

MEASUREMENT RESULTS														
Plot No.	Frequency		Mode/ Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Spacing [Side]	Device Serial Number	Data Rate [Mbps]	Duty Cycle	1g SAR [W/kg]	Scaling Factor	1g Scaled SAR [W/kg]
	MHz	Ch												
	5180	36	802.11a	OFDM	13.9	13.25	0.00	10mm [Front]	FCC#1	6	1:1	0.000	1.161	0.000
21	5180	36	802.11a	OFDM	13.9	13.25	0.00	10mm [Rear]	FCC#1	6	1:1	0.0511	1.161	0.0594
	5210	42	802.11ac	OFDM	13.9	12.13	0.00	10mm [Rear]	FCC#1	29.3	1:1	0.0376	1.505	0.0566
	5260	52	802.11a	OFDM	15.9	14.97	0.00	10mm [Front]	FCC#1	6	1:1	0.000	1.239	0.000
22	5260	52	802.11a	OFDM	15.9	14.97	0.00	10mm [Rear]	FCC#1	6	1:1	0.102	1.239	0.126
	5290	58	802.11ac	OFDM	13.9	12.09	0.00	10mm [Rear]	FCC#1	29.3	1:1	0.0460	1.518	0.0698
	5580	116	802.11a	OFDM	15.9	15.39	0.00	10mm [Front]	FCC#1	6	1:1	0	1.125	0.000
23	5580	116	802.11a	OFDM	15.9	15.39	0.00	10mm [Rear]	FCC#1	6	1:1	0.187	1.125	0.210
	5530	106	802.11ac	OFDM	13.9	12.24	0.00	10mm [Rear]	FCC#1	29.3	1:1	0.0687	1.467	0.101
ANSI / IEEE C95.1-2005- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Head 1.6 W/kg(mW/g) averaged over 1 gram						

Table 12.11 NII Body-Worn SAR

MEASUREMENT RESULTS														
Plot No.	Frequency		Mode/ Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Spacing [Side]	Device Serial Number	Data Rate [Mbps]	Duty Cycle	1g SAR [W/kg]	Scaling Factor	1g Scaled SAR [W/kg]
	MHz	Ch												
	5200	40	802.11n	OFDM	13.9	13.46	0.00	10mm [Front]	FCC#1	6.5	1:1	0.00501	1.107	0.00554
	5200	40	802.11n	OFDM	13.9	13.46	0.00	10mm [Rear]	FCC#1	6.5	1:1	0.0509	1.107	0.0563
24	5210	42	802.11ac	OFDM	13.9	12.13	0.00	10mm [Rear]	FCC#1	29.3	1:1	0.0376	1.505	0.0566
	5260	52	802.11n	OFDM	15.9	15.03	0.00	10mm [Front]	FCC#1	6.5	1:1	0.00273	1.222	0.00334
25	5260	52	802.11n	OFDM	15.9	15.03	0.00	10mm [Rear]	FCC#1	6.5	1:1	0.104	1.222	0.127
	5290	58	802.11ac	OFDM	13.9	12.09	0.00	10mm [Rear]	FCC#1	29.3	1:1	0.0460	1.518	0.0698
	5500	100	802.11n	OFDM	15.9	15.26	0.00	10mm [Front]	FCC#1	6.5	1:1	0.00425	1.159	0.00492
26	5500	100	802.11n	OFDM	15.9	15.26	0.00	10mm [Rear]	FCC#1	6.5	1:1	0.147	1.159	0.170
	5530	106	802.11ac	OFDM	13.9	12.24	0.00	10mm [Rear]	FCC#1	29.3	1:1	0.0687	1.467	0.101
ANSI / IEEE C95.1-2005- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Head 1.6 W/kg(mW/g) averaged over 1 gram						

Table 12.12 NII Body-Worn SAR

12.3 Standalone Wireless router SAR Results

MEASUREMENT RESULTS														
Plot No.	Frequency		Mode/ Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Spacing [Side]	Device Serial Number	# of Time slots	Dyty Cycle	1g SAR [W/kg]	Scaling Factor	1g Scaled SAR [W/kg]
	MHz	Ch												
	836.6	190	GSM850	GPRS	32.5	32.42	0.11	10mm [Bottom]	FCC#1	2	1:4.2	0.101	1.019	0.103
	836.6	190	GSM850	GPRS	32.5	32.42	-0.19	10mm [Front]	FCC#1	2	1:4.2	0.604	1.019	0.615
	836.6	190	GSM850	GPRS	33.0	32.91	-0.10	10mm [Rear]	FCC#1	1	1:8.3	0.452	1.021	0.461
	824.2	128	GSM850	GPRS	32.5	32.50	0.10	10mm [Rear]	FCC#1	2	1:4.2	0.837	1.000	0.837
	836.6	190	GSM850	GPRS	32.5	32.42	-0.19	10mm [Rear]	FCC#1	2	1:4.2	0.859	1.019	0.875
	848.8	251	GSM850	GPRS	32.5	32.36	-0.02	10mm [Rear]	FCC#1	2	1:4.2	0.681	1.033	0.703
	824.2	128	GSM850	GPRS	30.0	29.98	-0.03	10mm [Rear]	FCC#1	3	1:2.8	0.968	1.005	0.972
	836.6	190	GSM850	GPRS	30.0	29.97	-0.17	10mm [Rear]	FCC#1	3	1:2.8	0.916	1.007	0.922
	848.8	251	GSM850	GPRS	30.0	30.00	-0.17	10mm [Rear]	FCC#1	3	1:2.8	0.700	1.000	0.700
	824.2	128	GSM850	GPRS	29.5	28.85	0.09	10mm [Rear]	FCC#1	4	1:2.1	1.27	1.161	1.475
	836.6	190	GSM850	GPRS	29.5	28.88	0.04	10mm [Rear]	FCC#1	4	1:2.1	1.17	1.153	1.350
	848.8	251	GSM850	GPRS	29.5	29.15	-0.13	10mm [Rear]	FCC#1	4	1:2.1	0.917	1.084	0.994
	836.6	190	GSM850	GPRS	32.5	32.42	0.17	10mm [Right]	FCC#1	2	1:4.2	0.462	1.019	0.471
	836.6	190	GSM850	GPRS	32.5	32.42	-0.03	10mm [Left]	FCC#1	2	1:4.2	0.528	1.019	0.538
	836.6	190	GSM850	GPRS	32.5	32.42	-0.07	10mm [Rear]	FCC#2	2	1:4.2	0.812	1.019	0.827
27	824.2	128	GSM850	GPRS	29.5	28.85	0.19	10mm [Rear]	FCC#1	4	1:2.1	1.33	1.161	1.545
ANSI / IEEE C95.1-2005- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Head 1.6 W/kg(mW/g) averaged over 1 gram						

Table 12.13 GSM850 GPRS Hotspot SAR

Note: Yellow entries represent measurements with connected earphone cable. / Blue entries represent repeatability measurements.

MEASUREMENT RESULTS														
Plot No.	Frequency		Mode/ Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Spacing [Side]	Device Serial Number	# of Time slots	Dyty Cycle	1g SAR [W/kg]	Scaling Factor	1g Scaled SAR [W/kg]
	MHz	Ch												
	1880.0	661	PCS1900	GPRS	30.0	29.62	-0.08	10mm [Bottom]	FCC#1	2	1:4.2	0.584	1.091	0.637
	1880.0	661	PCS1900	GPRS	30.0	29.62	0.01	10mm [Front]	FCC#1	2	1:4.2	0.248	1.091	0.271
	1880.0	661	PCS1900	GPRS	30.0	29.65	0.20	10mm [Rear]	FCC#1	1	1:8.3	0.331	1.084	0.359
	1880.0	661	PCS1900	GPRS	30.0	29.62	0.01	10mm [Rear]	FCC#1	2	1:4.2	0.662	1.091	0.723
	1850.2	512	PCS1900	GPRS	28.0	27.57	-0.02	10mm [Rear]	FCC#1	3	1:2.8	0.830	1.104	0.916
	1880.0	661	PCS1900	GPRS	28.0	27.54	0.00	10mm [Rear]	FCC#1	3	1:2.8	0.842	1.112	0.936
	1909.8	810	PCS1900	GPRS	28.0	27.63	0.10	10mm [Rear]	FCC#1	3	1:2.8	0.878	1.089	0.956
	1850.2	512	PCS1900	GPRS	27.0	26.47	0.08	10mm [Rear]	FCC#1	4	1:2.1	0.881	1.130	0.995
28	1880.0	661	PCS1900	GPRS	27.0	26.38	0.05	10mm [Rear]	FCC#1	4	1:2.1	0.866	1.153	0.999
	1909.8	810	PCS1900	GPRS	27.0	26.54	0.12	10mm [Rear]	FCC#1	4	1:2.1	0.858	1.112	0.954
	1880.0	661	PCS1900	GPRS	30.0	29.62	0.03	10mm [Right]	FCC#1	2	1:4.2	0.191	1.091	0.208
	1880.0	661	PCS1900	GPRS	30.0	29.62	0.19	10mm [Left]	FCC#1	2	1:4.2	0.0377	1.091	0.0411
	1880.0	661	PCS1900	GPRS	30.0	29.62	-0.12	10mm [Rear]	FCC#1	2	1:4.2	0.673	1.091	0.735
	1880.0	661	PCS1900	GPRS	27.0	26.38	0.06	10mm [Rear]	FCC#1	4	1:2.1	0.863	1.153	0.995
ANSI / IEEE C95.1-2005– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Head 1.6 W/kg(mW/g) averaged over 1 gram						

Table 12.14 PCS1900 GPRS Hotspot SAR

Note: Yellow entries represent measurements with connected earphone cable. / Blue entries represent repeatability measurements.

MEASUREMENT RESULTS														
Plot No.	Frequency		Mode/ Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Spacing [Side]	Device Serial Number	# of Time slots	Dyty Cycle	1g SAR [W/kg]	Scaling Factor	1g Scaled SAR [W/kg]
	MHz	Ch												
	836.6	4183	WCDMA850	RMC	23.5	23.03	0.04	10mm [Bottom]	FCC#2	N/A	1:1	0.0575	1.114	0.0641
	836.6	4183	WCDMA850	RMC	23.5	23.03	-0.19	10mm [Front]	FCC#2	N/A	1:1	0.291	1.114	0.324
18	836.6	4183	WCDMA850	RMC	23.5	23.03	0.12	10mm [Rear]	FCC#2	N/A	1:1	0.425	1.114	0.474
	836.6	4183	WCDMA850	RMC	23.5	23.03	0.03	10mm [Right]	FCC#2	N/A	1:1	0.220	1.114	0.245
	836.6	4183	WCDMA850	RMC	23.5	23.03	0.02	10mm [Left]	FCC#2	N/A	1:1	0.250	1.114	0.279
	836.6	4183	WCDMA850	RMC	23.5	23.03	0.01	10mm [Rear]	FCC#2	N/A	1:1	0.392	1.114	0.437
	1880.0	9400	WCDMA1900	RMC	23.5	22.98	-0.04	10mm [Bottom]	FCC#1	N/A	1:1	0.464	1.127	0.523
	1880.0	9400	WCDMA1900	RMC	23.5	22.98	0.16	10mm [Front]	FCC#1	N/A	1:1	0.236	1.127	0.266
	1852.4	9262	WCDMA1900	RMC	23.5	23.18	-0.10	10mm [Rear]	FCC#1	N/A	1:1	0.180	1.076	0.194
19	1880.0	9400	WCDMA1900	RMC	23.5	22.98	0.05	10mm [Rear]	FCC#1	N/A	1:1	0.618	1.127	0.697
	1907.6	9538	WCDMA1900	RMC	23.5	23.42	-0.02	10mm [Rear]	FCC#1	N/A	1:1	0.268	1.019	0.273
	1880.0	9400	WCDMA1900	RMC	23.5	22.98	-0.04	10mm [Right]	FCC#1	N/A	1:1	0.148	1.127	0.167
	1880.0	9400	WCDMA1900	RMC	23.5	22.98	0.10	10mm [Left]	FCC#1	N/A	1:1	0.0294	1.127	0.0331
29	1880.0	9400	WCDMA1900	RMC	23.5	22.98	0.01	10mm [Rear]	FCC#1	N/A	1:1	0.672	1.127	0.757
ANSI / IEEE C95.1-2005– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Head 1.6 W/kg(mW/g) averaged over 1 gram						

Table 12.15 WCDMA Hotspot SAR

Note: Yellow entries represent measurements with connected earphone cable..



