	-	0.249	0.647	0.599	0.844	0.197	-	-	0.693	0.844

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: 1M2604240033-19.A3L) for the WPT exposure ratio values.

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

	Configuration	AGO Ratio to Limit	NFC + WPT Ratio to Limit	AGO + NFC+ WPT Ratio to Limit
Body	Back	0.957	0.013	0.970
	Front	0.631	0.000	0.631
	Top	0.272	0.000	0.272
	Bottom	0.841	0.000	0.841
	Right	0.729	0.000	0.729
	Left	0.844	0.000	0.844

Notes:

- For all combinations where the TER sum of AGO + 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	0.470	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	0.033	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: 1M2604240033-19.A3L) for the WPT exposure ratio values.

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

Body	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
	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

Back											
Bottom Set							Top Set			Bottom Set + Top 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	18.7	0.000	19.0	Ant F	0.424	-69.3	0.934	N/A
Ant C	0.499	33.7	0.011	18.7	0.000	19.0	Ant I	0.260	-35.2	0.770	N/A
Ant C	0.499	33.7	0.011	18.7	0.000	19.0	MIMO	0.639	-75.4	1.149	0.01

Left											
Bottom Set							Top Set			Bottom Set + Top 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	19.0	Ant F	0.844	-70.5	1.314	0.02
Ant C	0.470	30.4	0.000	87.9	0.000	19.0	MIMO	0.741	-69.6	1.211	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 SPLSR 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	0.242	-72.2
AG1	E	GSM 850	0.569	-30.0
AG0	B	GSM 1900	0.069	-77.1
AG0	A	UMTS 850	0.158	-73.8
AG1	E	UMTS 850	0.543	-31.9
AG0	A	LTE Band 12	0.177	-69.4
AG1	E	LTE Band 12	0.648	-26.1
AG0	A	LTE Band 13	0.209	-71.7
AG1	E	LTE Band 13	0.664	-27.9
AG0	A	LTE Band 5	0.269	-72.9
AG1	E	LTE Band 5	0.504	-29.0
AG0	B	LTE Band 66	0.088	-73.8
AG1	H	LTE Band 66	0.169	-2.4
AG0	B	LTE Band 25	0.209	-74.3
AG1	H	LTE Band 25	0.139	-5.6
AG0	B	LTE Band 41	0.056	-74.7
AG1	H	LTE Band 41	0.113	-43.6
AG0	A	NR Band n5	0.266	-73.1
AG1	E	NR Band n5	0.605	-30.0
AG0	B	NR Band n66	0.224	-75.8
AG1	H	NR Band n66	0.139	-3.8
AG0	B	NR Band n41	0.106	-71.7
AG1	H	NR Band n41	0.075	-42.5
AG0	C	2.4 GHz WIFI	0.025	-53.1
AG1	G	2.4 GHz WIFI	0.958	4.3
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	0.533	-63.5
AG1	MIMO	6 GHz WIFI	0.661	-4.1
AG0	C	2.4 GHz Bluetooth	0.076	-50.9
AG1	G	2.4 GHz Bluetooth	0.546	4.1

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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	0.943	88.5
AG1	E	GSM 850	0.499	-48.5
AG0	B	GSM 1900	0.918	84.1
AG0	A	UMTS 850	0.977	89.7
AG1	E	UMTS 850	0.465	-44.8
AG0	A	LTE Band 12	0.745	87.6
AG1	E	LTE Band 12	0.508	-47.5
AG0	A	LTE Band 13	0.855	87.3
AG1	E	LTE Band 13	0.481	-45.9
AG0	A	LTE Band 5	0.824	87.7
AG1	E	LTE Band 5	0.325	-43.7
AG0	B	LTE Band 66	0.706	89.7
AG1	H	LTE Band 66	0.569	-75.2
AG0	B	LTE Band 25	0.808	84.9
AG1	H	LTE Band 25	0.446	-56.9
AG0	B	LTE Band 41	0.804	78.9
AG1	H	LTE Band 41	0.230	-82.1
AG0	A	NR Band n5	0.889	88.1
AG1	E	NR Band n5	0.471	-47.7
AG0	B	NR Band n66	0.558	86.5
AG1	H	NR Band n66	0.441	-70.4
AG0	B	NR Band n41	0.910	84.9
AG1	H	NR Band n41	0.243	-79.1
AG0	C	2.4 GHz WIFI	0.559	33.4
AG1	G	2.4 GHz WIFI	0.413	-85.4
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	0.037	-50.8
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	0.361	-83.9
N/A	NFC	NFC	0.011	18.7
N/A	WPT	WPT	0.000	19.0

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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	0.497	79.0
AG1	E	UMTS 850	0.408	-49.5
AG0	A	LTE Band 12	0.434	91.2
AG1	E	LTE Band 12	0.512	-55.2
AG0	A	LTE Band 13	0.479	91.1
AG1	E	LTE Band 13	0.472	-51.3
AG0	A	LTE Band 5	0.512	93.5
AG1	E	LTE Band 5	0.324	-48.8
AG0	B	LTE Band 66	0.396	88.2
AG1	H	LTE Band 66	0.546	-73.4
AG0	B	LTE Band 25	0.411	86.8
AG1	H	LTE Band 25	0.270	-79.8
AG0	B	LTE Band 41	0.431	85.5
AG1	H	LTE Band 41	0.196	-75.3
AG0	A	NR Band n5	0.523	91.9
AG1	E	NR Band n5	0.468	-50.5
AG0	B	NR Band n66	0.351	86.8
AG1	H	NR Band n66	0.386	-74.4
AG0	B	NR Band n41	0.333	85.8
AG1	H	NR Band n41	0.269	-75.4
AG0	C	2.4 GHz WIFI	0.329	34.4
AG1	G	2.4 GHz WIFI	0.509	-84.6
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	0.613	-84.0
N/A	NFC	NFC	0.000	-100.7

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	0.343	33.8
AG0	A	LTE Band 12	0.343	32.0
AG0	A	LTE Band 13	0.384	32.7
AG0	A	LTE Band 5	0.361	39.4
AG1	H	LTE Band 66	0.819	-62.6
AG1	H	LTE Band 25	0.805	-51.3
AG1	H	LTE Band 41	0.431	-64.7
AG0	A	NR Band n5	0.393	36.2
AG1	H	NR Band n66	0.726	-43.8
AG1	H	NR Band n41	0.596	-64.7
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
N/A	NFC	NFC	0.000	42.7

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	0.589	-41.6
AG1	E	LTE Band 12	0.665	-43.8
AG1	E	LTE Band 13	0.633	-41.5
AG1	E	LTE Band 5	0.478	-41.6
AG0	B	LTE Band 66	0.241	74.5
AG0	B	LTE Band 25	0.235	44.9
AG0	B	LTE Band 41	0.124	38.2
AG1	E	NR Band n5	0.629	-41.6
AG0	B	NR Band n66	0.216	74.9
AG0	B	NR Band n41	0.196	34.9
AG0	C	2.4 GHz WIFI	0.661	36.2
AG1	G	2.4 GHz WIFI	0.145	-60.4
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	0.086	-68.7
N/A	NFC	NFC	0.000	87.9
N/A	WPT	WPT	0.000	19.0

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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