

APPENDIX E: CELLULAR ANTENNA CLUSTERING VALIDATION

E.1 Introduction

This device supports cellular antenna clustering which are co-located cellular antennas with significant overlap of RF exposure hotspots grouped together in a single cluster. All RF exposure for cellular antennas in the same cluster are aggregated and always will be maintained less than an assigned budget cap that maintains overall device compliance. Cellular antennas proven spatially separated from all antennas in a cluster may be grouped in a separate cluster.

This evaluation report is to comply with Apple's validation method for proving spatial separation between cellular antennas assigned to separate clusters.

This device also supports a dynamic budget sharing algorithm. It enables separate budget caps for the cellular standalone and cellular simultaneous use conditions. In cellular standalone operation, only the cellular radio is active; in cellular simultaneous operation, other radios (i.e. connectivity antennas) are operational concurrently. Additionally, connectivity radios have two different budget conditions depending on the cellular budget caps. When the cellular budget is 1.0 W/kg, the connectivity budget is 0.6 W/kg. However, when the cellular budget is 1.2 W/kg, the connectivity budget is 0.4 W/kg. For the purposes of this evaluation, the highest cellular budget of 1.2 W/kg and connectivity budget of 0.4 W/kg was used.

In certain scenarios where power levels are reduced, SAR values measured at the maximum power level are used to ensure a conservative evaluation in simultaneous transmission analysis. When SPLSR evaluation is required, the most conservative peak separation distance is applied to represent the worst-case condition. Additionally, when multiple antennas are part of the same cluster, the highest SAR value and the shortest separation distance among them are used for the simultaneous transmission assessment.

When performing antenna clustering summation and SPLSR calculation, Total Exposure Ratio (TER) may be used for evaluation.

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

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

Where:

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

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E.2 (Step 1): Antenna Cluster Definition

The table below describes the antennas that are considered for each antenna cluster (AC).

Antenna Cluster	Cellular Antenna		Connectivity Antenna	
AC 1	Ant 3	Ant 4b	Ant 4a	
AC 2	Ant 1	Ant 2b	Ant 2a	Ant WF5B

E.3 (Step 2): Antenna Combinations for spatial separation analysis

Spatial separation will be assessed per combination of antennas per cluster that supports simultaneous transmission.

Simultaneous Operation Support	
AC 1	AC 2
Ant 3 + Ant 4a	Ant 1 + Ant 2a/WF5B
Ant 4b + Ant 4a	Ant 2b + Ant 2a/WF5B

Antenna Combination	AC 1	AC 1
1	Ant 3 + Ant 4a	Ant 1 + Ant 2a/WF5B
2	Ant 3 + Ant 4a	Ant 2b + Ant 2a/WF5B
3	Ant 4b + Ant 4a	Ant 1 + Ant 2a/WF5B
4	Ant 4b + Ant 4a	Ant 2b + Ant 2a/WF5B

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E.4 (Step 3, 4, &5): Antenna Clustering Analysis Summation and SPLSR

E.4.1 Combination 1: AC1 (Ant 3 + Ant 4a) and AC2 (Ant 1 + Ant WF5B,2a)

E.4.1.1 Back Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 3 LTE Band 71	Ant 4a 2.4 GHz WIFI	1.192 + 0.400	0.745 + 0.250	0.995
Ant 3 LTE Band 66	Ant 4a 2.4 GHz WIFI	0.683 + 0.400	0.427 + 0.250	0.677
Ant 3 NR Band n41	Ant 4a 2.4 GHz WIFI	1.190 + 0.400	0.744 + 0.250	0.994
Ant 3 NR Band n77 DoD	Ant 4a 2.4 GHz WIFI	1.015 + 0.400	0.634 + 0.250	0.884

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 1 LTE Band 13	Ant 2a 5 GHz WIFI	1.184 + 0.400	0.740 + 0.250	0.990
Ant 1 UMTS 1900	Ant 2a 5 GHz WIFI	0.640 + 0.400	0.400 + 0.250	0.650
Ant 1 LTE Band 7	Ant 2a 5 GHz WIFI	1.182 + 0.400	0.739 + 0.250	0.989
Ant 1 NR Band n48	Ant 2a 5 GHz WIFI	0.865 + 0.400	0.541 + 0.250	0.791

E.4.1.2 Back Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum	Peak Separation Distance (mm)	SPLS Ratio
		Exposure Ratio 1:	Exposure Ratio 2:			
		a	b			
Ant 3 LTE Band 71 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 13 + Ant 2a 5 GHz WIFI	0.995	0.990	1.985	184.46	0.02
Ant 3 LTE Band 71 + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant 2a 5 GHz WIFI	0.995	0.650	1.645	184.46	0.01
Ant 3 LTE Band 71 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 7 + Ant 2a 5 GHz WIFI	0.995	0.989	1.984	184.46	0.02
Ant 3 LTE Band 71 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n48 + Ant 2a 5 GHz WIFI	0.995	0.791	1.786	184.46	0.01
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 13 + Ant 2a 5 GHz WIFI	0.677	0.990	1.667	184.46	0.01
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant 2a 5 GHz WIFI	0.677	0.650	1.327	184.46	0.01
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 7 + Ant 2a 5 GHz WIFI	0.677	0.989	1.666	184.46	0.01
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n48 + Ant 2a 5 GHz WIFI	0.677	0.791	1.468	184.46	0.01
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 13 + Ant 2a 5 GHz WIFI	0.994	0.990	1.984	184.46	0.02
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant 2a 5 GHz WIFI	0.994	0.650	1.644	184.46	0.01
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 7 + Ant 2a 5 GHz WIFI	0.994	0.989	1.983	184.46	0.02
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n48 + Ant 2a 5 GHz WIFI	0.994	0.791	1.785	184.46	0.01
Ant 3 NR Band n77 DoD + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 13 + Ant 2a 5 GHz WIFI	0.884	0.990	1.874	184.46	0.01
Ant 3 NR Band n77 DoD + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant 2a 5 GHz WIFI	0.884	0.650	1.534	184.46	0.01
Ant 3 NR Band n77 DoD + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 7 + Ant 2a 5 GHz WIFI	0.884	0.989	1.873	184.46	0.01
Ant 3 NR Band n77 DoD + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n48 + Ant 2a 5 GHz WIFI	0.884	0.791	1.675	184.46	0.01

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E.4.2 Combination 1: AC1 (Ant 3 + Ant 4a) and AC2 (Ant 1 + Ant WF5B,2a)

E.4.2.1 Top Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 3 NR Band n12	Ant 4a 2.4 GHz WIFI	1.177 + 0.230	0.736 + 0.144	0.880
Ant 3 LTE Band 66	Ant 4a 2.4 GHz WIFI	1.186 + 0.230	0.741 + 0.144	0.885
Ant 3 NR Band n41	Ant 4a 2.4 GHz WIFI	1.180 + 0.230	0.738 + 0.144	0.882
Ant 3 NR Band n77 DoD	Ant 4a 2.4 GHz WIFI	1.178 + 0.230	0.736 + 0.144	0.880