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MEASUREMENT RESULTS														
Plot No.	Frequency		Mode/ Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Spacing [Side]	Device Serial Number	Data Rate [Mbps]	Duty Cycle	1g SAR [W/kg]	Scaling Factor	1g Scaled SAR [W/kg]
	MHz	Ch												
	2462	11	802.11b	DSSS	16.9	15.90	-0.11	10mm [Top]	FCC#1	1	1:1	0.136	1.259	0.171
	2462	11	802.11b	DSSS	16.9	15.90	-0.19	10mm [Front]	FCC#1	1	1:1	0.0416	1.259	0.0524
20	2462	11	802.11b	DSSS	16.9	15.90	-0.02	10mm [Rear]	FCC#1	1	1:1	0.215	1.259	0.271
	2462	11	802.11b	DSSS	16.9	15.90	0.11	10mm [Right]	FCC#1	1	1:1	0.0265	1.259	0.0334
ANSI / IEEE C95.1-2005- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Head 1.6 W/kg(mW/g) averaged over 1 gram						

Table 12.16 WLAN Hotspot SAR

12.4 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2003, FCC/OET Bulletin 65, Supplement C [June 2001] and FCC KDB Publication 447498 D01v05r02.
2. Batteries are fully charged at the beginning of the SAR measurements. A standard battery was used for all SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v05r02.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 10 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. Per FCC KDB Publication 648474 D04v01r01, SAR was evaluated without a headset connected to the device. Since the standalone reported SAR was ≤ 1.2 W/kg, no additional SAR evaluations using a headset cable were required.
8. During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v01r01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 6.7 for more details).
9. Per FCC KDB 865664 D01v01r01, variability SAR tests were performed when the measured SAR results for a frequency band were greater than 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 14 for variability analysis.

GSM Notes:

1. This device supports GSM VOIP in the head and body-worn configurations, therefore GPRS was additionally evaluated for head and body-worn compliance.
2. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
3. Per FCC KDB Publication 447498 D01v05r02, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is $> \frac{1}{2}$ dB, instead of the middle channel, the highest output power channel was used.

WCDMA Notes:

1. WCDMA mode was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v02r02.
2. Body SAR for HSPA is not required for handsets with HSDPA capabilities when the maximum average output power of each RF channel with HSPA active is less than 0.25 dB higher than that measured without HSPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is $\leq 75\%$ of the SAR limit.
3. Per FCC KDB Publication 447498 D01v05r02, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is $> \frac{1}{2}$ dB, instead of the middle channel, the highest output power channel was used.

WLAN Notes:

1. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02 and October 2012 FCC/TCB Meeting Notes for 2.4 GHz WIFI: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11b. Other IEEE 802.11 modes (including 802.11g/n) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11b mode.
2. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02 and October 2012 FCC/TCB Meeting Notes for 5 GHz WIFI: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11a. Other IEEE 802.11 modes (including 802.11n 20 MHz and 40 MHz bandwidths) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11a mode.
3. Per April 2013 TCB Workshop notes, full SAR tests for all IEEE 802.11ac configurations were not required because the average output power was not more than 0.25 dB higher than IEEE 802.11a mode. IEEE 802.11ac was evaluated for the highest IEEE 802.11a position in each 5 GHz band and exposure condition.
4. When Hotspot is enabled, all 5 GHz bands are disabled. Therefore no 5 GHz WIFI Wireless Router SAR Data was required.
5. 5 GHz WIFI Direct GO is not supported in the 5 GHz band for this device. WIFI Direct GO is supported in the 2.4 GHz band only. The manufacturer expects 2.4 GHz WIFI Direct GO may be used in a similar manner to wireless router usage. Therefore, 2.4 GHz WIFI Direct GO was evaluated for SAR similarly to wireless router SAR procedures in FCC KDB Publication 941225.
6. WIFI transmission was verified using a spectrum analyzer.
7. Since the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the reported 1g averaged SAR is <0.8 W/kg, SAR testing on other default channels was not required.

13. FCC Multi-TX and Antenna SAR Considerations

13.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v05r02 are applicable to handsets with built-in unlicensed transmitters such as 802.11a/b/g/n/ac and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

13.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB 447498 D01v05r02 IV.C.1.iii, simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is ≤ 1.6 W/kg. When standalone SAR is not required to be measured, per FCC KDB 447498 D01v05r02 4.3.2 2), the following equation must be used to estimate the standalone 1g SAR for simultaneous transmission assessment involving that transmitter.

$$\text{Estimated SAR} = \frac{\text{Max. Tune up Power}_{(\text{mW})}}{\text{Min. Test Separation Distance}_{(\text{mm})}} \times \frac{\sqrt{f_{(\text{GHz})}}}{7.5}$$

Table 13.1 Estimated SAR

Mode	Frequency	Maximum Allowed Power		Separation Distance (Body)	Estimated SAR (Body)
	MHz	[dBm]	[mW]	[mm]	[W/kg]
Bluetooth	2480	6.9	4.89	10	0.103

Note : Held-to ear configurations are not applicable to Bluetooth operations and therefore were not considered for simultaneous transmission. Per KDB Publication 447498 D01v05r02, the maximum power of the channel was rounded to the nearest mW before calculation.

13.3 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v05r02, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds. Possible transmission paths for the DUT are shown in Figure 13.1 and are color-coded to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.



Figure 13.1 Simultaneous Transmission Paths

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D01v05r02 3) procedures.

13.4 Simultaneous Transmission SAR Analysis

KDB 447498 D01 General RF Exposure Guidance v05, introduces a new formula for calculating the SAR to Peak Location Ratio (SPLSR) between pairs of simultaneously transmitting antennas:

$$SPLSR = (SAR_1 + SAR_2)^{1.5} / Ri$$

Where:

SAR1 is the highest measured or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition

SAR2 is the highest measured or estimated SAR for the second of a pair of simultaneous transmitting antennas, in the same test operating mode and exposure condition as the first

Ri is the separation distance between the pair of simultaneous transmitting antennas. When the SAR is measured, for both antennas in the pair, it is determined by the actual x, y and z coordinates in the 1-g SAR for each SAR peak location, based on the extrapolated and interpolated result in the zoom scan measurement, using the formula of

$$[(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2]$$

A new threshold of 0.04 is also introduced in the draft KDB. Thus, in order for a pair of simultaneous transmitting antennas with the sum of 1-g SAR > 1.6 W/kg to qualify for exemption from Simultaneous Transmission SAR measurements, it has to satisfy the condition of:

$$(SAR_1 + SAR_2)^{1.5} / Ri < 0.04$$

Table 13.2 Simultaneous Transmission Scenarios

Ref.	Simultaneous Transmit Configurations	Head	Body-Worn Accessory	Hot Spot	Note
		IEEE1528 Supp C	Supplement C	FCC KDB 941225 D06 Edges/sides	
1	GSM850 Voice + 2.4GHz WIFI	Yes	Yes	N/A	
2	PCS1900 Voice + 2.4GHz WIFI	Yes	Yes	N/A	
3	WCDMA850 Voice + 2.4GHz WIFI	Yes	Yes	Yes	
4	WCDMA1900 Voice + 2.4GHz WIFI	Yes	Yes	Yes	
5	GSM850 Voice + 5GHz WIFI	Yes	Yes	N/A	
6	PCS1900 Voice + 5GHz WIFI	Yes	Yes	N/A	
7	WCDMA850 Voice + 5GHz WIFI	Yes	Yes	N/A	
8	WCDMA1900 Voice + 5GHz WIFI	Yes	Yes	N/A	
9	GSM850 GPRS + 2.4GHz WIFI	Yes	Yes	Yes	
10	GPRS1900 GPRS + 2.4GHz WIFI	Yes	Yes	Yes	
11	GSM850 GPRS + 5GHz WIFI	Yes	Yes	N/A	
12	GPRS1900 GPRS + 5GHz WIFI	Yes	Yes	N/A	
13	GSM850 Voice + Bluetooth	N/A	Yes	N/A	
14	PCS1900 Voice + Bluetooth	N/A	Yes	N/A	
15	WCDMA850 + Bluetooth	N/A	Yes	N/A	
16	WCDMA1900 + Bluetooth	N/A	Yes	N/A	
Notes: 2.4 GHz WIFI is supported Hotspot and WIFI-Direct. 5 GHz WIFI is not supported Hotspot and not supported WIFI-Direct. - WCDMA, GPRS is supported Hotspot. - Bluetooth and WIFI cannot transmit simultaneously since they share the same chip. - GSM and WCDMA cannot transmit simultaneously since they share the same chip. - VoIP is supported in WCDMA, GSM.					

Per the manufacturer, WIFI Direct is expected to be used in conjunction with a held-to-ear or body-worn accessory voice call. Simultaneous transmission scenarios involving WIFI Direct are specified above.

13.5 Head SAR Simultaneous Transmission Analysis

Simult TX	Configuration	GSM850 SAR [W/kg]	2.4G W-LAN (802.11b) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.286	0.105	0.391	No
	Left Touch	0.231	0.144	0.375	No
	Right Tilt	0.238	0.153	0.392	No
	Left Tilt	0.236	0.170	0.406	No

Simult TX	Configuration	PCS1900 SAR [W/kg]	2.4G W-LAN (802.11b) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.238	0.105	0.344	No
	Left Touch	0.160	0.144	0.305	No
	Right Tilt	0.0467	0.153	0.200	No
	Left Tilt	0.0460	0.170	0.216	No

Table 13.3 Simultaneous Transmission Scenario with 2.4 GHz W-LAN (Held to Ear)

Simult TX	Configuration	GPRS 850 SAR [W/kg]	2.4G W-LAN (802.11b) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.714	0.105	0.819	No
	Left Touch	0.464	0.144	0.609	No
	Right Tilt	0.449	0.153	0.603	No
	Left Tilt	0.445	0.170	0.615	No

Simult TX	Configuration	GPRS 1900 SAR [W/kg]	2.4G W-LAN (802.11b) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.576	0.105	0.681	No
	Left Touch	0.391	0.144	0.535	No
	Right Tilt	0.106	0.153	0.260	No
	Left Tilt	0.105	0.170	0.274	No

Table 13.4 Simultaneous Transmission Scenario with 2.4 GHz W-LAN (Held to Ear)

Simult TX	Configuration	WCDMA 850 SAR [W/kg]	2.4G W-LAN (802.11b) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.250	0.105	0.355	No
	Left Touch	0.210	0.144	0.354	No
	Right Tilt	0.146	0.153	0.299	No
	Left Tilt	0.163	0.170	0.333	No

Simult TX	Configuration	WCDMA 1900 SAR [W/kg]	2.4G W-LAN (802.11b) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.367	0.105	0.473	No
	Left Touch	0.248	0.144	0.393	No
	Right Tilt	0.0667	0.153	0.220	No
	Left Tilt	0.0704	0.170	0.240	No

Table 13.5 Simultaneous Transmission Scenario with 2.4 GHz W-LAN (Held to Ear)

Simult TX	Configuration	GSM850 SAR [W/kg]	5.2G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.286	0.0238	0.309	No
	Left Touch	0.231	0.0220	0.253	No
	Right Tilt	0.238	0.0218	0.260	No
	Left Tilt	0.236	0.0207	0.257	No

Simult TX	Configuration	PCS1900 SAR [W/kg]	5.2G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.238	0.0238	0.262	No
	Left Touch	0.160	0.0220	0.182	No
	Right Tilt	0.0467	0.0218	0.0686	No
	Left Tilt	0.0460	0.0207	0.0666	No

Table 13.6 Simultaneous Transmission Scenario with 5 GHz W-LAN (Held to Ear)

Simult TX	Configuration	GPRS 850 SAR [W/kg]	5.2G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.714	0.0238	0.738	No
	Left Touch	0.464	0.0220	0.486	No
	Right Tilt	0.449	0.0218	0.471	No
	Left Tilt	0.445	0.0207	0.466	No

Simult TX	Configuration	GPRS 1900 SAR [W/kg]	5.2G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.576	0.0238	0.599	No
	Left Touch	0.391	0.0220	0.413	No
	Right Tilt	0.106	0.0218	0.128	No
	Left Tilt	0.105	0.0207	0.125	No

Table 13.7 Simultaneous Transmission Scenario with 5 GHz W-LAN (Held to Ear)

Simult TX	Configuration	WCDMA 850 SAR [W/kg]	5.2G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.250	0.0238	0.274	No
	Left Touch	0.210	0.0220	0.232	No
	Right Tilt	0.146	0.0218	0.168	No
	Left Tilt	0.163	0.0207	0.184	No

Simult TX	Configuration	WCDMA 1900 SAR [W/kg]	5.2G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.367	0.0238	0.391	No
	Left Touch	0.248	0.0220	0.270	No
	Right Tilt	0.0667	0.0218	0.0885	No
	Left Tilt	0.0704	0.0207	0.0910	No

Table 13.8 Simultaneous Transmission Scenario with 5 GHz W-LAN (Held to Ear)

Simult TX	Configuration	GSM 850 SAR [W/kg]	5.3G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.286	0.0326	0.318	No
	Left Touch	0.231	0.0300	0.261	No
	Right Tilt	0.238	0.0346	0.273	No
	Left Tilt	0.236	0.0275	0.264	No

Simult TX	Configuration	PCS 1900 SAR [W/kg]	5.3G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.238	0.0326	0.271	No
	Left Touch	0.160	0.0300	0.190	No
	Right Tilt	0.0467	0.0346	0.0813	No
	Left Tilt	0.0460	0.0275	0.0735	No

