

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 4.3.2 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. 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.

Note:

SAR Summations for some scenarios when the output power levels are reduced, SAR values at the maximum output power level were used as the most conservative evaluation for simultaneous transmission analysis.

For each position, the highest SAR value across all modes for the applicable cellular band antenna was considered for summation to determine simultaneous SAR test exclusion.

*The SAR distributions for at least one of the antennas are spatially separated from the other antennas per FCC KDB Publication 248227 Section 6.1 procedures. Therefore, simultaneous transmission was treated independently for this configuration. See section E.4 for more information about the Spatial Separation Analysis.

Qualcomm Smart Transmit algorithm in WWAN adds directly the time-averaged RF exposure from 4G (including scenarios with inter-band ULCA active) and time-averaged RF exposure from 5G NR. Smart Transmit algorithm controls the total RF exposure from both 4G and 5G NR and during inter-band ULCA active conditions to not exceed FCC limit. Therefore, simultaneous transmission compliance between 4G+5G operations (including scenarios with inter-band ULCA active) is demonstrated in the Part 2 Report during algorithm validation.

All 3G/4G/5G transmitting antennas are within one Smart Transmit Gen2 antenna group, therefore no additional simultaneous analysis is required.

In some cases where simultaneous transmission scenarios overlap with the same power level (for example, cellular band + 2.4 GHz WIFI SISO and cellular band + 2.4 GHz WIFI MIMO), the most conservative SAR summation scenario was evaluated.

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E.3 Body SAR Simultaneous Transmission Analysis

Table E-1
Cellular Band Ant 4 Simultaneous Transmission Scenario with 2.4 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 4 ER	2.4 GHz WIFI Ant 3a ER	2.4 GHz WIFI Ant 1a ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.621	0.436	0.729	0.729*
	Top	0.558	0.296	0.008	0.862
	Bottom	0.023	0.005	0.198	0.226
	Right	0.051	0.746	0.000	0.797
	Left	0.605	0.000	0.746	0.746*

Table E-2
Cellular Band Ant 3b Simultaneous Transmission Scenario with 2.4 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 3b ER	2.4 GHz WIFI Ant 3a with 3.5 dB backoff ER	2.4 GHz WIFI Ant 1a ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.621	0.193	0.729	0.814*
	Top	0.621	0.140	0.008	0.769
	Bottom	0.009	0.005	0.198	0.212
	Right	0.087	0.299	0.000	0.386
	Left	0.038	0.000	0.746	0.784

Table E-3
Cellular Band Ant 3a Simultaneous Transmission Scenario with 2.4 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 3a ER	2.4 GHz WIFI Ant 3a with 3.5 dB backoff ER	2.4 GHz WIFI Ant 1a ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.399	0.193	0.729	0.729*
	Top	0.293	0.140	0.008	0.441
	Bottom	0.019	0.005	0.198	0.222
	Right	0.621	0.299	0.000	0.920
	Left	0.007	0.000	0.746	0.753

Table E-4
Cellular Band Ant 2a Simultaneous Transmission Scenario with 2.4 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 2a ER	2.4 GHz WIFI Ant 3a ER	2.4 GHz WIFI Ant 1a ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.619	0.436	0.729	0.729*
	Top	0.004	0.296	0.008	0.308
	Bottom	0.208	0.005	0.198	0.411
	Right	0.621	0.746	0.000	0.746*
	Left	0.003	0.000	0.746	0.749

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Table E-5
Cellular Band Ant 2b Simultaneous Transmission Scenario with 2.4 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 2b ER	2.4 GHz WIFI Ant 3a ER	2.4 GHz WIFI Ant 1a with 3.5 dB backoff ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.621	0.436	0.248	0.869*
	Top	0.004	0.296	0.008	0.308
	Bottom	0.614	0.005	0.073	0.692
	Right	0.063	0.746	0.000	0.809
	Left	0.016	0.000	0.286	0.302

Table E-6
Cellular Band Ant 1a Simultaneous Transmission Scenario with 2.4 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 1a ER	2.4 GHz WIFI Ant 3a ER	2.4 GHz WIFI Ant 1a with 3.5 dB backoff ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.546	0.436	0.248	0.794*
	Top	0.003	0.296	0.008	0.307
	Bottom	0.171	0.005	0.073	0.249
	Right	0.000	0.746	0.000	0.746
	Left	0.587	0.000	0.286	0.873

Table E-7
Cellular Band Ant 1b Simultaneous Transmission Scenario with 2.4 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 1b ER	2.4 GHz WIFI Ant 3a ER	2.4 GHz WIFI Ant 1a with 3.5 dB backoff ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.599	0.436	0.248	0.847*
	Top	0.004	0.296	0.008	0.308
	Bottom	0.621	0.005	0.073	0.699
	Right	0.008	0.746	0.000	0.754
	Left	0.056	0.000	0.286	0.342

Table E-8
Cellular Band Ant 4 Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 4 ER	5 GHz WIFI Ant 3a with 6 dB backoff ER	5 GHz WIFI Ant 1b ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.621	0.193	0.746	0.939*
	Top	0.558	0.038	0.000	0.596
	Bottom	0.023	0.003	0.641	0.667
	Right	0.051	0.173	0.004	0.228
	Left	0.605	0.000	0.065	0.670

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Table E-9
Cellular Band Ant 4 Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 4 ER	5 GHz WIFI Ant 3a with 6 dB backoff ER	5 GHz WIFI Ant 3c with 6 dB backoff ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.621	0.193	0.032	0.846
	Top	0.558	0.038	0.174	0.770
	Bottom	0.023	0.003	0.005	0.031
	Right	0.051	0.173	0.021	0.245
	Left	0.605	0.000	0.020	0.625

Table E-10
Cellular Band Ant 4 Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 4 ER	5 GHz WIFI Ant 1b ER	5 GHz WIFI Ant 3c with 6 dB backoff ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.621	0.746	0.032	0.746*
	Top	0.558	0.000	0.174	0.732
	Bottom	0.023	0.641	0.005	0.669
	Right	0.051	0.004	0.021	0.076
	Left	0.605	0.065	0.020	0.690

Table E-11
Cellular Band Ant 3b Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 3b ER	5 GHz WIFI Ant 3a with 6 dB backoff ER	5 GHz WIFI Ant 1b ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.621	0.193	0.746	0.814*
	Top	0.621	0.038	0.000	0.659
	Bottom	0.009	0.003	0.641	0.653
	Right	0.087	0.173	0.004	0.264
	Left	0.038	0.000	0.065	0.103

Table E-12
Cellular Band Ant 3b Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 3b ER	5 GHz WIFI Ant 3a with 6 dB backoff ER	5 GHz WIFI Ant 3c with 6 dB backoff ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.621	0.193	0.032	0.846
	Top	0.621	0.038	0.174	0.833
	Bottom	0.009	0.003	0.005	0.017
	Right	0.087	0.173	0.021	0.281
	Left	0.038	0.000	0.020	0.058

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Table E-13
Cellular Band Ant 3b Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 3b ER	5 GHz WIFI Ant 1b ER	5 GHz WIFI Ant 3c with 6 dB backoff ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.621	0.746	0.032	0.746*
	Top	0.621	0.000	0.174	0.795
	Bottom	0.009	0.641	0.005	0.655
	Right	0.087	0.004	0.021	0.112
	Left	0.038	0.065	0.020	0.123

Table E-14
Cellular Band Ant 3a Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 3a ER	5 GHz WIFI Ant 3a with 6 dB backoff ER	5 GHz WIFI Ant 1b ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.399	0.193	0.746	0.746*
	Top	0.293	0.038	0.000	0.331
	Bottom	0.019	0.003	0.641	0.663
	Right	0.621	0.173	0.004	0.798
	Left	0.007	0.000	0.065	0.072

Table E-15
Cellular Band Ant 3a Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 3a ER	5 GHz WIFI Ant 3a with 6 dB backoff ER	5 GHz WIFI Ant 3c with 6 dB backoff ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.399	0.193	0.032	0.624
	Top	0.293	0.038	0.174	0.505
	Bottom	0.019	0.003	0.005	0.027
	Right	0.621	0.173	0.021	0.815
	Left	0.007	0.000	0.020	0.027

Table E-16
Cellular Band Ant 3a Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 3a ER	5 GHz WIFI Ant 1b ER	5 GHz WIFI Ant 3c with 6 dB backoff ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.399	0.746	0.032	0.778*
	Top	0.293	0.000	0.174	0.467
	Bottom	0.019	0.641	0.005	0.665
	Right	0.621	0.004	0.021	0.646
	Left	0.007	0.065	0.020	0.092

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Table E-17
Cellular Band Ant 2a Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 2a ER	5 GHz WIFI Ant 3a ER	5 GHz WIFI Ant 1b ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.619	0.745	0.746	0.746*
	Top	0.004	0.170	0.000	0.174
	Bottom	0.208	0.003	0.641	0.852
	Right	0.621	0.746	0.004	0.750*
	Left	0.003	0.000	0.065	0.068