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 1 NR Band n14	Ant 2a 2.4 GHz WIFI	0.080 + 0.042	0.050 + 0.026	0.076
Ant 1 NR Band n25	Ant 2a 2.4 GHz WIFI	0.013 + 0.042	0.008 + 0.026	0.034
Ant 1 LTE Band 30	Ant 2a 2.4 GHz WIFI	0.022 + 0.042	0.014 + 0.026	0.040
Ant 1 NR Band n77	Ant 2a 2.4 GHz WIFI	0.030 + 0.042	0.019 + 0.026	0.045

E.4.2.2 Top Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum
		Exposure Ratio 1:	Exposure Ratio 2:	
		a	b	a+b
Ant 3 NR Band n12 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n14 + Ant 2a 2.4 GHz WIFI	0.880	0.076	0.956
Ant 3 NR Band n12 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n25 + Ant 2a 2.4 GHz WIFI	0.880	0.034	0.914
Ant 3 NR Band n12 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 30 + Ant 2a 2.4 GHz WIFI	0.880	0.040	0.920
Ant 3 NR Band n12 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant 2a 2.4 GHz WIFI	0.880	0.045	0.925
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n14 + Ant 2a 2.4 GHz WIFI	0.885	0.076	0.961
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n25 + Ant 2a 2.4 GHz WIFI	0.885	0.034	0.919
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 30 + Ant 2a 2.4 GHz WIFI	0.885	0.040	0.925
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant 2a 2.4 GHz WIFI	0.885	0.045	0.930
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n14 + Ant 2a 2.4 GHz WIFI	0.882	0.076	0.958
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n25 + Ant 2a 2.4 GHz WIFI	0.882	0.034	0.916
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 30 + Ant 2a 2.4 GHz WIFI	0.882	0.040	0.922
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant 2a 2.4 GHz WIFI	0.882	0.045	0.927
Ant 3 NR Band n77 DoD + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n14 + Ant 2a 2.4 GHz WIFI	0.88	0.076	0.956
Ant 3 NR Band n77 DoD + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n25 + Ant 2a 2.4 GHz WIFI	0.88	0.034	0.914
Ant 3 NR Band n77 DoD + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 30 + Ant 2a 2.4 GHz WIFI	0.88	0.040	0.920
Ant 3 NR Band n77 DoD + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant 2a 2.4 GHz WIFI	0.88	0.045	0.925

Any combination where the sum is less than or equal to the applicable Exposure Ratio limit is considered validated and can be excluded from further evaluation.

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E.4.3 Combination 1: AC1 (Ant 3 + Ant 4a) and AC2 (Ant 1 + Ant WF5B,2a)

E.4.3.1 Bottom Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 3 NR Band n14	Ant 4a 2.4 GHz WIFI	0.066 + 0.035	0.041 + 0.022	0.063
Ant 3 LTE Band 66	Ant 4a 2.4 GHz WIFI	0.013 + 0.035	0.008 + 0.022	0.030
Ant 3 LTE Band 41	Ant 4a 2.4 GHz WIFI	0.021 + 0.035	0.013 + 0.022	0.035
Ant 3 NR Band n77	Ant 4a 2.4 GHz WIFI	0.015 + 0.035	0.009 + 0.022	0.031

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 1 NR Band n26	Ant 2a 2.4 GHz WIFI	1.020 + 0.160	0.638 + 0.100	0.738
Ant 1 UMTS 1900	Ant 2a 2.4 GHz WIFI	1.175 + 0.160	0.734 + 0.100	0.834
Ant 1 LTE Band 41	Ant 2a 2.4 GHz WIFI	1.194 + 0.160	0.746 + 0.100	0.846
Ant 1 NR Band n77 DoD	Ant 2a 2.4 GHz WIFI	1.173 + 0.160	0.733 + 0.100	0.833

E.4.3.2 Bottom Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum
		Exposure Ratio 1:	Exposure Ratio 2:	
		a	b	a+b
Ant 3 NR Band n14 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n26 + Ant 2a 2.4 GHz WIFI	0.063	0.738	0.801
Ant 3 NR Band n14 + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant 2a 2.4 GHz WIFI	0.063	0.834	0.897
Ant 3 NR Band n14 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 41 + Ant 2a 2.4 GHz WIFI	0.063	0.846	0.909
Ant 3 NR Band n14 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 DoD + Ant 2a 2.4 GHz WIFI	0.063	0.833	0.896
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n26 + Ant 2a 2.4 GHz WIFI	0.030	0.738	0.768
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant 2a 2.4 GHz WIFI	0.030	0.834	0.864
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 41 + Ant 2a 2.4 GHz WIFI	0.030	0.846	0.876
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 DoD + Ant 2a 2.4 GHz WIFI	0.030	0.833	0.863
Ant 3 LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n26 + Ant 2a 2.4 GHz WIFI	0.035	0.738	0.773
Ant 3 LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant 2a 2.4 GHz WIFI	0.035	0.834	0.869
Ant 3 LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 41 + Ant 2a 2.4 GHz WIFI	0.035	0.846	0.881
Ant 3 LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 DoD + Ant 2a 2.4 GHz WIFI	0.035	0.833	0.868
Ant 3 NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n26 + Ant 2a 2.4 GHz WIFI	0.031	0.738	0.769
Ant 3 NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant 2a 2.4 GHz WIFI	0.031	0.834	0.865
Ant 3 NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 41 + Ant 2a 2.4 GHz WIFI	0.031	0.846	0.877
Ant 3 NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 DoD + Ant 2a 2.4 GHz WIFI	0.031	0.833	0.864

Any combination where the sum is less than or equal to the applicable Exposure Ratio limit is considered validated and can be excluded from further evaluation.

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E.4.4 Combination 1: AC1 (Ant 3 + Ant 4a) and AC2 (Ant 1 + Ant WF5B,2a)

E.4.4.1 Right Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 3 NR Band n5	Ant 4a 2.4 GHz WIFI	0.361 + 0.003	0.226 + 0.002	0.228
Ant 3 NR Band n66	Ant 4a 2.4 GHz WIFI	0.354 + 0.003	0.221 + 0.002	0.223
Ant 3 NR Band n41	Ant 4a 2.4 GHz WIFI	0.640 + 0.003	0.400 + 0.002	0.402
Ant 3 NR Band n77	Ant 4a 2.4 GHz WIFI	1.179 + 0.003	0.737 + 0.002	0.739

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 1 NR Band n12	Ant 2a 2.4 GHz WIFI	0.086 + 0.290	0.054 + 0.181	0.235
Ant 1 NR Band n70	Ant 2a 2.4 GHz WIFI	0.056 + 0.290	0.035 + 0.181	0.216
Ant 1 LTE Band 41	Ant 2a 2.4 GHz WIFI	0.046 + 0.290	0.029 + 0.181	0.210
Ant 1 NR Band n77	Ant 2a 2.4 GHz WIFI	0.043 + 0.290	0.027 + 0.181	0.208