Table 13.9 Simultaneous Transmission Scenario with 5 GHz W-LAN (Held to Ear)

Simult TX	Configuration	GPRS 850 SAR [W/kg]	5.3G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.714	0.0326	0.747	No
	Left Touch	0.464	0.0300	0.494	No
	Right Tilt	0.449	0.0346	0.484	No
	Left Tilt	0.445	0.0275	0.473	No

Simult TX	Configuration	GPRS 1900 SAR [W/kg]	5.2G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.576	0.0326	0.608	No
	Left Touch	0.391	0.0300	0.421	No
	Right Tilt	0.106	0.0346	0.141	No
	Left Tilt	0.105	0.0275	0.132	No

Table 13.10 Simultaneous Transmission Scenario with 5 GHz W-LAN (Held to Ear)

Simult TX	Configuration	WCDMA 850 SAR [W/kg]	5.3G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.250	0.0326	0.283	No
	Left Touch	0.210	0.0300	0.240	No
	Right Tilt	0.146	0.0346	0.180	No
	Left Tilt	0.163	0.0275	0.191	No

Simult TX	Configuration	WCDMA 1900 SAR [W/kg]	5.3G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.367	0.0326	0.400	No
	Left Touch	0.248	0.0300	0.278	No
	Right Tilt	0.0667	0.0346	0.101	No
	Left Tilt	0.0704	0.0275	0.098	No

Table 13.11 Simultaneous Transmission Scenario with 5 GHz W-LAN (Held to Ear)

Simult TX	Configuration	GSM850 SAR [W/kg]	5.5G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.286	0.0390	0.325	No
	Left Touch	0.231	0.0310	0.262	No
	Right Tilt	0.238	0.0489	0.287	No
	Left Tilt	0.236	0.0412	0.277	No

Simult TX	Configuration	PCS1900 SAR [W/kg]	5.5G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.238	0.0390	0.277	No
	Left Touch	0.160	0.0310	0.191	No
	Right Tilt	0.0467	0.0489	0.0956	No
	Left Tilt	0.0460	0.0412	0.0871	No

Table 13.12 Simultaneous Transmission Scenario with 5 GHz W-LAN (Held to Ear)

Simult TX	Configuration	GPRS 850 SAR [W/kg]	5.5G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.714	0.0390	0.753	No
	Left Touch	0.464	0.0310	0.496	No
	Right Tilt	0.449	0.0489	0.498	No
	Left Tilt	0.445	0.0412	0.486	No

Simult TX	Configuration	GPRS 1900 SAR [W/kg]	5.5G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.576	0.0390	0.615	No
	Left Touch	0.391	0.0310	0.422	No
	Right Tilt	0.106	0.0489	0.155	No
	Left Tilt	0.105	0.0412	0.146	No

Table 13.13 Simultaneous Transmission Scenario with 5 GHz W-LAN (Held to Ear)

Simult TX	Configuration	WCDMA 850 SAR [W/kg]	5.5G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.250	0.0390	0.289	No
	Left Touch	0.210	0.0310	0.241	No
	Right Tilt	0.146	0.0489	0.195	No
	Left Tilt	0.163	0.0412	0.204	No

Simult TX	Configuration	WCDMA 1900 SAR [W/kg]	5.5G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.367	0.0390	0.406	No
	Left Touch	0.248	0.0310	0.280	No
	Right Tilt	0.0667	0.0489	0.116	No
	Left Tilt	0.0704	0.0412	0.112	No

Table 13.14 Simultaneous Transmission Scenario with 5 GHz W-LAN (Held to Ear)

Simult TX	Configuration	GSM850 SAR [W/kg]	5.2G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.286	0.0217	0.307	No
	Left Touch	0.231	0.0185	0.250	No
	Right Tilt	0.238	0.0202	0.258	No
	Left Tilt	0.236	0.0189	0.255	No

Simult TX	Configuration	PCS1900 SAR [W/kg]	5.2G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.238	0.0217	0.260	No
	Left Touch	0.160	0.0185	0.179	No
	Right Tilt	0.0467	0.0202	0.0669	No
	Left Tilt	0.0460	0.0189	0.0649	No

Table 13.15 Simultaneous Transmission Scenario with 5 GHz W-LAN (Held to Ear)

Simult TX	Configuration	GPRS 850 SAR [W/kg]	5.2G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.714	0.0217	0.736	No
	Left Touch	0.464	0.0185	0.483	No
	Right Tilt	0.449	0.0202	0.469	No
	Left Tilt	0.445	0.0189	0.464	No

Simult TX	Configuration	GPRS 1900 SAR [W/kg]	5.2G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.576	0.0217	0.597	No
	Left Touch	0.391	0.0185	0.410	No
	Right Tilt	0.106	0.0202	0.127	No
	Left Tilt	0.105	0.0189	0.123	No

Table 13.16 Simultaneous Transmission Scenario with 5 GHz W-LAN (Held to Ear)

Simult TX	Configuration	WCDMA 850 SAR [W/kg]	5.2G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.250	0.0217	0.272	No
	Left Touch	0.210	0.0185	0.229	No
	Right Tilt	0.146	0.0202	0.166	No
	Left Tilt	0.163	0.0189	0.182	No

Simult TX	Configuration	WCDMA 1900 SAR [W/kg]	5.2G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.367	0.0217	0.389	No
	Left Touch	0.248	0.0185	0.267	No
	Right Tilt	0.0667	0.0202	0.0868	No
	Left Tilt	0.0704	0.0189	0.0893	No

Table 13.17 Simultaneous Transmission Scenario with 5 GHz W-LAN (Held to Ear)

Simult TX	Configuration	GSM 850 SAR [W/kg]	5.3G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.286	0.0411	0.327	No
	Left Touch	0.231	0.0339	0.265	No
	Right Tilt	0.238	0.0378	0.276	No
	Left Tilt	0.236	0.0284	0.265	No

Simult TX	Configuration	PCS 1900 SAR [W/kg]	5.3G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.238	0.0411	0.280	No
	Left Touch	0.160	0.0339	0.194	No
	Right Tilt	0.0467	0.0378	0.0845	No
	Left Tilt	0.0460	0.0284	0.0743	No

Table 13.18 Simultaneous Transmission Scenario with 5 GHz W-LAN (Held to Ear)

Simult TX	Configuration	GPRS 850 SAR [W/kg]	5.3G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.714	0.0411	0.755	No
	Left Touch	0.464	0.0339	0.498	No
	Right Tilt	0.449	0.0378	0.487	No
	Left Tilt	0.445	0.0284	0.473	No

Simult TX	Configuration	GPRS 1900 SAR [W/kg]	5.3G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.576	0.0411	0.617	No
	Left Touch	0.391	0.0339	0.425	No
	Right Tilt	0.106	0.0378	0.144	No
	Left Tilt	0.105	0.0284	0.133	No

Table 13.19 Simultaneous Transmission Scenario with 5 GHz W-LAN (Held to Ear)

Simult TX	Configuration	WCDMA 850 SAR [W/kg]	5.3G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.250	0.0411	0.291	No
	Left Touch	0.210	0.0339	0.244	No
	Right Tilt	0.146	0.0378	0.184	No
	Left Tilt	0.163	0.0284	0.192	No

Simult TX	Configuration	WCDMA 1900 SAR [W/kg]	5.3G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.367	0.0411	0.408	No
	Left Touch	0.248	0.0339	0.282	No
	Right Tilt	0.0667	0.0378	0.104	No
	Left Tilt	0.0704	0.0284	0.099	No

Table 13.20 Simultaneous Transmission Scenario with 5 GHz W-LAN (Held to Ear)

Simult TX	Configuration	GSM850 SAR [W/kg]	5.5G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.286	0.0274	0.313	No
	Left Touch	0.231	0.0260	0.257	No
	Right Tilt	0.238	0.0384	0.277	No
	Left Tilt	0.236	0.0317	0.268	No

Simult TX	Configuration	PCS1900 SAR [W/kg]	5.5G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.238	0.0274	0.266	No
	Left Touch	0.160	0.0260	0.186	No
	Right Tilt	0.0467	0.0384	0.0851	No
	Left Tilt	0.0460	0.0317	0.0776	No

Table 13.21 Simultaneous Transmission Scenario with 5 GHz W-LAN (Held to Ear)

Simult TX	Configuration	GPRS 850 SAR [W/kg]	5.5G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.714	0.0274	0.741	No
	Left Touch	0.464	0.0260	0.490	No
	Right Tilt	0.449	0.0384	0.488	No
	Left Tilt	0.445	0.0317	0.477	No

Simult TX	Configuration	GPRS 1900 SAR [W/kg]	5.5G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.576	0.0274	0.603	No
	Left Touch	0.391	0.0260	0.417	No
	Right Tilt	0.106	0.0384	0.145	No
	Left Tilt	0.105	0.0317	0.136	No

Table 13.22 Simultaneous Transmission Scenario with 5 GHz W-LAN (Held to Ear)

Simult TX	Configuration	WCDMA 850 SAR [W/kg]	5.5G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.250	0.0274	0.277	No
	Left Touch	0.210	0.0260	0.236	No
	Right Tilt	0.146	0.0384	0.184	No
	Left Tilt	0.163	0.0317	0.195	No

Simult TX	Configuration	WCDMA 1900 SAR [W/kg]	5.5G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Head SAR	Right Touch	0.367	0.0274	0.394	No
	Left Touch	0.248	0.0260	0.274	No
	Right Tilt	0.0667	0.0384	0.105	No
	Left Tilt	0.0704	0.0317	0.102	No

Table 13.23 Simultaneous Transmission Scenario with 5 GHz W-LAN (Held to Ear)

13.6 Body-Worn Simultaneous Transmission Analysis

Configuration	Mode	2G/3G SAR [W/kg]	2.4G W-LAN (802.11b) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Front Side	GSM 850	0.390	0.0524	0.442	No
Rear Side	GSM 850	0.569	0.271	0.840	No
Front Side	GPRS 850	0.615	0.0524	0.668	No
Rear Side	GPRS 850	1.545	0.271	1.816	Yes
Front Side	PCS 1900	0.166	0.0524	0.218	No
Rear Side	PCS 1900	0.503	0.271	0.774	No
Front Side	GPRS 1900	0.287	0.0524	0.340	No
Rear Side	GPRS 1900	0.999	0.271	1.270	No
Front Side	WCDMA 850	0.324	0.0524	0.377	No
Rear Side	WCDMA 850	0.474	0.271	0.744	No
Front Side	WCDMA 1900	0.266	0.0524	0.318	No
Rear Side	WCDMA 1900	0.697	0.271	0.967	No

Table 13.24 Simultaneous Transmission Scenario with 2.4 GHz W-LAN (Body-Worn at 10 mm)

Configuration	Mode	2G/3G SAR [W/kg]	5.2G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Front Side	GSM 850	0.390	0.000	0.390	No
Rear Side	GSM 850	0.569	0.0594	0.629	No
Front Side	GPRS 850	0.615	0.000	0.615	No
Rear Side	GPRS 850	1.545	0.0594	1.604	Yes
Front Side	PCS 1900	0.166	0.000	0.166	No
Rear Side	PCS 1900	0.503	0.0594	0.562	No
Front Side	GPRS 1900	0.287	0.000	0.287	No
Rear Side	GPRS 1900	0.999	0.0594	1.058	No
Front Side	WCDMA 850	0.324	0.000	0.324	No
Rear Side	WCDMA 850	0.474	0.0594	0.533	No
Front Side	WCDMA 1900	0.266	0.000	0.266	No
Rear Side	WCDMA 1900	0.697	0.0594	0.756	No

Table 13.25 Simultaneous Transmission Scenario with 5 GHz W-LAN (Body-Worn at 10 mm)

Configuration	Mode	2G/3G SAR [W/kg]	5.3G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Front Side	GSM 850	0.390	0.000	0.390	No
Rear Side	GSM 850	0.569	0.126	0.696	No
Front Side	GPRS 850	0.615	0.000	0.615	No
Rear Side	GPRS 850	1.545	0.126	1.671	Yes
Front Side	PCS 1900	0.166	0.000	0.166	No
Rear Side	PCS 1900	0.503	0.126	0.629	No
Front Side	GPRS 1900	0.287	0.000	0.287	No
Rear Side	GPRS 1900	0.999	0.126	1.125	No
Front Side	WCDMA 850	0.324	0.000	0.324	No
Rear Side	WCDMA 850	0.474	0.126	0.600	No
Front Side	WCDMA 1900	0.266	0.000	0.266	No
Rear Side	WCDMA 1900	0.697	0.126	0.823	No

Table 13.26 Simultaneous Transmission Scenario with 5 GHz W-LAN (Body-Worn at 10 mm)