Table E-18
Cellular Band Ant 2a Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 2a ER	5 GHz WIFI Ant 3a ER	5 GHz WIFI Ant 3c ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.619	0.745	0.218	0.963*
	Top	0.004	0.170	0.746	0.920
	Bottom	0.208	0.003	0.005	0.216
	Right	0.621	0.746	0.021	0.767*
	Left	0.003	0.000	0.088	0.091

Table E-19
Cellular Band Ant 2a Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 2a ER	5 GHz WIFI Ant 1b ER	5 GHz WIFI Ant 3c ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.619	0.746	0.218	0.964*
	Top	0.004	0.000	0.746	0.750
	Bottom	0.208	0.641	0.005	0.854
	Right	0.621	0.004	0.021	0.646
	Left	0.003	0.065	0.088	0.156

Table E-20
Cellular Band Ant 2b Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 2b ER	5 GHz WIFI Ant 3a ER	5 GHz WIFI Ant 1b with 6 dB backoff ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.621	0.745	0.171	0.792*
	Top	0.004	0.170	0.000	0.174
	Bottom	0.614	0.003	0.134	0.751
	Right	0.063	0.746	0.004	0.813
	Left	0.016	0.000	0.021	0.037

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Table E-21
Cellular Band Ant 2b Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 2b ER	5 GHz WIFI Ant 3a ER	5 GHz WIFI Ant 3c ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.621	0.745	0.218	0.963*
	Top	0.004	0.170	0.746	0.920
	Bottom	0.614	0.003	0.005	0.622
	Right	0.063	0.746	0.021	0.830
	Left	0.016	0.000	0.088	0.104

Table E-22
Cellular Band Ant 2b Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 2b ER	5 GHz WIFI Ant 1b with 6 dB backoff ER	5 GHz WIFI Ant 3c ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.621	0.171	0.218	0.792*
	Top	0.004	0.000	0.746	0.750
	Bottom	0.614	0.134	0.005	0.753
	Right	0.063	0.004	0.021	0.088
	Left	0.016	0.021	0.088	0.125

Table E-23
Cellular Band Ant 1a Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 1a ER	5 GHz WIFI Ant 3a ER	5 GHz WIFI Ant 1b with 6 dB backoff ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.546	0.745	0.171	0.745*
	Top	0.003	0.170	0.000	0.173
	Bottom	0.171	0.003	0.134	0.308
	Right	0.000	0.746	0.004	0.750
	Left	0.587	0.000	0.021	0.608

Table E-24
Cellular Band Ant 1a Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 1a ER	5 GHz WIFI Ant 3a ER	5 GHz WIFI Ant 3c ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.546	0.745	0.218	0.963*
	Top	0.003	0.170	0.746	0.919
	Bottom	0.171	0.003	0.005	0.179
	Right	0.000	0.746	0.021	0.767
	Left	0.587	0.000	0.088	0.675

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Table E-25
Cellular Band Ant 1a Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 1a ER	5 GHz WIFI Ant 1b with 6 dB backoff ER	5 GHz WIFI Ant 3c ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.546	0.171	0.218	0.935
	Top	0.003	0.000	0.746	0.749
	Bottom	0.171	0.134	0.005	0.310
	Right	0.000	0.004	0.021	0.025
	Left	0.587	0.021	0.088	0.696

Table E-26
Cellular Band Ant 1b Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 1b ER	5 GHz WIFI Ant 3a ER	5 GHz WIFI Ant 1b with 6 dB backoff ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.599	0.745	0.171	0.770*
	Top	0.004	0.170	0.000	0.174
	Bottom	0.621	0.003	0.134	0.758
	Right	0.008	0.746	0.004	0.758
	Left	0.056	0.000	0.021	0.077

Table E-27
Cellular Band Ant 1b Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 1b ER	5 GHz WIFI Ant 3a ER	5 GHz WIFI Ant 3c ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.599	0.745	0.218	0.963*
	Top	0.004	0.170	0.746	0.920
	Bottom	0.621	0.003	0.005	0.629
	Right	0.008	0.746	0.021	0.775
	Left	0.056	0.000	0.088	0.144

Table E-28
Cellular Band Ant 1b Simultaneous Transmission Scenario with 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 1b ER	5 GHz WIFI Ant 1b with 6 dB backoff ER	5 GHz WIFI Ant 3c ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.599	0.171	0.218	0.988
	Top	0.004	0.000	0.746	0.750
	Bottom	0.621	0.134	0.005	0.760
	Right	0.008	0.004	0.021	0.033
	Left	0.056	0.021	0.088	0.165

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Table E-29

Cellular Band Ant 4 Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF

Simult Tx	Configuration	Cellular Band Ant 4 ER	2.4 GHz Bluetooth Ant 3a ER	2.4 GHz Bluetooth Ant 1a ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.621	0.386	0.712	0.712*
	Top	0.558	0.318	0.017	0.893
	Bottom	0.023	0.024	0.220	0.267
	Right	0.051	0.744	0.000	0.795
	Left	0.605	0.000	0.744	0.744*

Table E-30

Cellular Band Ant 3b Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF

Simult Tx	Configuration	Cellular Band Ant 3b ER	2.4 GHz Bluetooth Ant 3a with 3.5 dB backoff ER	2.4 GHz Bluetooth Ant 1a ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.621	0.179	0.712	0.800*
	Top	0.621	0.136	0.017	0.774
	Bottom	0.009	0.024	0.220	0.253
	Right	0.087	0.223	0.000	0.310
	Left	0.038	0.000	0.744	0.782

Table E-31

Cellular Band Ant 3a Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF

Simult Tx	Configuration	Cellular Band Ant 3a ER	2.4 GHz Bluetooth Ant 3a with 3.5 dB backoff ER	2.4 GHz Bluetooth Ant 1a ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.399	0.179	0.712	0.712*
	Top	0.293	0.136	0.017	0.446
	Bottom	0.019	0.024	0.220	0.263
	Right	0.621	0.223	0.000	0.844
	Left	0.007	0.000	0.744	0.751

Table E-32

Cellular Band Ant 2a Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF

Simult Tx	Configuration	Cellular Band Ant 2a ER	2.4 GHz Bluetooth Ant 3a ER	2.4 GHz Bluetooth Ant 1a ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.619	0.386	0.712	0.712*
	Top	0.004	0.318	0.017	0.339
	Bottom	0.208	0.024	0.220	0.452
	Right	0.621	0.744	0.000	0.744*
	Left	0.003	0.000	0.744	0.747

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Table E-33

Cellular Band Ant 2b Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF

Simult Tx	Configuration	Cellular Band Ant 2b ER	2.4 GHz Bluetooth Ant 3a ER	2.4 GHz Bluetooth Ant 1a with 3.5 dB backoff ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.621	0.386	0.394	0.780*
	Top	0.004	0.318	0.017	0.339
	Bottom	0.614	0.024	0.127	0.765
	Right	0.063	0.744	0.000	0.807
	Left	0.016	0.000	0.407	0.423

Table E-34

Cellular Band Ant 1a Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF

Simult Tx	Configuration	Cellular Band Ant 1a ER	2.4 GHz Bluetooth Ant 3a ER	2.4 GHz Bluetooth Ant 1a with 3.5 dB backoff ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.546	0.386	0.394	0.940*
	Top	0.003	0.318	0.017	0.338
	Bottom	0.171	0.024	0.127	0.322
	Right	0.000	0.744	0.000	0.744
	Left	0.587	0.000	0.407	0.994

Table E-35

Cellular Band Ant 1b Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF

Simult Tx	Configuration	Cellular Band Ant 1b ER	2.4 GHz Bluetooth Ant 3a ER	2.4 GHz Bluetooth Ant 1a with 3.5 dB backoff ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.599	0.386	0.394	0.993*
	Top	0.004	0.318	0.017	0.339
	Bottom	0.621	0.024	0.127	0.772
	Right	0.008	0.744	0.000	0.752
	Left	0.056	0.000	0.407	0.463

Table E-36

Cellular Band Ant 4 Simultaneous Transmission Scenario with 2.4 GHz WIFI and 2.4 GHz Bluetooth

Simult Tx	Configuration	Cellular Band Ant 4 ER	2.4 GHz WIFI Ant 3a ER	2.4 GHz Bluetooth Ant 1a ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.621	0.436	0.712	0.712*
	Top	0.558	0.296	0.017	0.871
	Bottom	0.023	0.005	0.220	0.248
	Right	0.051	0.746	0.000	0.797
	Left	0.605	0.000	0.744	0.744*

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Table E-37

Cellular Band Ant 3b Simultaneous Transmission Scenario with 2.4 GHz WIFI and 2.4 GHz Bluetooth

Simult Tx	Configuration	Cellular Band Ant 3b ER	2.4 GHz WIFI Ant 3a with 3.5 dB backoff ER	2.4 GHz Bluetooth Ant 1a ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.621	0.193	0.712	0.814*
	Top	0.621	0.140	0.017	0.778
	Bottom	0.009	0.005	0.220	0.234
	Right	0.087	0.299	0.000	0.386
	Left	0.038	0.000	0.744	0.782