E.4.4.2 Right Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum
		Exposure Ratio 1:	Exposure Ratio 2:	
		a	b	a+b
Ant 3 NR Band n5 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n12 + Ant 2a 2.4 GHz WIFI	0.228	0.235	0.463
Ant 3 NR Band n5 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n70 + Ant 2a 2.4 GHz WIFI	0.228	0.216	0.444
Ant 3 NR Band n5 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 41 + Ant 2a 2.4 GHz WIFI	0.228	0.210	0.438
Ant 3 NR Band n5 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant 2a 2.4 GHz WIFI	0.228	0.208	0.436
Ant 3 NR Band n66 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n12 + Ant 2a 2.4 GHz WIFI	0.223	0.235	0.458
Ant 3 NR Band n66 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n70 + Ant 2a 2.4 GHz WIFI	0.223	0.216	0.439
Ant 3 NR Band n66 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 41 + Ant 2a 2.4 GHz WIFI	0.223	0.210	0.433
Ant 3 NR Band n66 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant 2a 2.4 GHz WIFI	0.223	0.208	0.431
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n12 + Ant 2a 2.4 GHz WIFI	0.402	0.235	0.637
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n70 + Ant 2a 2.4 GHz WIFI	0.402	0.216	0.618
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 41 + Ant 2a 2.4 GHz WIFI	0.402	0.210	0.612
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant 2a 2.4 GHz WIFI	0.402	0.208	0.610
Ant 3 NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n12 + Ant 2a 2.4 GHz WIFI	0.739	0.235	0.974
Ant 3 NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n70 + Ant 2a 2.4 GHz WIFI	0.739	0.216	0.955
Ant 3 NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 41 + Ant 2a 2.4 GHz WIFI	0.739	0.210	0.949
Ant 3 NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant 2a 2.4 GHz WIFI	0.739	0.208	0.947

Any combination where the sum is less than or equal to the applicable Exposure Ratio limit is considered validated and can be excluded from further evaluation.

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E.4.5 Combination 1: AC1 (Ant 3 + Ant 4a) and AC2 (Ant 1 + Ant WF5B,2a)

E.4.5.1 Left Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 3 LTE Band 71	Ant 4a 2.4 GHz WIFI	0.073 + 0.390	0.046 + 0.244	0.290
Ant 3 LTE Band 66	Ant 4a 2.4 GHz WIFI	0.036 + 0.390	0.023 + 0.244	0.267
Ant 3 LTE Band 41	Ant 4a 2.4 GHz WIFI	0.038 + 0.390	0.024 + 0.244	0.268
Ant 3 NR Band n48	Ant 4a 2.4 GHz WIFI	0.035 + 0.390	0.022 + 0.244	0.266

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 1 NR Band n26	Ant WF5B 5 GHz WIFI	0.444 + 0.028	0.278 + 0.018	0.296
Ant 1 UMTS 1900	Ant WF5B 5 GHz WIFI	0.353 + 0.028	0.221 + 0.018	0.239
Ant 1 NR Band n41	Ant WF5B 5 GHz WIFI	0.440 + 0.028	0.275 + 0.018	0.293
Ant 1 NR Band n77	Ant WF5B 5 GHz WIFI	1.179 + 0.028	0.737 + 0.018	0.755

E.4.5.2 Left Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum	Peak Separation Distance (mm)	SPLS Ratio
		Exposure Ratio 1:	Exposure Ratio 2:			
		a	b			
Ant 3 LTE Band 71 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n26 + Ant WF5B 5 GHz WIFI	0.290	0.296	0.586	125.01	0.00
Ant 3 LTE Band 71 + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant WF5B 5 GHz WIFI	0.290	0.239	0.529	125.01	0.00
Ant 3 LTE Band 71 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n41 + Ant WF5B 5 GHz WIFI	0.290	0.293	0.583	125.01	0.00
Ant 3 LTE Band 71 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant WF5B 5 GHz WIFI	0.290	0.755	1.045	125.01	0.01
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n26 + Ant WF5B 5 GHz WIFI	0.267	0.296	0.563	125.01	0.00
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant WF5B 5 GHz WIFI	0.267	0.239	0.506	125.01	0.00
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n41 + Ant WF5B 5 GHz WIFI	0.267	0.293	0.560	125.01	0.00
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant WF5B 5 GHz WIFI	0.267	0.755	1.022	125.01	0.01
Ant 3 LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n26 + Ant WF5B 5 GHz WIFI	0.268	0.296	0.564	125.01	0.00
Ant 3 LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant WF5B 5 GHz WIFI	0.268	0.239	0.507	125.01	0.00
Ant 3 LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n41 + Ant WF5B 5 GHz WIFI	0.268	0.293	0.561	125.01	0.00
Ant 3 LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant WF5B 5 GHz WIFI	0.268	0.755	1.023	125.01	0.01
Ant 3 NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n26 + Ant WF5B 5 GHz WIFI	0.266	0.296	0.562	125.01	0.00
Ant 3 NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant WF5B 5 GHz WIFI	0.266	0.239	0.505	125.01	0.00
Ant 3 NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n41 + Ant WF5B 5 GHz WIFI	0.266	0.293	0.559	125.01	0.00
Ant 3 NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant WF5B 5 GHz WIFI	0.266	0.755	1.021	125.01	0.01

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E.4.6 Combination 2: AC1 (Ant 3 + Ant 4a) and AC2 (Ant 2b + Ant WF5B,2a)

E.4.6.1 Back Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 3 LTE Band 71	Ant 4a 2.4 GHz WIFI	1.192 + 0.400	0.745 + 0.250	0.995
Ant 3 LTE Band 66	Ant 4a 2.4 GHz WIFI	0.683 + 0.400	0.427 + 0.250	0.677
Ant 3 NR Band n41	Ant 4a 2.4 GHz WIFI	1.190 + 0.400	0.744 + 0.250	0.994
Ant 3 NR Band n77 DoD	Ant 4a 2.4 GHz WIFI	1.015 + 0.400	0.634 + 0.250	0.884

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 2b NR Band n66	Ant 2a 5 GHz WIFI	0.722 + 0.400	0.451 + 0.250	0.701
Ant 2b NR Band n30	Ant 2a 5 GHz WIFI	0.937 + 0.400	0.586 + 0.250	0.836
Ant 2b NR Band n77	Ant 2a 5 GHz WIFI	0.908 + 0.400	0.568 + 0.250	0.818

E.4.6.2 Back Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum	Peak Separation Distance (mm)	SPLS Ratio
		Exposure Ratio 1:	Exposure Ratio 2:			
		a	b	a+b	D _{a,b}	(a+b) ^{1.5} /D _{a,b}
Ant 3 LTE Band 71 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n66 + Ant 2a 5 GHz WIFI	0.995	0.701	1.696	184.46	0.01
Ant 3 LTE Band 71 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n30 + Ant 2a 5 GHz WIFI	0.995	0.836	1.831	184.46	0.01
Ant 3 LTE Band 71 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant 2a 5 GHz WIFI	0.995	0.818	1.813	184.46	0.01
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n66 + Ant 2a 5 GHz WIFI	0.677	0.701	1.378	184.46	0.01
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n30 + Ant 2a 5 GHz WIFI	0.677	0.836	1.513	184.46	0.01
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant 2a 5 GHz WIFI	0.677	0.818	1.495	184.46	0.01
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n66 + Ant 2a 5 GHz WIFI	0.994	0.701	1.695	184.46	0.01
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n30 + Ant 2a 5 GHz WIFI	0.994	0.836	1.830	184.46	0.01
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant 2a 5 GHz WIFI	0.994	0.818	1.812	184.46	0.01
Ant 3 NR Band n77 DoD + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n66 + Ant 2a 5 GHz WIFI	0.884	0.701	1.585	184.46	0.01
Ant 3 NR Band n77 DoD + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n30 + Ant 2a 5 GHz WIFI	0.884	0.836	1.720	184.46	0.01
Ant 3 NR Band n77 DoD + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant 2a 5 GHz WIFI	0.884	0.818	1.702	184.46	0.01

