



**FCC 47 CFR Parts 1 & 2
Published RF Exposure KDB Procedures
IEEE Std 1528-2003 and IEEE Std 1528a-2005**

SAR EVALUATION REPORT

For
iPhone

Model: A1529

FCC ID: BCG-E2694A

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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	9/3/2013	Initial Issue	--
A	9/5/13	Made the following changes based on reviewer's comments: 1. Removed OET 65 supplement C from cover page, Sec. 1, 2 and 10 2. Sec. 7.1: Added description of detect mode 3. Sec. 7.3 & 7.4: Corrected some typo 4. Sec. 8.2: Added explanation on selected test separation distance for Body-worn accessory test configurations. 5. Sec. 8.3: Added justification for testing at 5 mm to cover hotspot operation. 6. Sec. 9.4: Added WLAN channels 12 and 13 and added justification (note 2) why channels 12 and 13 were not tested. 7. Sec. 12.3.2. and 12.4.2.: Added justification for SAR test exclusion for HSPA 8. Updated project no. from 13U15037-7A to 13U15037-21A 9. Sec. 7.1: Added flowchart and descriptions. 10. Sec. 9: Added note	Sunny Shih

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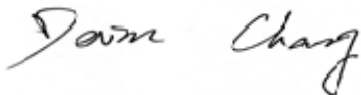
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1. Attestation of Test Results

Applicant	Apple Inc.			
DUT description	iPhone			
Model	A1529			
Test device is	An identical prototype			
Device category	Portable			
Exposure category	General Population/Uncontrolled Exposure			
Date tested	6/3/2013 – 7/17/2013			
The highest reported SAR values	RF exposure conditions	Licensed	DTS	UNII
	Head	1.190 W/kg	0.576 W/kg	0.590 W/kg
	Body-worn Accessory	1.150 W/kg	0.536 W/kg	0.561 W/kg
	Wireless Router (Hotspot)	1.180 W/kg	0.536 W/kg	N/A
	Simultaneous Transmission	1.573 W/kg	1.547 W/kg	1.573 W/kg
Applicable Standards	FCC 47 CFR Parts 1 & 2 Published RF Exposure KDB Procedures, and TCB workshop updates IEEE Std 1528-2003 and IEEE Std 1528a-2005			
Test Results	Pass			
UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report. Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government (NIST Handbook 150, Annex A). This report is written to support regulatory compliance of the applicable standards stated above.				
Approved & Released By:		Prepared By:		
				
Sunny Shih WiSE Operations Manager UL Verification Services Inc.		Devin Chang WiSE Engineer UL Verification Services Inc.		

2. Test Methodology

The tests documented in this report were performed in accordance with FCC 47 CFR Parts 1 & 2, IEEE STD 1528-2003, IEEE Std 1528a-2005, the following FCC Published RF exposure KDB procedures, and TCB workshop updates:

- o 447498 D01 General RF Exposure Guidance v05r01
- o 648474 D04 SAR Handsets Multi Xmitter and Ant v01r01
- o 941225 D01 SAR test for 3G devices v02
- o 941225 D02 HSPA and 1x Advanced v02r02
- o 941225 D03 SAR Test Reduction GSM GPRS EDGE v01
- o 941225 D04 SAR for GSM E GPRS Dual Xfer Mode v01
- o 941225 D05 SAR for LTE Devices v02r02
- o 941225 D06 Hot Spot SAR v01r01
- o 248227 D01 SAR Meas for 802 11abg v01r02
- o 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r01
- o 865664 D02 SAR Reporting v01r01
- o 690783 D01 SAR Listings on Grants v01r02

3. Facilities and Accreditation

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

4. Calibration and Uncertainty

4.1. Measuring Instrument Calibration

The measuring equipment used to perform the tests documented in this report has been calibrated in accordance with the manufacturers' recommendations, and is traceable to recognized national standards.

Tissue Dielectric Properties

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Network Analyzer	Agilent	E5071B	MY42100131	2/21/2014
Dielectronic Probe kit	SPEAG	DAK-3.5	1087	10/16/2013
Dielectronic Probe kit	SPEAG	DAK-3.5 Short	SM DAK 200 BA	N/A
Thermometer	Control Company	4242	122529163	9/19/2013

System Performance Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Synthesized Signal Generator	HP	8665B	3546A00784	3/26/2014
Power Meter	HP	438A	3513U04320	9/24/2013
Power Sensor	HP	8481A	2237A31744	9/24/2013
Power Sensor	HP	8481A	2702A76223	8/21/2013
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1795093	N/A
Directional coupler	Werlatone	C8060-102	2711	N/A
DC Power Supply	AMETEK	XHR60-18	1308A01935	N/A
Synthesized Signal Generator	HP	8665B	3744A01155	3/6/2014
Power Meter	HP	438A	2822A05684	10/7/2013
Power Sensor	HP	8481A	2702A66876	9/24/2013
Power Sensor	HP	8482A	2349A08568	9/26/2013
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1622052	N/A
Directional coupler	Werlatone	C8060-102	2149	N/A
DC Power Supply	EKNWOOD	PA36-3A	7060074	N/A
Thermometer	TRACEABLE	4242	122529162	9/19/2013
E-Field Probe	SPEAG	EX3DV4	3749	1/15/2014
E-Field Probe	SPEAG	EX3DV4	3751	12/15/2013
E-Field Probe	SPEAG	EX3DV4	3772	2/20/2014
E-Field Probe	SPEAG	EX3DV4	3686	3/12/2014
E-Field Probe	SPEAG	EX3DV4	3901	2/13/2014
E-Field Probe	SPEAG	EX3DV4	3885	10/9/2013
Data Acquisition Electronics	SPEAG	DAE4	1343	8/20/2013
Data Acquisition Electronics	SPEAG	DAE3	427	1/9/2014
Data Acquisition Electronics	SPEAG	DAE4	1258	3/6/2014
Data Acquisition Electronics	SPEAG	DAE4	1257	8/28/2013
Data Acquisition Electronics	SPEAG	DAE4	1357	2/5/2014
Data Acquisition Electronics	SPEAG	DAE4	1352	10/8/2013
Data Acquisition Electronics	SPEAG	DAE4	1360	2/7/2014
System Validation Dipole	SPEAG	D835V2	4d002	10/24/2013
System Validation Dipole	SPEAG	D835V2	4d142	10/4/2013
System Validation Dipole	SPEAG	D1900V2	5d163	10/4/2013
System Validation Dipole	SPEAG	D1900V2	5d043	12/6/2013
System Validation Dipole	SPEAG	D2450V2	899	10/5/2013
System Validation Dipole	SPEAG	D2450V2	748	2/11/2014
System Validation Dipole	SPEAG	D5GHzV2	1138	10/9/2013
System Validation Dipole	SPEAG	D5GHzV2	1003	9/18/2013

Others

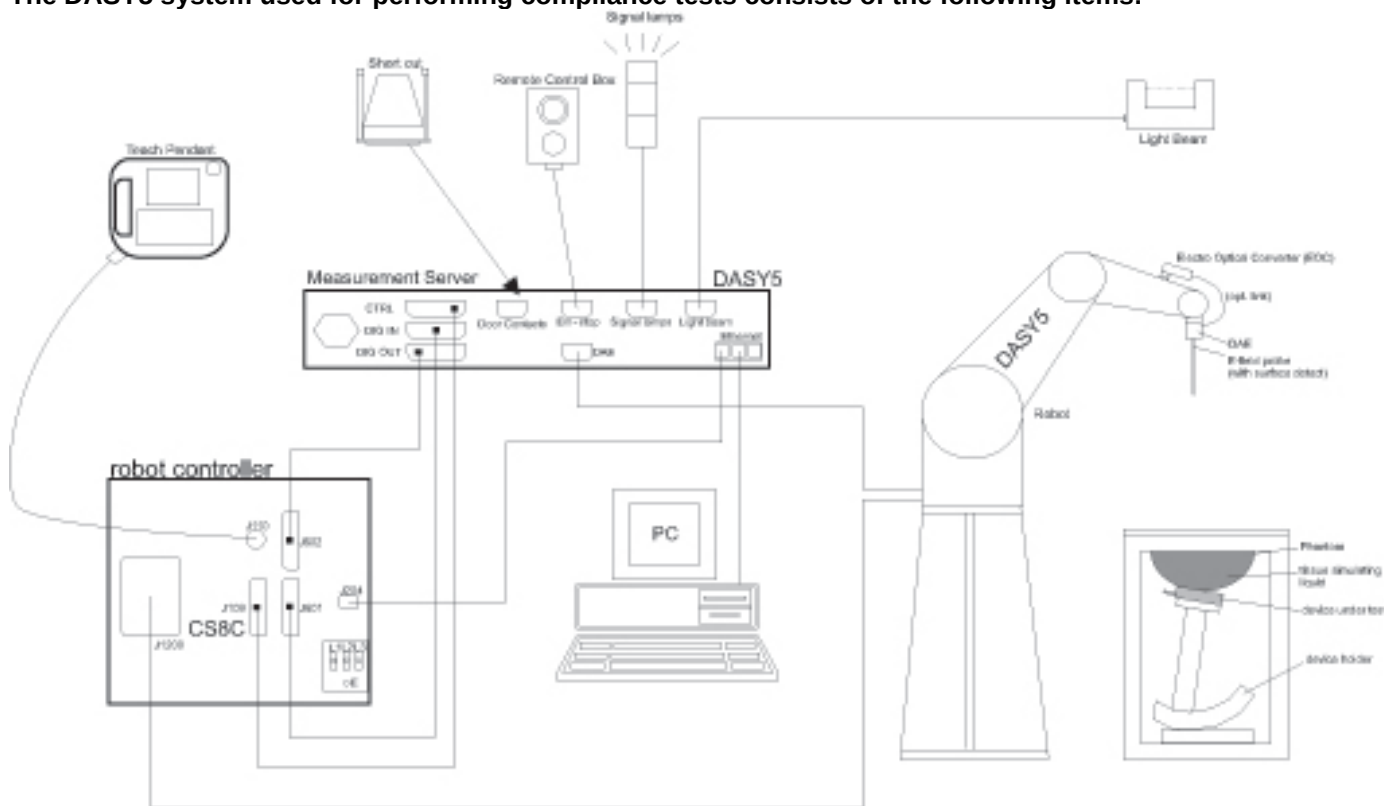
Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Base Station Simulator	Agilent	8960	MY48360200	3/20/2014
Base Station Simulator	R & S	CMU200	106291	8/8/2013
Base Station Simulator	R & S	CMU200	117455	5/20/2014
Base Station Simulator	R & S	CMU200	118715	5/20/2014
Base Station Simulator	R & S	CMW500	132910-cp	2/19/2014
Base Station Simulator	R & S	CMW500	132909-bp	2/19/2014
Base Station Simulator	R & S	CMW500	103764-dn	8/16/2014
Base Station Simulator	R & S	CMW500	103766-ly	8/19/2014
Base Station Simulator	R & S	CMW500	107513-be	7/26/2014
Power Meter	Agilent	N1912A	MY50001018	8/10/2013
Power Sensor	Agilent	N1921A	MY52020011	5/13/2014
Power Sensor	Agilent	N1921A	MY52200012	7/24/2013

4.2. Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r01 Section 2.8.1., when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2003 is not required in SAR reports submitted for equipment approval.

5. Measurement System Description and Setup

The DASY5 system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

6. SAR Measurement Procedure

6.1. Normal SAR Measurement Procedure

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE Standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Area Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r01

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
Maximum area scan spatial resolution: $\Delta x_{\text{Area}}, \Delta y_{\text{Area}}$	≤ 2 GHz: ≤ 15 mm $2 - 3$ GHz: ≤ 12 mm	$3 - 4$ GHz: ≤ 12 mm $4 - 6$ GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

Step 3: Zoom Scan

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Zoom Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r01

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{\text{Zoom}}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{\text{Zoom}}(1)$: between 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{\text{Zoom}}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.				
* When zoom scan is required and the <i>reported</i> SAR from the area scan based <i>1-g SAR estimation</i> procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

Step 5: Z-Scan (FCC only)

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation the extrapolated distance should not be larger than the step size in Z-direction.

6.2. Volume Scan Procedures

Step 1: Repeat Step 1-4 in Section 6.1

Step 2: Volume Scan

Volume Scans are used to assess peak SAR and averaged SAR measurements 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.

Step 3: Power drift measurement

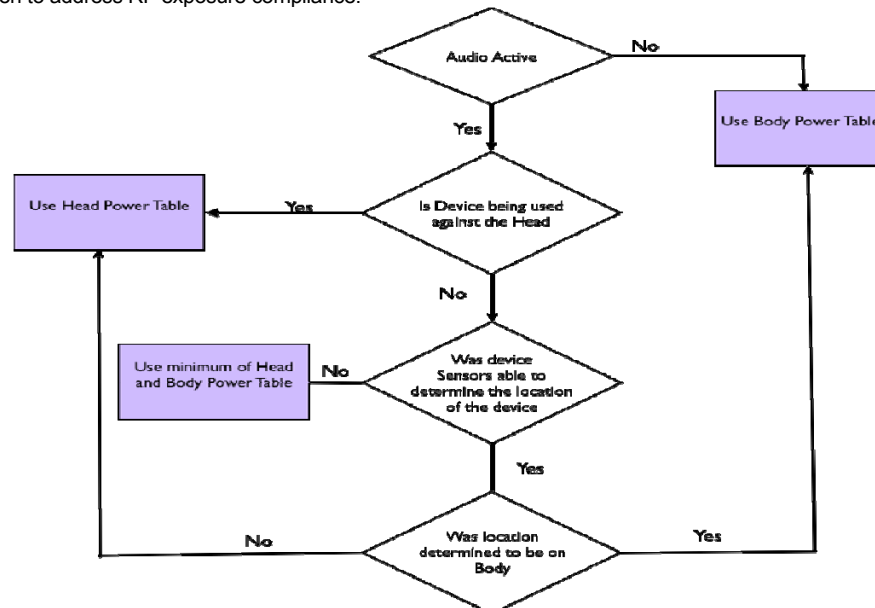
The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

7. Device Under Test

7.1. General Information

iPhone

Model: A1529 The FCC ID: BCG-E2694A device uses sensors present in it to determine if the device is against the user's body so that the correct power table can be chosen to address RF exposure compliance.



Device uses 2 different power tables to meet RF exposure compliance:

- Head Power Table: Head Power Table is used when device is used against the head.
- Body Power Table: Body Power Table is used when device is used against the body. Device uses sensors to determine if the device is against the user's body or not.

The sensors used for this detection are a part of the device. The measurements from the sensors are processed to produce a metric. The device is declared to be on the body if the computed metric exceeds a priori specified threshold. When the device is identified to be on the body, the "body power table" is used. When the device is identified as not on the body, the "head power table" is used.