Configuration	Mode	2G/3G SAR [W/kg]	5.5G W-LAN (802.11a) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Front Side	GSM 850	0.390	0.000	0.390	No
Rear Side	GSM 850	0.569	0.210	0.780	No
Front Side	GPRS 850	0.615	0.000	0.615	No
Rear Side	GPRS 850	1.545	0.210	1.755	Yes
Front Side	PCS 1900	0.166	0.000	0.166	No
Rear Side	PCS 1900	0.503	0.210	0.713	No
Front Side	GPRS 1900	0.287	0.000	0.287	No
Rear Side	GPRS 1900	0.999	0.210	1.209	No
Front Side	WCDMA 850	0.324	0.000	0.324	No
Rear Side	WCDMA 850	0.474	0.210	0.684	No
Front Side	WCDMA 1900	0.266	0.000	0.266	No
Rear Side	WCDMA 1900	0.697	0.210	0.907	No

Table 13.27 Simultaneous Transmission Scenario with 5 GHz W-LAN (Body-Worn at 10 mm)

Configuration	Mode	2G/3G SAR [W/kg]	5.2G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Front Side	GSM 850	0.390	0.00554	0.395	No
Rear Side	GSM 850	0.569	0.0563	0.626	No
Front Side	GPRS 850	0.615	0.00554	0.621	No
Rear Side	GPRS 850	1.545	0.0563	1.601	Yes
Front Side	PCS 1900	0.166	0.00554	0.172	No
Rear Side	PCS 1900	0.503	0.0563	0.559	No
Front Side	GPRS 1900	0.287	0.00554	0.293	No
Rear Side	GPRS 1900	0.999	0.0563	1.055	No
Front Side	WCDMA 850	0.324	0.00554	0.330	No
Rear Side	WCDMA 850	0.474	0.0563	0.530	No
Front Side	WCDMA 1900	0.266	0.00554	0.272	No
Rear Side	WCDMA 1900	0.697	0.0563	0.753	No

Table 13.28 Simultaneous Transmission Scenario with 5 GHz W-LAN (Body-Worn at 10 mm)

Configuration	Mode	2G/3G SAR [W/kg]	5.3G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Front Side	GSM 850	0.390	0.00334	0.393	No
Rear Side	GSM 850	0.569	0.127	0.696	No
Front Side	GPRS 850	0.615	0.00334	0.619	No
Rear Side	GPRS 850	1.545	0.127	1.672	Yes
Front Side	PCS 1900	0.166	0.00334	0.169	No
Rear Side	PCS 1900	0.503	0.127	0.630	No
Front Side	GPRS 1900	0.287	0.00334	0.291	No
Rear Side	GPRS 1900	0.999	0.127	1.126	No
Front Side	WCDMA 850	0.324	0.00334	0.328	No
Rear Side	WCDMA 850	0.474	0.127	0.601	No
Front Side	WCDMA 1900	0.266	0.00334	0.269	No
Rear Side	WCDMA 1900	0.697	0.127	0.824	No

Table 13.29 Simultaneous Transmission Scenario with 5 GHz W-LAN (Body-Worn at 10 mm)

Configuration	Mode	2G/3G SAR [W/kg]	5.5G W-LAN (802.11n) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Front Side	GSM 850	0.390	0.00492	0.395	No
Rear Side	GSM 850	0.569	0.170	0.740	No
Front Side	GPRS 850	0.615	0.00492	0.620	No
Rear Side	GPRS 850	1.545	0.170	1.715	Yes
Front Side	PCS 1900	0.166	0.00492	0.171	No
Rear Side	PCS 1900	0.503	0.170	0.673	No
Front Side	GPRS 1900	0.287	0.00492	0.292	No
Rear Side	GPRS 1900	0.999	0.170	1.169	No
Front Side	WCDMA 850	0.324	0.00492	0.329	No
Rear Side	WCDMA 850	0.474	0.170	0.644	No
Front Side	WCDMA 1900	0.266	0.00492	0.271	No
Rear Side	WCDMA 1900	0.697	0.170	0.867	No

Table 13.30 Simultaneous Transmission Scenario with 5 GHz W-LAN (Body-Worn at 10 mm)

Configuration	Mode	2G/3G SAR [W/kg]	Bluetooth SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Front Side	GSM 850	0.390	0.105	0.495	No
Rear Side	GSM 850	0.569	0.105	0.674	No
Front Side	GPRS 850	0.615	0.105	0.720	No
Rear Side	GPRS 850	1.545	0.105	1.650	Yes
Front Side	PCS 1900	0.166	0.105	0.271	No
Rear Side	PCS 1900	0.503	0.105	0.608	No
Front Side	GPRS 1900	0.287	0.105	0.392	No
Rear Side	GPRS 1900	0.999	0.105	1.104	No
Front Side	WCDMA 850	0.324	0.105	0.429	No
Rear Side	WCDMA 850	0.474	0.105	0.579	No
Front Side	WCDMA 1900	0.266	0.105	0.371	No
Rear Side	WCDMA 1900	0.697	0.105	0.802	No

Table 13.31 Simultaneous Transmission Scenario with Bluetooth (Body-Worn at 10 mm)

Note: Bluetooth SAR was not required to be measured per FCC KDB 447498. Estimated SAR results were used in the above table to determine simultaneous transmission SAR test exclusion.

13.7 Hotspot SAR Simultaneous Transmission Analysis

Per FCC KDB Publication 941225 D06v01r01, the device edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR ("-").

Simult TX	Configuration	GPRS 850 SAR [W/kg]	2.4G W-LAN (802.11b) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Body SAR	Top	-	0.171	0.171	No
	Bottom	0.103	-	0.103	No
	Front	0.615	0.0524	0.668	No
	Rear	1.545	0.271	1.815	Yes
	Right	0.471	0.0334	0.504	No
	Left	0.538	-	0.538	No

Simult TX	Configuration	GPRS 1900 SAR [W/kg]	2.4G W-LAN (802.11b) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Body SAR	Top	-	0.171	0.171	No
	Bottom	0.637	-	0.637	No
	Front	0.271	0.0524	0.323	No
	Rear	0.999	0.271	1.270	No
	Right	0.208	0.0334	0.242	No
	Left	0.0411	-	0.0411	No

Table 13.32 Simultaneous Transmission Scenario (Hotspot at 10 mm)

Simult TX	Configuration	WCDMA 850 SAR [W/kg]	2.4G W-LAN (802.11b) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Body SAR	Top	-	0.171	0.171	No
	Bottom	0.0641	-	0.0641	No
	Front	0.324	0.0524	0.377	No
	Rear	0.474	0.271	0.744	No
	Right	0.245	0.0334	0.279	No
	Left	0.279	-	0.279	No

Simult TX	Configuration	WCDMA 1900 SAR [W/kg]	2.4G W-LAN (802.11b) SAR [W/kg]	Σ SAR [W/kg]	SPLSR [Yes/No]
Body SAR	Top	-	0.171	0.171	No
	Bottom	0.523	-	0.523	No
	Front	0.266	0.0524	0.318	No
	Rear	0.697	0.271	0.967	No
	Right	0.167	0.0334	0.200	No
	Left	0.0331	-	0.0331	No

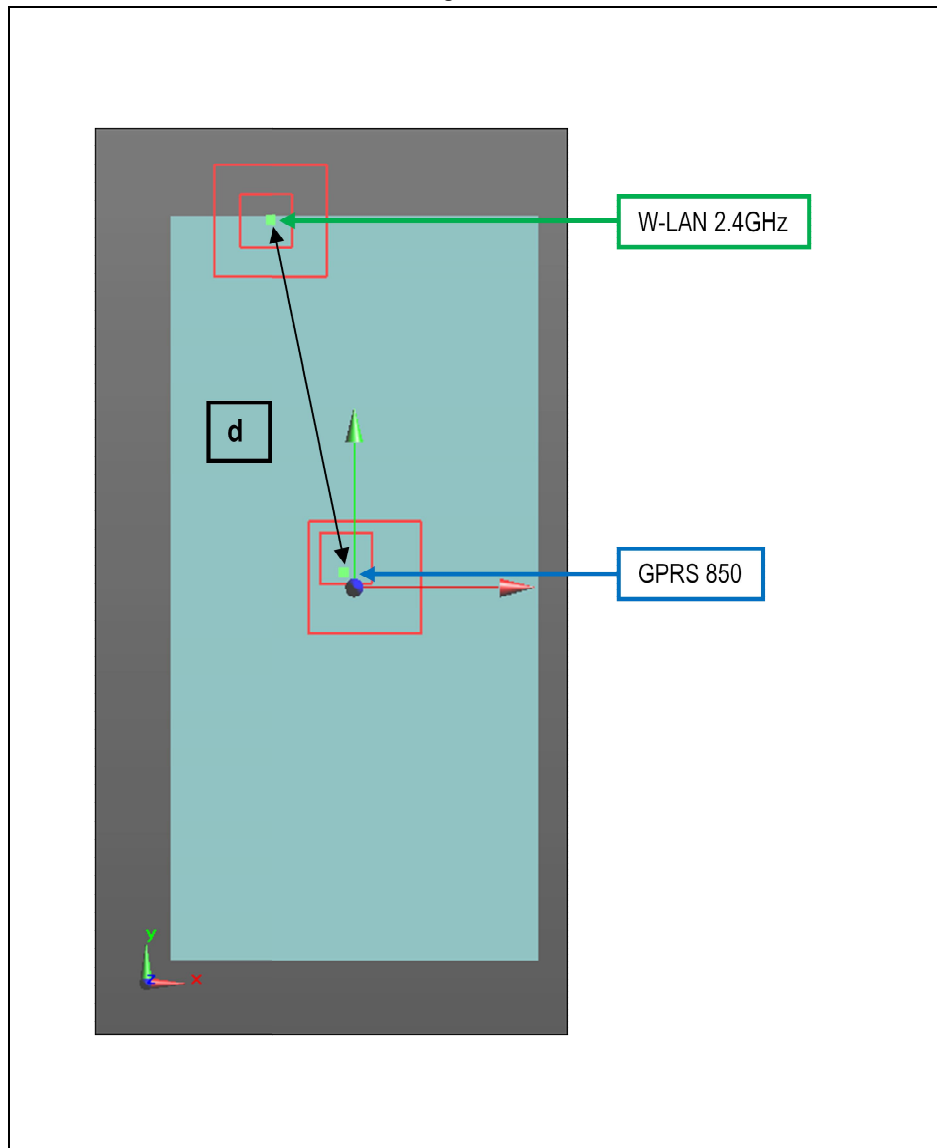
Table 13.33 Simultaneous Transmission Scenario (Hotspot at 10 mm)

13.8 SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Worst-case combination								Σ SAR [W/kg]	Calculated distance [mm]	SPLSR [≤ 0.04]	Volume Scan [Yes/No]	Figure
	GPRS 850	W-LAN 2.4GHz	W-LAN W52 11a	W-LAN W53 11a	W-LAN W56 11a	W-LAN W52 11ac	W-LAN W53 11n	W-LAN W56 11n					
Rear	1.545	0.271	-	-	-	-	-	-	1.816	68.5	0.036	No	13-1
Rear	1.545	-	0.0594	-	-	-	-	-	1.604	67.0	0.030	No	13-2
Rear	1.545	-	-	0.126	-	-	-	-	1.671	67.0	0.032	No	13-3
Rear	1.545	-	-	-	0.21	-	-	-	1.755	67.0	0.035	No	13-4
Rear	1.545	-	-	-	-	0.0566	-	-	1.602	69.1	0.029	No	13-5
Rear	1.545	-	-	-	-	-	0.127	-	1.672	63.3	0.034	No	13-6
Rear	1.545	-	-	-	-	-	-	0.17	1.715	65.1	0.034	No	13-7

Table 13.34 SAR to Peak Location Separation Ratio (SPLSR)