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E.4.7 Combination 2: AC1 (Ant 3 + Ant 4a) and AC2 (Ant 2b + Ant WF5B,2a)

E.4.7.1 Top Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 3 NR Band n12	Ant 4a 2.4 GHz WIFI	1.177 + 0.230	0.736 + 0.144	0.880
Ant 3 LTE Band 66	Ant 4a 2.4 GHz WIFI	1.186 + 0.230	0.741 + 0.144	0.885
Ant 3 NR Band n41	Ant 4a 2.4 GHz WIFI	1.180 + 0.230	0.738 + 0.144	0.882
Ant 3 NR Band n77 DoD	Ant 4a 2.4 GHz WIFI	1.178 + 0.230	0.736 + 0.144	0.880

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 2b UMTS 1750	Ant 2a 2.4 GHz WIFI	0.012 + 0.042	0.008 + 0.026	0.034
Ant 2b LTE Band 30	Ant 2a 2.4 GHz WIFI	0.020 + 0.042	0.013 + 0.026	0.039
Ant 2b NR Band n77	Ant 2a 2.4 GHz WIFI	0.014 + 0.042	0.009 + 0.026	0.035

E.4.7.2 Top Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum
		Exposure Ratio 1:	Exposure Ratio 2:	
		a	b	a+b
Ant 3 NR Band n12 + Ant 4a 2.4 GHz WIFI	Ant 2b UMTS 1750 + Ant 2a 2.4 GHz WIFI	0.880	0.034	0.914
Ant 3 NR Band n12 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 30 + Ant 2a 2.4 GHz WIFI	0.880	0.039	0.919
Ant 3 NR Band n12 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant 2a 2.4 GHz WIFI	0.880	0.035	0.915
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 2b UMTS 1750 + Ant 2a 2.4 GHz WIFI	0.885	0.034	0.919
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 30 + Ant 2a 2.4 GHz WIFI	0.885	0.039	0.924
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant 2a 2.4 GHz WIFI	0.885	0.035	0.920
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 2b UMTS 1750 + Ant 2a 2.4 GHz WIFI	0.882	0.034	0.916
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 30 + Ant 2a 2.4 GHz WIFI	0.882	0.039	0.921
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant 2a 2.4 GHz WIFI	0.882	0.035	0.917
Ant 3 NR Band n77 DoD + Ant 4a 2.4 GHz WIFI	Ant 2b UMTS 1750 + Ant 2a 2.4 GHz WIFI	0.880	0.034	0.914
Ant 3 NR Band n77 DoD + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 30 + Ant 2a 2.4 GHz WIFI	0.880	0.039	0.919
Ant 3 NR Band n77 DoD + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant 2a 2.4 GHz WIFI	0.880	0.035	0.915

Any combination where the sum is less than or equal to the applicable Exposure Ratio limit is considered validated and can be excluded from further evaluation.

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E.4.8 Combination 2: AC1 (Ant 3 + Ant 4a) and AC2 (Ant 2b + Ant WF5B,2a)

E.4.8.1 Bottom Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 3 NR Band n14	Ant 4a 2.4 GHz WIFI	0.066 + 0.035	0.041 + 0.022	0.063
Ant 3 LTE Band 66	Ant 4a 2.4 GHz WIFI	0.013 + 0.035	0.008 + 0.022	0.030
Ant 3 LTE Band 41	Ant 4a 2.4 GHz WIFI	0.021 + 0.035	0.013 + 0.022	0.035
Ant 3 NR Band n77	Ant 4a 2.4 GHz WIFI	0.015 + 0.035	0.009 + 0.022	0.031

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 2b LTE Band 25	Ant 2a 2.4 GHz WIFI	1.193 + 0.160	0.746 + 0.100	0.846
Ant 2b LTE Band 7	Ant 2a 2.4 GHz WIFI	1.191 + 0.160	0.744 + 0.100	0.844
Ant 2b LTE Band 48	Ant 2a 2.4 GHz WIFI	1.191 + 0.160	0.744 + 0.100	0.844

E.4.8.2 Bottom Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum
		Exposure Ratio 1:	Exposure Ratio 2:	
		a	b	a+b
Ant 3 NR Band n14 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 25 + Ant 2a 2.4 GHz WIFI	0.063	0.846	0.909
Ant 3 NR Band n14 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 7 + Ant 2a 2.4 GHz WIFI	0.063	0.844	0.907
Ant 3 NR Band n14 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 48 + Ant 2a 2.4 GHz WIFI	0.063	0.844	0.907
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 25 + Ant 2a 2.4 GHz WIFI	0.030	0.846	0.876
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 7 + Ant 2a 2.4 GHz WIFI	0.030	0.844	0.874
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 48 + Ant 2a 2.4 GHz WIFI	0.030	0.844	0.874
Ant 3 LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 25 + Ant 2a 2.4 GHz WIFI	0.035	0.846	0.881
Ant 3 LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 7 + Ant 2a 2.4 GHz WIFI	0.035	0.844	0.879
Ant 3 LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 48 + Ant 2a 2.4 GHz WIFI	0.035	0.844	0.879
Ant 3 NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 25 + Ant 2a 2.4 GHz WIFI	0.031	0.846	0.877
Ant 3 NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 7 + Ant 2a 2.4 GHz WIFI	0.031	0.844	0.875
Ant 3 NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 48 + Ant 2a 2.4 GHz WIFI	0.031	0.844	0.875

Any combination where the sum is less than or equal to the applicable Exposure Ratio limit is considered validated and can be excluded from further evaluation.