Table E-38

Cellular Band Ant 3a Simultaneous Transmission Scenario with 2.4 GHz WIFI and 2.4 GHz Bluetooth

Simult Tx	Configuration	Cellular Band Ant 3a ER	2.4 GHz WIFI Ant 3a with 3.5 dB backoff ER	2.4 GHz Bluetooth Ant 1a ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.399	0.193	0.712	0.712*
	Top	0.293	0.140	0.017	0.450
	Bottom	0.019	0.005	0.220	0.244
	Right	0.621	0.299	0.000	0.920
	Left	0.007	0.000	0.744	0.751

Table E-39

Cellular Band Ant 2a Simultaneous Transmission Scenario with 2.4 GHz WIFI and 2.4 GHz Bluetooth

Simult Tx	Configuration	Cellular Band Ant 2a ER	2.4 GHz WIFI Ant 3a ER	2.4 GHz Bluetooth Ant 1a ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.619	0.436	0.712	0.712*
	Top	0.004	0.296	0.017	0.317
	Bottom	0.208	0.005	0.220	0.433
	Right	0.621	0.746	0.000	0.746*
	Left	0.003	0.000	0.744	0.747

Table E-40

Cellular Band Ant 2b Simultaneous Transmission Scenario with 2.4 GHz WIFI and 2.4 GHz Bluetooth

Simult Tx	Configuration	Cellular Band Ant 2b ER	2.4 GHz WIFI Ant 3a ER	2.4 GHz Bluetooth Ant 1a with 3.5 dB backoff ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.621	0.436	0.394	0.830*
	Top	0.004	0.296	0.017	0.317
	Bottom	0.614	0.005	0.127	0.746
	Right	0.063	0.746	0.000	0.809
	Left	0.016	0.000	0.407	0.423

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Table E-41

Cellular Band Ant 1a Simultaneous Transmission Scenario with 2.4 GHz WIFI and 2.4 GHz Bluetooth

Simult Tx	Configuration	Cellular Band Ant 1a ER	2.4 GHz WIFI Ant 3a ER	2.4 GHz Bluetooth Ant 1a with 3.5 dB backoff ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.546	0.436	0.394	0.940*
	Top	0.003	0.296	0.017	0.316
	Bottom	0.171	0.005	0.127	0.303
	Right	0.000	0.746	0.000	0.746
	Left	0.587	0.000	0.407	0.994

Table E-42

Cellular Band Ant 1b Simultaneous Transmission Scenario with 2.4 GHz WIFI and 2.4 GHz Bluetooth

Simult Tx	Configuration	Cellular Band Ant 1b ER	2.4 GHz WIFI Ant 3a ER	2.4 GHz Bluetooth Ant 1a with 3.5 dB backoff ER	Σ ER
		1	2	3	1+2+3
Body SAR	Back	0.599	0.436	0.394	0.993*
	Top	0.004	0.296	0.017	0.317
	Bottom	0.621	0.005	0.127	0.753
	Right	0.008	0.746	0.000	0.754
	Left	0.056	0.000	0.407	0.463

Table E-43

Cellular Band Ant 4 Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 4 ER	2.4 GHz Bluetooth Ant 3a with 7 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 5.5 dB backoff ER	5 GHz WIFI Ant 3a with 6 dB backoff ER	5 GHz WIFI Ant 1b ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.621	0.071	0.242	0.193	0.746	0.988*
	Top	0.558	0.057	0.017	0.038	0.000	0.670
	Bottom	0.023	0.024	0.078	0.003	0.641	0.769
	Right	0.051	0.087	0.000	0.173	0.004	0.315
	Left	0.605	0.000	0.272	0.000	0.065	0.942

Table E-44

Cellular Band Ant 4 Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 4 ER	2.4 GHz Bluetooth Ant 3a with 7 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 5.5 dB backoff ER	5 GHz WIFI Ant 3a with 6 dB backoff ER	5 GHz WIFI Ant 3c with 6 dB backoff ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.621	0.071	0.242	0.193	0.032	0.917*
	Top	0.558	0.057	0.017	0.038	0.174	0.844
	Bottom	0.023	0.024	0.078	0.003	0.005	0.133
	Right	0.051	0.087	0.000	0.173	0.021	0.332
	Left	0.605	0.000	0.272	0.000	0.020	0.897

Table E-45

Cellular Band Ant 4 Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 4 ER	2.4 GHz Bluetooth Ant 3a with 7 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 5.5 dB backoff ER	5 GHz WIFI Ant 1b ER	5 GHz WIFI Ant 3c with 6 dB backoff ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.621	0.071	0.242	0.746	0.032	0.988*
	Top	0.558	0.057	0.017	0.000	0.174	0.806
	Bottom	0.023	0.024	0.078	0.641	0.005	0.771
	Right	0.051	0.087	0.000	0.004	0.021	0.163
	Left	0.605	0.000	0.272	0.065	0.020	0.962

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Table E-46

Cellular Band Ant 3b Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 3b ER	2.4 GHz Bluetooth Ant 3a with 7 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 5.5 dB backoff ER	5 GHz WIFI Ant 3a with 6 dB backoff ER	5 GHz WIFI Ant 1b ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.621	0.071	0.242	0.193	0.746	0.988*
	Top	0.621	0.057	0.017	0.038	0.000	0.733
	Bottom	0.009	0.024	0.078	0.003	0.641	0.755
	Right	0.087	0.087	0.000	0.173	0.004	0.351
	Left	0.038	0.000	0.272	0.000	0.065	0.375

Table E-47

Cellular Band Ant 3b Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 3b ER	2.4 GHz Bluetooth Ant 3a with 7 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 5.5 dB backoff ER	5 GHz WIFI Ant 3a with 6 dB backoff ER	5 GHz WIFI Ant 3c with 6 dB backoff ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.621	0.071	0.242	0.193	0.032	0.917*
	Top	0.621	0.057	0.017	0.038	0.174	0.907
	Bottom	0.009	0.024	0.078	0.003	0.005	0.119
	Right	0.087	0.087	0.000	0.173	0.021	0.368
	Left	0.038	0.000	0.272	0.000	0.020	0.330

Table E-48

Cellular Band Ant 3b Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 3b ER	2.4 GHz Bluetooth Ant 3a with 7 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 5.5 dB backoff ER	5 GHz WIFI Ant 1b ER	5 GHz WIFI Ant 3c with 6 dB backoff ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.621	0.071	0.242	0.746	0.032	0.988*
	Top	0.621	0.057	0.017	0.000	0.174	0.869
	Bottom	0.009	0.024	0.078	0.641	0.005	0.757
	Right	0.087	0.087	0.000	0.004	0.021	0.199
	Left	0.038	0.000	0.272	0.065	0.020	0.395

Table E-49

Cellular Band Ant 3a Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 3a ER	2.4 GHz Bluetooth Ant 3a with 7 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 5.5 dB backoff ER	5 GHz WIFI Ant 3a with 6 dB backoff ER	5 GHz WIFI Ant 1b ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.399	0.071	0.242	0.193	0.746	0.988*
	Top	0.293	0.057	0.017	0.038	0.000	0.405
	Bottom	0.019	0.024	0.078	0.003	0.641	0.765
	Right	0.621	0.087	0.000	0.173	0.004	0.885
	Left	0.007	0.000	0.272	0.000	0.065	0.344

Table E-50

Cellular Band Ant 3a Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 3a ER	2.4 GHz Bluetooth Ant 3a with 7 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 5.5 dB backoff ER	5 GHz WIFI Ant 3a with 6 dB backoff ER	5 GHz WIFI Ant 3c with 6 dB backoff ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.399	0.071	0.242	0.193	0.032	0.937
	Top	0.293	0.057	0.017	0.038	0.174	0.579
	Bottom	0.019	0.024	0.078	0.003	0.005	0.129
	Right	0.621	0.087	0.000	0.173	0.021	0.902
	Left	0.007	0.000	0.272	0.000	0.020	0.299

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Table E-51

Cellular Band Ant 3a Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 3a ER	2.4 GHz Bluetooth Ant 3a with 7 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 5.5 dB backoff ER	5 GHz WIFI Ant 1b ER	5 GHz WIFI Ant 3c with 6 dB backoff ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.399	0.071	0.242	0.746	0.032	0.988*
	Top	0.293	0.057	0.017	0.000	0.174	0.541
	Bottom	0.019	0.024	0.078	0.641	0.005	0.767
	Right	0.621	0.087	0.000	0.004	0.021	0.733
	Left	0.007	0.000	0.272	0.065	0.020	0.364

Table E-52

Cellular Band Ant 2a Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 2a ER	2.4 GHz Bluetooth Ant 3a with 5.5 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 7 dB backoff ER	5 GHz WIFI Ant 3a ER	5 GHz WIFI Ant 1b with 6 dB backoff ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.619	0.110	0.170	0.745	0.171	0.960*
	Top	0.004	0.089	0.017	0.170	0.000	0.280
	Bottom	0.208	0.024	0.053	0.003	0.134	0.422
	Right	0.621	0.138	0.000	0.746	0.004	0.888*
	Left	0.003	0.000	0.196	0.000	0.021	0.220