Operating Configuration(s)	Held to head and Body-worn (Voice call)
Mobile Hotspot	WiFi Hotspot mode permits the device to share its cellular data connection with other WiFi-enabled devices. ☒ Mobile Hotspot (WiFi 2.4 GHz) ☐ Mobile Hotspot (WiFi 5 GHz)
SV-LTE & SV-DO	Not Supported
AirPlay	AirPlay mode enabled devices transfer data directly between each other ☒ AirPlay (WiFi 2.4 GHz) ☒ AirPlay (WiFi 5 GHz)
RF Exposure Condition(s)	Head, Body-worn Accessory, Hotspot (wireless router)
Device dimension	Overall (Length x Width): 124.0 mm x 58.5 mm Overall Diagonal: 130.4 mm Display Diagonal: 103.0 mm
Accessory	Headset
Battery Options	☒ Standard – Lithium-ion battery, Rating 3.8 Vdc, 5.73 Wh ☐ Extended (large capacity)

7.2. Wireless Technologies

Wireless Technology and Frequency Bands	GSM: 850 /1900 W-CDMA Band: 2 / 5 LTE Band 2 / 5 WiFi: 2.4 / 5 GHz Bluetooth: 2.4 GHz.
Mode	GSM - ☒ Voice (GMSK) - ☒ GPRS (GMSK) - ☒ EGPRS (8PSK) W-CDMA - ☒ UMTS Rel. 99 (Voice & Data) - ☒ HSDPA (Rel. 7, CAT 14) - ☒ HSUPA (Rel. 6, CAT 6) - ☒ DC-HSDPA (Rel. 8, CAT 24) - ☒ HSPA+ (Rel. 6, CAT 6) LTE - ☒ QPSK - ☒ 16QAM WiFi 2.4GHz (802.11b/g/n) - ☒ 802.11b - ☒ 802.11g - ☒ 802.11n (20MHz) - ☐ 802.11n (40MHz) - ☐ 802.11ac (20MHz) WiFi 5GHz - ☒ 802.11a - ☒ 802.11n (20MHz) - ☒ 802.11n (40MHz) - ☐ 802.11ac (80MHz) Bluetooth Ver. 4.0 (LE)
Duty Cycle	GSM Voice: 12.5%; GPRS 1 Slot: 12.5%; 2 Slots: 25% W-CDMA: 100% LTE: 100% WiFi 802.11a/b/g/n: 100% Bluetooth: 32.25% (DH1), 66.68% (DH3), 77.52% (DH5)
GPRS Multi-Slot Class	☐ Class 8 - One Up ☒ Class 10 - Two Up ☐ Class 12 - Four Up
Mobile Phone Capability	☐ Class A - Mobile phones can be connected to both GPRS and GSM services simultaneously. ☒ Class B - Mobile phones can be attached to both GPRS and GSM services, using one service at a time. ☐ Class C - Mobile phones are attached to either GPRS or GSM voice service. You need to switch manually between services
DTM (Dual Transfer Mode)	Not Supported
VoIP (GPRS)	Supported

7.3. Simultaneous Transmission Condition

RF Exposure Condition	Capable Transmit Configurations
Head	1. GSM 850/1900 Voice + WiFi 2.4/5GHz 2. GSM 850/1900 (GPRS/EDGE) + WiFi 2.4/5GHz 3. WCDMA Band 2/5 + WiFi 2.4/5GHz 4. LTE B2/B5 + WiFi 2.4/5GHz
Body-worn Accessory	1. GSM 850/1900 Voice + WiFi 2.4/5GHz 2. GSM 850/1900 Voice + BT 3. GSM 850/1900 (GPRS/EDGE) + WiFi 2.4/5GHz 4. GSM 850/1900 (GPRS/EDGE) + BT 5. WCDMA Band 2/5 + WiFi 2.4/5GHz 6. WCDMA Band 2/5 + BT 7. LTE B2/B5 + WiFi 2.4/5GHz 8. LTE B2/B5 + BT
Wireless Router (Hotspot)	1. GSM 850/1900 (GPRS/EDGE) + WiFi 2.4GHz 2. WCDMA Band 2/5 + WiFi 2.4GHz 3. LTE B2/B5 + WiFi 2.4GHz
Notes: 1. WiFi only 2.4GHz supports Hotspot. 2. GPRS/EDGE, CDMA, WCDMA and LTE support Hotspot. 3. VoIP is supported in CDMA, LTE, WCDMA and GPRS. 4. WiFi 2.4 GHz Radio cannot transmit simultaneously with Bluetooth Radio.	

7.4. General LTE SAR Test and Reporting Considerations

Item	Description																																																				
Frequency range, Channel Bandwidth, Numbers and Frequencies	Band 2	Frequency range: 1850 - 1910 MHz																																																			
		Channel Bandwidth																																																			
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																														
	Low	18700 /1860	18675/ 1857.5	18650/ 1855	18625/ 1852.5	18615/ 1851.5	18607/ 1850.7																																														
	Mid	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880																																														
	High	19100/ 1900	19125/ 1902.5	19150/ 1905	19175/ 1907.5	19185/ 1908.5	19193/ 1909.3																																														
	Band 5	Frequency range: 824 - 849 MHz																																																			
		Channel Bandwidth																																																			
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																														
	Low			20450/ 829	20425/ 826.5	20415/ 825.5	20407/ 824.7																																														
	Mid			20525/ 836.5	20525/ 836.5	20525/ 836.5	20525/ 836.5																																														
	High			20600/ 844	20625/ 846.5	20635/ 847.5	20643/ 848.3																																														
LTE transmitter and antenna implementation	LTE can transmit from either UAT (Secondary Antenna) or LAT (Primary Antenna). The antenna switching is implemented with a physical, “break-before-make” switch such that only one antenna can be used for LTE transmission at a time.																																																				
Maximum power reduction (MPR)	<table><tr><th colspan="8">Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3</th></tr><tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (RB)</th><th rowspan="2">MPR (dB)</th></tr><tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr><tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr></table> MPR Built-in by design A-MPR (additional MPR) was disabled during SAR testing							Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3								Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3																																																					
Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)																																														
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz																																															
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1																																														
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1																																														
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2																																														
Power reduction	No																																																				
Spectrum plots for RB configurations	When a properly configured basestation simulator is not used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration should be included in the SAR report to demonstrate that the tested RB allocations have been correctly established at the maximum output power conditions.																																																				

8. RF Exposure Conditions

Refer to Section 17 "Antenna Locations and Separation Distances" for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

8.1. Head Exposure Conditions

For GSM, W-CDMA, CDMA, LTE and WiFi

Test Configurations	SAR Required	Note
Left Touch	Yes	
Left Tilt (15°)	Yes	
Right Touch	Yes	
Right Tilt (15°)	Yes	

8.2. Body-worn Accessory Exposure Conditions

The Body-worn accessory test configurations were tested using a conservative minimum test separation distance of 5 mm.

For WWAN and LTE (LAT/Primary Antenna)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	<25 mm	Yes	
Front	<25 mm	Yes	

For WWAN and LTE (UAT/Secondary Antenna)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	<25 mm	Yes	
Front	<25 mm	Yes	

For WiFi

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	<25 mm	Yes	
Front	<25 mm	Yes	

8.3. Hotspot Exposure Conditions

Per Section 4 of test plan submitted in the manufacturer KDB titled Detect Mode Feature, hotspot operation SAR test cases are covered by worse-cases in Body-worn SAR at 5 mm separation distance.

For WWAN and LTE (LAT/Primary Antenna)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	<25 mm	Yes	
Front	<25 mm	Yes	
Edge 1 (Top)	0 mm	Yes	
Edge 2 (Right)	0 mm	Yes	
Edge 3 (Bottom)	>25 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR v01r01
Edge 4 (Left)	0 mm	Yes	

For WWAN and LTE (UAT/Secondary Antenna)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	<25 mm	Yes	
Front	<25 mm	Yes	
Edge 1 (Top)	>25 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR v01r01
Edge 2 (Right)	0 mm	Yes	
Edge 3 (Bottom)	0 mm	Yes	
Edge 4 (Left)	0 mm	Yes	

For WiFi

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	<25 mm	Yes	
Front	<25 mm	Yes	
Edge 1 (Top)	4.7 mm	Yes	
Edge 2 (Right)	35.2 mm	Yes	
Edge 3 (Bottom)	115.4 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR v01r01
Edge 4 (Left)	10.5 mm	Yes	

9. RF Output Power Measurement

The proprietary logic is used to determine when head/body power table is used.

9.1. GSM

GSM (GMSK) - Voice Mode

Band	Ch No.	Freq. (MHz)	Avg Power (dBm)			
			HEAD		BODY	
			UAT	LAT	UAT	LAT
850	128	824.2	33.2	33.5	33.2	33.5
	190	836.6	33.2	33.5	33.2	33.5
	251	848.8	33.1	33.5	33.2	33.5

GPRS (GMSK) - Coding Scheme: CS1

Band	Ch No.	Freq. (MHz)	HEAD				BODY			
			UAT		LAT		UAT		LAT	
			1 slot	2 slots	1 slot	2 slots	1 slot	2 slots	1 slot	2 slots
Burst Power (dBm)										
850	128	824.2	33.2	32.2	33.5	32.4	33.2	32.2	33.5	31.0
	190	836.6	33.2	32.2	33.5	32.5	33.2	32.2	33.5	31.0
	251	848.8	33.1	32.2	33.5	32.5	33.2	32.2	33.5	31.0
Frame Power (dBm)										
850	128	824.2	24.2	26.2	24.5	26.4	24.2	26.2	24.5	25.0
	190	836.6	24.2	26.2	24.5	26.5	24.2	26.2	24.5	25.0
	251	848.8	24.1	26.2	24.5	26.5	24.2	26.2	24.5	25.0

EGPRS (8PSK) - Coding Scheme: MCS5

Band	Ch No.	Freq. (MHz)	HEAD				BODY			
			UAT		LAT		UAT		LAT	
			1 slot	2 slots	1 slot	2 slots	1 slot	2 slots	1 slot	2 slots
Burst Power (dBm)										
850	128	824.2	28.6	28.6	28.9	29.0	28.6	28.6	28.9	29.0
	190	836.6	28.6	28.6	29.0	29.0	28.6	28.6	29.0	29.0
	251	848.8	28.7	28.7	28.9	28.9	28.7	28.7	28.9	28.9
Frame Power (dBm)										
850	128	824.2	19.6	22.6	19.9	23.0	19.6	22.6	19.9	23.0
	190	836.6	19.6	22.6	20.0	23.0	19.6	22.6	20.0	23.0
	251	848.8	19.7	22.6	19.9	22.9	19.7	22.6	19.9	22.9

Notes:

The worst-case configuration and mode for SAR testing is determined to be as follows:

- Head & Body-worn Accessory: GMSK Voice Mode
- Hotspot mode: GMSK (GPRS) mode with 2 time slots, based on the output power measurements above
- SAR is not required for EGPRS (8PSK) mode because its output power is less than that of GPRS Mode

GSM (GMSK) - Voice Mode

Band	Ch No.	Freq. (MHz)	Avg Power (dBm)			
			HEAD		BODY	
			UAT	LAT	UAT	LAT
1900	512	1850.2	30.9	31.5	30.9	31.20
	661	1880.0	30.9	31.5	30.9	31.20
	810	1909.8	30.9	31.5	30.9	31.20

GPRS (GMSK) - Coding Scheme: CS1

Band	Ch No.	Freq. (MHz)	HEAD				BODY			
			UAT		LAT		UAT		LAT	
			1 slot	2 slots	1 slot	2 slots	1 slot	2 slots	1 slot	2 slots
			Burst Power (dBm)				Burst Power (dBm)			
1900	512	1850.2	30.9	29.9	31.5	29.4	30.9	29.9	31.20	28.5
	661	1880.0	30.9	29.9	31.5	29.5	30.9	29.9	31.20	28.5
	810	1909.8	30.9	29.9	31.5	29.5	30.9	29.9	31.20	28.5
			Frame Power (dBm)				Frame Power (dBm)			
1900	512	1850.2	21.9	23.9	22.5	23.4	21.9	23.9	22.17	22.5
	661	1880.0	21.9	23.9	22.5	23.5	21.9	23.9	22.17	22.5
	810	1909.8	21.9	23.9	22.5	23.5	21.9	23.9	22.17	22.5

EGPRS (8PSK) - Coding Scheme: MCS5

Band	Ch No.	Freq. (MHz)	HEAD				BODY			
			UAT		LAT		UAT		LAT	
			1 slot	2 slots	1 slot	2 slots	1 slot	2 slots	1 slot	2 slots
			Burst Power (dBm)				Burst Power (dBm)			
1900	512	1850.2	27.4	27.4	27.8	27.7	27.4	27.4	27.8	27.7
	661	1880.0	27.3	27.4	27.9	27.7	27.3	27.4	27.9	27.7
	810	1909.8	27.4	27.4	27.9	27.8	27.4	27.4	27.9	27.8
			Frame Power (dBm)				Frame Power (dBm)			
1900	512	1850.2	18.4	21.4	18.8	21.7	18.4	21.4	18.8	21.7
	661	1880.0	18.3	21.3	18.9	21.7	18.3	21.3	18.9	21.7
	810	1909.8	18.3	21.4	18.8	21.8	18.3	21.4	18.8	21.8

Notes:

The worst-case configuration and mode for SAR testing is determined to be as follows:

- Head & Body-worn Accessory: GMSK Voice Mode
- Hotspot mode: GMSK (GPRS) mode with 2 time slots, based on the output power measurements above
- SAR is not required for EGPRS (8PSK) mode because its output power is less than that of GPRS Mode

9.2. W-CDMA

Release 99

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β_c/β_d	8/15

Measured Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)			
				HEAD		BODY	
				UAT	LAT	UAT	LAT
W-CDMA Band 2	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	22.9	23.0	23.9	21.25
		9400	1880.0	23.0	23.0	23.9	21.25
		9538	1907.6	23.0	22.9	23.8	21.25
W-CDMA Band 5	Rel 99 (RMC, 12.2 kbps)	4132	826.4	24.2	24.3	24.2	24.4
		4183	836.6	24.2	24.5	24.2	24.5
		4233	846.6	24.2	24.3	24.2	24.3

HSDPA

The following 4 Sub-tests were completed according to Release 7 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm 2			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
HSDPA Specific Settings	MPR (dB)	0	1	1.5	1.5
	D _{ACK}	8			
	D _{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	A _{hs} = β_{hs}/β_c	30/15			

Measured Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)			
				HEAD		BODY	
				UAT	LAT	UAT	LAT
W-CDMA Band 2	Subtest 1	9262	1852.4	22.6	21.8	22.6	21.2
		9400	1880.0	22.7	21.8	22.7	21.1
		9538	1907.6	22.7	21.6	22.5	21.1
	Subtest 2	9262	1852.4	21.7	21.6	22.6	20.2
		9400	1880.0	21.7	22.0	22.8	20.1
		9538	1907.6	21.6	21.5	22.6	20.1
	Subtest 3	9262	1852.4	21.3	21.6	22.5	19.6
		9400	1880.0	21.2	21.7	22.6	19.5
		9538	1907.6	21.2	21.5	22.4	19.5
	Subtest 4	9262	1852.4	21.3	21.6	22.5	19.5
		9400	1880.0	21.2	21.8	22.6	19.4
		9538	1907.6	21.3	21.5	22.6	19.3
W-CDMA Band 5	Subtest 1	4132	826.4	23.1	23.5	24.0	24.0
		4183	836.6	23.0	23.4	24.0	23.9
		4233	846.6	23.1	23.5	23.9	23.9
	Subtest 2	4132	826.4	23.1	23.4	23.2	23.0
		4183	836.6	23.1	23.5	23.0	23.2
		4233	846.6	23.2	23.5	23.1	23.1
	Subtest 3	4132	826.4	22.8	23.2	21.7	22.7
		4183	836.6	22.7	23.2	21.5	22.8
		4233	846.6	23.2	23.3	21.5	22.8
	Subtest 4	4132	826.4	22.7	23.0	21.6	22.8
		4183	836.6	22.8	23.3	21.5	22.8
		4233	846.6	22.8	23.0	21.4	22.9

Maximum output power levels that are possible for all subtests reported.