Figure 13-1



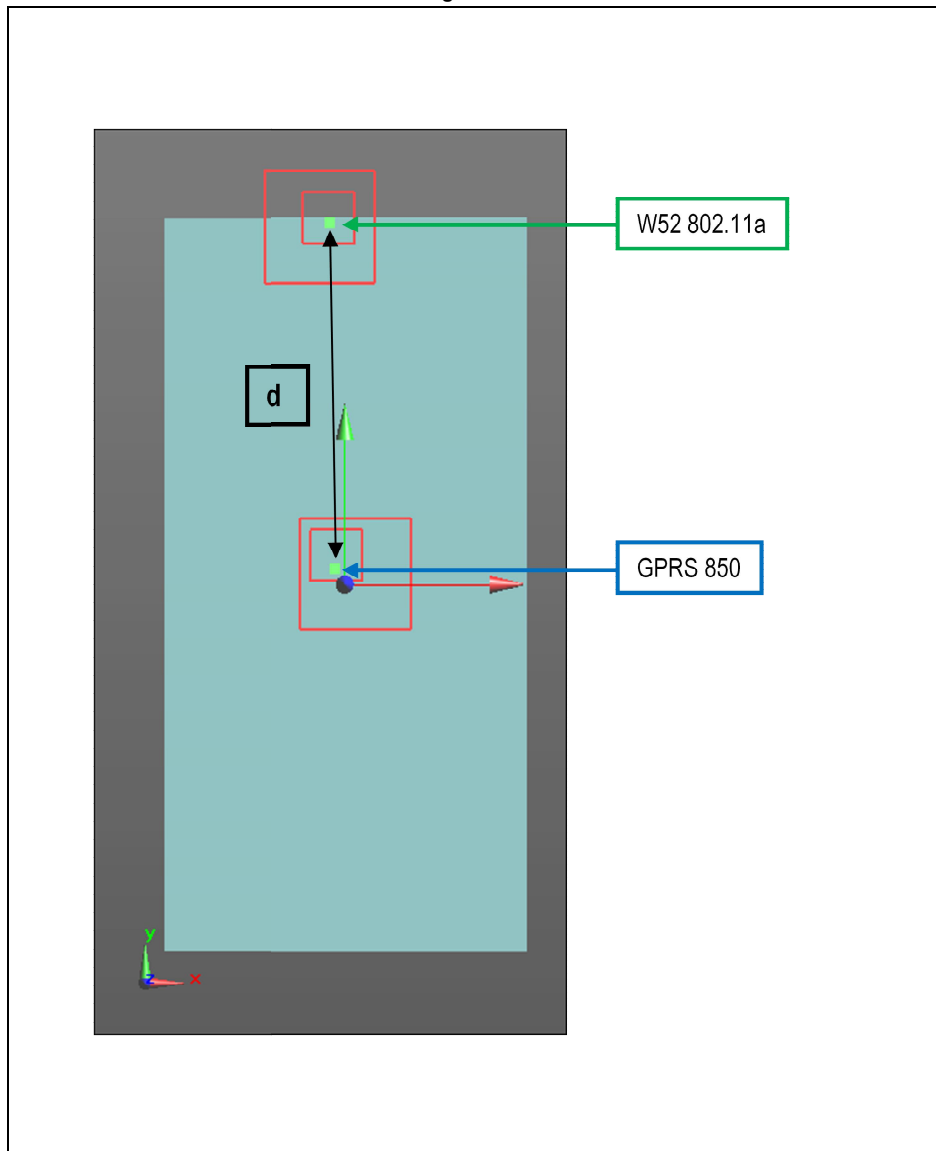
Mode	Peak SAR	X	Y	Z
	[mW/g]	m	m	m
GPRS 850	1.66	-0.002	-0.002	-0.183
W-LAN 2.4GHz	0.327	-0.016	0.07	-0.183

d: Calculated distance(mm)	68.5
----------------------------	------

The Peak Location Separation Distance is computed by using the formula below:

$$\text{SQRT}((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$$

Figure 13-2



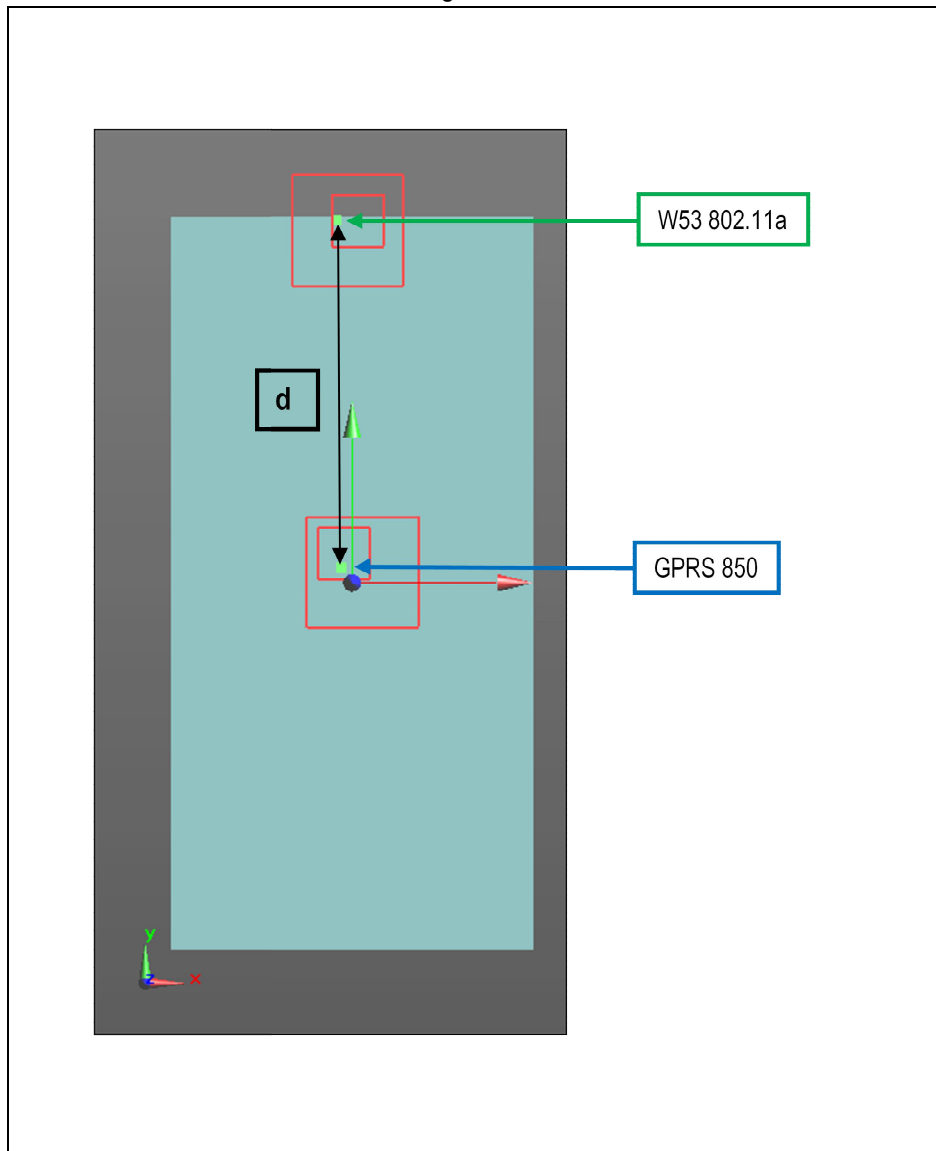
Mode	Peak SAR	X	Y	Z
	[mW/g]	m	m	m
GPRS 850	1.66	-0.002	-0.002	-0.183
W-LAN W52 802.11a	0.119	-0.004	0.07	-0.182

d: Calculated distance(mm)	67.0
----------------------------	------

The Peak Location Separation Distance is computed by using the formula below:

$$\text{SQRT}((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$$

Figure 13-3



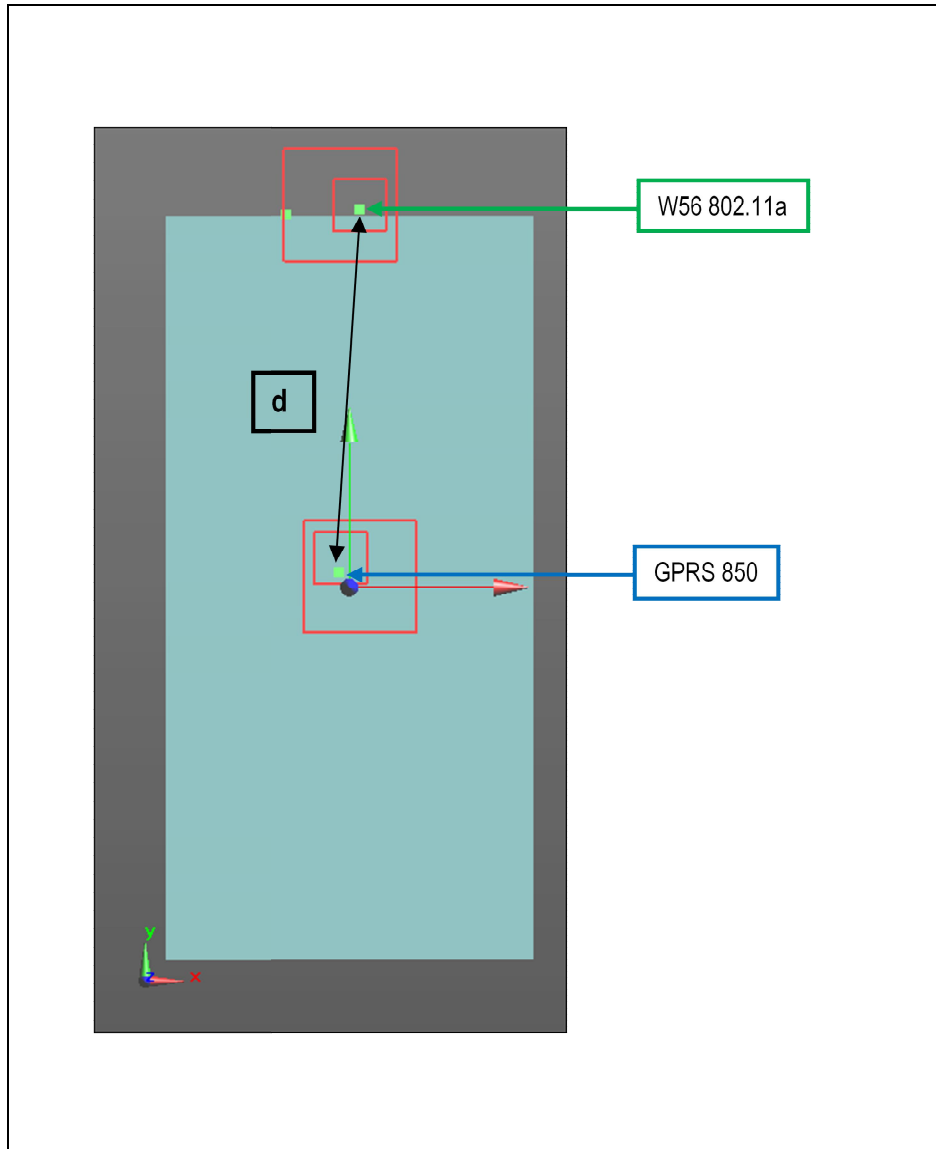
Mode	Peak SAR	X	Y	Z
	[mW/g]	m	m	m
GPRS 850	1.66	-0.002	-0.002	-0.183
W-LAN W53 802.11a	0.217	0.002	0.069	-0.182

d: Calculated distance(mm)	67.0
----------------------------	------

The Peak Location Separation Distance is computed by using the formula below:

$$\text{SQRT}((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$$

Figure 13-4



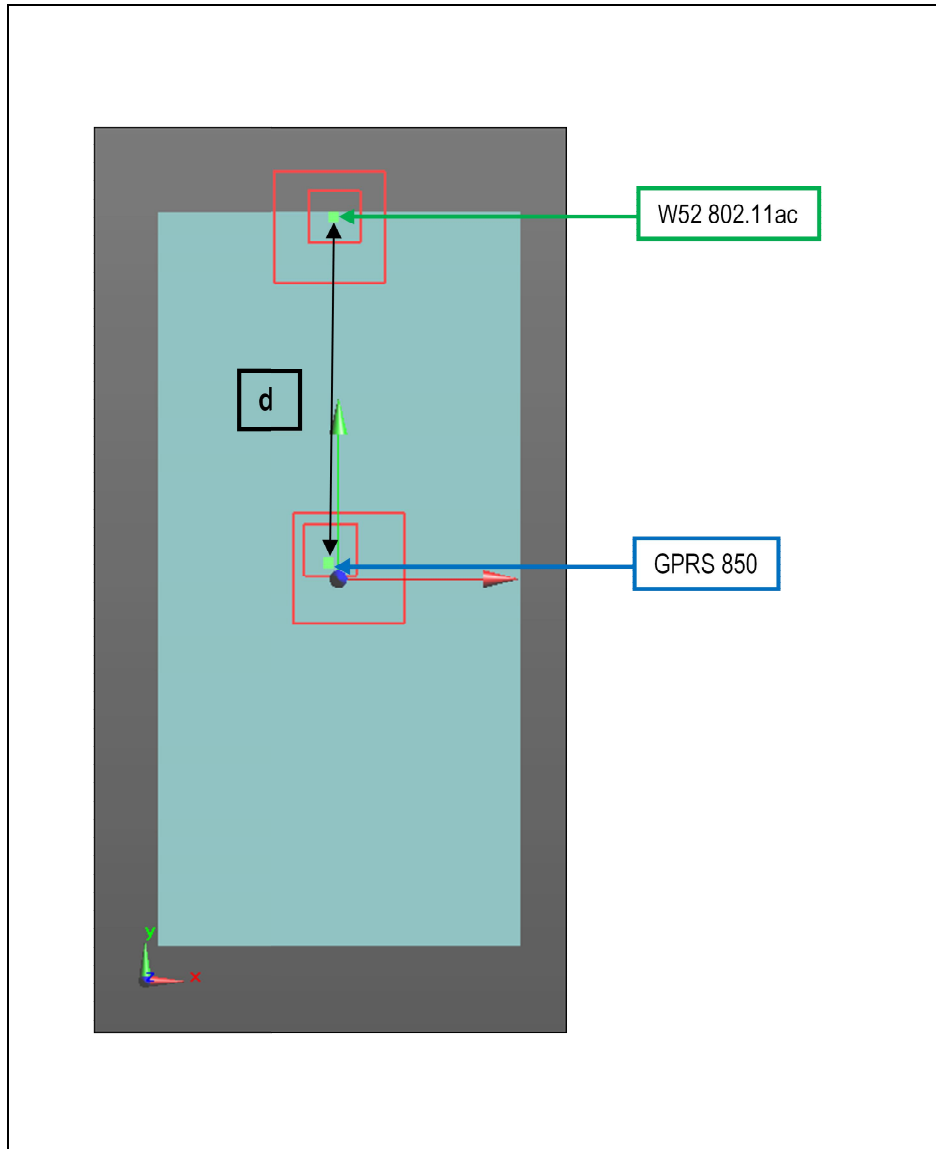
Mode	Peak SAR	X	Y	Z
	[mW/g]	m	m	m
GPRS 850	1.66	-0.002	-0.002	-0.183
W-LAN W56 802.11a	0.385	0.003	0.071	-0.182