Table E-53

Cellular Band Ant 2a Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 2a ER	2.4 GHz Bluetooth Ant 3a with 5.5 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 7 dB backoff ER	5 GHz WIFI Ant 3a ER	5 GHz WIFI Ant 3c ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.619	0.110	0.170	0.745	0.218	0.855*
	Top	0.004	0.089	0.017	0.170	0.746	0.767*
	Bottom	0.208	0.024	0.053	0.003	0.005	0.293
	Right	0.621	0.138	0.000	0.746	0.021	0.905*
	Left	0.003	0.000	0.196	0.000	0.088	0.287

Table E-54

Cellular Band Ant 2a Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 2a ER	2.4 GHz Bluetooth Ant 3a with 5.5 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 7 dB backoff ER	5 GHz WIFI Ant 1b with 6 dB backoff ER	5 GHz WIFI Ant 3c ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.619	0.110	0.170	0.171	0.218	0.960*
	Top	0.004	0.089	0.017	0.000	0.746	0.856
	Bottom	0.208	0.024	0.053	0.134	0.005	0.424
	Right	0.621	0.138	0.000	0.004	0.021	0.784
	Left	0.003	0.000	0.196	0.021	0.088	0.308

Table E-55

Cellular Band Ant 2b Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 2b ER	2.4 GHz Bluetooth Ant 3a with 5.5 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 7 dB backoff ER	5 GHz WIFI Ant 3a ER	5 GHz WIFI Ant 1b with 6 dB backoff ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.621	0.110	0.170	0.745	0.171	0.962*
	Top	0.004	0.089	0.017	0.170	0.000	0.280
	Bottom	0.614	0.024	0.053	0.003	0.134	0.828
	Right	0.063	0.138	0.000	0.746	0.004	0.951
	Left	0.016	0.000	0.196	0.000	0.021	0.233

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Table E-56

Cellular Band Ant 2b Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 2b ER	2.4 GHz Bluetooth Ant 3a with 5.5 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 7 dB backoff ER	5 GHz WIFI Ant 3a ER	5 GHz WIFI Ant 3c ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.621	0.110	0.170	0.745	0.218	0.855*
	Top	0.004	0.089	0.017	0.170	0.746	0.767*
	Bottom	0.614	0.024	0.053	0.003	0.005	0.699
	Right	0.063	0.138	0.000	0.746	0.021	0.968
	Left	0.016	0.000	0.196	0.000	0.088	0.300

Table E-57

Cellular Band Ant 2b Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 2b ER	2.4 GHz Bluetooth Ant 3a with 5.5 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 7 dB backoff ER	5 GHz WIFI Ant 1b with 6 dB backoff ER	5 GHz WIFI Ant 3c ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.621	0.110	0.170	0.171	0.218	0.962*
	Top	0.004	0.089	0.017	0.000	0.746	0.856
	Bottom	0.614	0.024	0.053	0.134	0.005	0.830
	Right	0.063	0.138	0.000	0.004	0.021	0.226
	Left	0.016	0.000	0.196	0.021	0.088	0.321

Table E-58

Cellular Band Ant 1a Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 1a ER	2.4 GHz Bluetooth Ant 3a with 5.5 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 7 dB backoff ER	5 GHz WIFI Ant 3a ER	5 GHz WIFI Ant 1b with 6 dB backoff ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.546	0.110	0.170	0.745	0.171	0.887*
	Top	0.003	0.089	0.017	0.170	0.000	0.279
	Bottom	0.171	0.024	0.053	0.003	0.134	0.385
	Right	0.000	0.138	0.000	0.746	0.004	0.888
	Left	0.587	0.000	0.196	0.000	0.021	0.804

Table E-59

Cellular Band Ant 1a Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 1a ER	2.4 GHz Bluetooth Ant 3a with 5.5 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 7 dB backoff ER	5 GHz WIFI Ant 3a ER	5 GHz WIFI Ant 3c ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.546	0.110	0.170	0.745	0.218	0.934*
	Top	0.003	0.089	0.017	0.170	0.746	0.766*
	Bottom	0.171	0.024	0.053	0.003	0.005	0.256
	Right	0.000	0.138	0.000	0.746	0.021	0.905
	Left	0.587	0.000	0.196	0.000	0.088	0.871

Table E-60

Cellular Band Ant 1a Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 1a ER	2.4 GHz Bluetooth Ant 3a with 5.5 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 7 dB backoff ER	5 GHz WIFI Ant 1b with 6 dB backoff ER	5 GHz WIFI Ant 3c ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.546	0.110	0.170	0.171	0.218	0.887*
	Top	0.003	0.089	0.017	0.000	0.746	0.855
	Bottom	0.171	0.024	0.053	0.134	0.005	0.387
	Right	0.000	0.138	0.000	0.004	0.021	0.163
	Left	0.587	0.000	0.196	0.021	0.088	0.892

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Table E-61

Cellular Band Ant 1b Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 1b ER	2.4 GHz Bluetooth Ant 3a with 5.5 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 7 dB backoff ER	5 GHz WIFI Ant 3a ER	5 GHz WIFI Ant 1b with 6 dB backoff ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.599	0.110	0.170	0.745	0.171	0.940*
	Top	0.004	0.089	0.017	0.170	0.000	0.280
	Bottom	0.621	0.024	0.053	0.003	0.134	0.835
	Right	0.008	0.138	0.000	0.746	0.004	0.896
	Left	0.056	0.000	0.196	0.000	0.021	0.273

Table E-62

Cellular Band Ant 1b Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 1b ER	2.4 GHz Bluetooth Ant 3a with 5.5 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 7 dB backoff ER	5 GHz WIFI Ant 3a ER	5 GHz WIFI Ant 3c ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.599	0.110	0.170	0.745	0.218	0.987*
	Top	0.004	0.089	0.017	0.170	0.746	0.767*
	Bottom	0.621	0.024	0.053	0.003	0.005	0.706
	Right	0.008	0.138	0.000	0.746	0.021	0.913
	Left	0.056	0.000	0.196	0.000	0.088	0.340

Table E-63

Cellular Band Ant 1b Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 1b ER	2.4 GHz Bluetooth Ant 3a with 5.5 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 7 dB backoff ER	5 GHz WIFI Ant 1b with 6 dB backoff ER	5 GHz WIFI Ant 3c ER	Σ ER
		1	2	3	4	5	1+2+3+4+5
Body SAR	Back	0.599	0.110	0.170	0.171	0.218	0.940*
	Top	0.004	0.089	0.017	0.000	0.746	0.856
	Bottom	0.621	0.024	0.053	0.134	0.005	0.837
	Right	0.008	0.138	0.000	0.004	0.021	0.171
	Left	0.056	0.000	0.196	0.021	0.088	0.361

Table E-64

Cellular Band Ant 2a Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF, 5 GHz WIFI TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 2a ER	2.4 GHz Bluetooth Ant 3a with 5.5 dB backoff ER	5 GHz WIFI Ant 3a ER	5 GHz WIFI Ant 1b ER	Σ ER
		1	2	3	4	1+2+3+4
Body SAR	Back	0.619	0.110	0.745	0.746	0.855*
	Top	0.004	0.089	0.170	0.000	0.263
	Bottom	0.208	0.024	0.003	0.641	0.876
	Right	0.621	0.138	0.746	0.004	0.888*
	Left	0.003	0.000	0.000	0.065	0.068

Table E-65

Cellular Band Ant 2a Simultaneous Transmission Scenario with 2.4 GHz Bluetooth and 5 GHz WIFI MIMO

Simult Tx	Configuration	Cellular Band Ant 2a ER	2.4 GHz Bluetooth Ant 3a with 5.5 dB backoff ER	5 GHz WIFI Ant 1b ER	5 GHz WIFI Ant 3c ER	Σ ER
		1	2	3	4	1+2+3+4
Body SAR	Back	0.619	0.110	0.746	0.218	0.964*
	Top	0.004	0.089	0.000	0.746	0.839
	Bottom	0.208	0.024	0.641	0.005	0.878
	Right	0.621	0.138	0.004	0.021	0.784
	Left	0.003	0.000	0.065	0.088	0.156

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Table E-66

Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	2.4 GHz Bluetooth Ant 3a with 5.5 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 5.5 dB backoff ER	5 GHz WIFI Ant 3a ER	5 GHz WIFI Ant 1b ER	Σ ER
		1	2	3	4	1+2+3+4
Body SAR	Back	0.110	0.242	0.745	0.746	0.988*
	Top	0.089	0.017	0.170	0.000	0.276
	Bottom	0.024	0.078	0.003	0.641	0.746
	Right	0.138	0.000	0.746	0.004	0.888
	Left	0.000	0.272	0.000	0.065	0.337