HSPA (HSDPA & HSUPA)

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSPA	HSPA	HSPA	HSPA	HSPA
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	15/15
	β_{ec}	209/225	12/15	30/15	2/15	24/15
	β_c/β_d	11/15	6/15	15/9	2/15	15/15
	β_{hs}	22/15	12/15	30/15	4/15	30/15
	β_{ed}	1309/225	94/75	47/15	56/75	134/15
	CM (dB)	1.0	3.0	2.0	3.0	1.0
	MPR (dB)	0	2	1	2	0
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	Ahs = β_{hs}/β_c	30/15				
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18		E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27

Measured Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)			
				HEAD		BODY	
				UAT	LAT	UAT	LAT
W-CDMA Band 2	Subtest 1	9262	1852.4	21.8	21.9	22.4	21.2
		9400	1880.0	21.7	21.8	22.7	21.0
		9538	1907.6	21.7	21.7	22.6	21.0
	Subtest 2	9262	1852.4	20.8	21.0	22.0	19.1
		9400	1880.0	21.0	21.3	21.9	19.1
		9538	1907.6	21.0	21.6	21.6	19.0
	Subtest 3	9262	1852.4	21.8	20.5	22.3	19.8
		9400	1880.0	21.8	20.8	22.4	19.7
		9538	1907.6	21.7	21.0	22.5	19.7
	Subtest 4	9262	1852.4	20.8	21.7	22.4	19.1
		9400	1880.0	20.7	21.8	22.2	19.0
		9538	1907.6	20.7	21.8	22.6	19.0
W-CDMA Band 5	Subtest 1	9262	1852.4	21.9	21.8	22.6	21.1
		9400	1880.0	22.0	21.8	22.6	21.1
		9538	1907.6	21.8	21.8	22.5	21.0
	Subtest 2	4132	826.4	23.1	23.2	23.7	23.5
		4183	836.6	22.8	23.0	23.8	23.6
		4233	846.6	23.0	23.3	23.8	23.7
	Subtest 3	4132	826.4	22.7	22.3	22.1	22.2
		4183	836.6	22.5	22.5	21.9	22.1
		4233	846.6	22.7	22.2	22.1	22.2
	Subtest 4	4132	826.4	22.6	22.3	22.9	23.1
		4183	836.6	22.3	22.1	22.7	23.0
		4233	846.6	22.6	22.6	22.7	22.9
	Subtest 5	4132	826.4	22.5	22.9	21.9	22.1
		4183	836.6	22.5	22.9	21.8	21.9
		4233	846.6	22.4	22.6	21.7	21.9
	Subtest 6	4132	826.4	23.0	23.2	23.8	23.7
		4183	836.6	22.9	22.8	24.0	23.6
		4233	846.6	22.9	22.9	23.8	23.7

DC-HSDPA

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

Table E.5.0: Levels for HSDPA connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table. Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

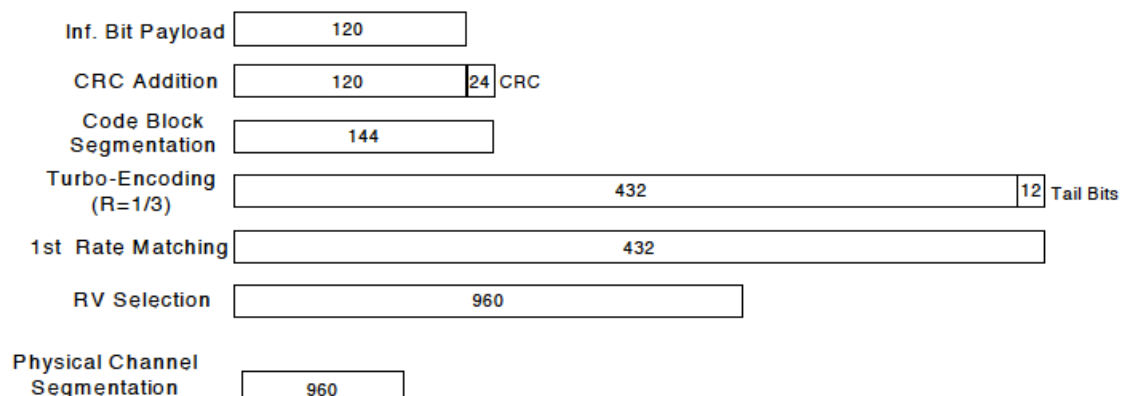


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 4 Sub-tests for HSDPA were completed according to Release 8 procedures in section 5.2 of 3GPP TS34.121. A summary of subtest settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm2			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	β_d (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
HSDPA Specific Settings	MPR (dB)	0	0	0.5	0.5
	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack Repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	Ahs = β_{hs}/β_c	30/15			

Up commands are set continuously to set the UE to Max power.

Measured Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)			
				HEAD		BODY	
				UAT	LAT	UAT	LAT
W-CDMA Band 2	Subtest 1	9262	1852.4	21.7	21.8	22.6	20.5
		9400	1880.0	21.8	21.8	22.6	20.3
		9538	1907.6	21.8	21.7	22.7	20.3
	Subtest 2	9262	1852.4	21.7	21.8	22.8	20.5
		9400	1880.0	21.7	21.8	22.7	20.4
		9538	1907.6	21.9	21.8	22.7	20.3
	Subtest 3	9262	1852.4	21.5	21.4	22.5	20.1
		9400	1880.0	21.4	21.5	22.4	19.9
		9538	1907.6	21.4	21.6	22.3	20.0
	Subtest 4	9262	1852.4	21.4	21.4	22.5	19.9
		9400	1880.0	21.3	21.5	22.5	19.8
		9538	1907.6	21.5	21.6	22.2	19.9
W-CDMA Band 5	Subtest 1	4132	826.4	23.1	23.4	23.5	23.6
		4183	836.6	23.1	23.2	23.7	23.5
		4233	846.6	23.1	23.3	23.6	23.4
	Subtest 2	4132	826.4	23.1	23.4	23.6	23.5
		4183	836.6	23.1	23.2	23.6	23.5
		4233	846.6	23.1	23.3	23.5	23.4
	Subtest 3	4132	826.4	23.0	23.1	23.0	23.1
		4183	836.6	22.8	22.7	23.0	23.2
		4233	846.6	22.8	22.7	22.9	23.0
	Subtest 4	4132	826.4	23.0	23.1	23.0	23.1
		4183	836.6	22.7	22.7	22.8	23.1
		4233	846.6	22.8	22.9	22.9	23.0

HSPA+

Since 16QAM is not used for uplink, the uplink Category and release is same as HSUPA, i.e., CAT 6 Rel 6. Therefore, the RF conducted power is not measured.

9.3. LTE

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signalling Value of "NS_01".³

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10, 15, 20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23 ¹	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

9.3.1. LTE Band 2

Measured Results

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)			
							HEAD		BODY	
							UAT	LAT	UAT	LAT
20	18700	1860.0	QPSK	1	0	0	22.9	23.0	23.3	20.8
				1	49	0	22.9	23.0	23.4	21.0
				1	99	0	22.9	23.0	23.3	20.9
				50	0	1	21.9	21.9	21.8	19.8
				50	24	1	21.9	21.9	21.8	19.9
				50	49	1	21.8	22.0	22.0	19.9
				100	0	1	21.8	21.9	22.0	19.8
			16QAM	1	0	1	21.8	21.8	21.4	19.9
				1	49	1	21.7	22.0	21.9	19.8
				1	99	1	21.9	22.0	22.0	19.7
				50	0	2	20.9	20.8	20.9	18.9
				50	24	2	20.8	20.9	20.8	18.9
				50	49	2	20.8	21.0	21.1	18.7
				100	0	2	20.8	20.9	21.1	18.8
	18900	1880.0	QPSK	1	0	0	22.8	22.9	23.2	20.9
				1	49	0	23.0	23.0	23.4	21.0
				1	99	0	23.0	23.0	23.3	20.9
				50	0	1	22.0	22.2	21.9	19.9
				50	24	1	22.0	22.1	21.9	19.9
				50	49	1	21.9	21.9	21.8	19.8
				100	0	1	22.0	22.1	21.9	19.8
			16QAM	1	0	1	21.8	22.1	22.0	19.7
				1	49	1	21.9	22.1	21.9	19.8
				1	99	1	22.0	21.8	21.9	19.7
				50	0	2	21.0	21.1	20.9	18.8
				50	24	2	20.8	21.2	20.9	18.8
				50	49	2	20.8	21.0	20.9	18.9
				100	0	2	20.9	21.0	20.9	18.8
	19100	1900.0	QPSK	1	0	0	23.0	23.0	23.4	21.0
				1	49	0	23.0	23.0	23.4	21.0
				1	99	0	22.9	23.0	23.4	20.9
				50	0	1	21.9	22.0	22.0	19.9
				50	24	1	21.9	22.2	22.0	19.8
				50	49	1	21.8	22.3	22.0	19.8
				100	0	1	21.8	22.1	22.0	19.7
			16QAM	1	0	1	21.7	21.9	22.3	19.8
				1	49	1	21.8	22.2	22.1	19.7
				1	99	1	21.8	22.0	22.0	19.8
				50	0	2	20.9	21.1	21.0	18.8
				50	24	2	20.8	21.2	21.1	18.7
				50	49	2	20.8	21.2	21.0	18.7
				100	0	2	20.8	21.1	21.2	18.8

LTE Band 2 Measured Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)			
							HEAD		BODY	
							UAT	LAT	UAT	LAT
15	18675	1857.5	QPSK	1	0	0	22.8	22.9	22.9	20.9
				1	37	0	22.9	22.8	23.1	21.0
				1	74	0	22.9	23.0	23.4	20.8
				36	0	1	21.9	21.7	21.8	19.7
				36	16	1	21.8	21.8	21.9	19.9
				36	35	1	21.8	22.0	21.9	19.9
				75	0	1	21.7	22.0	21.9	19.8
			16QAM	1	0	1	21.8	21.6	21.7	19.9
				1	37	1	21.7	21.8	21.8	19.7
				1	74	1	21.8	22.0	22.0	19.7
				36	0	2	20.8	20.8	20.9	18.9
				36	16	2	20.8	20.9	21.0	18.8
				36	35	2	20.8	21.0	20.9	18.7
				75	0	2	20.7	21.0	21.0	18.8
	18900	1880.0	QPSK	1	0	0	22.8	23.0	23.3	20.8
				1	37	0	23.0	22.9	23.3	21.0
				1	74	0	22.9	22.9	22.9	20.9
				36	0	1	22.0	22.3	21.8	19.9
				36	16	1	22.0	22.1	21.8	19.7
				36	35	1	21.9	21.9	21.8	19.9
				75	0	1	21.7	22.1	21.8	19.8
			16QAM	1	0	1	21.8	22.1	21.9	19.7
				1	37	1	21.9	22.2	22.0	19.8
				1	74	1	22.0	21.9	21.8	19.8
				36	0	2	21.0	21.3	20.9	18.8
				36	16	2	20.7	21.0	21.0	18.7
				36	35	2	20.8	21.0	21.0	18.9
				75	0	2	20.9	21.0	20.9	18.8
	19125	1902.5	QPSK	1	0	0	22.8	22.9	23.4	21.0
				1	37	0	22.8	23.0	23.2	20.8
				1	74	0	22.7	22.9	23.2	20.9
				36	0	1	21.9	22.2	22.0	19.9
				36	16	1	21.7	22.4	22.2	19.8
				36	35	1	21.8	22.3	22.0	19.9
				75	0	1	21.8	22.2	22.0	19.7
			16QAM	1	0	1	21.7	22.2	22.0	19.8
				1	37	1	21.8	22.5	21.9	19.7
				1	74	1	21.8	21.8	22.0	19.8
				36	0	2	20.7	21.2	21.1	18.8
				36	16	2	20.8	21.4	21.1	18.8
				36	35	2	20.7	21.3	21.1	18.7
				75	0	2	20.8	21.2	21.0	18.8

LTE Band 2 Measured Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)			
							HEAD		BODY	
							UAT	LAT	UAT	LAT
10	18650	1855.0	QPSK	1	0	0	22.8	22.8	23.0	20.9
				1	24	0	22.7	22.8	23.4	21.0
				1	49	0	22.7	23.0	22.9	20.9
				25	0	1	21.9	21.8	21.8	19.7
				25	12	1	21.7	21.8	21.9	19.8
				25	24	1	21.8	21.9	21.9	19.9
				50	0	1	21.7	21.8	21.8	19.7
			16QAM	1	0	1	21.8	21.9	21.7	19.8
				1	24	1	21.8	21.8	22.0	19.7
				1	49	1	21.8	22.0	21.9	19.7
				25	0	2	20.8	20.9	20.9	18.9
				25	12	2	20.7	20.8	21.0	18.7
				25	24	2	20.8	20.9	21.0	18.7
				50	0	2	20.7	20.7	20.8	18.8
	18900	1880.0	QPSK	1	0	0	22.9	23.0	23.1	20.8
				1	24	0	22.9	22.9	23.4	21.0
				1	49	0	22.8	23.0	22.9	20.8
				25	0	1	22.0	22.3	21.9	19.8
				25	12	1	22.1	22.1	21.9	19.7
				25	24	1	21.8	22.0	21.9	19.7
				50	0	1	21.7	22.1	21.9	19.8
			16QAM	1	0	1	21.8	22.2	21.9	19.7
				1	24	1	21.9	22.1	22.0	19.8
				1	49	1	21.9	22.0	21.9	19.7
				25	0	2	21.0	21.3	21.0	18.8
				25	12	2	20.7	21.1	21.0	18.7
				25	24	2	20.8	21.1	21.0	18.9
				50	0	2	20.8	21.2	20.9	18.8
	19150	1905.0	QPSK	1	0	0	22.7	22.9	23.1	20.8
				1	24	0	22.8	23.0	23.4	20.8
				1	49	0	22.7	22.8	22.9	20.9
				25	0	1	21.8	22.4	22.0	19.7
				25	12	1	21.7	22.4	22.0	19.8
				25	24	1	21.8	22.1	21.9	19.9
				50	0	1	21.8	22.2	22.0	19.7
			16QAM	1	0	1	21.7	22.2	22.1	19.8
				1	24	1	21.8	22.3	22.1	19.7
				1	49	1	21.8	21.9	22.1	19.8
				25	0	2	20.7	21.4	21.2	18.8
				25	12	2	20.8	21.5	21.1	18.9
				25	24	2	20.8	21.1	21.0	18.7
				50	0	2	20.8	21.2	21.0	18.9

LTE Band 2 Measured Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)			
							HEAD		BODY	
							UAT	LAT	UAT	LAT
5	18625	1855.0	QPSK	1	0	0	22.8	23.0	22.8	20.9
				1	12	0	22.7	22.9	22.3	20.8
				1	24	0	22.7	22.9	23.3	20.7
				12	0	1	21.8	21.9	21.8	19.6
				12	6	1	21.7	21.9	21.8	19.7
				12	11	1	21.8	21.8	21.9	19.8
				25	0	1	21.7	21.8	21.8	19.7
			16QAM	1	0	1	21.8	21.9	21.6	19.8
				1	12	1	21.8	21.9	21.8	19.8
				1	24	1	21.8	21.8	22.0	19.6
				12	0	2	20.9	21.0	20.9	18.9
				12	6	2	20.7	21.0	21.0	18.7
				12	11	2	20.8	20.9	21.0	18.7
				25	0	2	20.7	20.8	20.8	18.6
	18900	1880.0	QPSK	1	0	0	22.8	23.0	23.4	20.8
				1	12	0	22.8	22.9	23.1	20.9
				1	24	0	22.8	23.0	23.0	20.7
				12	0	1	22.1	22.3	22.0	19.8
				12	6	1	22.1	22.1	22.0	19.7
				12	11	1	21.8	22.1	22.0	19.7
				25	0	1	21.7	22.1	21.9	19.6
			16QAM	1	0	1	21.8	22.3	22.1	19.7
				1	12	1	21.8	22.2	22.0	19.8
				1	24	1	21.9	22.1	22.0	19.7
				12	0	2	21.0	21.3	21.2	18.6
				12	6	2	20.7	21.2	21.2	18.7
				12	11	2	20.8	21.3	21.2	18.9
				25	0	2	20.6	21.1	21.0	18.7
	19175	1907.5	QPSK	1	0	0	22.7	23.0	23.0	20.8
				1	12	0	22.7	22.9	23.1	20.8
				1	24	0	22.7	23.0	23.4	20.9
				12	0	1	21.8	22.4	22.0	19.7
				12	6	1	21.7	22.1	22.0	19.6
				12	11	1	21.8	22.1	22.0	19.9
				25	0	1	21.7	22.1	21.9	19.7
			16QAM	1	0	1	21.7	22.6	22.1	19.8
				1	12	1	21.8	22.1	22.0	19.7
				1	24	1	21.6	21.9	22.0	19.8
				12	0	2	20.6	21.4	21.2	18.7
				12	6	2	20.8	21.2	21.1	18.8
				12	11	2	20.8	21.3	21.1	18.7
				25	0	2	20.8	21.0	20.9	18.8