d: Calculated distance(mm)	67.0
----------------------------	------

The Peak Location Separation Distance is computed by using the formula below:

$$\text{SQRT}((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$$

Figure 13-5



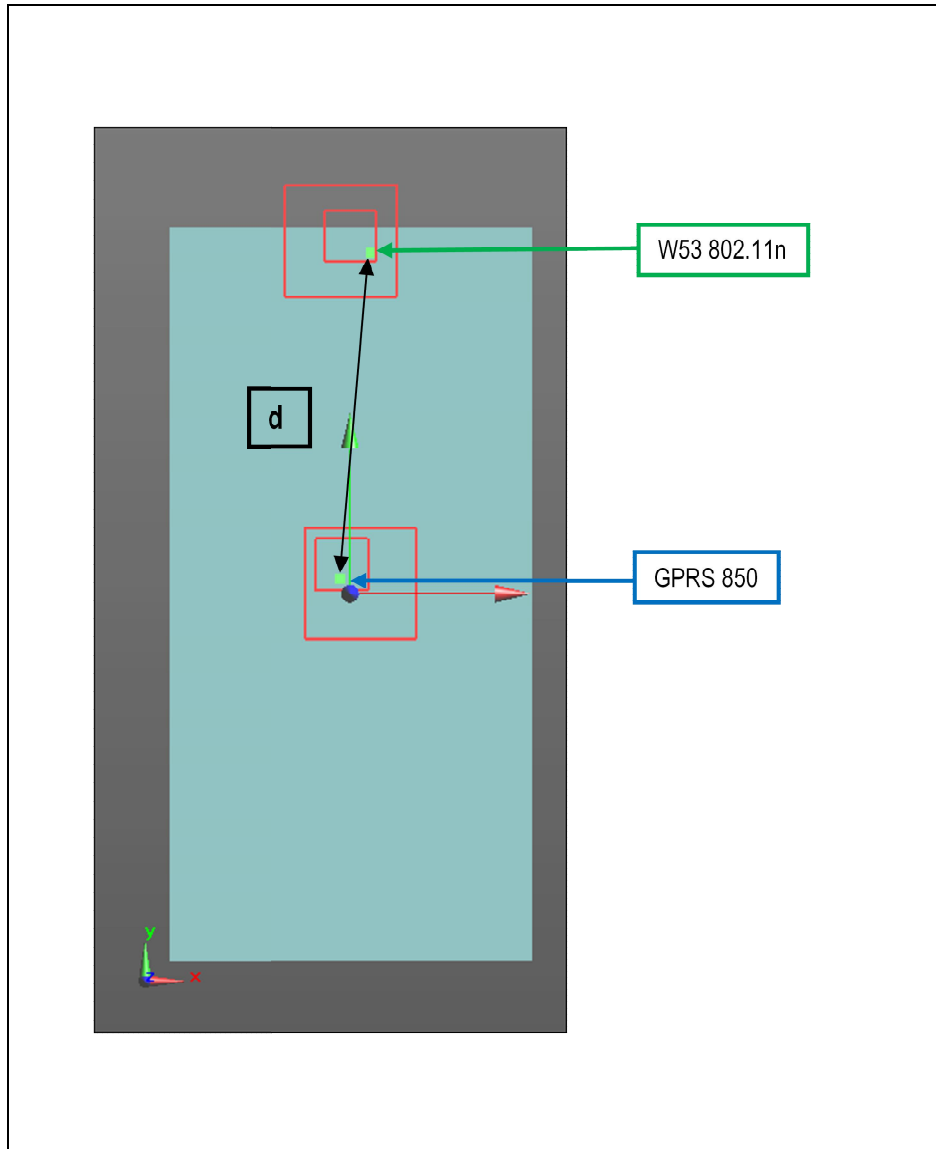
Mode	Peak SAR	X	Y	Z
	[mW/g]	m	m	m
GPRS 850	1.66	-0.002	-0.002	-0.183
W-LAN W52 802.11ac	0.0867	-0.003	0.069	-0.182

d: Calculated distance(mm)	69.1
----------------------------	------

The Peak Location Separation Distance is computed by using the formula below:

$$\text{SQRT}((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$$

Figure 13-6



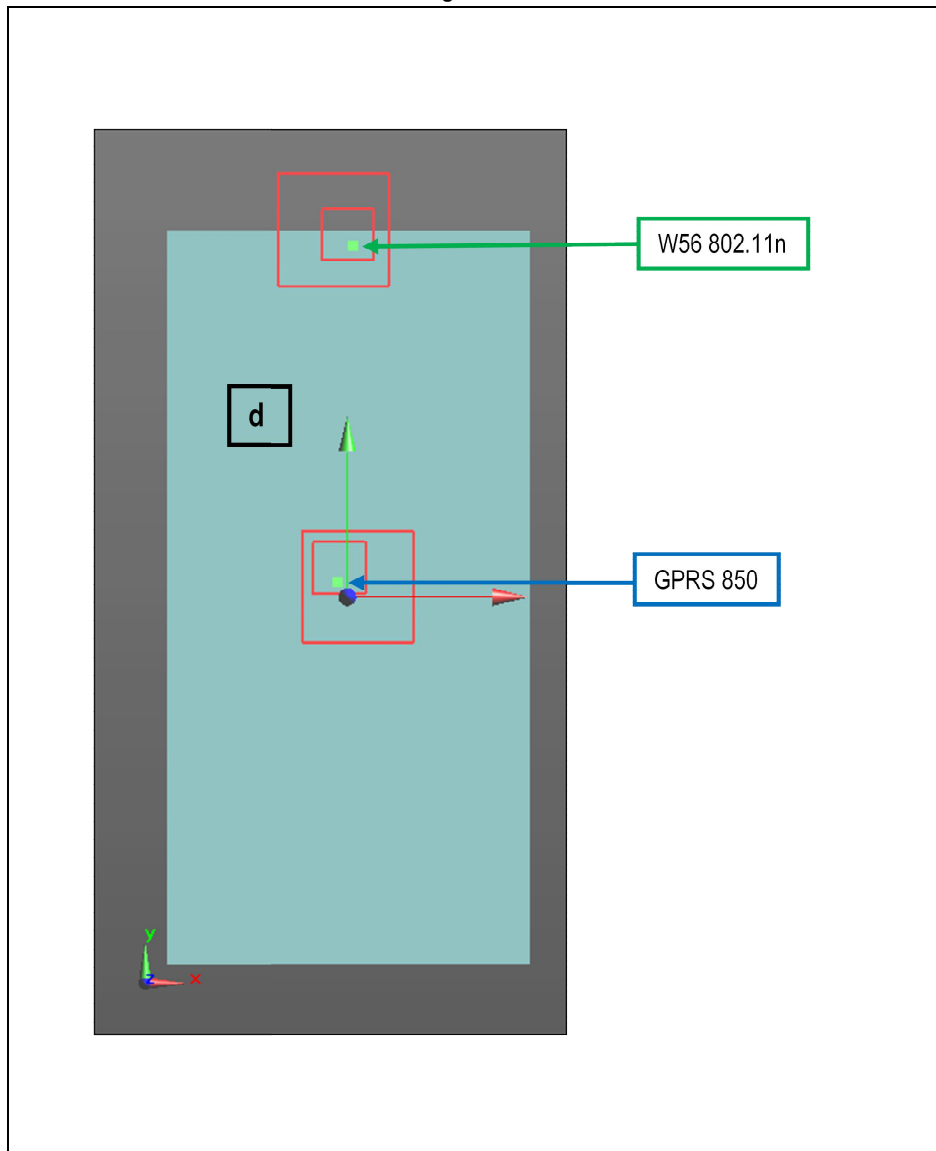
Mode	Peak SAR	X	Y	Z
	[mW/g]	m	m	m
GPRS 850	1.66	-0.002	-0.002	-0.183
W-LAN W53 802.11n	0.212	0.001	0.07	-0.182

d: Calculated distance(mm)	63.3
----------------------------	------

The Peak Location Separation Distance is computed by using the formula below:

$$\text{SQRT}((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$$

Figure 13-7



Mode	Peak SAR	X	Y	Z
	[mW/g]	m	m	m
GPRS 850	1.66	-0.002	-0.002	-0.183
W-LAN W56 802.11n	0.304	0.002	0.071	-0.182

d: Calculated distance(mm)	65.1
----------------------------	------

The Peak Location Separation Distance is computed by using the formula below:

$$\text{SQRT}((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$$

13.9 Simultaneous Transmission Conclusion

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

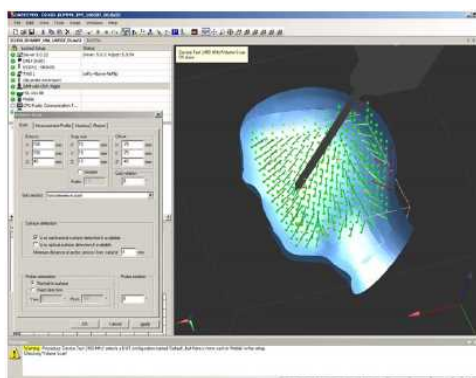
Description of Volume Scan:

In order to determine the EM field distribution in a three-dimensional spatial extension, volume scans are required. In free space, these assessments can help to gain more information on the performance of the DUT (e.g., to determine the degree of symmetry of the field radiated from a horn antenna).

For dosimetric application, it is necessary to assess the peak spatial SAR value averaged over a volume. For this purpose, fine resolution volume scans need to be performed at the peak SAR location(s) determined during the Area Scan. In DASY5 software these scans are called Zoom Scan jobs. The default Zoom Scan measures $7 \times 7 \times 7$ points with a step size of 5 mm. Faster evaluations can be achieved with a reduced number of measurement points. For example, a Zoom Scan with a grid step size in x- and y-directions of 7.5 mm ($5 \times 5 \times 7$ cube configuration) reduces the measurement time to almost half with only 1-2% difference in SAR reading compared to the fine-resolution $7 \times 7 \times 7$ scan.

For SAR evaluations with larger spatial extensions (e.g., within a complete phantom head section) a Volume Scan job should be used.

The Volume Scan job is compatible with DASY5 SAR, PRO and NEO system levels. Volume Scans are used to assess peak SAR and averaged SAR measurement in largely extended 3-dimensional volumes within any phantom. This measurement does not need any previous area scan. The grid can be anchored to a user specific point or to the current probe location. With an Administrator access mode, the grid can be optionally graded in Z-direction, whereby the smallest grid step and the grading ratio can be defined. Chosen grading ratio is automatically adjusted so that the desired extent in Z-direction is fully covered.



Under the Report page, the quantity to be evaluated for an instant report may be selected.

SAR Assessment:

Alternative 1

- Evaluation Method
 - Maximum summed SAR Value
- Description
 - Easiest and most conservative method to determine the upper limit of multi-band SAR
- Example
 - F1's SAR Value is 0.9
 - F2's SAR Value is 1.3
 - Multi-band SAR Value is $0.9 + 1.3 = 2.2$

Alternative 2

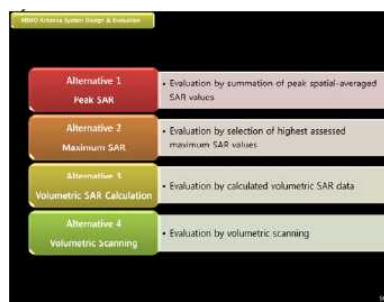
- Evaluation Method
 - Selection of highest assessed maximum SAR Value
- Description
 - Accurate estimate of the multi-band SAR
- Example
 - F1's SAR Value is 0.9
 - F2's SAR Value is 1.3
 - Multi-band SAR Value is 1.3

Alternative 3

- Evaluation Method
 - Combining existing Area and Zoom Scan results by Post-Processor
- Description
 - Rapid way of obtaining the multi-band SAR. It is always applicable.
- Example
 - F1's SAR Value is 0.9
 - F2's SAR Value is 1.3
 - Combining results by Post-Processor

Alternative 4

- Evaluation Method
 - Combining existing Area and Zoom Scan results by Post-Processor
- Description
 - The most accurate way of assessing the multi-band SAR and always
- Example
 - F1's SAR Value is 0.9
 - F2's SAR Value is 1.3
 - Combining results by Post-Processor



14. SAR Measurement Variability

14.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01r01, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium.