Table E-67

Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	2.4 GHz Bluetooth Ant 3a with 5.5 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 5.5 dB backoff ER	5 GHz WIFI Ant 3a ER	5 GHz WIFI Ant 3c ER	Σ ER
		1	2	3	4	1+2+3+4
Body SAR	Back	0.110	0.242	0.745	0.218	0.855*
	Top	0.089	0.017	0.170	0.746	0.763*
	Bottom	0.024	0.078	0.003	0.005	0.110
	Right	0.138	0.000	0.746	0.021	0.905
	Left	0.000	0.272	0.000	0.088	0.360

Table E-68

Simultaneous Transmission Scenario with 2.4 GHz Bluetooth TxBF and 5 GHz WIFI MIMO

Simult Tx	Configuration	2.4 GHz Bluetooth Ant 3a with 5.5 dB backoff ER	2.4 GHz Bluetooth Ant 1a with 5.5 dB backoff ER	5 GHz WIFI Ant 1b ER	5 GHz WIFI Ant 3c ER	Σ ER
		1	2	3	4	1+2+3+4
Body SAR	Back	0.110	0.242	0.746	0.218	0.988*
	Top	0.089	0.017	0.000	0.746	0.852
	Bottom	0.024	0.078	0.641	0.005	0.748
	Right	0.138	0.000	0.004	0.021	0.163
	Left	0.000	0.272	0.065	0.088	0.425

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E.4 Spatial Separation Analysis

Per FCC KDB Publication 248227, antennas may be considered spatially separated when the aggregate SAR from multiple antennas at any location in the combined SAR distribution is either ≤ 1.2 W/kg where at least 90% of the SAR is attributed to a single SAR distribution or ≤ 0.4 W/kg where no more than one SAR distribution is contributing > 0.1 W/kg.

Spatial separation was determined by inspection of the area scan SAR distributions to confirm that at all locations, SAR was < 1.2 W/kg, where at least 90% of the SAR is attributed to a single SAR distribution. See below for illustrations of the spatial separated antennas considered.

E.4.1 Back Side Spatial Separation Analysis

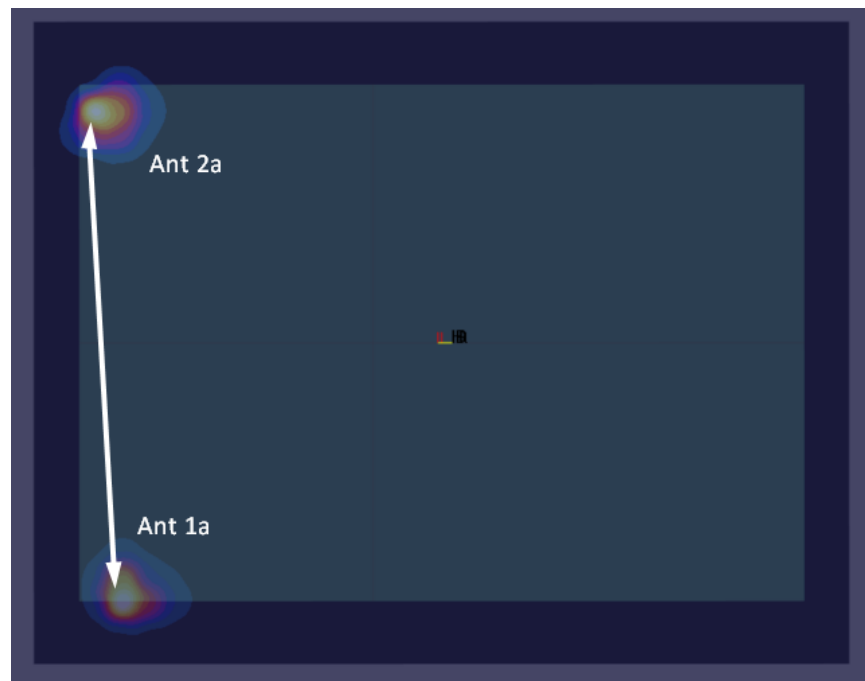


Figure E-1
Back Side Spatial Separation for Antenna 1a and Antenna 2a

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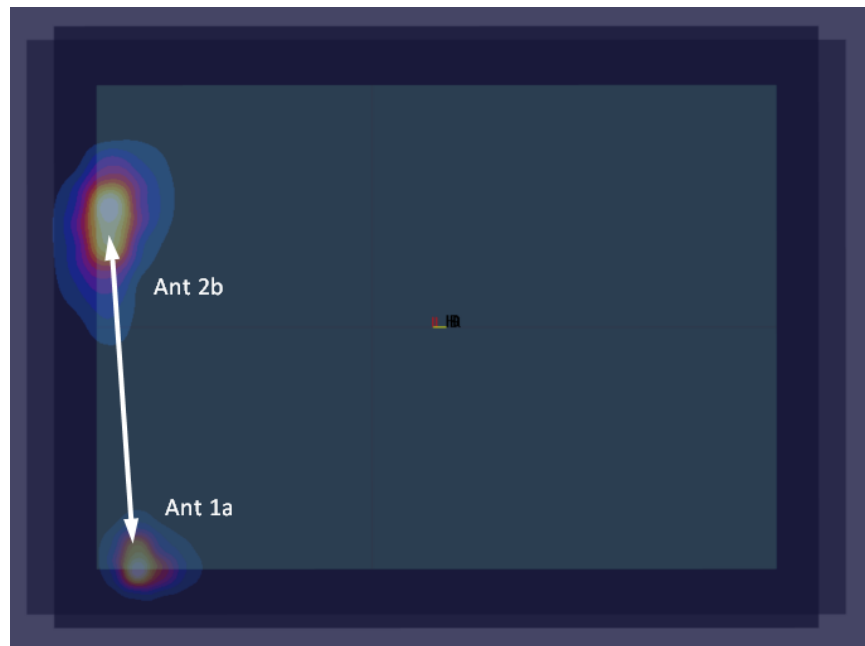


Figure E-2
Back Side Spatial Separation for Antenna 1a and Antenna 2b

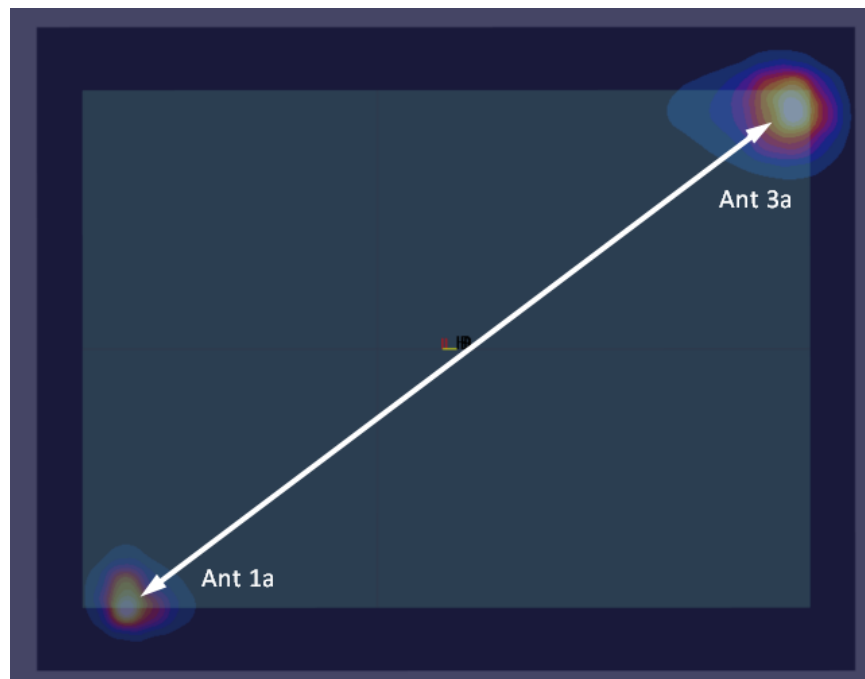


Figure E-3
Back Side Spatial Separation for Antenna 1a and Antenna 3a

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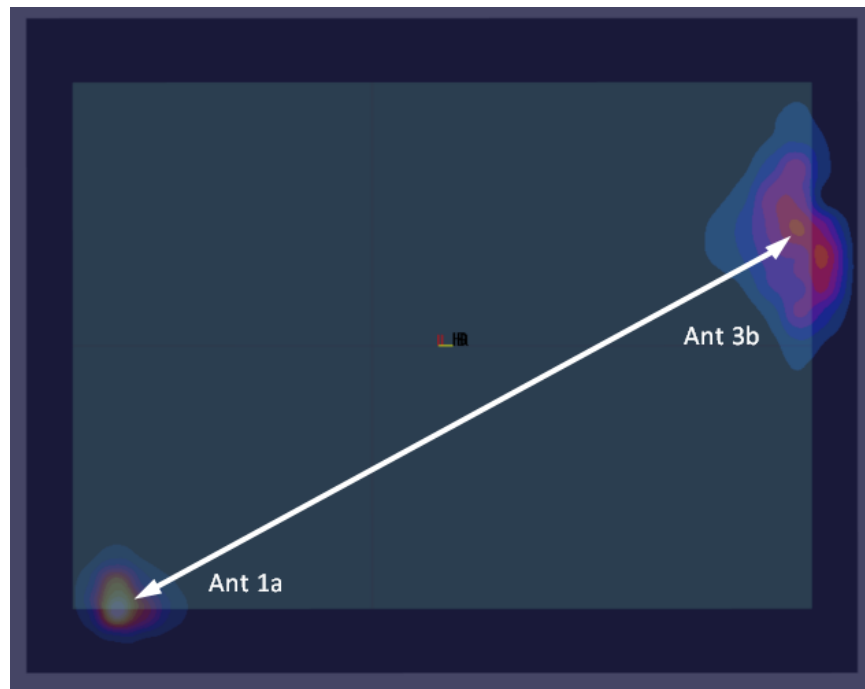