LTE Band 2 Measured Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)			
							HEAD		BODY	
							UAT	LAT	UAT	LAT
3	18615	1851.5	QPSK	1	0	0	22.7	22.9	23.0	20.7
				1	7	0	22.7	22.8	23.3	20.8
				1	14	0	22.7	22.9	22.9	20.8
				8	0	1	21.8	21.9	21.8	19.6
				8	4	1	21.7	21.9	21.9	19.6
				8	7	1	21.7	21.8	21.9	19.7
				15	0	1	21.7	21.9	21.8	19.7
			16QAM	1	0	1	21.8	21.9	21.8	19.8
				1	7	1	21.8	21.9	21.8	19.8
				1	14	1	21.9	21.8	21.8	19.6
				8	0	2	20.7	20.9	20.9	18.6
				8	4	2	20.7	20.9	20.9	18.7
				8	7	2	20.8	20.9	21.0	18.7
				15	0	2	20.6	20.9	20.9	18.6
	18900	1880.0	QPSK	1	0	0	22.8	23.0	23.2	20.8
				1	7	0	22.9	22.9	23.3	20.8
				1	14	0	22.7	23.0	23.0	20.7
				8	0	1	22.0	22.2	22.0	19.8
				8	4	1	22.1	22.2	22.1	19.8
				8	7	1	21.9	22.1	22.0	19.7
				15	0	1	21.7	22.2	22.0	19.7
			16QAM	1	0	1	21.8	22.3	22.0	19.7
				1	7	1	21.8	22.1	22.0	19.6
				1	14	1	21.8	22.0	21.9	19.7
				8	0	2	21.0	21.2	21.1	18.6
				8	4	2	20.7	21.2	21.1	18.7
				8	7	2	20.8	21.2	21.1	18.8
				15	0	2	20.6	21.2	21.1	18.7
	19185	1908.5	QPSK	1	0	0	22.7	23.0	23.1	20.8
				1	7	0	22.7	22.9	23.2	20.8
				1	14	0	22.7	22.8	23.4	20.8
				8	0	1	21.8	22.1	22.0	19.7
				8	4	1	21.8	22.1	22.0	19.6
				8	7	1	21.6	22.0	22.0	19.9
				15	0	1	21.6	21.9	21.9	19.7
			16QAM	1	0	1	21.7	22.1	22.0	19.8
				1	7	1	21.8	21.9	21.9	19.6
				1	14	1	21.6	21.8	21.9	19.8
				8	0	2	20.6	21.1	21.1	18.7
				8	4	2	20.8	21.0	21.0	18.8
				8	7	2	20.8	21.1	21.1	18.7
				15	0	2	20.7	21.2	21.1	18.7

LTE Band 2 Measured Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)			
							HEAD		BODY	
							UAT	LAT	UAT	LAT
1.4	18607	1850.7	QPSK	1	0	0	22.7	22.9	23.4	20.7
				1	2	0	22.8	22.9	23.4	20.8
				1	5	0	22.7	22.8	22.1	20.8
				3	0	0	22.8	22.8	22.7	20.7
				3	1	0	22.7	22.9	22.7	20.8
				3	2	0	22.7	22.9	22.8	20.8
				6	0	1	21.6	21.9	21.8	19.7
			16QAM	1	0	1	21.5	21.8	21.7	19.6
				1	2	1	21.6	21.9	21.7	19.8
				1	5	1	21.5	21.9	21.7	19.8
				3	0	1	21.5	21.8	21.5	19.7
				3	1	1	21.4	21.7	21.6	19.6
				3	2	1	21.6	21.7	21.6	19.6
				6	0	2	20.5	20.9	20.7	18.5
	18900	1880.0	QPSK	1	0	0	22.8	23.0	23.2	20.8
				1	2	0	22.8	23.0	23.3	20.9
				1	5	0	22.6	23.0	23.0	20.7
				3	0	0	22.8	23.0	22.9	20.7
				3	1	0	22.7	22.9	23.1	20.6
				3	2	0	22.6	23.0	22.9	20.6
				6	0	1	21.5	22.2	22.0	19.5
			16QAM	1	0	1	21.4	22.1	21.9	19.4
				1	2	1	21.5	22.1	21.9	19.5
				1	5	1	21.4	22.0	22.0	19.5
				3	0	1	21.4	22.2	21.8	19.3
				3	1	1	21.4	22.2	21.8	19.3
				3	2	1	21.3	22.2	21.9	19.4
				6	0	2	20.3	21.1	21.0	18.3
	19193	1909.3	QPSK	1	0	0	22.7	22.9	23.3	20.7
				1	2	0	22.6	22.9	22.9	20.6
				1	5	0	22.6	22.9	22.9	20.8
				3	0	0	22.6	22.9	22.9	20.6
				3	1	0	22.7	23.0	22.9	20.7
				3	2	0	22.7	22.8	22.9	20.7
				6	0	1	21.5	22.0	21.9	19.6
			16QAM	1	0	1	21.6	21.9	21.9	19.5
				1	2	1	21.5	21.8	21.8	19.6
				1	5	1	21.5	21.8	21.9	19.5
				3	0	1	21.4	22.0	22.1	19.4
				3	1	1	21.6	21.8	22.1	19.6
				3	2	1	21.5	21.7	22.1	19.4
				6	0	2	20.4	21.0	21.1	18.4

9.3.2. LTE Band 5

Measured Results

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)			
							HEAD		BODY	
							UAT	LAT	UAT	LAT
10	20450	829.0	QPSK	1	0	0	23.7	23.8	23.5	23.8
				1	24	0	23.7	23.9	23.7	24.0
				1	49	0	23.7	23.7	23.6	23.8
				25	0	1	22.6	22.7	22.4	22.7
				25	12	1	22.5	22.7	22.6	22.8
				25	24	1	22.3	22.7	22.5	22.7
				50	0	1	22.3	22.7	22.5	22.6
			16QAM	1	0	1	22.7	23.1	22.8	22.7
				1	24	1	22.6	23.1	22.8	22.6
				1	49	1	22.5	23.1	22.7	22.6
				25	0	2	21.6	21.8	21.8	22.6
				25	12	2	21.5	21.8	21.8	22.8
				25	24	2	21.4	21.9	21.8	22.7
				50	0	2	21.2	21.8	21.7	21.8
	20525	836.5	QPSK	1	0	0	23.6	24.0	23.7	24.0
				1	24	0	23.7	24.0	23.7	24.0
				1	49	0	23.6	24.0	23.7	23.9
				25	0	1	22.6	22.8	22.7	22.9
				25	12	1	22.7	22.7	22.7	23.0
				25	24	1	22.7	22.7	22.7	23.0
				50	0	1	22.6	22.6	22.7	23.0
			16QAM	1	0	1	22.5	23.2	22.6	22.8
				1	24	1	22.8	23.1	22.7	23.0
				1	49	1	22.7	23.3	22.7	22.9
				25	0	2	21.7	22.0	21.8	21.8
				25	12	2	21.7	21.8	21.7	21.9
				25	24	2	21.7	21.9	21.6	22.0
				50	0	2	21.4	21.7	21.6	22.0
	20600	844.0	QPSK	1	0	0	23.6	24.0	23.5	23.7
				1	24	0	23.7	24.0	23.6	23.7
				1	49	0	23.7	24.0	23.5	23.7
				25	0	1	22.3	22.6	22.5	22.6
				25	12	1	22.4	23.2	22.6	22.7
				25	24	1	22.3	22.7	22.4	22.7
				50	0	1	22.4	23.0	22.5	22.6
			16QAM	1	0	1	22.4	22.9	22.6	22.7
				1	24	1	22.3	22.7	22.5	22.8
				1	49	1	22.7	22.9	22.5	22.7
				25	0	2	21.3	21.7	22.5	22.6
				25	12	2	21.6	22.2	22.4	22.5
				25	24	2	21.5	21.8	22.6	22.6
				50	0	2	21.3	22.2	22.5	22.6

LTE Band 5 Measured Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)			
							HEAD		BODY	
							UAT	LAT	UAT	LAT
5	20425	826.5	QPSK	1	0	0	23.7	23.9	23.6	23.7
				1	12	0	23.7	23.9	23.6	23.9
				1	24	0	23.6	24.0	23.5	23.8
				12	0	1	22.6	22.8	22.4	22.7
				12	6	1	22.6	22.7	22.6	22.7
				12	11	1	22.5	22.7	22.6	22.7
				25	0	1	22.4	22.7	22.5	22.6
			16QAM	1	0	1	22.8	22.9	22.7	22.7
				1	12	1	22.6	23.0	22.7	22.7
				1	24	1	22.6	22.9	22.7	22.8
				12	0	2	21.7	22.0	21.8	21.8
				12	6	2	21.6	22.0	21.9	21.7
				12	11	2	21.7	22.0	21.7	21.8
				25	0	2	21.5	21.7	21.8	21.7
	20525	836.5	QPSK	1	0	0	23.6	24.0	23.7	23.8
				1	12	0	23.7	23.9	23.8	24.0
				1	24	0	23.7	24.0	23.7	23.9
				12	0	1	22.8	22.9	22.8	22.8
				12	6	1	22.8	22.9	22.8	23.0
				12	11	1	22.7	22.9	22.7	23.0
				25	0	1	22.5	22.8	22.7	22.9
			16QAM	1	0	1	22.7	23.0	22.7	22.8
				1	12	1	22.6	22.9	22.7	23.0
				1	24	1	22.9	22.8	22.8	22.9
				12	0	2	21.6	22.0	21.8	21.7
				12	6	2	21.8	22.1	21.8	21.9
				12	11	2	21.8	22.0	21.6	21.8
				25	0	2	21.4	21.8	21.6	22.0
	20625	846.5	QPSK	1	0	0	23.7	24.0	23.5	23.8
				1	12	0	23.7	24.0	23.7	23.7
				1	24	0	23.7	23.9	23.5	23.7
				12	0	1	22.7	22.8	22.5	22.7
				12	6	1	22.8	22.8	22.7	22.8
				12	11	1	22.8	22.9	22.4	22.7
				25	0	1	22.7	22.7	22.5	22.6
			16QAM	1	0	1	22.5	23.0	22.6	22.7
				1	12	1	22.8	23.1	22.5	22.8
				1	24	1	22.7	23.2	22.6	22.7
				12	0	2	21.8	22.1	22.5	22.6
				12	6	2	21.8	21.9	22.6	22.5
				12	11	2	21.9	21.8	22.6	22.6
				25	0	2	21.6	21.9	22.5	22.6

LTE Band 5 Measured Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)			
							HEAD		BODY	
							UAT	LAT	UAT	LAT
3	20415	825.5	QPSK	1	0	0	23.6	24.0	23.6	23.7
				1	7	0	23.6	24.0	23.7	23.8
				1	14	0	23.6	23.9	23.5	23.8
				8	0	1	22.3	22.8	22.5	22.6
				8	4	1	22.7	22.8	22.6	22.7
				8	7	1	22.5	22.8	22.6	22.7
				15	0	1	22.8	22.7	22.6	22.6
			16QAM	1	0	1	22.5	23.0	22.8	22.7
				1	7	1	22.6	23.1	22.7	22.7
				1	14	1	22.6	23.1	22.7	22.8
				8	0	2	21.6	22.1	21.8	21.6
				8	4	2	21.7	22.0	21.9	21.8
				8	7	2	21.5	22.0	21.7	21.7
				15	0	2	21.6	21.7	21.8	21.7
	20525	836.5	QPSK	1	0	0	23.7	24.0	23.7	23.8
				1	7	0	23.7	23.9	23.8	23.9
				1	14	0	23.7	24.0	23.7	23.9
				8	0	1	22.7	23.0	22.8	22.8
				8	4	1	22.6	22.9	22.8	23.0
				8	7	1	22.6	22.9	22.7	22.9
				15	0	1	22.5	22.8	22.7	22.9
			16QAM	1	0	1	22.6	23.1	22.7	22.8
				1	7	1	22.5	23.0	22.7	23.0
				1	14	1	22.4	23.3	22.8	22.9
				8	0	2	21.7	22.0	21.8	21.7
				8	4	2	21.6	22.1	21.8	21.8
				8	7	2	21.7	22.1	21.6	21.8
				15	0	2	21.6	22.0	21.6	22.0
	20635	847.5	QPSK	1	0	0	23.6	24.0	23.5	23.8
				1	7	0	23.7	24.0	23.7	23.7
				1	14	0	23.7	24.0	23.5	23.7
				8	0	1	22.8	22.9	22.5	22.8
				8	4	1	22.8	22.8	22.7	22.8
				8	7	1	22.8	22.8	22.4	22.7
				15	0	1	22.8	22.9	22.5	22.7
			16QAM	1	0	1	22.7	23.1	22.6	22.7
				1	7	1	22.8	23.2	22.5	22.8
				1	14	1	22.7	23.1	22.6	22.7
				8	0	2	21.8	21.9	22.5	22.7
				8	4	2	21.8	21.9	22.6	22.5
				8	7	2	21.8	21.9	22.6	22.7
				15	0	2	21.7	21.9	22.5	22.6

LTE Band 5 Measured Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)			
							HEAD		BODY	
							UAT	LAT	UAT	LAT
1.4	20407	824.7	QPSK	1	0	0	23.5	24.0	23.7	23.7
				1	2	0	23.7	24.0	23.7	23.9
				1	5	0	23.6	24.0	23.7	23.8
				3	0	0	23.7	24.0	23.7	23.7
				3	1	0	23.7	23.9	23.6	23.8
				3	2	0	23.6	23.9	23.6	23.8
				6	0	1	22.6	22.9	22.8	22.6
			16QAM	1	0	1	22.3	23.1	22.8	22.7
				1	2	1	22.3	23.2	22.7	22.6
				1	5	1	22.5	23.3	22.7	22.5
				3	0	1	22.3	23.1	22.6	22.6
				3	1	1	22.5	23.1	22.8	22.7
				3	2	1	22.4	23.0	22.6	22.7
				6	0	2	21.6	22.0	21.6	21.5
	20525	836.5	QPSK	1	0	0	23.7	24.0	23.8	23.6
				1	2	0	23.7	23.9	23.8	23.7
				1	5	0	23.7	24.0	23.6	23.8
				3	0	0	23.5	23.9	23.7	23.6
				3	1	0	23.5	23.9	23.6	23.7
				3	2	0	23.6	24.0	23.5	23.5
				6	0	1	22.6	23.0	22.8	22.7
			16QAM	1	0	1	22.5	23.1	22.7	22.6
				1	2	1	22.5	23.1	22.8	22.6
				1	5	1	22.5	23.1	22.8	22.5
				3	0	1	22.4	23.1	22.9	22.5
				3	1	1	22.4	23.1	22.8	22.5
				3	2	1	22.4	23.1	22.7	22.6
				6	0	2	21.6	22.0	21.7	21.6
	20643	848.3	QPSK	1	0	0	23.7	24.0	23.8	23.6
				1	2	0	23.7	23.9	23.7	23.7
				1	5	0	23.7	23.8	23.7	23.7
				3	0	0	23.7	23.9	23.5	23.6
				3	1	0	23.7	23.8	23.6	23.6
				3	2	0	23.6	23.8	23.6	23.5
				6	0	1	22.8	22.7	22.7	22.6
			16QAM	1	0	1	22.7	22.8	22.8	22.7
				1	2	1	22.7	23.1	22.7	22.8
				1	5	1	22.6	23.1	22.6	22.6
				3	0	1	22.6	23.1	22.7	22.7
				3	1	1	22.6	23.1	22.6	22.7
				3	2	1	22.6	23.0	22.5	22.8
				6	0	2	21.7	21.8	21.5	21.7

9.4. WiFi (2.4 GHz Band)

Required Test Channels per KDB 248227 D01

Mode	Band	GHz	Channel	"Default Test Channels"	
				802.11b	802.11g
802.11b/g	2.4 GHz	2.412	1 [#]	√	▽
		2.437	6	√	▽
		2.462	11 [#]	√	▽

Notes:

√ = "default test channels"

▽ = possible 802.11g channels with maximum average output 1/4 dB ≥ the "default test channels"

[#] = when output power is reduced for channel 1 and /or 11 to meet restricted band requirements the highest output channels closest to each of these channels should be tested.