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E.4.9 Combination 2: AC1 (Ant 3 + Ant 4a) and AC2 (Ant 2b + Ant WF5B,2a)

E.4.9.1 Right Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 3 NR Band n5	Ant 4a 2.4 GHz WIFI	0.361 + 0.003	0.226 + 0.002	0.228
Ant 3 NR Band n66	Ant 4a 2.4 GHz WIFI	0.354 + 0.003	0.221 + 0.002	0.223
Ant 3 NR Band n41	Ant 4a 2.4 GHz WIFI	0.640 + 0.003	0.400 + 0.002	0.402
Ant 3 NR Band n77	Ant 4a 2.4 GHz WIFI	1.179 + 0.003	0.737 + 0.002	0.739

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 2b UMTS 1750	Ant 2a 2.4 GHz WIFI	0.079 + 0.290	0.049 + 0.181	0.230
Ant 2b NR Band n30	Ant 2a 2.4 GHz WIFI	0.097 + 0.290	0.061 + 0.181	0.242
Ant 2b LTE Band 48	Ant 2a 2.4 GHz WIFI	0.114 + 0.290	0.071 + 0.181	0.252

E.4.9.2 Right Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum
		Exposure Ratio 1:	Exposure Ratio 2:	
		a	b	a+b
Ant 3 NR Band n5 + Ant 4a 2.4 GHz WIFI	Ant 2b UMTS 1750 + Ant 2a 2.4 GHz WIFI	0.228	0.230	0.458
Ant 3 NR Band n5 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n30 + Ant 2a 2.4 GHz WIFI	0.228	0.242	0.470
Ant 3 NR Band n5 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 48 + Ant 2a 2.4 GHz WIFI	0.228	0.252	0.480
Ant 3 NR Band n66 + Ant 4a 2.4 GHz WIFI	Ant 2b UMTS 1750 + Ant 2a 2.4 GHz WIFI	0.223	0.230	0.453
Ant 3 NR Band n66 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n30 + Ant 2a 2.4 GHz WIFI	0.223	0.242	0.465
Ant 3 NR Band n66 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 48 + Ant 2a 2.4 GHz WIFI	0.223	0.252	0.475
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 2b UMTS 1750 + Ant 2a 2.4 GHz WIFI	0.402	0.230	0.632
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n30 + Ant 2a 2.4 GHz WIFI	0.402	0.242	0.644
Ant 3 NR Band n41 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 48 + Ant 2a 2.4 GHz WIFI	0.402	0.252	0.654
Ant 3 NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 2b UMTS 1750 + Ant 2a 2.4 GHz WIFI	0.739	0.230	0.969
Ant 3 NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n30 + Ant 2a 2.4 GHz WIFI	0.739	0.242	0.981
Ant 3 NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 48 + Ant 2a 2.4 GHz WIFI	0.739	0.252	0.991

Any combination where the sum is less than or equal to the applicable Exposure Ratio limit is considered validated and can be excluded from further evaluation.

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E.4.10 Combination 2: AC1 (Ant 3 + Ant 4a) and AC2 (Ant 2b + Ant WF5B,2a)

E.4.10.1 Left Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 3 LTE Band 71	Ant 4a 2.4 GHz WIFI	0.073 + 0.390	0.046 + 0.244	0.290
Ant 3 LTE Band 66	Ant 4a 2.4 GHz WIFI	0.036 + 0.390	0.023 + 0.244	0.267
Ant 3 LTE Band 41	Ant 4a 2.4 GHz WIFI	0.038 + 0.390	0.024 + 0.244	0.268
Ant 3 NR Band n48	Ant 4a 2.4 GHz WIFI	0.035 + 0.390	0.022 + 0.244	0.266

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 2b NR Band n25	Ant WF5B 5 GHz WIFI	0.017 + 0.028	0.011 + 0.018	0.029
Ant 2b LTE Band 41	Ant WF5B 5 GHz WIFI	0.040 + 0.028	0.025 + 0.018	0.043
Ant 2b NR Band n77	Ant WF5B 5 GHz WIFI	0.050 + 0.028	0.031 + 0.018	0.049

E.4.10.2 Left Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum
		Exposure Ratio 1:	Exposure Ratio 2:	
		a	b	a+b
Ant 3 LTE Band 71 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n25 + Ant WF5B 5 GHz WIFI	0.290	0.029	0.319
Ant 3 LTE Band 71 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 41 + Ant WF5B 5 GHz WIFI	0.290	0.043	0.333
Ant 3 LTE Band 71 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant WF5B 5 GHz WIFI	0.290	0.049	0.339
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n25 + Ant WF5B 5 GHz WIFI	0.267	0.029	0.296
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 41 + Ant WF5B 5 GHz WIFI	0.267	0.043	0.310
Ant 3 LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant WF5B 5 GHz WIFI	0.267	0.049	0.316
Ant 3 LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n25 + Ant WF5B 5 GHz WIFI	0.268	0.029	0.297
Ant 3 LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 41 + Ant WF5B 5 GHz WIFI	0.268	0.043	0.311
Ant 3 LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant WF5B 5 GHz WIFI	0.268	0.049	0.317
Ant 3 NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n25 + Ant WF5B 5 GHz WIFI	0.266	0.029	0.295
Ant 3 NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 41 + Ant WF5B 5 GHz WIFI	0.266	0.043	0.309
Ant 3 NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant WF5B 5 GHz WIFI	0.266	0.049	0.315

Any combination where the sum is less than or equal to the applicable Exposure Ratio limit is considered validated and can be excluded from further evaluation.

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E.4.11 Combination 3: AC1 (Ant 4b + Ant 4a) and AC2 (Ant 1 + Ant WF5B,2a)

E.4.11.1 Back Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 4b NR Band n25	Ant 4a 2.4 GHz WIFI	0.827 + 0.400	0.517 + 0.250	0.767
Ant 4b LTE Band 30	Ant 4a 2.4 GHz WIFI	1.040 + 0.400	0.650 + 0.250	0.900
Ant 4b NR Band n77	Ant 4a 2.4 GHz WIFI	0.906 + 0.400	0.566 + 0.250	0.816

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 1 LTE Band 13	Ant 2a 5 GHz WIFI	1.184 + 0.400	0.740 + 0.250	0.990
Ant 1 UMTS 1900	Ant 2a 5 GHz WIFI	0.640 + 0.400	0.400 + 0.250	0.650
Ant 1 LTE Band 7	Ant 2a 5 GHz WIFI	1.182 + 0.400	0.739 + 0.250	0.989
Ant 1 NR Band n48	Ant 2a 5 GHz WIFI	0.865 + 0.400	0.541 + 0.250	0.791

E.4.11.2 Back Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum	Peak Separation Distance (mm)	SPLS Ratio
		Exposure Ratio 1:	Exposure Ratio 2:			
		a	b	a+b	D _{a+b}	(a+b) ^{1.5} /D _{a+b}
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 13 + Ant 2a 5 GHz WIFI	0.767	0.990	1.757	214.11	0.01
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant 2a 5 GHz WIFI	0.767	0.650	1.417	214.11	0.01
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 7 + Ant 2a 5 GHz WIFI	0.767	0.989	1.756	214.11	0.01
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n48 + Ant 2a 5 GHz WIFI	0.767	0.791	1.558	214.11	0.01
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 13 + Ant 2a 5 GHz WIFI	0.900	0.990	1.890	214.11	0.01
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant 2a 5 GHz WIFI	0.900	0.650	1.550	214.11	0.01
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 7 + Ant 2a 5 GHz WIFI	0.900	0.989	1.889	214.11	0.01
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n48 + Ant 2a 5 GHz WIFI	0.900	0.791	1.691	214.11	0.01
Ant 4b NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 13 + Ant 2a 5 GHz WIFI	0.816	0.990	1.806	214.11	0.01
Ant 4b NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant 2a 5 GHz WIFI	0.816	0.650	1.466	214.11	0.01
Ant 4b NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 7 + Ant 2a 5 GHz WIFI	0.816	0.989	1.805	214.11	0.01
Ant 4b NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n48 + Ant 2a 5 GHz WIFI	0.816	0.791	1.607	214.11	0.01