Figure E-4
Back Side Spatial Separation for Antenna 1a and Antenna 3b

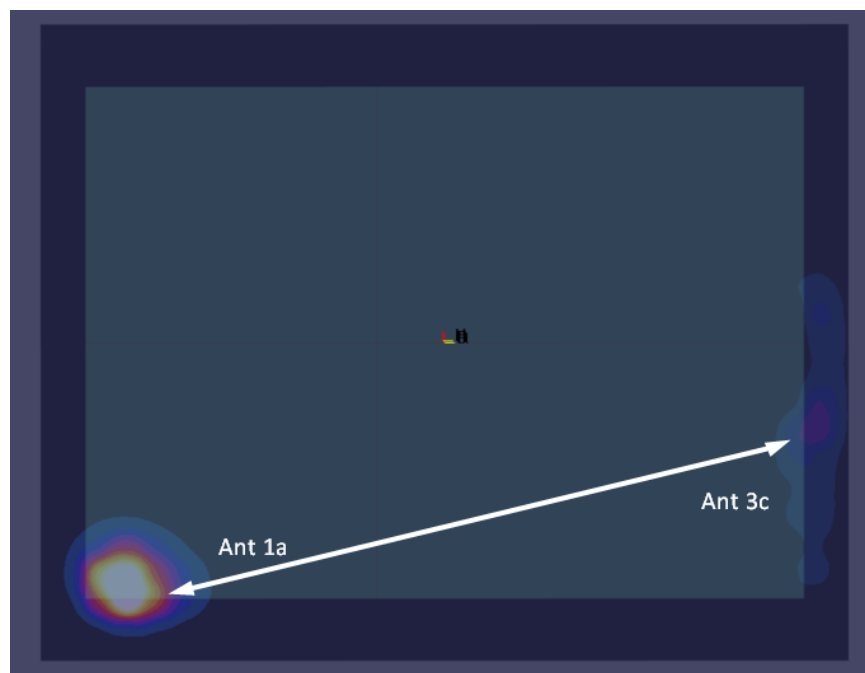


Figure E-5
Back Side Spatial Separation for Antenna 1a and Antenna 3c

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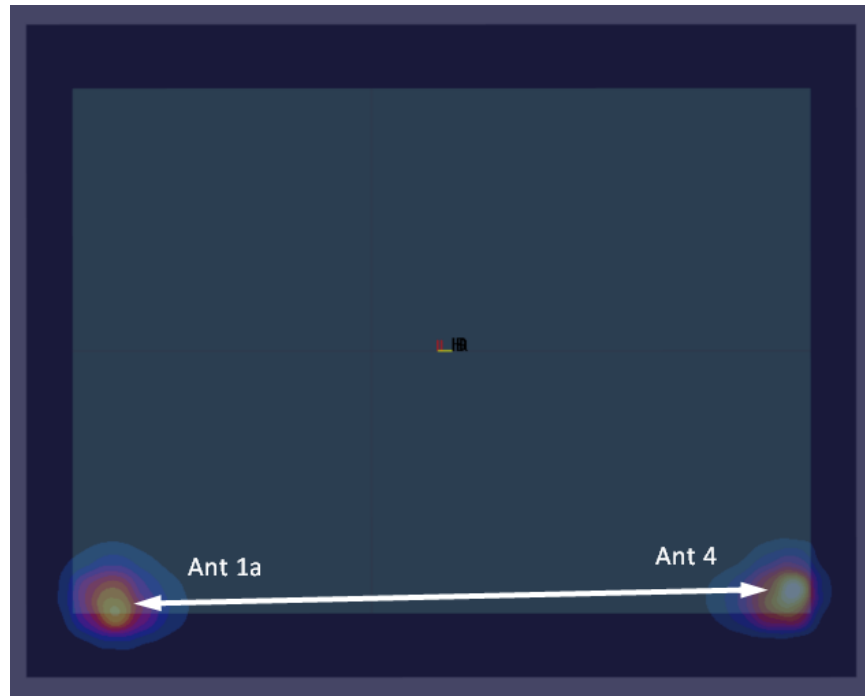


Figure E-6
Back Side Spatial Separation for Antenna 1a and Antenna 4



Figure E-7
Back Side Spatial Separation for Antenna 1b and Antenna 2a

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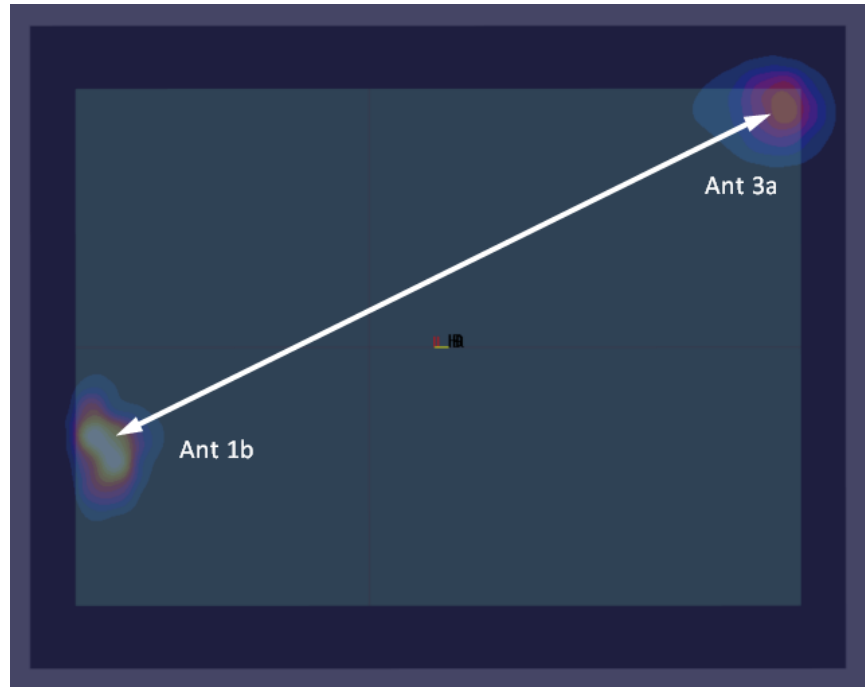