Measured Results

Band (GHz)	Mode	Ch #	Freq. (MHz)	Avg Pwr (dBm)	
				Vendor A	Vendor B
2.4 (DTS)	802.11b	1	2412	16.0	16.0
		6	2437	17.0	17.0
		11	2462	15.9	16.0
		12	2467	15.5	15.5
		13	2472	14.0	14.0
	802.11g	1	2412	16.0	15.9
		6	2437	17.0	17.0
		11	2462	16.0	16.0
		12	2467	11.5	11.5
		13	2472	4.5	4.5
	802.11n (HT20)	1	2412	16.0	16.0
		6	2437	17.0	16.9
		11	2462	15.9	16.0
		12	2467	11.5	11.5
		13	2472	4.5	4.5

Note(s):

- Per KDB 248227 D01, SAR is not required for 802.11g/HT20 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels.
- Additionally, SAR is not required for Channels 12 and 13 because the tune-up limit and the measured output power for these two channels are no greater than those for the default test channels.

9.5. WiFi (5 GHz Bands)

Required Test Channels per KDB 248227 D01

Mode		Band	GHz	Channel	"Default Test Channels"	
					802.11a	
802.11a	UNII (15.407)	5.2 GHz	5.180	36	√	
			5.200	40		*
			2.220	44		*
			5.240	48	√	
		5.3 GHz	5.260	52	√	
			5.280	56		*
			5.300	60		*
			5.320	64	√	
		5.5 GHz	5.500	100		
			5.520	104	√	
			5.540	108		*
			5.560	112		*
			5.580	116	√	
			5.600	120		*
			5.620	124	√	
			5.640	128		*
			5.660	132		*
			5.680	136	√	
			5.700	140		*
	DTS (15.247)	5.8 GHz	5.745	149	√	
			5.765	153		*
			5.785	157	√	
			5.805	161		*
			5.825	165	√	

√ = "default test channels"

* = possible 802.11a channels with maximum average output > the "default test channels"

= when output power is reduced for channel 1 and /or 11 to meet restricted band requirements the highest output channels closest to each of these channels should be tested.

Measured Results

Band (GHz)	Mode	Ch #	Freq. (MHz)	Avg Pwr (dBm)	
				Vendor A	Vendor B
5.2 (UNII)	802.11a	36	5180	14.0	13.9
		40	5200	13.8	14.0
		44	5220	13.9	14.0
		48	5240	14.0	14.0
	802.11n (HT20)	36	5180	13.9	14.0
		40	5200	14.0	14.0
		48	5240	14.0	13.9
	802.11n (HT40)	38	5190	13.9	14.0
		46	5230	13.9	13.9
5.3 (UNII)	802.11a	52	5260	16.0	16.0
		56	5280	16.0	15.9
		60	5300	15.9	16.0
		64	5320	15.9	15.9
	802.11n (HT20)	52	5260	16.0	15.9
		60	5300	16.0	16.0
		64	5320	15.9	15.9
	802.11n (HT40)	54	5270	16.0	15.9
		62	5310	15.9	16.0
5.5 (UNII)	802.11a	100	5500	13.9	14.0
		104	5520	14.0	14.0
		108	5540	13.9	14.0
		112	5560	14.0	14.0
		116	5580	14.0	14.0
		120	5600	14.0	13.9
		124	5620	14.0	14.0
		128	5640	13.9	13.8
		132	5660	13.8	14.0
		136	5680	14.0	14.0
		140	5700	13.9	13.9
	802.11n (HT20)	100	5500	14.0	14.0
		116	5580	14.0	14.0
		140	5700	13.8	14.0
	802.11n (HT40)	102	5510	14.0	14.0
		118	5590	14.0	13.8
		134	5670	13.8	14.0
5.8 (DTS)	802.11a	149	5745	14.5	14.5
		153	5765	14.4	14.4
		157	5785	14.5	14.5
		161	5805	14.5	14.4
		165	5825	14.5	14.5
	802.11n (HT20)	149	5745	14.4	14.4
		157	5785	14.5	14.5
		165	5825	14.5	14.5
	802.11n (HT40)	151	5755	14.4	14.5
		159	5795	14.4	14.5

Note(s):

- SAR is not required for 802.11n HT20/HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a/b channels. As per KDB 248227

9.6. Bluetooth

Band (GHz)	Mode	Ch #	Freq. (MHz)	Avg Pwr (dBm)	
				Vendor A	Vendor B
2.4	V3.0 + EDR, GFSK	0	2402	11.3	11.5
		39	2441	12.8	12.8
		78	2480	11.8	11.7
	V3.0 + EDR, 8-DPSK	0	2402	10.6	10.7
		39	2441	12.0	11.7
		78	2480	9.9	10.0
	V4.0 LE, GFSK	0	2402	8.1	8.2
		19	2440	8.8	8.7
		39	2480	8.6	8.6

10. Tissue Dielectric Properties

IEEE Std 1528-2003 Table 2

Target Frequency (MHz)	Head	
	ϵ_r	σ (S/m)
300	45.3	0.87
450	43.5	0.87
835	41.5	0.90
900	41.5	0.97
1450	40.5	1.20
1800 – 2000	40.0	1.40
2450	39.2	1.80
2600	39.0	1.96
3000	38.5	2.40

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r01

Target Frequency (MHz)	Head		Body	
	ϵ_r	σ (S/m)	ϵ_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5000	36.2	4.45	49.3	5.07
5100	36.1	4.55	49.1	5.18
5200	36.0	4.66	49.0	5.30
5300	35.9	4.76	48.9	5.42
5400	35.8	4.86	48.7	5.53
5500	35.6	4.96	48.6	5.65
5600	35.5	5.07	48.5	5.77
5700	35.4	5.17	48.3	5.88
5800	35.3	5.27	48.2	6.00

10.1. Composition of Ingredients for the Tissue Material Used in the SAR Tests

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

Salt: 99+% Pure Sodium Chloride

Sugar: 98+% Pure Sucrose

Water: De-ionized, 16 MΩ+ resistivity

HEC: Hydroxyethyl Cellulose

DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]

Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1, 3, 3-tetramethylbutyl)phenyl]ether

MSL/HSL750 (Body and Head liquids for 700 – 800 MHz)

Item	Head Tissue Simulation Liquids HSL750 Muscle (body) Tissue Simulation Liquids MSL750
Type No	SL AAH 075
Manufacturer	SPEAG
The item is composed of the following ingredients:	
H ₂ O	Water, 35 – 58%
Sucrose	Sugar, white, refined, 40-60%
NaCl	Sodium Chloride, 0-6%
Hydroxyethyl-cellulose	Medium Viscosity (CAS# 9004-62-0), <0.3%
Preventol-D7	Preservative: aqueous preparation, (CAS# 55965-84-9), containing 5-chloro-2-methyl-3(2H)-isothiazolone and 2-methyl-3(2H)-isothiazolone, 0.1-0.7%

MSL/HSL1750 (Body and Head liquids for 1700 – 1800 MHz)

Item	Head Tissue Simulation Liquids HSL1750 Muscle (body) Tissue Simulation Liquids MSL1750
Type No	SL AAM 175
Manufacturer	SPEAG
-The item is composed of the following ingredients:	
H ₂ O	Water, 52 – 75%
C8H18O3	Diethylene glycol monobutyl ether (DGBE), 25-48%
NaCl	Sodium Chloride, <1.0%

Simulating Liquids for 5 GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	78
Mineral oil	11
Emulsifiers	9
Additives and Salt	2

10.2. Tissue Dielectric Parameter Check Results

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within $\pm 2^\circ\text{C}$ of the temperature when the tissue parameters are characterized.

The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance; for example, when the parameters are marginal at the beginning of the measurement series.

Tissue dielectric parameters were measured at the low, middle and high frequency of each operating frequency range of the test device.

SAR Room A

	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit $\pm$ (%)
7/6/2013	Head 835	e'	41.0300	Relative Permittivity (ϵ_r):	41.03	41.50	-1.13	5
		e"	19.8800	Conductivity (σ):	0.92	0.90	2.56	5
	Head 820	e'	41.2000	Relative Permittivity (ϵ_r):	41.20	41.60	-0.97	5
		e"	19.9700	Conductivity (σ):	0.91	0.90	1.34	5
	Head 850	e'	40.8900	Relative Permittivity (ϵ_r):	40.89	41.50	-1.47	5
		e"	19.8100	Conductivity (σ):	0.94	0.92	2.32	5
7/9/2013	Head 835	e'	40.1100	Relative Permittivity (ϵ_r):	40.11	41.50	-3.35	5
		e"	19.3300	Conductivity (σ):	0.90	0.90	-0.28	5
	Head 820	e'	40.2900	Relative Permittivity (ϵ_r):	40.29	41.60	-3.16	5
		e"	19.3800	Conductivity (σ):	0.88	0.90	-1.65	5
	Head 850	e'	39.9400	Relative Permittivity (ϵ_r):	39.94	41.50	-3.76	5
		e"	19.3000	Conductivity (σ):	0.91	0.92	-0.31	5
7/11/2013	Body 2450	e'	51.3900	Relative Permittivity (ϵ_r):	51.39	52.70	-2.49	5
		e"	13.6900	Conductivity (σ):	1.86	1.95	-4.36	5
	Body 2410	e'	51.5100	Relative Permittivity (ϵ_r):	51.51	52.76	-2.37	5
		e"	13.5400	Conductivity (σ):	1.81	1.91	-4.88	5
	Body 2475	e'	51.3100	Relative Permittivity (ϵ_r):	51.31	52.67	-2.58	5
		e"	13.7900	Conductivity (σ):	1.90	1.99	-4.40	5
7/11/2013	Head 2450	e'	38.1500	Relative Permittivity (ϵ_r):	38.15	39.20	-2.68	5
		e"	13.2000	Conductivity (σ):	1.80	1.80	-0.10	5
	Head 2410	e'	38.2900	Relative Permittivity (ϵ_r):	38.29	39.28	-2.52	5
		e"	13.0900	Conductivity (σ):	1.75	1.76	-0.36	5
	Head 2475	e'	38.0500	Relative Permittivity (ϵ_r):	38.05	39.17	-2.86	5
		e"	13.2800	Conductivity (σ):	1.83	1.83	0.03	5
7/12/2013	Head 2450	e'	38.5600	Relative Permittivity (ϵ_r):	38.56	39.20	-1.63	5
		e"	13.5800	Conductivity (σ):	1.85	1.80	2.78	5
	Head 2410	e'	38.7100	Relative Permittivity (ϵ_r):	38.71	39.28	-1.45	5
		e"	13.4800	Conductivity (σ):	1.81	1.76	2.61	5
	Head 2475	e'	38.4600	Relative Permittivity (ϵ_r):	38.46	39.17	-1.81	5
		e"	13.6600	Conductivity (σ):	1.88	1.83	2.89	5
7/12/2013	Body 2450	e'	51.5000	Relative Permittivity (ϵ_r):	51.50	52.70	-2.28	5
		e"	14.5600	Conductivity (σ):	1.98	1.95	1.72	5
	Body 2410	e'	51.6400	Relative Permittivity (ϵ_r):	51.64	52.76	-2.12	5
		e"	14.4100	Conductivity (σ):	1.93	1.91	1.23	5
	Body 2475	e'	51.4100	Relative Permittivity (ϵ_r):	51.41	52.67	-2.39	5
		e"	14.6700	Conductivity (σ):	2.02	1.99	1.70	5

Tissue Dielectric Parameter Check Results (SAR Room A continued)

	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit $\pm$ (%)
7/12/2013	Head 2450	e'	38.5600	Relative Permittivity (ϵ_r):	38.56	39.20	-1.63	5
		e"	13.5800	Conductivity (σ):	1.85	1.80	2.78	5
	Head 2410	e'	38.7100	Relative Permittivity (ϵ_r):	38.71	39.28	-1.45	5
		e"	13.4800	Conductivity (σ):	1.81	1.76	2.61	5
	Head 2475	e'	38.4600	Relative Permittivity (ϵ_r):	38.46	39.17	-1.81	5
		e"	13.6600	Conductivity (σ):	1.88	1.83	2.89	5
7/12/2013	Head 835	e'	43.0800	Relative Permittivity (ϵ_r):	43.08	41.50	3.81	5
		e"	19.9300	Conductivity (σ):	0.93	0.90	2.81	5
	Head 820	e'	43.2700	Relative Permittivity (ϵ_r):	43.27	41.60	4.01	5
		e"	19.9900	Conductivity (σ):	0.91	0.90	1.44	5
	Head 850	e'	42.9000	Relative Permittivity (ϵ_r):	42.90	41.50	3.37	5
		e"	19.8700	Conductivity (σ):	0.94	0.92	2.63	5

SAR Room B

	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit $\pm$ (%)
7/5/2013	Head 1900	e'	38.1100	Relative Permittivity (ϵ_r):	38.11	40.00	-4.73	5
		e"	13.5900	Conductivity (σ):	1.44	1.40	2.55	5
	Head 1850	e'	38.3500	Relative Permittivity (ϵ_r):	38.35	40.00	-4.13	5
		e"	13.4900	Conductivity (σ):	1.39	1.40	-0.88	5
	Head 1910	e'	38.0600	Relative Permittivity (ϵ_r):	38.06	40.00	-4.85	5
		e"	13.6000	Conductivity (σ):	1.44	1.40	3.17	5
7/9/2013	Head 1900	e'	38.5800	Relative Permittivity (ϵ_r):	38.58	40.00	-3.55	5
		e"	13.3600	Conductivity (σ):	1.41	1.40	0.82	5
	Head 1850	e'	38.8000	Relative Permittivity (ϵ_r):	38.80	40.00	-3.00	5
		e"	13.2600	Conductivity (σ):	1.36	1.40	-2.57	5
	Head 1910	e'	38.5300	Relative Permittivity (ϵ_r):	38.53	40.00	-3.68	5
		e"	13.3800	Conductivity (σ):	1.42	1.40	1.50	5
7/12/2013	Head 1900	e'	41.1800	Relative Permittivity (ϵ_r):	41.18	40.00	2.95	5
		e"	13.3100	Conductivity (σ):	1.41	1.40	0.44	5
	Head 1850	e'	41.3800	Relative Permittivity (ϵ_r):	41.38	40.00	3.45	5
		e"	13.2100	Conductivity (σ):	1.36	1.40	-2.94	5
	Head 1910	e'	41.1400	Relative Permittivity (ϵ_r):	41.14	40.00	2.85	5
		e"	13.3300	Conductivity (σ):	1.42	1.40	1.12	5