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E.4.12 Combination 3: AC1 (Ant 4b + Ant 4a) and AC2 (Ant 1 + Ant WF5B,2a)

E.4.12.1 Top Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 4b NR Band n25	Ant 4a 2.4 GHz WIFI	1.184 + 0.230	0.740 + 0.144	0.884
Ant 4b LTE Band 41	Ant 4a 2.4 GHz WIFI	1.187 + 0.230	0.742 + 0.144	0.886
Ant 4b NR Band n48	Ant 4a 2.4 GHz WIFI	1.191 + 0.230	0.744 + 0.144	0.888

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 1 NR Band n14	Ant 2a 2.4 GHz WIFI	0.080 + 0.042	0.050 + 0.026	0.076
Ant 1 NR Band n25	Ant 2a 2.4 GHz WIFI	0.013 + 0.042	0.008 + 0.026	0.034
Ant 1 LTE Band 30	Ant 2a 2.4 GHz WIFI	0.022 + 0.042	0.014 + 0.026	0.040
Ant 1 NR Band n77	Ant 2a 2.4 GHz WIFI	0.030 + 0.042	0.019 + 0.026	0.045

E.4.12.2 Top Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum
		Exposure Ratio 1:	Exposure Ratio 2:	
		a	b	a+b
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n14 + Ant 2a 2.4 GHz WIFI	0.884	0.076	0.960
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n25 + Ant 2a 2.4 GHz WIFI	0.884	0.034	0.918
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 30 + Ant 2a 2.4 GHz WIFI	0.884	0.040	0.924
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant 2a 2.4 GHz WIFI	0.884	0.045	0.929
Ant 4b LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n14 + Ant 2a 2.4 GHz WIFI	0.886	0.076	0.962
Ant 4b LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n25 + Ant 2a 2.4 GHz WIFI	0.886	0.034	0.920
Ant 4b LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 30 + Ant 2a 2.4 GHz WIFI	0.886	0.040	0.926
Ant 4b LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant 2a 2.4 GHz WIFI	0.886	0.045	0.931
Ant 4b NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n14 + Ant 2a 2.4 GHz WIFI	0.888	0.076	0.964
Ant 4b NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n25 + Ant 2a 2.4 GHz WIFI	0.888	0.034	0.922
Ant 4b NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 30 + Ant 2a 2.4 GHz WIFI	0.888	0.040	0.928
Ant 4b NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant 2a 2.4 GHz WIFI	0.888	0.045	0.933

Any combination where the sum is less than or equal to the applicable Exposure Ratio limit is considered validated and can be excluded from further evaluation.

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E.4.13 Combination 3: AC1 (Ant 4b + Ant 4a) and AC2 (Ant 1 + Ant WF5B,2a)

E.4.13.1 Bottom Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 4b UMTS 1900	Ant 4a 2.4 GHz WIFI	0.013 + 0.035	0.008 + 0.022	0.030
Ant 4b LTE Band 30	Ant 4a 2.4 GHz WIFI	0.003 + 0.035	0.002 + 0.022	0.024

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 1 NR Band n26	Ant 2a 2.4 GHz WIFI	1.020 + 0.160	0.638 + 0.100	0.738
Ant 1 UMTS 1900	Ant 2a 2.4 GHz WIFI	1.175 + 0.160	0.734 + 0.100	0.834
Ant 1 LTE Band 41	Ant 2a 2.4 GHz WIFI	1.194 + 0.160	0.746 + 0.100	0.846
Ant 1 NR Band n77 DoD	Ant 2a 2.4 GHz WIFI	1.173 + 0.160	0.733 + 0.100	0.833

E.4.13.2 Bottom Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum
		Exposure Ratio 1:	Exposure Ratio 2:	
		a	b	a+b
Ant 4b UMTS 1900 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n26 + Ant 2a 2.4 GHz WIFI	0.030	0.738	0.768
Ant 4b UMTS 1900 + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant 2a 2.4 GHz WIFI	0.030	0.834	0.864
Ant 4b UMTS 1900 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 41 + Ant 2a 2.4 GHz WIFI	0.030	0.846	0.876
Ant 4b UMTS 1900 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 DoD + Ant 2a 2.4 GHz WIFI	0.030	0.833	0.863
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n26 + Ant 2a 2.4 GHz WIFI	0.024	0.738	0.762
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant 2a 2.4 GHz WIFI	0.024	0.834	0.858
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 41 + Ant 2a 2.4 GHz WIFI	0.024	0.846	0.870
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 DoD + Ant 2a 2.4 GHz WIFI	0.024	0.833	0.857

Any combination where the sum is less than or equal to the applicable Exposure Ratio limit is considered validated and can be excluded from further evaluation.

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E.4.14 Combination 3: AC1 (Ant 4b + Ant 4a) and AC2 (Ant 1 + Ant WF5B,2a)

E.4.14.1 Right Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 4b NR Band n25	Ant 4a 2.4 GHz WIFI	0.012 + 0.003	0.008 + 0.002	0.010
Ant 4b NR Band n7	Ant 4a 2.4 GHz WIFI	0.067 + 0.003	0.042 + 0.002	0.044
Ant 4b NR Band n77	Ant 4a 2.4 GHz WIFI	0.030 + 0.003	0.019 + 0.002	0.021

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 1 NR Band n12	Ant 2a 2.4 GHz WIFI	0.086 + 0.290	0.054 + 0.181	0.235
Ant 1 NR Band n70	Ant 2a 2.4 GHz WIFI	0.056 + 0.290	0.035 + 0.181	0.216
Ant 1 LTE Band 41	Ant 2a 2.4 GHz WIFI	0.046 + 0.290	0.029 + 0.181	0.210
Ant 1 NR Band n77	Ant 2a 2.4 GHz WIFI	0.043 + 0.290	0.027 + 0.181	0.208

E.4.14.2 Right Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum
		Exposure Ratio 1:	Exposure Ratio 2:	
		a	b	a+b
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n12 + Ant 2a 2.4 GHz WIFI	0.010	0.235	0.245
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n70 + Ant 2a 2.4 GHz WIFI	0.010	0.216	0.226
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 41 + Ant 2a 2.4 GHz WIFI	0.010	0.210	0.220
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant 2a 2.4 GHz WIFI	0.010	0.208	0.218
Ant 4b NR Band n7 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n12 + Ant 2a 2.4 GHz WIFI	0.044	0.235	0.279
Ant 4b NR Band n7 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n70 + Ant 2a 2.4 GHz WIFI	0.044	0.216	0.260
Ant 4b NR Band n7 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 41 + Ant 2a 2.4 GHz WIFI	0.044	0.210	0.254
Ant 4b NR Band n7 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant 2a 2.4 GHz WIFI	0.044	0.208	0.252
Ant 4b NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n12 + Ant 2a 2.4 GHz WIFI	0.021	0.235	0.256
Ant 4b NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n70 + Ant 2a 2.4 GHz WIFI	0.021	0.216	0.237
Ant 4b NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 1 LTE Band 41 + Ant 2a 2.4 GHz WIFI	0.021	0.210	0.231
Ant 4b NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant 2a 2.4 GHz WIFI	0.021	0.208	0.229

Any combination where the sum is less than or equal to the applicable Exposure Ratio limit is considered validated and can be excluded from further evaluation.