Figure E-8
Back Side Spatial Separation for Antenna 1b and Antenna 3a

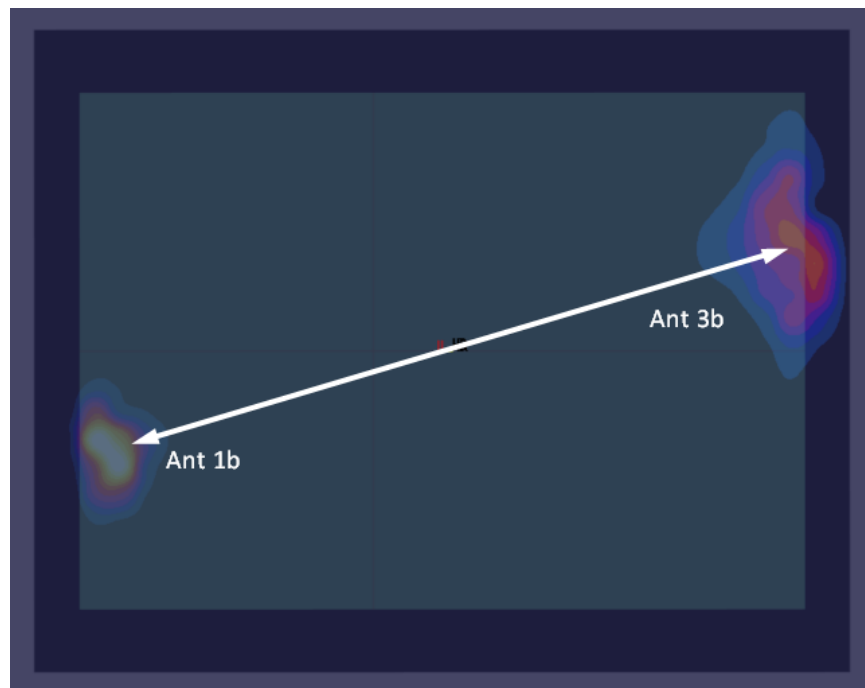


Figure E-9
Back Side Spatial Separation for Antenna 1b and Antenna 3b

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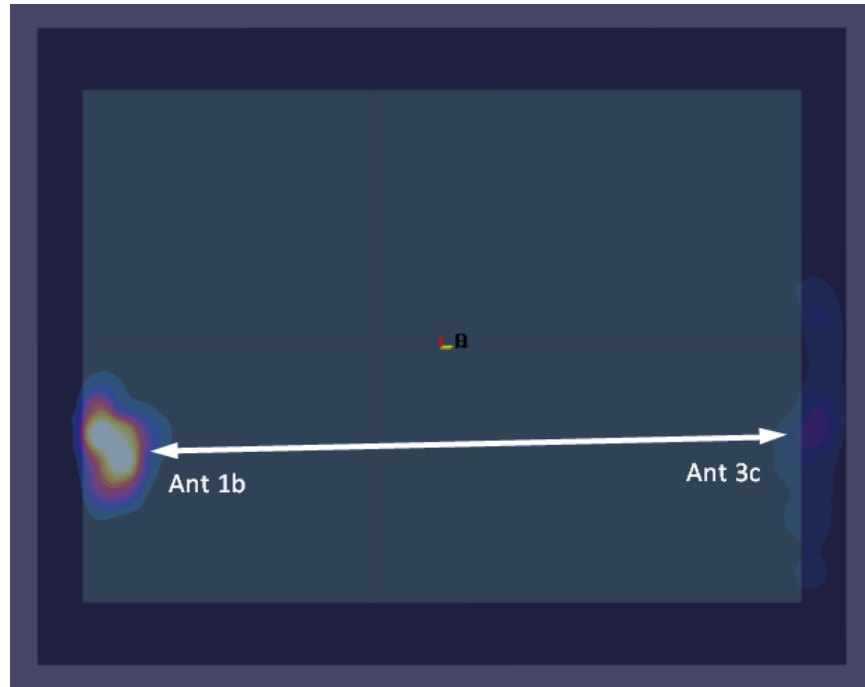


Figure E-10
Back Side Spatial Separation for Antenna 1b and Antenna 3c

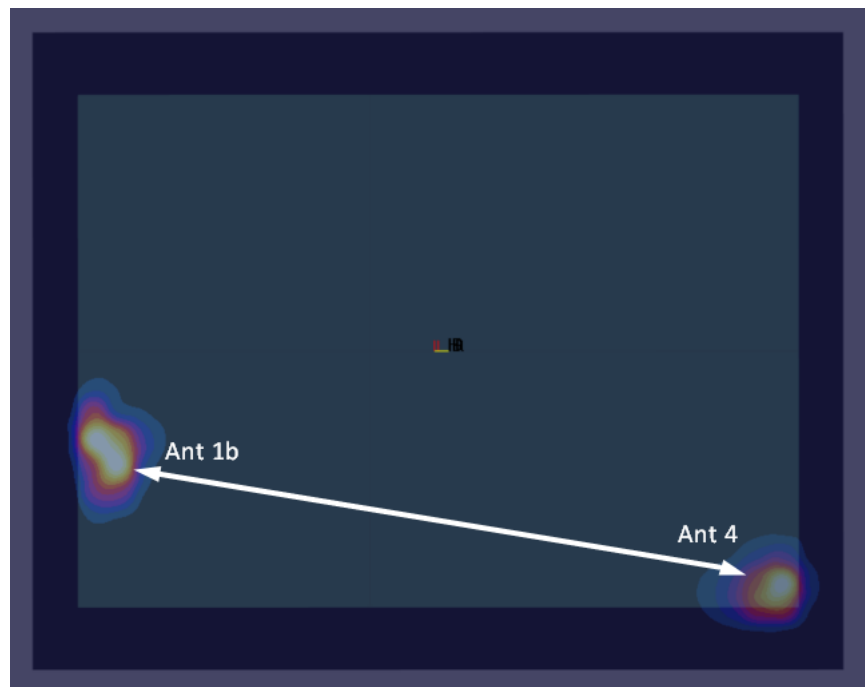


Figure E-11
Back Side Spatial Separation for Antenna 1b and Antenna 4

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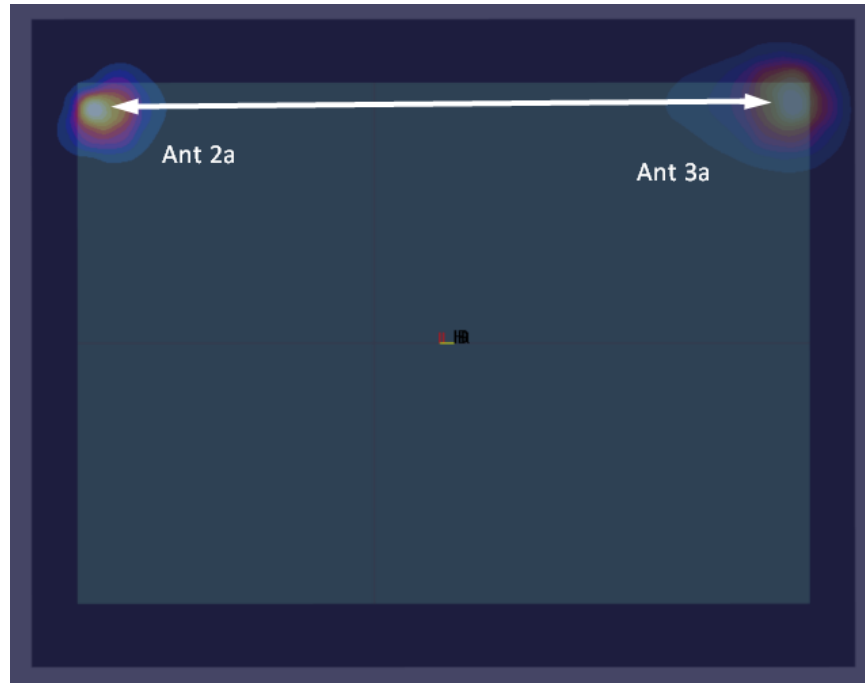


Figure E-12
Back Side Spatial Separation for Antenna 2a and Antenna 3a

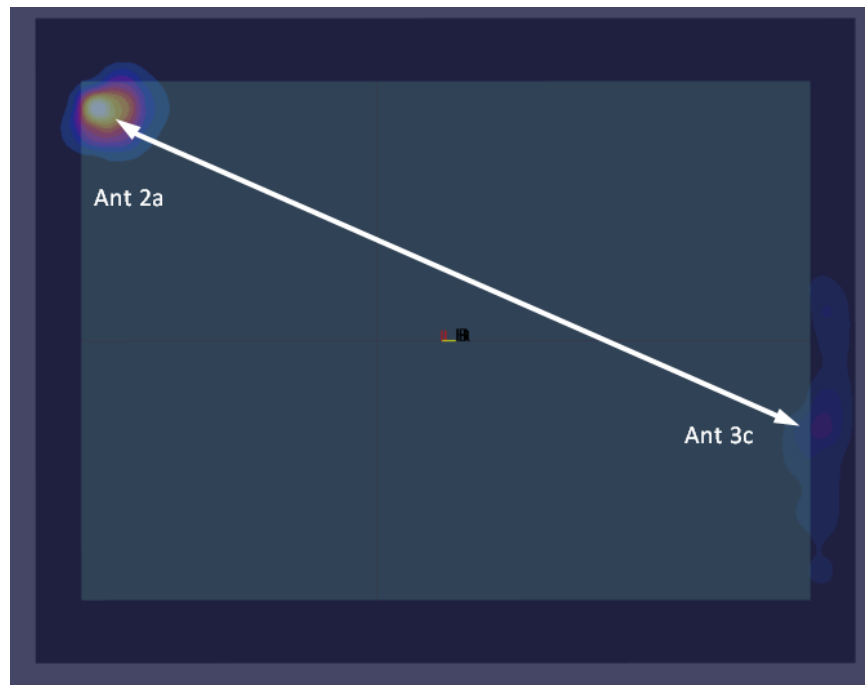


Figure E-13
Back Side Spatial Separation for Antenna 2a and Antenna 3c

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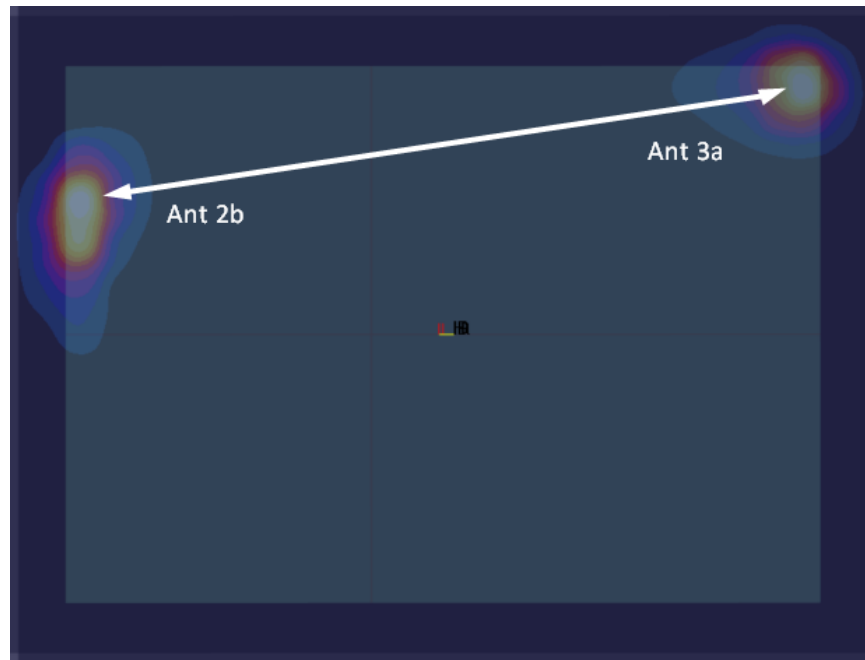