SAR Room C

	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit $\pm$ (%)
7/9/2013	Body 5180	e'	47.8000	Relative Permittivity (ϵ_r):	47.80	49.05	-2.54	5
		e"	18.0900	Conductivity (σ):	5.21	5.27	-1.16	5
	Body 5200	e'	47.8300	Relative Permittivity (ϵ_r):	47.83	49.02	-2.43	5
		e"	17.9900	Conductivity (σ):	5.20	5.29	-1.76	5
	Body 5600	e'	47.0300	Relative Permittivity (ϵ_r):	47.03	48.48	-2.99	5
		e"	18.3600	Conductivity (σ):	5.72	5.76	-0.77	5
	Body 5800	e'	46.8200	Relative Permittivity (ϵ_r):	46.82	48.20	-2.86	5
		e"	18.6000	Conductivity (σ):	6.00	6.00	-0.03	5
7/9/2013	Body 5825	e'	46.8900	Relative Permittivity (ϵ_r):	46.89	48.20	-2.72	5
		e"	18.5000	Conductivity (σ):	5.99	6.00	-0.13	5
	Head 5180	e'	37.0700	Relative Permittivity (ϵ_r):	37.07	36.01	2.94	5
		e"	15.7800	Conductivity (σ):	4.55	4.63	-1.85	5
	Head 5200	e'	37.0900	Relative Permittivity (ϵ_r):	37.09	35.99	3.06	5
		e"	15.7300	Conductivity (σ):	4.55	4.65	-2.21	5
	Head 5600	e'	36.3700	Relative Permittivity (ϵ_r):	36.37	35.53	2.35	5
		e"	15.9700	Conductivity (σ):	4.97	5.06	-1.73	5
7/12/2013	Head 5800	e'	36.1600	Relative Permittivity (ϵ_r):	36.16	35.30	2.44	5
		e"	16.1100	Conductivity (σ):	5.20	5.27	-1.41	5
	Head 5825	e'	36.0400	Relative Permittivity (ϵ_r):	36.04	35.30	2.10	5
		e"	16.0500	Conductivity (σ):	5.20	5.27	-1.36	5
	Body 5180	e'	48.9900	Relative Permittivity (ϵ_r):	48.99	49.05	-0.12	5
		e"	18.0200	Conductivity (σ):	5.19	5.27	-1.54	5
	Body 5200	e'	48.9300	Relative Permittivity (ϵ_r):	48.93	49.02	-0.18	5
		e"	18.0300	Conductivity (σ):	5.21	5.29	-1.54	5
7/12/2013	Body 5600	e'	48.3400	Relative Permittivity (ϵ_r):	48.34	48.48	-0.28	5
		e"	18.4700	Conductivity (σ):	5.75	5.76	-0.17	5
	Body 5800	e'	48.0600	Relative Permittivity (ϵ_r):	48.06	48.20	-0.29	5
		e"	18.7000	Conductivity (σ):	6.03	6.00	0.51	5
	Body 5825	e'	48.0400	Relative Permittivity (ϵ_r):	48.04	48.20	-0.33	5
		e"	18.7200	Conductivity (σ):	6.06	6.00	1.05	5
	Head 5180	e'	37.5200	Relative Permittivity (ϵ_r):	37.52	36.01	4.18	5
		e"	15.8300	Conductivity (σ):	4.56	4.63	-1.54	5
7/12/2013	Head 5200	e'	37.4600	Relative Permittivity (ϵ_r):	37.46	35.99	4.08	5
		e"	15.8300	Conductivity (σ):	4.58	4.65	-1.59	5
	Head 5600	e'	36.8700	Relative Permittivity (ϵ_r):	36.87	35.53	3.76	5
		e"	16.1100	Conductivity (σ):	5.02	5.06	-0.87	5
	Head 5800	e'	36.5700	Relative Permittivity (ϵ_r):	36.57	35.30	3.60	5
		e"	16.2700	Conductivity (σ):	5.25	5.27	-0.44	5
	Head 5825	e'	36.5500	Relative Permittivity (ϵ_r):	36.55	35.30	3.54	5
		e"	16.2800	Conductivity (σ):	5.27	5.27	0.06	5

SAR Room D

	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
7/5/2013	Body 835	e'	52.6600	Relative Permittivity (ϵ_r):	52.66	55.20	-4.60	5
		e"	21.6800	Conductivity (σ):	1.01	0.97	3.77	5
	Body 820	e'	52.8100	Relative Permittivity (ϵ_r):	52.81	55.28	-4.46	5
		e"	21.7800	Conductivity (σ):	0.99	0.97	2.54	5
	Body 850	e'	52.5500	Relative Permittivity (ϵ_r):	52.55	55.16	-4.73	5
		e"	21.6000	Conductivity (σ):	1.02	0.99	3.42	5
7/9/2013	Body 835	e'	53.7700	Relative Permittivity (ϵ_r):	53.77	55.20	-2.59	5
		e"	21.2600	Conductivity (σ):	0.99	0.97	1.76	5
	Body 820	e'	53.9200	Relative Permittivity (ϵ_r):	53.92	55.28	-2.45	5
		e"	21.3200	Conductivity (σ):	0.97	0.97	0.37	5
	Body 850	e'	53.6200	Relative Permittivity (ϵ_r):	53.62	55.16	-2.79	5
		e"	21.2100	Conductivity (σ):	1.00	0.99	1.55	5
7/12/2013	Body 835	e'	53.3200	Relative Permittivity (ϵ_r):	53.32	55.20	-3.41	5
		e"	21.8300	Conductivity (σ):	1.01	0.97	4.49	5
	Body 820	e'	53.4800	Relative Permittivity (ϵ_r):	53.48	55.28	-3.25	5
		e"	21.9000	Conductivity (σ):	1.00	0.97	3.10	5
	Body 850	e'	53.1400	Relative Permittivity (ϵ_r):	53.14	55.16	-3.66	5
		e"	21.7500	Conductivity (σ):	1.03	0.99	4.14	5
7/12/2013	Head 835	e'	40.7400	Relative Permittivity (ϵ_r):	40.74	41.50	-1.83	5
		e"	19.9200	Conductivity (σ):	0.92	0.90	2.76	5
	Head 820	e'	40.9500	Relative Permittivity (ϵ_r):	40.95	41.60	-1.57	5
		e"	19.9800	Conductivity (σ):	0.91	0.90	1.39	5
	Head 850	e'	40.5400	Relative Permittivity (ϵ_r):	40.54	41.50	-2.31	5
		e"	19.8700	Conductivity (σ):	0.94	0.92	2.63	5

SAR Room E

	Freq. (MHz)		Liquid Parameters		Measured	Target	Delta (%)	Limit $\pm$ (%)
6/24/2013	Head 5180	e'	36.9900	Relative Permittivity (ϵ_r):	36.99	36.01	2.71	5
		e"	15.8500	Conductivity (σ):	4.57	4.63	-1.41	5
	Head 5200	e'	36.9700	Relative Permittivity (ϵ_r):	36.97	35.99	2.72	5
		e"	15.8600	Conductivity (σ):	4.59	4.65	-1.40	5
	Head 5600	e'	36.4100	Relative Permittivity (ϵ_r):	36.41	35.53	2.47	5
		e"	16.0400	Conductivity (σ):	4.99	5.06	-1.30	5
	Head 5800	e'	36.1300	Relative Permittivity (ϵ_r):	36.13	35.30	2.35	5
		e"	16.1500	Conductivity (σ):	5.21	5.27	-1.17	5
6/24/2013	Head 5825	e'	36.1100	Relative Permittivity (ϵ_r):	36.11	35.30	2.29	5
		e"	16.1500	Conductivity (σ):	5.23	5.27	-0.74	5
	Body 5180	e'	47.6900	Relative Permittivity (ϵ_r):	47.69	49.05	-2.77	5
		e"	18.6000	Conductivity (σ):	5.36	5.27	1.63	5
	Body 5200	e'	47.6900	Relative Permittivity (ϵ_r):	47.69	49.02	-2.71	5
		e"	18.6100	Conductivity (σ):	5.38	5.29	1.63	5
	Body 5600	e'	47.0000	Relative Permittivity (ϵ_r):	47.00	48.48	-3.05	5
		e"	18.9500	Conductivity (σ):	5.90	5.76	2.42	5
6/27/2013	Body 5800	e'	46.6800	Relative Permittivity (ϵ_r):	46.68	48.20	-3.15	5
		e"	19.1200	Conductivity (σ):	6.17	6.00	2.77	5
	Body 5825	e'	46.6800	Relative Permittivity (ϵ_r):	46.68	48.20	-3.15	5
		e"	19.1400	Conductivity (σ):	6.20	6.00	3.32	5
	Head 5180	e'	37.7100	Relative Permittivity (ϵ_r):	37.71	36.01	4.71	5
		e"	16.0300	Conductivity (σ):	4.62	4.63	-0.29	5
	Head 5200	e'	37.6800	Relative Permittivity (ϵ_r):	37.68	35.99	4.70	5
		e"	16.0500	Conductivity (σ):	4.64	4.65	-0.22	5
6/27/2013	Head 5600	e'	37.1700	Relative Permittivity (ϵ_r):	37.17	35.53	4.60	5
		e"	16.2500	Conductivity (σ):	5.06	5.06	-0.01	5
	Head 5800	e'	36.8800	Relative Permittivity (ϵ_r):	36.88	35.30	4.48	5
		e"	16.3400	Conductivity (σ):	5.27	5.27	-0.01	5
	Head 5825	e'	36.8600	Relative Permittivity (ϵ_r):	36.86	35.30	4.42	5
		e"	16.3600	Conductivity (σ):	5.30	5.27	0.55	5
	Body 5180	e'	47.7400	Relative Permittivity (ϵ_r):	47.74	49.05	-2.66	5
		e"	18.6200	Conductivity (σ):	5.36	5.27	1.74	5
6/27/2013	Body 5200	e'	47.7100	Relative Permittivity (ϵ_r):	47.71	49.02	-2.67	5
		e"	18.6500	Conductivity (σ):	5.39	5.29	1.84	5
	Body 5600	e'	47.1000	Relative Permittivity (ϵ_r):	47.10	48.48	-2.84	5
		e"	19.0000	Conductivity (σ):	5.92	5.76	2.69	5
	Body 5800	e'	46.7500	Relative Permittivity (ϵ_r):	46.75	48.20	-3.01	5
		e"	19.1900	Conductivity (σ):	6.19	6.00	3.15	5
	Body 5825	e'	46.7100	Relative Permittivity (ϵ_r):	46.71	48.20	-3.09	5
		e"	19.2000	Conductivity (σ):	6.22	6.00	3.64	5

Tissue Dielectric Parameter Check Results (SAR Room E continued)

	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit $\pm$ (%)
7/1/2013	Head 5180	e'	34.8200	Relative Permittivity (ϵ_r):	34.82	36.01	-3.31	5
		e"	15.4200	Conductivity (σ):	4.44	4.63	-4.09	5
	Head 5200	e'	34.7500	Relative Permittivity (ϵ_r):	34.75	35.99	-3.45	5
		e"	15.4300	Conductivity (σ):	4.46	4.65	-4.08	5
	Head 5600	e'	34.1800	Relative Permittivity (ϵ_r):	34.18	35.53	-3.81	5
		e"	15.6500	Conductivity (σ):	4.87	5.06	-3.70	5
	Head 5800	e'	33.9100	Relative Permittivity (ϵ_r):	33.91	35.30	-3.94	5
		e"	15.7200	Conductivity (σ):	5.07	5.27	-3.80	5
7/1/2013	Head 5825	e'	33.8600	Relative Permittivity (ϵ_r):	33.86	35.30	-4.08	5
		e"	15.7500	Conductivity (σ):	5.10	5.27	-3.20	5
	Body 5180	e'	47.9000	Relative Permittivity (ϵ_r):	47.90	49.05	-2.34	5
		e"	18.3300	Conductivity (σ):	5.28	5.27	0.15	5
	Body 5200	e'	47.8100	Relative Permittivity (ϵ_r):	47.81	49.02	-2.47	5
		e"	18.3400	Conductivity (σ):	5.30	5.29	0.15	5
	Body 5600	e'	47.1700	Relative Permittivity (ϵ_r):	47.17	48.48	-2.70	5
		e"	18.7500	Conductivity (σ):	5.84	5.76	1.34	5
7/2/2013	Body 5800	e'	46.8700	Relative Permittivity (ϵ_r):	46.87	48.20	-2.76	5
		e"	18.8800	Conductivity (σ):	6.09	6.00	1.48	5
	Body 5825	e'	46.8200	Relative Permittivity (ϵ_r):	46.82	48.20	-2.86	5
		e"	18.9300	Conductivity (σ):	6.13	6.00	2.19	5
	Head 2450	e'	37.6300	Relative Permittivity (ϵ_r):	37.63	39.20	-4.01	5
		e"	13.5400	Conductivity (σ):	1.84	1.80	2.47	5
	Head 2410	e'	37.9100	Relative Permittivity (ϵ_r):	37.91	39.28	-3.49	5
		e"	13.4300	Conductivity (σ):	1.80	1.76	2.23	5
7/2/2013	Head 2475	e'	37.5600	Relative Permittivity (ϵ_r):	37.56	39.17	-4.11	5
		e"	13.6600	Conductivity (σ):	1.88	1.83	2.89	5
	Body 2450	e'	51.3100	Relative Permittivity (ϵ_r):	51.31	52.70	-2.64	5
		e"	13.9900	Conductivity (σ):	1.91	1.95	-2.27	5
	Body 2410	e'	51.5900	Relative Permittivity (ϵ_r):	51.59	52.76	-2.22	5
		e"	13.8300	Conductivity (σ):	1.85	1.91	-2.84	5
	Body 2475	e'	51.2800	Relative Permittivity (ϵ_r):	51.28	52.67	-2.64	5
		e"	14.1500	Conductivity (σ):	1.95	1.99	-1.91	5
7/6/2013	Head 2450	e'	38.4300	Relative Permittivity (ϵ_r):	38.43	39.20	-1.96	5
		e"	13.7900	Conductivity (σ):	1.88	1.80	4.37	5
	Head 2410	e'	38.6100	Relative Permittivity (ϵ_r):	38.61	39.28	-1.70	5
		e"	13.7000	Conductivity (σ):	1.84	1.76	4.28	5
	Head 2475	e'	38.3300	Relative Permittivity (ϵ_r):	38.33	39.17	-2.14	5
		e"	13.8800	Conductivity (σ):	1.91	1.83	4.55	5
	Body 2450	e'	50.7800	Relative Permittivity (ϵ_r):	50.78	52.70	-3.64	5
		e"	14.4300	Conductivity (σ):	1.97	1.95	0.81	5
7/6/2013	Body 2410	e'	50.9400	Relative Permittivity (ϵ_r):	50.94	52.76	-3.45	5
		e"	14.3000	Conductivity (σ):	1.92	1.91	0.46	5
	Body 2475	e'	50.7100	Relative Permittivity (ϵ_r):	50.71	52.67	-3.72	5
		e"	14.5500	Conductivity (σ):	2.00	1.99	0.87	5
	Body 1900	e'	52.2900	Relative Permittivity (ϵ_r):	52.29	53.30	-1.89	5
		e"	14.9300	Conductivity (σ):	1.58	1.52	3.77	5
	Body 1850	e'	52.5200	Relative Permittivity (ϵ_r):	52.52	53.30	-1.46	5
		e"	14.8100	Conductivity (σ):	1.52	1.52	0.23	5
7/7/2013	Body 1910	e'	52.2500	Relative Permittivity (ϵ_r):	52.25	53.30	-1.97	5
		e"	14.9500	Conductivity (σ):	1.59	1.52	4.46	5