These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR Measurement Variability was assessed using the following procedures for each frequency band:

1. When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
2. A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).
3. A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .
4. Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg.

Table 14.1 Body SAR Measurement Variability Results

Frequency		Mode	Service	# of Time Slots	Spacing [Side]	Measured SAR(1g)	1st Repeated SAR(1g)	Ratio	2nd Repeated SAR(1g)	Ratio	3rd Repeated SAR(1g)	Ratio
MHz	Ch					[W/kg]	[W/kg]		[W/kg]		[W/kg]	
824.2	128	GSM850	GPRS	4	10 mm [Rear]	1.475	1.545	0.95	N/A	N/A	N/A	N/A
1880.0	661	PCS1900	GPRS	4	10 mm [Rear]	0.999	0.995	1.00	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1-2005 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General population Exposure							Body 1.6 W/kg(mW/g) averaged over 1 gram					

14.2 Measurement Uncertainty

The measured SAR was < 1.5 W/kg for all frequency bands. Therefore, per KDB Publication 865664D01v01r01, the standard measurement uncertainty analysis per IEEE 1528-2003 was not required.

15. IEEE P1528 - Measurement uncertainties

Expanded uncertainties stated are calculated with a coverage Factor $k=2$.

Please note that these results are not taken into account when determining compliance or non-compliance with test result.

835MHz Head

Error Description	Uncertainty Value $\pm \%$	Probability distribution	Divisor	c_i (1g)	Standard uncertainty $\pm \%, (1g)$	v_i or v_{eff}
Measurement System						
Probe Calibration	± 6.0	N	1	1	± 6.0	∞
Axial Isotropy	± 4.7	R	$\sqrt{3}$	0.7	± 1.9	∞
Hemispherical Isotropy	± 9.6	R	$\sqrt{3}$	0.7	± 3.9	∞
Boundary Effect	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Linearity	± 4.7	R	$\sqrt{3}$	1	± 2.7	∞
System Detection Limits	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Readout Electronics	± 0.3	N	1	1	± 0.3	∞
Response Time	± 0.8	R	$\sqrt{3}$	1	± 0.5	∞
Integration Time	± 2.6	R	$\sqrt{3}$	1	± 1.5	∞
RF Ambient Noise	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
RF Ambient Reflections	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
Probe Positioner	± 0.4	R	$\sqrt{3}$	1	± 0.2	∞
Probe Positioning	± 2.9	R	$\sqrt{3}$	1	± 1.7	∞
Max. SAR Eval.	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Test sample related						
Device Positioning	± 2.9	N	1	1	± 2.9	145
Device Holder	± 3.6	N	1	1	± 3.6	5
Power Drift	± 5.0	R	$\sqrt{3}$	1	± 2.9	∞
Phantom and set-up						
Phantom Uncertainty	± 4.0	R	$\sqrt{3}$	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	R	$\sqrt{3}$	0.64	± 1.8	∞
Liquid conductivity (meas.)	± 1.2	R	1	0.64	± 0.8	∞
Liquid permittivity (target)	± 5.0	R	$\sqrt{3}$	0.6	± 1.7	∞
Liquid permittivity (meas.)	± 1.1	R	1	0.6	± 0.7	∞
Combined Std. Uncertainty					± 10.6	387
Expanded uncertainty (95% confidence interval)					± 21.2	

835MHz Body

Error Description	Uncertainty Value $\pm \%$	Probability distribution	Divisor	ci (1g)	Standard uncertainty $\pm \%, (1g)$	vi or veff
Measurement System						
Probe Calibration	± 6.0	N	1	1	± 6.0	∞
Axial Isotropy	± 4.7	R	$\sqrt{3}$	0.7	± 1.9	∞
Hemispherical Isotropy	± 9.6	R	$\sqrt{3}$	0.7	± 3.9	∞
Boundary Effect	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Linearity	± 4.7	R	$\sqrt{3}$	1	± 2.7	∞
System Detection Limits	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Readout Electronics	± 0.3	N	1	1	± 0.3	∞
Response Time	± 0.8	R	$\sqrt{3}$	1	± 0.5	∞
Integration Time	± 2.6	R	$\sqrt{3}$	1	± 1.5	∞
RF Ambient Noise	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
RF Ambient Reflections	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
Probe Positioner	± 0.4	R	$\sqrt{3}$	1	± 0.2	∞
Probe Positioning	± 2.9	R	$\sqrt{3}$	1	± 1.7	∞
Max. SAR Eval.	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Test sample related						
Device Positioning	± 2.9	N	1	1	± 2.9	145
Device Holder	± 3.6	N	1	1	± 3.6	5
Power Drift	± 5.0	R	$\sqrt{3}$	1	± 2.9	∞
Phantom and set-up						
Phantom Uncertainty	± 4.0	R	$\sqrt{3}$	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	R	$\sqrt{3}$	0.64	± 1.8	∞
Liquid conductivity (meas.)	± 4.6	R	1	0.64	± 2.9	∞
Liquid permittivity (target)	± 5.0	R	$\sqrt{3}$	0.6	± 1.7	∞
Liquid permittivity (meas.)	± 1.7	R	1	0.6	± 1.0	∞
Combined Std. Uncertainty					± 13.0	387
Expanded uncertainty (95% confidence interval)					± 26.0	

1900MHz Head

Error Description	Uncertainty Value $\pm \%$	Probability distribution	Divisor	ci (1g)	Standard uncertainty $\pm \%, (1g)$	vi or veff
Measurement System						
Probe Calibration	± 6.0	N	1	1	± 6.0	∞
Axial Isotropy	± 4.7	R	$\sqrt{3}$	0.7	± 1.9	∞
Hemispherical Isotropy	± 9.6	R	$\sqrt{3}$	0.7	± 3.9	∞
Boundary Effect	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Linearity	± 4.7	R	$\sqrt{3}$	1	± 2.7	∞
System Detection Limits	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Readout Electronics	± 0.3	N	1	1	± 0.3	∞
Response Time	± 0.8	R	$\sqrt{3}$	1	± 0.5	∞
Integration Time	± 2.6	R	$\sqrt{3}$	1	± 1.5	∞
RF Ambient Noise	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
RF Ambient Reflections	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
Probe Positioner	± 0.4	R	$\sqrt{3}$	1	± 0.2	∞
Probe Positioning	± 2.9	R	$\sqrt{3}$	1	± 1.7	∞
Max. SAR Eval.	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Test sample related						
Device Positioning	± 2.9	N	1	1	± 2.9	145
Device Holder	± 3.6	N	1	1	± 3.6	5
Power Drift	± 5.0	R	$\sqrt{3}$	1	± 2.9	∞
Phantom and set-up						
Phantom Uncertainty	± 4.0	R	$\sqrt{3}$	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	R	$\sqrt{3}$	0.64	± 1.8	∞
Liquid conductivity (meas.)	± 3.9	R	1	0.64	± 2.5	∞
Liquid permittivity (target)	± 5.0	R	$\sqrt{3}$	0.6	± 1.7	∞
Liquid permittivity (meas.)	± 0.7	R	1	0.6	± 0.4	∞
Combined Std. Uncertainty					± 12.0	387
Expanded uncertainty (95% confidence interval)					± 24.0	

1900MHz Body

Error Description	Uncertainty Value $\pm \%$	Probability distribution	Divisor	ci (1g)	Standard uncertainty $\pm \%, (1g)$	vi or veff
Measurement System						
Probe Calibration	± 6.0	N	1	1	± 6.0	∞
Axial Isotropy	± 4.7	R	$\sqrt{3}$	0.7	± 1.9	∞
Hemispherical Isotropy	± 9.6	R	$\sqrt{3}$	0.7	± 3.9	∞
Boundary Effect	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Linearity	± 4.7	R	$\sqrt{3}$	1	± 2.7	∞
System Detection Limits	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Readout Electronics	± 0.3	N	1	1	± 0.3	∞
Response Time	± 0.8	R	$\sqrt{3}$	1	± 0.5	∞
Integration Time	± 2.6	R	$\sqrt{3}$	1	± 1.5	∞
RF Ambient Noise	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
RF Ambient Reflections	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
Probe Positioner	± 0.4	R	$\sqrt{3}$	1	± 0.2	∞
Probe Positioning	± 2.9	R	$\sqrt{3}$	1	± 1.7	∞
Max. SAR Eval.	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Test sample related						
Device Positioning	± 2.9	N	1	1	± 2.9	145
Device Holder	± 3.6	N	1	1	± 3.6	5
Power Drift	± 5.0	R	$\sqrt{3}$	1	± 2.9	∞
Phantom and set-up						
Phantom Uncertainty	± 4.0	R	$\sqrt{3}$	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	R	$\sqrt{3}$	0.64	± 1.8	∞
Liquid conductivity (meas.)	± 3.0	R	1	0.64	± 1.9	∞
Liquid permittivity (target)	± 5.0	R	$\sqrt{3}$	0.6	± 1.7	∞
Liquid permittivity (meas.)	± 3.9	R	1	0.6	± 2.3	∞
Combined Std. Uncertainty					± 13.3	387
Expanded uncertainty (95% confidence interval)					± 26.6	

2450MHz Head

Error Description	Uncertainty Value $\pm \%$	Probability distribution	Divisor	ci (1g)	Standard uncertainty $\pm \%, (1g)$	vi or veff
Measurement System						
Probe Calibration	± 6.0	N	1	1	± 6.0	∞
Axial Isotropy	± 4.7	R	$\sqrt{3}$	0.7	± 1.9	∞
Hemispherical Isotropy	± 9.6	R	$\sqrt{3}$	0.7	± 3.9	∞
Boundary Effect	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Linearity	± 4.7	R	$\sqrt{3}$	1	± 2.7	∞
System Detection Limits	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Readout Electronics	± 0.3	N	1	1	± 0.3	∞
Response Time	± 0.8	R	$\sqrt{3}$	1	± 0.5	∞
Integration Time	± 2.6	R	$\sqrt{3}$	1	± 1.5	∞
RF Ambient Noise	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
RF Ambient Reflections	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
Probe Positioner	± 0.4	R	$\sqrt{3}$	1	± 0.2	∞
Probe Positioning	± 2.9	R	$\sqrt{3}$	1	± 1.7	∞
Max. SAR Eval.	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Test sample related						
Device Positioning	± 2.9	N	1	1	± 2.9	145
Device Holder	± 3.6	N	1	1	± 3.6	5
Power Drift	± 5.0	R	$\sqrt{3}$	1	± 2.9	∞
Phantom and set-up						
Phantom Uncertainty	± 4.0	R	$\sqrt{3}$	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	R	$\sqrt{3}$	0.64	± 1.8	∞
Liquid conductivity (meas.)	± 4.7	R	1	0.64	± 3.0	∞
Liquid permittivity (target)	± 5.0	R	$\sqrt{3}$	0.6	± 1.7	∞
Liquid permittivity (meas.)	± 2.9	R	1	0.6	± 1.7	∞
Combined Std. Uncertainty					± 13.8	387
Expanded uncertainty (95% confidence interval)					± 27.6	

2450MHz Body

Error Description	Uncertainty Value $\pm \%$	Probability distribution	Divisor	ci (1g)	Standard uncertainty $\pm \%, (1g)$	vi or veff
Measurement System						
Probe Calibration	± 6.0	N	1	1	± 6.0	∞
Axial Isotropy	± 4.7	R	$\sqrt{3}$	0.7	± 1.9	∞
Hemispherical Isotropy	± 9.6	R	$\sqrt{3}$	0.7	± 3.9	∞
Boundary Effect	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Linearity	± 4.7	R	$\sqrt{3}$	1	± 2.7	∞
System Detection Limits	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Readout Electronics	± 0.3	N	1	1	± 0.3	∞
Response Time	± 0.8	R	$\sqrt{3}$	1	± 0.5	∞
Integration Time	± 2.6	R	$\sqrt{3}$	1	± 1.5	∞
RF Ambient Noise	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
RF Ambient Reflections	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
Probe Positioner	± 0.4	R	$\sqrt{3}$	1	± 0.2	∞
Probe Positioning	± 2.9	R	$\sqrt{3}$	1	± 1.7	∞
Max. SAR Eval.	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Test sample related						
Device Positioning	± 2.9	N	1	1	± 2.9	145
Device Holder	± 3.6	N	1	1	± 3.6	5
Power Drift	± 5.0	R	$\sqrt{3}$	1	± 2.9	∞
Phantom and set-up						
Phantom Uncertainty	± 4.0	R	$\sqrt{3}$	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	R	$\sqrt{3}$	0.64	± 1.8	∞
Liquid conductivity (meas.)	± 0.7	R	1	0.64	± 0.4	∞
Liquid permittivity (target)	± 5.0	R	$\sqrt{3}$	0.6	± 1.7	∞
Liquid permittivity (meas.)	± 0.4	R	1	0.6	± 0.2	∞
Combined Std. Uncertainty					± 9.7	387
Expanded uncertainty (95% confidence interval)					± 19.4	