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E.4.15 Combination 3: AC1 (Ant 4b + Ant 4a) and AC2 (Ant 1 + Ant WF5B,2a)

E.4.15.1 Left Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 4b LTE Band 66	Ant 4a 2.4 GHz WIFI	0.069 + 0.390	0.043 + 0.244	0.287
Ant 4b LTE Band 30	Ant 4a 2.4 GHz WIFI	0.101 + 0.390	0.063 + 0.244	0.307
Ant 4b NR Band n48	Ant 4a 2.4 GHz WIFI	0.054 + 0.390	0.034 + 0.244	0.278

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 1 NR Band n26	Ant WF5B 5 GHz WIFI	0.444 + 0.028	0.278 + 0.018	0.296
Ant 1 UMTS 1900	Ant WF5B 5 GHz WIFI	0.353 + 0.028	0.221 + 0.018	0.239
Ant 1 NR Band n41	Ant WF5B 5 GHz WIFI	0.440 + 0.028	0.275 + 0.018	0.293
Ant 1 NR Band n77	Ant WF5B 5 GHz WIFI	1.179 + 0.028	0.737 + 0.018	0.755

E.4.15.2 Left Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum	Peak Separation Distance (mm)	SPLS Ratio
		Exposure Ratio 1:	Exposure Ratio 2:			
		a	b			
Ant 4b LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n26 + Ant WF5B 5 GHz WIFI	0.287	0.296	0.583	173.51	0.00
Ant 4b LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant WF5B 5 GHz WIFI	0.287	0.239	0.526	173.51	0.00
Ant 4b LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n41 + Ant WF5B 5 GHz WIFI	0.287	0.293	0.580	173.51	0.00
Ant 4b LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant WF5B 5 GHz WIFI	0.287	0.755	1.042	173.51	0.01
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n26 + Ant WF5B 5 GHz WIFI	0.307	0.296	0.603	173.51	0.00
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant WF5B 5 GHz WIFI	0.307	0.239	0.546	173.51	0.00
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n41 + Ant WF5B 5 GHz WIFI	0.307	0.293	0.600	173.51	0.00
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant WF5B 5 GHz WIFI	0.307	0.755	1.062	173.51	0.01
Ant 4b NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n26 + Ant WF5B 5 GHz WIFI	0.278	0.296	0.574	173.51	0.00
Ant 4b NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 1 UMTS 1900 + Ant WF5B 5 GHz WIFI	0.278	0.239	0.517	173.51	0.00
Ant 4b NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n41 + Ant WF5B 5 GHz WIFI	0.278	0.293	0.571	173.51	0.00
Ant 4b NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 1 NR Band n77 + Ant WF5B 5 GHz WIFI	0.278	0.755	1.033	173.51	0.01

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E.4.16 Combination 4: AC1 (Ant 4b + Ant 4a) and AC2 (Ant 2b + Ant WF5B,2a)

E.4.16.1 Back Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 4b NR Band n25	Ant 4a 2.4 GHz WIFI	0.827 + 0.400	0.517 + 0.250	0.767
Ant 4b LTE Band 30	Ant 4a 2.4 GHz WIFI	1.040 + 0.400	0.650 + 0.250	0.900
Ant 4b NR Band n77	Ant 4a 2.4 GHz WIFI	0.906 + 0.400	0.566 + 0.250	0.816

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 2b NR Band n66	Ant 2a 5 GHz WIFI	0.722 + 0.400	0.451 + 0.250	0.701
Ant 2b NR Band n30	Ant 2a 5 GHz WIFI	0.937 + 0.400	0.586 + 0.250	0.836
Ant 2b NR Band n77	Ant 2a 5 GHz WIFI	0.908 + 0.400	0.568 + 0.250	0.818

E.4.16.2 Back Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum	Peak Separation Distance (mm)	SPLS Ratio
		Exposure Ratio 1:	Exposure Ratio 2:			
		a	b			
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n66 + Ant 2a 5 GHz WIFI	0.767	0.701	1.468	230.22	0.01
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n30 + Ant 2a 5 GHz WIFI	0.767	0.836	1.603	230.22	0.01
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant 2a 5 GHz WIFI	0.767	0.818	1.585	230.22	0.01
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n66 + Ant 2a 5 GHz WIFI	0.900	0.701	1.601	230.22	0.01
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n30 + Ant 2a 5 GHz WIFI	0.900	0.836	1.736	230.22	0.01
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant 2a 5 GHz WIFI	0.900	0.818	1.718	230.22	0.01
Ant 4b NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n66 + Ant 2a 5 GHz WIFI	0.816	0.701	1.517	230.22	0.01
Ant 4b NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n30 + Ant 2a 5 GHz WIFI	0.816	0.836	1.652	230.22	0.01
Ant 4b NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant 2a 5 GHz WIFI	0.816	0.818	1.634	230.22	0.01

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E.4.17 Combination 4: AC1 (Ant 4b + Ant 4a) and AC2 (Ant 2b + Ant WF5B,2a)

E.4.17.1 Top Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 4b NR Band n25	Ant 4a 2.4 GHz WIFI	1.184 + 0.230	0.740 + 0.144	0.884
Ant 4b LTE Band 41	Ant 4a 2.4 GHz WIFI	1.187 + 0.230	0.742 + 0.144	0.886
Ant 4b NR Band n48	Ant 4a 2.4 GHz WIFI	1.191 + 0.230	0.744 + 0.144	0.888

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 2b UMTS 1750	Ant 2a 2.4 GHz WIFI	0.012 + 0.042	0.008 + 0.026	0.034
Ant 2b LTE Band 30	Ant 2a 2.4 GHz WIFI	0.020 + 0.042	0.013 + 0.026	0.039
Ant 2b NR Band n77	Ant 2a 2.4 GHz WIFI	0.014 + 0.042	0.009 + 0.026	0.035

E.4.17.2 Top Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum
		Exposure Ratio 1:	Exposure Ratio 2:	
		a	b	a+b
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 2b UMTS 1750 + Ant 2a 2.4 GHz WIFI	0.884	0.034	0.918
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 30 + Ant 2a 2.4 GHz WIFI	0.884	0.039	0.923
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant 2a 2.4 GHz WIFI	0.884	0.035	0.919
Ant 4b LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 2b UMTS 1750 + Ant 2a 2.4 GHz WIFI	0.886	0.034	0.920
Ant 4b LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 30 + Ant 2a 2.4 GHz WIFI	0.886	0.039	0.925
Ant 4b LTE Band 41 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant 2a 2.4 GHz WIFI	0.886	0.035	0.921
Ant 4b NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 2b UMTS 1750 + Ant 2a 2.4 GHz WIFI	0.888	0.034	0.922
Ant 4b NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 30 + Ant 2a 2.4 GHz WIFI	0.888	0.039	0.927
Ant 4b NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant 2a 2.4 GHz WIFI	0.888	0.035	0.923

Any combination where the sum is less than or equal to the applicable Exposure Ratio limit is considered validated and can be excluded from further evaluation.