Tissue Dielectric Parameter Check Results (SAR Room E continued)

	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
7/9/2013	Body 1900	e'	52.5000	Relative Permittivity (ϵ_r):	52.50	53.30	-1.50	5
		e"	14.5500	Conductivity (σ):	1.54	1.52	1.13	5
	Body 1850	e'	52.6700	Relative Permittivity (ϵ_r):	52.67	53.30	-1.18	5
		e"	14.4200	Conductivity (σ):	1.48	1.52	-2.41	5
	Body 1910	e'	52.4600	Relative Permittivity (ϵ_r):	52.46	53.30	-1.58	5
		e"	14.5600	Conductivity (σ):	1.55	1.52	1.73	5
7/9/2013	Head 2450	e'	38.4900	Relative Permittivity (ϵ_r):	38.49	39.20	-1.81	5
		e"	13.3700	Conductivity (σ):	1.82	1.80	1.19	5
	Head 2410	e'	38.6600	Relative Permittivity (ϵ_r):	38.66	39.28	-1.58	5
		e"	13.3700	Conductivity (σ):	1.79	1.76	1.77	5
	Head 2475	e'	38.4100	Relative Permittivity (ϵ_r):	38.41	39.17	-1.94	5
		e"	13.5500	Conductivity (σ):	1.86	1.83	2.06	5
7/12/2013	Body 1900	e'	51.7100	Relative Permittivity (ϵ_r):	51.71	53.30	-2.98	5
		e"	14.7300	Conductivity (σ):	1.56	1.52	2.38	5
	Body 1850	e'	51.8700	Relative Permittivity (ϵ_r):	51.87	53.30	-2.68	5
		e"	14.6700	Conductivity (σ):	1.51	1.52	-0.72	5
	Body 1910	e'	51.6800	Relative Permittivity (ϵ_r):	51.68	53.30	-3.04	5
		e"	14.7600	Conductivity (σ):	1.57	1.52	3.13	5
7/14/2013	Head 2450	e'	37.7700	Relative Permittivity (ϵ_r):	37.77	39.20	-3.65	5
		e"	13.5300	Conductivity (σ):	1.84	1.80	2.40	5
	Head 2410	e'	37.9500	Relative Permittivity (ϵ_r):	37.95	39.28	-3.38	5
		e"	13.4400	Conductivity (σ):	1.80	1.76	2.30	5
	Head 2475	e'	37.6800	Relative Permittivity (ϵ_r):	37.68	39.17	-3.80	5
		e"	13.6200	Conductivity (σ):	1.87	1.83	2.59	5

SAR Room F

DATE	FREQ. (MHz)		LIQUID PARAMETERS		MEASURED	TARGET	DELTA (%)	LIMIT ±(%)
6/24/2013	Head 5180	e'	35.9300	Relative Permittivity (ε _r):	35.93	36.01	-0.23	5
		e"	15.4300	Conductivity (σ):	4.44	4.63	-4.02	5
	Head 5200	e'	35.9200	Relative Permittivity (ε _r):	35.92	35.99	-0.20	5
		e"	15.4400	Conductivity (σ):	4.46	4.65	-4.01	5
	Head 5600	e'	35.3800	Relative Permittivity (ε _r):	35.38	35.53	-0.43	5
		e"	15.6200	Conductivity (σ):	4.86	5.06	-3.88	5
	Head 5800	e'	35.1000	Relative Permittivity (ε _r):	35.10	35.30	-0.57	5
		e"	15.7300	Conductivity (σ):	5.07	5.27	-3.74	5
Head 5825	e'	35.0900	Relative Permittivity (ε _r):	35.09	35.30	-0.59	5	
	e"	15.7300	Conductivity (σ):	5.09	5.27	-3.33	5	
6/24/2013	Body 5180	e'	49.0900	Relative Permittivity (ε _r):	49.09	49.05	0.09	5
		e"	18.7600	Conductivity (σ):	5.40	5.27	2.50	5
	Body 5200	e'	49.0600	Relative Permittivity (ε _r):	49.06	49.02	0.08	5
		e"	18.7600	Conductivity (σ):	5.42	5.29	2.45	5
	Body 5600	e'	48.3500	Relative Permittivity (ε _r):	48.35	48.48	-0.26	5
		e"	19.1300	Conductivity (σ):	5.96	5.76	3.40	5
	Body 5800	e'	48.0400	Relative Permittivity (ε _r):	48.04	48.20	-0.33	5
		e"	19.3600	Conductivity (σ):	6.24	6.00	4.06	5
Body 5825	e'	48.0100	Relative Permittivity (ε _r):	48.01	48.20	-0.39	5	
	e"	19.3800	Conductivity (σ):	6.28	6.00	4.62	5	
6/27/2013	Head 5180	e'	35.8900	Relative Permittivity (ε _r):	35.89	36.01	-0.34	5
		e"	15.8400	Conductivity (σ):	4.56	4.63	-1.47	5
	Head 5200	e'	35.8800	Relative Permittivity (ε _r):	35.88	35.99	-0.31	5
		e"	15.8700	Conductivity (σ):	4.59	4.65	-1.34	5
	Head 5600	e'	35.3300	Relative Permittivity (ε _r):	35.33	35.53	-0.57	5
		e"	16.0200	Conductivity (σ):	4.99	5.06	-1.42	5
	Head 5800	e'	35.0600	Relative Permittivity (ε _r):	35.06	35.30	-0.68	5
		e"	16.1200	Conductivity (σ):	5.20	5.27	-1.35	5
Head 5825	e'	34.9900	Relative Permittivity (ε _r):	34.99	35.30	-0.88	5	
	e"	16.1400	Conductivity (σ):	5.23	5.27	-0.81	5	
6/27/2013	Body 5180	e'	48.4800	Relative Permittivity (ε _r):	48.48	49.05	-1.16	5
		e"	18.5200	Conductivity (σ):	5.33	5.27	1.19	5
	Body 5200	e'	48.4200	Relative Permittivity (ε _r):	48.42	49.02	-1.22	5
		e"	18.5500	Conductivity (σ):	5.36	5.29	1.30	5
	Body 5600	e'	47.8200	Relative Permittivity (ε _r):	47.82	48.48	-1.36	5
		e"	18.9100	Conductivity (σ):	5.89	5.76	2.21	5
	Body 5800	e'	47.5000	Relative Permittivity (ε _r):	47.50	48.20	-1.45	5
		e"	19.1600	Conductivity (σ):	6.18	6.00	2.98	5
Body 5825	e'	47.4300	Relative Permittivity (ε _r):	47.43	48.20	-1.60	5	
	e"	19.1300	Conductivity (σ):	6.20	6.00	3.27	5	

Tissue Dielectric Parameter Check Results (SAR Room F continued)

	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit $\pm$ (%)
7/1/2013	Head 5180	e'	36.0800	Relative Permittivity (ϵ_r):	36.08	36.01	0.19	5
		e"	16.1400	Conductivity (σ):	4.65	4.63	0.39	5
	Head 5200	e'	36.0100	Relative Permittivity (ϵ_r):	36.01	35.99	0.06	5
		e"	16.1500	Conductivity (σ):	4.67	4.65	0.40	5
	Head 5600	e'	35.3600	Relative Permittivity (ϵ_r):	35.36	35.53	-0.49	5
		e"	16.4300	Conductivity (σ):	5.12	5.06	1.10	5
	Head 5800	e'	35.0600	Relative Permittivity (ϵ_r):	35.06	35.30	-0.68	5
		e"	16.5200	Conductivity (σ):	5.33	5.27	1.09	5
7/1/2013	Head 5825	e'	35.0100	Relative Permittivity (ϵ_r):	35.01	35.30	-0.82	5
		e"	16.5500	Conductivity (σ):	5.36	5.27	1.71	5
	Body 5180	e'	47.8900	Relative Permittivity (ϵ_r):	47.89	49.05	-2.36	5
		e"	18.3300	Conductivity (σ):	5.28	5.27	0.15	5
	Body 5200	e'	47.8000	Relative Permittivity (ϵ_r):	47.80	49.02	-2.49	5
		e"	18.3500	Conductivity (σ):	5.31	5.29	0.21	5
	Body 5600	e'	47.1600	Relative Permittivity (ϵ_r):	47.16	48.48	-2.72	5
		e"	18.7500	Conductivity (σ):	5.84	5.76	1.34	5
7/9/2013	Body 5800	e'	46.8700	Relative Permittivity (ϵ_r):	46.87	48.20	-2.76	5
		e"	18.8900	Conductivity (σ):	6.09	6.00	1.53	5
	Body 5825	e'	46.8100	Relative Permittivity (ϵ_r):	46.81	48.20	-2.88	5
		e"	18.9300	Conductivity (σ):	6.13	6.00	2.19	5
	Head 5180	e'	35.8600	Relative Permittivity (ϵ_r):	35.86	36.01	-0.42	5
		e"	16.1100	Conductivity (σ):	4.64	4.63	0.21	5
	Head 5200	e'	35.8400	Relative Permittivity (ϵ_r):	35.84	35.99	-0.42	5
		e"	16.1000	Conductivity (σ):	4.66	4.65	0.09	5
7/12/2013	Head 5600	e'	35.2100	Relative Permittivity (ϵ_r):	35.21	35.53	-0.91	5
		e"	16.3300	Conductivity (σ):	5.08	5.06	0.49	5
	Head 5800	e'	34.8900	Relative Permittivity (ϵ_r):	34.89	35.30	-1.16	5
		e"	16.4500	Conductivity (σ):	5.10	5.27	0.67	5
	Head 5825	e'	34.8800	Relative Permittivity (ϵ_r):	34.88	35.30	-1.19	5
		e"	16.4600	Conductivity (σ):	5.33	5.27	1.16	5
	Head 5180	e'	37.6000	Relative Permittivity (ϵ_r):	37.60	36.01	4.41	5
		e"	15.5600	Conductivity (σ):	4.48	4.63	-3.21	5
7/14/2013	Head 5200	e'	37.5500	Relative Permittivity (ϵ_r):	37.55	35.99	4.33	5
		e"	15.5700	Conductivity (σ):	4.50	4.65	-3.21	5
	Head 5600	e'	36.9800	Relative Permittivity (ϵ_r):	36.98	35.53	4.07	5
		e"	15.8200	Conductivity (σ):	4.93	5.06	-2.65	5
	Head 5800	e'	36.7100	Relative Permittivity (ϵ_r):	36.71	35.30	3.99	5
		e"	15.9700	Conductivity (σ):	5.15	5.27	-2.27	5
	Head 5825	e'	36.6900	Relative Permittivity (ϵ_r):	36.69	35.30	3.94	5
		e"	15.9800	Conductivity (σ):	5.18	5.27	-1.79	5
7/14/2013	Head 5180	e'	36.9600	Relative Permittivity (ϵ_r):	36.96	36.01	2.63	5
		e"	15.5900	Conductivity (σ):	4.49	4.63	-3.03	5
	Head 5200	e'	36.9100	Relative Permittivity (ϵ_r):	36.91	35.99	2.56	5
		e"	15.5900	Conductivity (σ):	4.51	4.65	-3.08	5
	Head 5600	e'	36.3100	Relative Permittivity (ϵ_r):	36.31	35.53	2.18	5
		e"	15.7600	Conductivity (σ):	4.91	5.06	-3.02	5
	Head 5800	e'	36.0600	Relative Permittivity (ϵ_r):	36.06	35.30	2.15	5
		e"	15.8600	Conductivity (σ):	5.11	5.27	-2.94	5
7/14/2013	Head 5825	e'	36.0300	Relative Permittivity (ϵ_r):	36.03	35.30	2.07	5
		e"	15.8700	Conductivity (σ):	5.14	5.27	-2.46	5

11. System Performance Check

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are remeasured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

11.1. System Performance Check Measurement Conditions

- The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0 ± 0.2 mm (bottom plate) filled with Body or Head simulating liquid of the following parameters.
- The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm ± 0.5 cm for SAR measurements ≤ 3 GHz and ≥ 10.0 cm ± 0.5 cm for measurements > 3 GHz.
- The DASY system with an E-Field Probe was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10 mm (above 1 GHz) and 15 mm (below 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 15 mm was aligned with the dipole.
For 5 GHz band - The coarse grid with a grid spacing of 10 mm was aligned with the dipole.
- Special 7x7x7 (below 3 GHz) and/or 8x8x7 (above 3 GHz) fine cube was chosen for the cube.
- Distance between probe sensors and phantom surface was set to 3 mm.
For 5 GHz band - Distance between probe sensors and phantom surface was set to 2.5 mm
- The dipole input power (forward power) was 100 mW.
- The results are normalized to 1 W input power.

11.2. Reference SAR Values for System Performance Check

The reference SAR values can be obtained from the calibration certificate of system validation dipoles

System Dipole	Serial No.	Cal. Date	Freq. (MHz)	Target SAR Values (mW/g)		
				1g/10g	Head	Body
D835V2	4d002	10/24/2012	835	1g	9.58	9.48
				10g	6.28	6.26
D835V2	4d142	10/04/2012	835	1g	9.45	9.5
				10g	6.23	6.29
D1900V2	5d163	10/04/2012	1900	1g	39.4	39.6
				10g	20.7	21.1
D1900V2	5d043	12/06/2012	1900	1g	39.9	40.9
				10g	20.9	21.6
D2450V2	899	10/05/2012	2450	1g	53.6	51.7
				10g	25.0	24.3
D2450V2	748	02/11/2013	2450	1g	52.9	49.9
				10g	24.6	23.2
D5GHV2	1138	10/9/2012	5200	1g	79.5	73.2
				10g	22.8	20.4
			5500	1g	83.6	77.9
				10g	23.8	21.7
			5800	1g	78.7	72.8
				10g	22.4	20.1
D5GHV2	1003	9/18/2012	5200	1g	76.5	74.8
				10g	21.9	20.9
			5600	1g	82.8	79.0
				10g	23.6	22.0
			5800	1g	76.9	77.0
				10g	22.0	21.4

11.3. System Performance Check Results

The 1-g and 10-g SAR measured with a reference dipole, using the required tissue-equivalent medium at the test frequency, must be within 10% of the manufacturer calibrated dipole SAR target.