Figure E-14
Back Side Spatial Separation for Antenna 2b and Antenna 3a

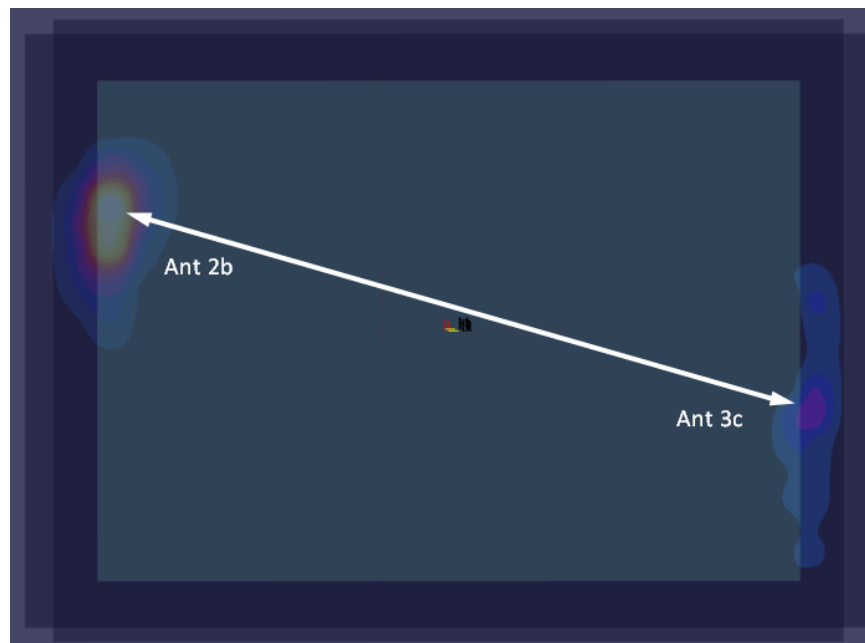


Figure E-15
Back Side Spatial Separation for Antenna 2b and Antenna 3c

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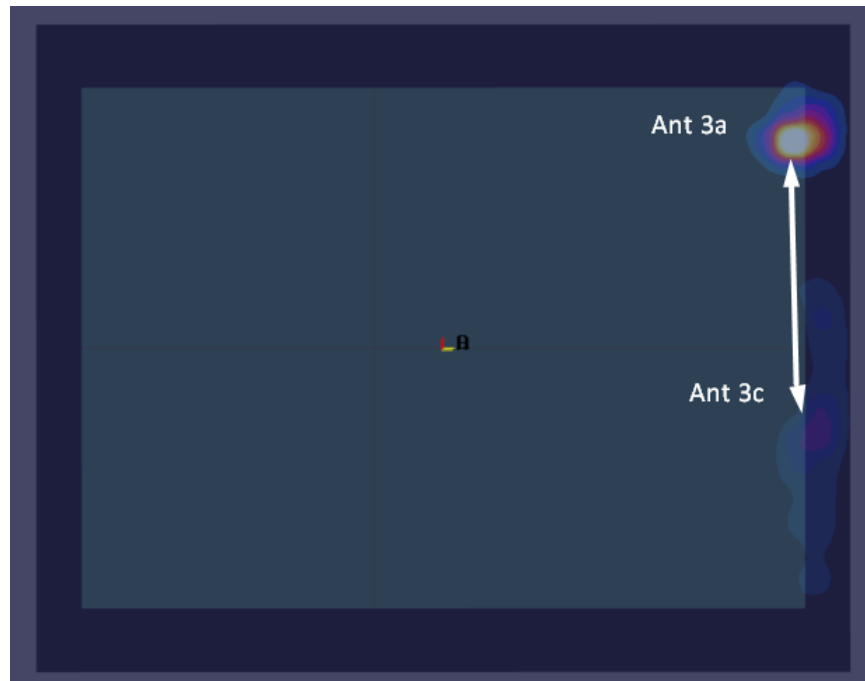


Figure E-16
Back Side Spatial Separation for Antenna 3a and Antenna 3c

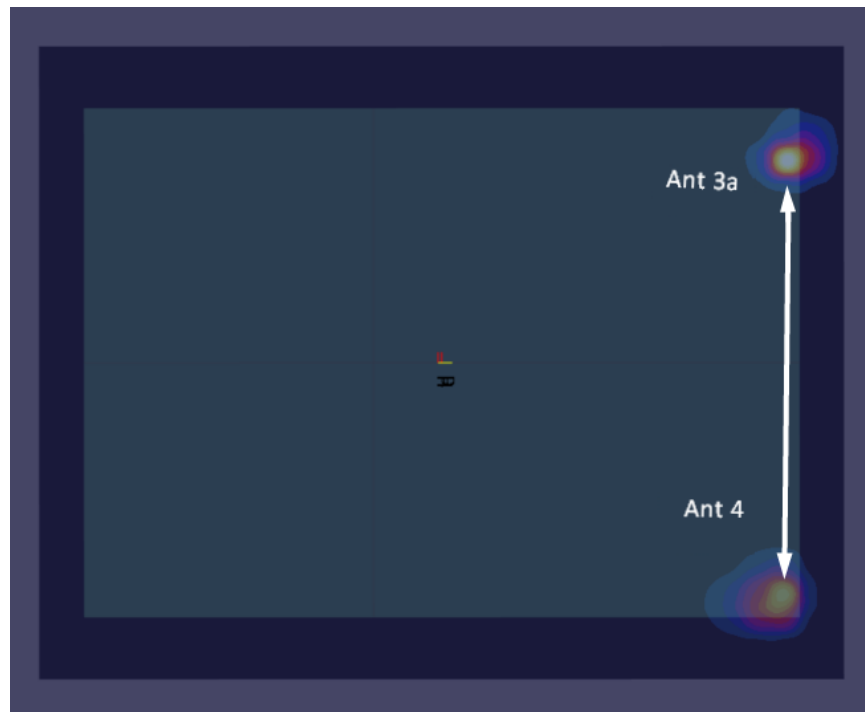


Figure E-17
Back Side Spatial Separation for Antenna 3a and Antenna 4

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E.4.2 Top Edge Spatial Separation Analysis

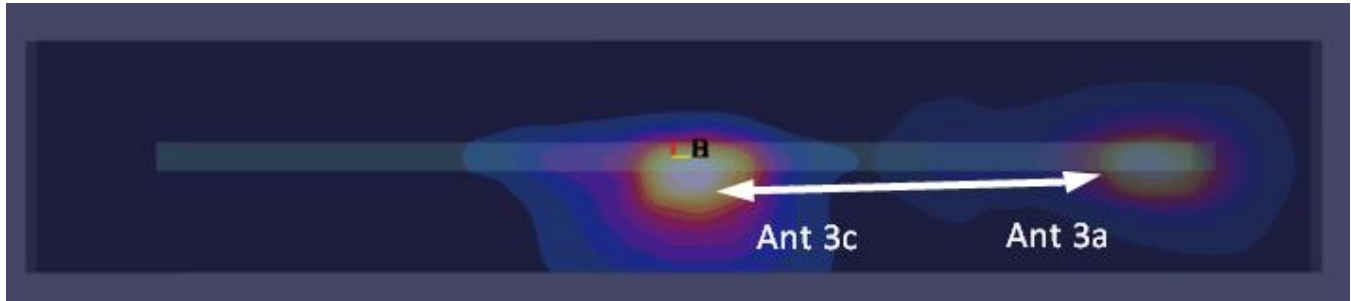


Figure E-18
Top Edge Spatial Separation for Antenna 3a and Antenna 3c

E.4.3 Right Edge Spatial Separation Analysis



Figure E-19
Right Edge Spatial Separation for Antenna 2a and Antenna 3a

E.4.4 Left Edge Spatial Separation Analysis



Figure E-20
Left Edge Spatial Separation for Antenna 1a and Antenna 4

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E.5 Simultaneous Transmission Conclusion

The above numerical summed SAR results for all the worst-case simultaneous transmission conditions were below the SAR limit. Therefore, the above analysis is sufficient to determine that 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 6.3.4.1.2.

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