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E.4.18 Combination 4: AC1 (Ant 4b + Ant 4a) and AC2 (Ant 2b + Ant WF5B,2a)

E.4.18.1 Bottom Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 4b UMTS 1900	Ant 4a 2.4 GHz WIFI	0.013 + 0.035	0.008 + 0.022	0.030
Ant 4b LTE Band 30	Ant 4a 2.4 GHz WIFI	0.003 + 0.035	0.002 + 0.022	0.024

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 2b LTE Band 25	Ant 2a 2.4 GHz WIFI	1.193 + 0.160	0.746 + 0.100	0.846
Ant 2b LTE Band 7	Ant 2a 2.4 GHz WIFI	1.191 + 0.160	0.744 + 0.100	0.844
Ant 2b LTE Band 48	Ant 2a 2.4 GHz WIFI	1.191 + 0.160	0.744 + 0.100	0.844

E.4.18.2 Bottom Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum
		Exposure Ratio 1:	Exposure Ratio 2:	
		a	b	a+b
Ant 4b UMTS 1900 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 25 + Ant 2a 2.4 GHz WIFI	0.030	0.846	0.876
Ant 4b UMTS 1900 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 7 + Ant 2a 2.4 GHz WIFI	0.030	0.844	0.874
Ant 4b UMTS 1900 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 48 + Ant 2a 2.4 GHz WIFI	0.030	0.844	0.874
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 25 + Ant 2a 2.4 GHz WIFI	0.024	0.846	0.870
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 7 + Ant 2a 2.4 GHz WIFI	0.024	0.844	0.868
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 48 + Ant 2a 2.4 GHz WIFI	0.024	0.844	0.868

Any combination where the sum is less than or equal to the applicable Exposure Ratio limit is considered validated and can be excluded from further evaluation.

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E.4.19 Combination 4: AC1 (Ant 4b + Ant 4a) and AC2 (Ant 2b + Ant WF5B,2a)

E.4.19.1 Right Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 4b NR Band n25	Ant 4a 2.4 GHz WIFI	0.012 + 0.003	0.008 + 0.002	0.010
Ant 4b NR Band n7	Ant 4a 2.4 GHz WIFI	0.067 + 0.003	0.042 + 0.002	0.044
Ant 4b NR Band n77	Ant 4a 2.4 GHz WIFI	0.030 + 0.003	0.019 + 0.002	0.021

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 2b UMTS 1750	Ant 2a 2.4 GHz WIFI	0.079 + 0.290	0.049 + 0.181	0.230
Ant 2b NR Band n30	Ant 2a 2.4 GHz WIFI	0.097 + 0.290	0.061 + 0.181	0.242
Ant 2b LTE Band 48	Ant 2a 2.4 GHz WIFI	0.114 + 0.290	0.071 + 0.181	0.252

E.4.19.2 Right Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum
		Exposure Ratio 1:	Exposure Ratio 2:	
		a	b	a+b
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 2b UMTS 1750 + Ant 2a 2.4 GHz WIFI	0.010	0.230	0.240
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n30 + Ant 2a 2.4 GHz WIFI	0.010	0.242	0.252
Ant 4b NR Band n25 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 48 + Ant 2a 2.4 GHz WIFI	0.010	0.252	0.262
Ant 4b NR Band n7 + Ant 4a 2.4 GHz WIFI	Ant 2b UMTS 1750 + Ant 2a 2.4 GHz WIFI	0.044	0.230	0.274
Ant 4b NR Band n7 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n30 + Ant 2a 2.4 GHz WIFI	0.044	0.242	0.286
Ant 4b NR Band n7 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 48 + Ant 2a 2.4 GHz WIFI	0.044	0.252	0.296
Ant 4b NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 2b UMTS 1750 + Ant 2a 2.4 GHz WIFI	0.021	0.230	0.251
Ant 4b NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n30 + Ant 2a 2.4 GHz WIFI	0.021	0.242	0.263
Ant 4b NR Band n77 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 48 + Ant 2a 2.4 GHz WIFI	0.021	0.252	0.273

Any combination where the sum is less than or equal to the applicable Exposure Ratio limit is considered validated and can be excluded from further evaluation.

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E.4.20 Combination 4: AC1 (Ant 4b + Ant 4a) and AC2 (Ant 2b + Ant WF5B,2a)

E.4.20.1 Left Antenna Cluster Summation

Antenna Cluster 1				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC1 Sum (ER)
Ant 4b LTE Band 66	Ant 4a 2.4 GHz WIFI	0.069 + 0.390	0.043 + 0.244	0.287
Ant 4b LTE Band 30	Ant 4a 2.4 GHz WIFI	0.101 + 0.390	0.063 + 0.244	0.307
Ant 4b NR Band n48	Ant 4a 2.4 GHz WIFI	0.054 + 0.390	0.034 + 0.244	0.278

Antenna Cluster 2				
Ant "a"	Ant "b"	a + b (W/kg)	a + b (ER)	AC2 Sum (ER)
Ant 2b NR Band n25	Ant WF5B 5 GHz WIFI	0.017 + 0.028	0.011 + 0.018	0.029
Ant 2b LTE Band 41	Ant WF5B 5 GHz WIFI	0.040 + 0.028	0.025 + 0.018	0.043
Ant 2b NR Band n77	Ant WF5B 5 GHz WIFI	0.050 + 0.028	0.031 + 0.018	0.049

E.4.20.2 Left Antenna Cluster 1 + 2 SPLSR

AC1	AC2	Standalone Values		Standalone ER Sum
		Exposure Ratio 1:	Exposure Ratio 2:	
		a	b	a+b
Ant 4b LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n25 + Ant WF5B 5 GHz WIFI	0.287	0.029	0.316
Ant 4b LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 41 + Ant WF5B 5 GHz WIFI	0.287	0.043	0.330
Ant 4b LTE Band 66 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant WF5B 5 GHz WIFI	0.287	0.049	0.336
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n25 + Ant WF5B 5 GHz WIFI	0.307	0.029	0.336
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 41 + Ant WF5B 5 GHz WIFI	0.307	0.043	0.350
Ant 4b LTE Band 30 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant WF5B 5 GHz WIFI	0.307	0.049	0.356
Ant 4b NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n25 + Ant WF5B 5 GHz WIFI	0.278	0.029	0.307
Ant 4b NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 2b LTE Band 41 + Ant WF5B 5 GHz WIFI	0.278	0.043	0.321
Ant 4b NR Band n48 + Ant 4a 2.4 GHz WIFI	Ant 2b NR Band n77 + Ant WF5B 5 GHz WIFI	0.278	0.049	0.327

Any combination where the sum is less than or equal to the applicable Exposure Ratio limit is considered validated and can be excluded from further evaluation.

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