5200MHz Head

Error Description	Uncertainty Value ± %	Probability distribution	Divisor	ci (1g)	Standard uncertainty ±%,(1g)	vi or veff
Measurement System						
Probe Calibration	± 6.55	N	1	1	± 6.55	∞
Axial Isotropy	± 4.7	R	$\sqrt{3}$	0.7	± 1.9	∞
Hemispherical Isotropy	± 9.6	R	$\sqrt{3}$	0.7	± 3.9	∞
Boundary Effect	± 2.0	R	$\sqrt{3}$	1	± 1.2	∞
Linearity	± 4.7	R	$\sqrt{3}$	1	± 2.7	∞
System Detection Limits	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Readout Electronics	± 0.3	N	1	1	± 0.3	∞
Response Time	± 0.8	R	$\sqrt{3}$	1	± 0.5	∞
Integration Time	± 2.6	R	$\sqrt{3}$	1	± 1.5	∞
RF Ambient Noise	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
RF Ambient Reflections	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
Probe Positioner	± 0.8	R	$\sqrt{3}$	1	± 0.5	∞
Probe Positioning	± 6.7	R	$\sqrt{3}$	1	± 3.9	∞
Max. SAR Eval.	± 4.0	R	$\sqrt{3}$	1	± 2.3	∞
Test sample related						
Device Positioning	± 2.9	N	1	1	± 2.9	145
Device Holder	± 3.6	N	1	1	± 3.6	5
Power Drift	± 5.0	R	$\sqrt{3}$	1	± 2.9	∞
Phantom and set-up						
Phantom Uncertainty	± 4.0	R	$\sqrt{3}$	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	R	$\sqrt{3}$	0.64	± 1.8	∞
Liquid conductivity (meas.)	± 2.8	R	1	0.64	± 1.8	∞
Liquid permittivity (target)	± 5.0	R	$\sqrt{3}$	0.6	± 1.7	∞
Liquid permittivity (meas.)	± 3.0	R	1	0.6	± 1.8	∞
Combined Std. Uncertainty					± 13.8	330
Expanded uncertainty (95% confidence interval)					± 27.6	

5200MHz Body

Error Description	Uncertainty Value ± %	Probability distribution	Divisor	ci (1g)	Standard uncertainty ±%,(1g)	vi or veff
Measurement System						
Probe Calibration	± 6.55	N	1	1	± 6.55	∞
Axial Isotropy	± 4.7	R	$\sqrt{3}$	0.7	± 1.9	∞
Hemispherical Isotropy	± 9.6	R	$\sqrt{3}$	0.7	± 3.9	∞
Boundary Effect	± 2.0	R	$\sqrt{3}$	1	± 1.2	∞
Linearity	± 4.7	R	$\sqrt{3}$	1	± 2.7	∞
System Detection Limits	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Readout Electronics	± 0.3	N	1	1	± 0.3	∞
Response Time	± 0.8	R	$\sqrt{3}$	1	± 0.5	∞
Integration Time	± 2.6	R	$\sqrt{3}$	1	± 1.5	∞
RF Ambient Noise	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
RF Ambient Reflections	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
Probe Positioner	± 0.8	R	$\sqrt{3}$	1	± 0.5	∞
Probe Positioning	± 6.7	R	$\sqrt{3}$	1	± 3.9	∞
Max. SAR Eval.	± 4.0	R	$\sqrt{3}$	1	± 2.3	∞
Test sample related						
Device Positioning	± 2.9	N	1	1	± 2.9	145
Device Holder	± 3.6	N	1	1	± 3.6	5
Power Drift	± 5.0	R	$\sqrt{3}$	1	± 2.9	∞
Phantom and set-up						
Phantom Uncertainty	± 4.0	R	$\sqrt{3}$	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	R	$\sqrt{3}$	0.64	± 1.8	∞
Liquid conductivity (meas.)	± 3.7	R	1	0.64	± 2.4	∞
Liquid permittivity (target)	± 5.0	R	$\sqrt{3}$	0.6	± 1.7	∞
Liquid permittivity (meas.)	± 3.9	R	1	0.6	± 2.3	∞
Combined Std. Uncertainty					± 14.9	330
Expanded uncertainty (95% confidence interval)					± 29.8	

5300MHz Head

Error Description	Uncertainty Value ± %	Probability distribution	Divisor	ci (1g)	Standard uncertainty ±%,(1g)	vi or veff
Measurement System						
Probe Calibration	± 6.55	N	1	1	± 6.55	∞
Axial Isotropy	± 4.7	R	$\sqrt{3}$	0.7	± 1.9	∞
Hemispherical Isotropy	± 9.6	R	$\sqrt{3}$	0.7	± 3.9	∞
Boundary Effect	± 2.0	R	$\sqrt{3}$	1	± 1.2	∞
Linearity	± 4.7	R	$\sqrt{3}$	1	± 2.7	∞
System Detection Limits	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Readout Electronics	± 0.3	N	1	1	± 0.3	∞
Response Time	± 0.8	R	$\sqrt{3}$	1	± 0.5	∞
Integration Time	± 2.6	R	$\sqrt{3}$	1	± 1.5	∞
RF Ambient Noise	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
RF Ambient Reflections	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
Probe Positioner	± 0.8	R	$\sqrt{3}$	1	± 0.5	∞
Probe Positioning	± 6.7	R	$\sqrt{3}$	1	± 3.9	∞
Max. SAR Eval.	± 4.0	R	$\sqrt{3}$	1	± 2.3	∞
Test sample related						
Device Positioning	± 2.9	N	1	1	± 2.9	145
Device Holder	± 3.6	N	1	1	± 3.6	5
Power Drift	± 5.0	R	$\sqrt{3}$	1	± 2.9	∞
Phantom and set-up						
Phantom Uncertainty	± 4.0	R	$\sqrt{3}$	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	R	$\sqrt{3}$	0.64	± 1.8	∞
Liquid conductivity (meas.)	± 2.9	R	1	0.64	± 1.9	∞
Liquid permittivity (target)	± 5.0	R	$\sqrt{3}$	0.6	± 1.7	∞
Liquid permittivity (meas.)	± 3.3	R	1	0.6	± 2.0	∞
Combined Std. Uncertainty					± 14.1	330
Expanded uncertainty (95% confidence interval)					± 28.2	

5300MHz Body

Error Description	Uncertainty Value ± %	Probability distribution	Divisor	ci (1g)	Standard uncertainty ±%,(1g)	vi or veff
Measurement System						
Probe Calibration	± 6.55	N	1	1	± 6.55	∞
Axial Isotropy	± 4.7	R	$\sqrt{3}$	0.7	± 1.9	∞
Hemispherical Isotropy	± 9.6	R	$\sqrt{3}$	0.7	± 3.9	∞
Boundary Effect	± 2.0	R	$\sqrt{3}$	1	± 1.2	∞
Linearity	± 4.7	R	$\sqrt{3}$	1	± 2.7	∞
System Detection Limits	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Readout Electronics	± 0.3	N	1	1	± 0.3	∞
Response Time	± 0.8	R	$\sqrt{3}$	1	± 0.5	∞
Integration Time	± 2.6	R	$\sqrt{3}$	1	± 1.5	∞
RF Ambient Noise	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
RF Ambient Reflections	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
Probe Positioner	± 0.8	R	$\sqrt{3}$	1	± 0.5	∞
Probe Positioning	± 6.7	R	$\sqrt{3}$	1	± 3.9	∞
Max. SAR Eval.	± 4.0	R	$\sqrt{3}$	1	± 2.3	∞
Test sample related						
Device Positioning	± 2.9	N	1	1	± 2.9	145
Device Holder	± 3.6	N	1	1	± 3.6	5
Power Drift	± 5.0	R	$\sqrt{3}$	1	± 2.9	∞
Phantom and set-up						
Phantom Uncertainty	± 4.0	R	$\sqrt{3}$	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	R	$\sqrt{3}$	0.64	± 1.8	∞
Liquid conductivity (meas.)	± 3.4	R	1	0.64	± 2.2	∞
Liquid permittivity (target)	± 5.0	R	$\sqrt{3}$	0.6	± 1.7	∞
Liquid permittivity (meas.)	± 4.4	R	1	0.6	± 2.6	∞
Combined Std. Uncertainty					± 14.8	330
Expanded uncertainty (95% confidence interval)					± 25.6	

5500MHz Head

Error Description	Uncertainty Value ± %	Probability distribution	Divisor	ci (1g)	Standard uncertainty ±%,(1g)	vi or veff
Measurement System						
Probe Calibration	± 6.55	N	1	1	± 6.55	∞
Axial Isotropy	± 4.7	R	$\sqrt{3}$	0.7	± 1.9	∞
Hemispherical Isotropy	± 9.6	R	$\sqrt{3}$	0.7	± 3.9	∞
Boundary Effect	± 2.0	R	$\sqrt{3}$	1	± 1.2	∞
Linearity	± 4.7	R	$\sqrt{3}$	1	± 2.7	∞
System Detection Limits	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Readout Electronics	± 0.3	N	1	1	± 0.3	∞
Response Time	± 0.8	R	$\sqrt{3}$	1	± 0.5	∞
Integration Time	± 2.6	R	$\sqrt{3}$	1	± 1.5	∞
RF Ambient Noise	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
RF Ambient Reflections	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
Probe Positioner	± 0.8	R	$\sqrt{3}$	1	± 0.5	∞
Probe Positioning	± 6.7	R	$\sqrt{3}$	1	± 3.9	∞
Max. SAR Eval.	± 4.0	R	$\sqrt{3}$	1	± 2.3	∞
Test sample related						
Device Positioning	± 2.9	N	1	1	± 2.9	145
Device Holder	± 3.6	N	1	1	± 3.6	5
Power Drift	± 5.0	R	$\sqrt{3}$	1	± 2.9	∞
Phantom and set-up						
Phantom Uncertainty	± 4.0	R	$\sqrt{3}$	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	R	$\sqrt{3}$	0.64	± 1.8	∞
Liquid conductivity (meas.)	± 2.8	R	1	0.64	± 1.8	∞
Liquid permittivity (target)	± 5.0	R	$\sqrt{3}$	0.6	± 1.7	∞
Liquid permittivity (meas.)	± 3.1	R	1	0.6	± 1.9	∞
Combined Std. Uncertainty					± 13.9	330
Expanded uncertainty (95% confidence interval)					± 27.8	

5500MHz Body

Error Description	Uncertainty Value ± %	Probability distribution	Divisor	ci (1g)	Standard uncertainty ±%,(1g)	vi or veff
Measurement System						
Probe Calibration	± 6.55	N	1	1	± 6.55	∞
Axial Isotropy	± 4.7	R	$\sqrt{3}$	0.7	± 1.9	∞
Hemispherical Isotropy	± 9.6	R	$\sqrt{3}$	0.7	± 3.9	∞
Boundary Effect	± 2.0	R	$\sqrt{3}$	1	± 1.2	∞
Linearity	± 4.7	R	$\sqrt{3}$	1	± 2.7	∞
System Detection Limits	± 1.0	R	$\sqrt{3}$	1	± 0.6	∞
Readout Electronics	± 0.3	N	1	1	± 0.3	∞
Response Time	± 0.8	R	$\sqrt{3}$	1	± 0.5	∞
Integration Time	± 2.6	R	$\sqrt{3}$	1	± 1.5	∞
RF Ambient Noise	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
RF Ambient Reflections	± 3.0	R	$\sqrt{3}$	1	± 1.7	∞
Probe Positioner	± 0.8	R	$\sqrt{3}$	1	± 0.5	∞
Probe Positioning	± 6.7	R	$\sqrt{3}$	1	± 3.9	∞
Max. SAR Eval.	± 4.0	R	$\sqrt{3}$	1	± 2.3	∞
Test sample related						
Device Positioning	± 2.9	N	1	1	± 2.9	145
Device Holder	± 3.6	N	1	1	± 3.6	5
Power Drift	± 5.0	R	$\sqrt{3}$	1	± 2.9	∞
Phantom and set-up						
Phantom Uncertainty	± 4.0	R	$\sqrt{3}$	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	R	$\sqrt{3}$	0.64	± 1.8	∞
Liquid conductivity (meas.)	± 3.8	R	1	0.64	± 2.4	∞
Liquid permittivity (target)	± 5.0	R	$\sqrt{3}$	0.6	± 1.7	∞
Liquid permittivity (meas.)	± 4.2	R	1	0.6	± 2.5	∞
Combined Std. Uncertainty					± 14.9	330
Expanded uncertainty (95% confidence interval)					± 29.8	



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16. Conclusion

Measurement Conclusion

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the FCC. These measurements are taken to simulate the RF effects exposure under the worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The tested device complies with the requirements in respect to all parameters subject to the test. The test results and statements relate only to the item(s) tested. Please note that the absorption and distribution of electromagnetic energy in the body are very complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role impossible biological effect are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because innumerable factors may interact to determine the specific biological outcome of an exposure to electromagnetic fields, any protection guide shall consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables.

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