SAR Room A

Date Tested	System Dipole		T.S. Liquid	Measured Results			Target (Ref. Value)	Delta $\pm 10\%$	Est./Zoom Ratio $\pm 3\%$	Plot No.
	Type	Serial #		Area Scan	Zoom Scan	Normalize to 1 W				
7/6/2013	D835V2	4d142	Head	1g	1.04	1.02	10.20	9.45	7.94	1,2
				10g	0.70	0.67	6.65	6.23	6.74	
7/9/2013	D835V2	4d142	Head	1g	1.01	0.97	9.66	9.45	2.22	4.36
				10g	0.68	0.63	6.33	6.23	1.61	
7/11/2013	D2450V2	748	Body	1g	5.29	5.33	53.30	49.90	6.81	-0.76
				10g	2.30	2.47	24.70	23.20	6.47	
7/11/2013	D2450V2	748	Head	1g	5.40	5.34	53.40	52.90	0.95	1.11
				10g	2.36	2.44	24.40	24.60	-0.81	
7/12/2013	D2450V2	748	Head	1g	5.63	5.50	55.00	52.90	3.97	2.31
				10g	2.47	2.48	24.80	24.60	0.81	
7/12/2013	D2450V2	748	Body	1g	5.03	5.00	50.00	49.90	0.20	0.60
				10g	2.20	2.28	22.80	23.20	-1.72	
7/12/2013	D835V2	4d002	Head	1g	1.02	1.00	10.00	9.58	4.38	1.96
				10g	0.69	0.66	6.55	6.28	4.30	

SAR Room B

Date Tested	System Dipole		T.S. Liquid	Measured Results			Target (Ref. Value)	Delta $\pm 10\%$	Est./Zoom Ratio $\pm 3\%$	Plot No.
	Type	Serial #		Area Scan	Zoom Scan	Normalize to 1 W				
7/5/2013	D1900V2	5d163	Head	1g	4.26	4.16	41.60	39.4	5.58	2.35
				10g	2.25	2.13	21.30	20.7	2.90	
7/9/2013	D1900V2	5d163	Head	1g	4.10	4.06	40.60	39.40	3.05	0.98
				10g	2.17	2.10	21.00	20.70	1.45	
7/12/2013	D1900V2	5d163	Head	1g	4.35	4.13	41.30	39.40	4.82	5.06
				10g	2.29	2.14	21.40	20.70	3.38	

SAR Room C

Date Tested	System Dipole		T.S. Liquid	Measured Results			Target (Ref. Value)	Delta $\pm 10\%$	Est./Zoom Ratio $\pm 3\%$	Plot No.
	Type	Serial #		Area Scan	Zoom Scan	Normalize to 1 W				
7/9/2013	D5GHzV2 (5.2 GHz)	1003	Head	1g	6.53	7.08	70.80	76.50	-7.45	-8.42
				10g	1.88	2.05	20.50	21.90	-6.39	
7/9/2013	D5GHzV2 (5.6GHz)	1003	Head	1g	7.02	7.68	76.80	82.80	-7.25	-9.40
				10g	1.99	2.19	21.90	23.60	-7.20	
7/9/2013	D5GHzV2 (5.2 GHz)	1003	Body	1g	7.20	7.71	77.10	74.80	3.07	-7.08
				10g	2.00	2.19	21.90	20.90	4.78	
7/9/2013	D5GHzV2 (5.6GHz)	1003	Body	1g	7.62	8.48	84.80	79.00	7.34	-11.29
				10g	2.06	2.35	23.50	22.00	6.82	
7/12/2013	D5GHzV2 (5.2 GHz)	1003	Head	1g	6.93	7.51	75.10	76.50	-1.83	-8.37
				10g	2.00	2.19	21.90	21.90	0.00	
7/12/2013	D5GHzV2 (5.6 GHz)	1003	Head	1g	6.98	7.55	75.50	82.80	-8.82	-8.17
				10g	1.98	2.15	21.50	23.60	-8.90	
7/12/2013	D5GHzV2 (5.2 GHz)	1003	Body	1g	7.47	8.00	80.00	74.80	6.95	-7.10
				10g	2.04	2.26	22.60	20.90	8.13	
7/12/2013	D5GHzV2 (5.6 GHz)	1003	Body	1g	7.36	7.87	78.70	79.00	-0.38	-6.93
				10g	1.96	2.18	21.80	22.00	-0.91	

SAR Room D

Date Tested	System Dipole		T.S. Liquid		Measured Results			Target (Ref. Value)	Delta ±10 %	Est./Zoom Ratio ±3 %	Plot No.
	Type	Serial #			Area Scan	Zoom Scan	Normalize to 1 W				
7/5/2013	D835V2	4d142	Body	1g	1.01	1.00	10.00	9.50	5.26	0.99	11,12
				10g	0.68	0.66	6.57	6.29	4.45		
7/9/2013	D835V2	4d142	Body	1g	0.96	0.95	9.45	9.50	-0.53	1.15	
				10g	0.64	0.62	6.22	6.29	-1.11		
7/12/2013	D835V2	4d002	Body	1g	0.97	0.95	9.48	9.48	0.00	1.96	
				10g	0.65	0.62	6.24	6.26	-0.32		
7/12/2013	D835V2	4d002	Head	1g	0.93	0.91	9.14	9.58	-4.59	1.93	13,14
				10g	0.63	0.60	5.99	6.28	-4.62		

SAR Room E

Date Tested	System Dipole		T.S. Liquid		Measured Results			Target (Ref. Value)	Delta ±10 %	Est./Zoom Ratio ±3 %	Plot No.
	Type	Serial #			Area Scan	Zoom Scan	Normalize to 1 W				
6/24/2013	D5GHV2 (5.2GHz)	1138	Head	1g	7.06	7.31	73.10	79.5	-8.05	-3.54	15,16
				10g	1.94	2.07	20.70	22.8	-9.21		
6/24/2013	D5GHV2 (5.2GHz)	1138	Body	1g	7.34	7.68	76.80	73.2	4.92	-4.63	
				10g	2.04	2.19	21.90	20.4	7.35		
6/27/2013	D5GHV2 (5.2GHz)	1138	Head	1g	7.45	7.39	73.90	79.5	-7.04	0.81	
				10g	2.04	2.10	21.00	22.8	-7.89		
6/27/2013	D5GHV2 (5.2GHz)	1138	Body	1g	6.96	7.41	74.10	73.2	1.23	-6.47	
				10g	1.93	2.12	21.20	20.4	3.92		
7/1/2013	D5GHV2 (5.2GHz)	1003	Head	1g	7.60	7.80	78.00	76.50	1.96	-2.63	
				10g	2.07	2.22	22.20	21.90	1.37		
7/1/2013	D5GHV2 (5.2GHz)	1003	Body	1g	7.52	7.99	79.90	74.80	6.82	-6.25	17,18
				10g	2.12	2.29	22.90	20.90	9.57		
7/2/2013	D2450V2	899	Head	1g	5.24	5.21	52.10	53.6	-2.80	0.57	19,20
				10g	2.31	2.39	23.90	25.0	-4.40		
7/2/2013	D2450V2	899	Body	1g	4.99	5.10	51.00	51.7	-1.35	-2.20	
				10g	2.17	2.38	23.80	24.3	-2.06		
7/6/2013	D2450V2	899	Head	1g	5.49	5.47	54.70	53.6	2.05	0.36	
				10g	2.44	2.50	25.00	25.0	0.00		
7/6/2013	D2450V2	899	Body	1g	5.16	5.24	52.40	51.7	1.35	-1.55	
				10g	2.23	2.44	24.40	24.3	0.41		
7/7/2013	D1900V2	5d163	Body	1g	4.01	4.03	40.30	39.6	1.77	-0.50	
				10g	2.02	2.12	21.20	21.1	0.47		
7/9/2013	D1900V2	5d043	Body	1g	3.84	3.85	38.50	40.90	-5.87	-0.26	21,22
				10g	1.94	2.04	20.40	21.60	-5.56		
7/9/2013	D2450V2	899	Head	1g	5.16	5.18	51.80	53.6	-3.36	-0.39	
				10g	2.27	2.40	24.00	25.0	-4.00		
7/12/2013	D1900V2	5d043	Body	1g	4.01	3.98	39.80	40.90	-2.69	0.75	
				10g	2.00	2.09	20.90	21.60	-3.24		
7/14/2013	D2450V2	748	Head	1g	5.15	5.13	51.30	52.9	-3.02	0.39	23,24
				10g	2.26	2.36	23.60	24.6	-4.07		

SAR Room F

Dark Room

Date Tested	System Dipole		T.S. Liquid	Measured Results			Target (Ref. Value)	Delta ±10 %	Est./Zoom Ratio ±3 %	Plot No.	
	Type	Serial #		Area Scan	Zoom Scan	Normalize to 1 W					
6/24/2013	D5GHzV2 (5.6GHz)	1003	Head	1g	7.70	7.89	78.90	82.8	-4.71	-2.47	
				10g	2.12	2.27	22.70	23.6	-3.81		
6/24/2013	D5GHzV2 (5.6GHz)	1003	Body	1g	7.75	7.72	77.20	79.0	-2.28	0.39	
				10g	2.10	2.16	21.60	22.0	-1.82		
6/27/2013	D5GHzV2 (5.6GHz)	1003	Head	1g	7.78	8.34	83.40	82.8	0.72	-7.20	
				10g	2.16	2.38	23.80	23.6	0.85		
6/27/2013	D5GHzV2 (5.6GHz)	1003	Body	1g	7.93	7.99	79.90	79.0	1.14	-0.76	
				10g	2.14	2.25	22.50	22.0	2.27		
7/1/2013	D5GHzV2 (5.6GHz)	1003	Head	1g	8.27	8.17	81.70	82.8	-1.33	1.21	
				10g	2.30	2.34	23.40	23.6	-0.85		
7/1/2013	D5GHzV2 (5.6GHz)	1003	Body	1g	7.64	7.77	77.70	79.0	-1.65	-1.70	
				10g	2.09	2.20	22.00	22.0	0.00		
7/9/2013	D5GHzV2 (5.8GHz)	1138	Head	1g	7.56	8.16	81.60	78.7	3.68	-7.94	
				10g	2.11	2.38	23.80	22.4	6.25		
7/9/2013	D5GHzV2 (5.8GHz)	1138	Body	1g	7.41	7.62	76.20	72.8	4.67	-2.83	25,26
				10g	2.05	2.19	21.90	20.1	8.96		
7/12/2013	D5GHzV2 (5.8GHz)	1003	Head	1g	6.64	7.15	71.50	76.9	-7.02	-7.68	27,28
				10g	1.80	2.03	20.30	22.0	-7.73		
7/12/2013	D5GHzV2 (5.8GHz)	1003	Body	1g	7.68	7.71	77.10	77.0	0.13	-0.39	
				10g	2.13	2.21	22.10	21.4	3.27		
7/14/2013	D5GHzV2 (5.2GHz)	1003	Head	1g	7.82	8.00	80.00	76.50	4.58	-2.30	
				10g	2.19	2.32	23.20	21.90	5.94		

12. SAR Test Results

12.1. GSM850

12.1.1. Head Exposure Conditions

Test Position	Antenna	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
					Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Left Touch	UAT	Voice	190	836.6	33.2	33.2	0.314	0.314	0.147	0.147	
Left Tilt	UAT	Voice	190	836.6	33.2	33.2	0.138	0.138	0.058	0.058	
Right Touch	UAT	Voice	190	836.6	33.2	33.2	0.188	0.188	0.134	0.134	
Right Tilt	UAT	Voice	190	836.6	33.2	33.2	0.122	0.122	0.074	0.074	
Left Touch	UAT	GPRS 2 slots	190	836.6	32.2	32.2	0.445	0.445	0.317	0.317	
Left Tilt	UAT	GPRS 2 slots	190	836.6	32.2	32.2	0.247	0.247	0.164	0.164	
Right Touch	UAT	GPRS 2 slots	190	836.6	32.2	32.2	0.366	0.366	0.250	0.250	
Right Tilt	UAT	GPRS 2 slots	190	836.6	32.2	32.2	0.223	0.223	0.141	0.141	
Left Touch	LAT	Voice	190	836.6	33.5	33.5	0.637	0.637	0.481	0.481	
Left Tilt	LAT	Voice	190	836.6	33.5	33.5	0.318	0.318	0.242	0.242	
Right Touch	LAT	Voice	190	836.6	33.5	33.5	0.582	0.582	0.437	0.437	
Right Tilt	LAT	Voice	190	836.6	33.5	33.5	0.540	0.540	0.400	0.400	
Left Touch	LAT	GPRS 2 slots	128	824.2	32.5	32.4	0.965	0.987	0.728	0.745	
Left Touch	LAT	GPRS 2 slots	190	836.6	32.5	32.5	0.999	0.999	0.754	0.754	
Left Touch	LAT	GPRS 2 slots	251	848.8	32.5	32.5	1.190	1.190	0.888	0.888	1
Left Tilt	LAT	GPRS 2 slots	190	836.6	32.5	32.5	0.526	0.526	0.400	0.400	
Right Touch	LAT	GPRS 2 slots	128	824.2	32.5	32.4	0.890	0.911	0.652	0.667	
Right Touch	LAT	GPRS 2 slots	190	836.6	32.5	32.5	1.160	1.160	0.674	0.674	
Right Touch	LAT	GPRS 2 slots	251	848.8	32.5	32.5	1.100	1.100	0.822	0.822	
Right Tilt	LAT	GPRS 2 slots	190	836.6	32.5	32.5	0.532	0.532	0.397	0.397	

12.1.2. Body-worn Accessory Exposure Conditions

Test Position	Antenna	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Rear	UAT	Voice	5	190	836.6	33.2	33.2	0.121	0.121	0.077	0.077	
Front	UAT	Voice	5	190	836.6	33.2	33.2	0.099	0.099	0.070	0.070	
Rear	LAT	Voice	5	128	824.2	33.5	33.5	0.768	0.768	0.569	0.569	
Rear	LAT	Voice	5	190	836.6	33.5	33.5	0.847	0.847	0.642	0.642	
Rear	LAT	Voice	5	251	848.8	33.5	33.5	0.925	0.925	0.693	0.693	2
Front	LAT	Voice	5	128	824.2	33.5	33.5	0.699	0.699	0.535	0.535	
Front	LAT	Voice	5	190	836.6	33.5	33.5	0.834	0.834	0.646	0.646	
Front	LAT	Voice	5	251	848.8	33.5	33.5	0.855	0.855	0.656	0.656	

12.1.3. Hotspot Exposure Conditions

Test Position	Antenna	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Rear	UAT	GPRS 2 slots	5	190	836.6	32.2	32.2	0.251	0.251	0.181	0.181	
Front	UAT	GPRS 2 slots	5	190	836.6	32.2	32.2	0.200	0.200	0.142	0.142	
Edge 1	UAT	GPRS 2 slots	5	190	836.6	32.2	32.2	0.115	0.115	0.053	0.053	
Edge 2	UAT	GPRS 2 slots	5	190	836.6	32.2	32.2	0.217	0.217	0.146	0.146	
Edge 4	UAT	GPRS 2 slots	5	190	836.6	32.2	32.2	0.100	0.100	0.065	0.065	
Rear	LAT	GPRS 2 slots	5	128	824.2	31.0	31.0	1.010	1.010	0.758	0.758	
Rear	LAT	GPRS 2 slots	5	190	836.6	31.0	31.0	1.160	1.160	0.872	0.872	
Rear	LAT	GPRS 2 slots	5	251	848.8	31.0	31.0	1.180	1.180	0.878	0.878	3
Front	LAT	GPRS 2 slots	5	128	824.2	31.0	31.0	0.913	0.913	0.705	0.705	
Front	LAT	GPRS 2 slots	5	190	836.6	31.0	31.0	1.060	1.060	0.814	0.814	
Front	LAT	GPRS 2 slots	5	251	848.8	31.0	31.0	1.060	1.060	0.812	0.812	
Edge 2	LAT	GPRS 2 slots	5	128	824.2	31.0	31.0	0.679	0.679	0.452	0.452	
Edge 2	LAT	GPRS 2 slots	5	190	836.6	31.0	31.0	0.800	0.800	0.529	0.529	
Edge 2	LAT	GPRS 2 slots	5	251	848.8	31.0	31.0	0.792	0.792	0.522	0.522	
Edge 3	LAT	GPRS 2 slots	5	190	836.6	31.0	31.0	0.188	0.188	0.098	0.098	
Edge 4	LAT	GPRS 2 slots	5	128	824.2	31.0	31.0	1.020	1.020	0.686	0.686	
Edge 4	LAT	GPRS 2 slots	5	190	836.6	31.0	31.0	1.020	1.020	0.681	0.681	
Edge 4	LAT	GPRS 2 slots	5	251	848.8	31.0	31.0	1.020	1.020	0.681	0.681	

Note(s):

- Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
 - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
 - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
- With headset attached. According to KDB 648474 Section 2.3, when the reported SAR for body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

12.2. GSM1900

12.2.1. Head Exposure Conditions

Test Position	Antenna	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
					Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Left Touch	UAT	Voice	661	1880.0	30.9	30.9	0.349	0.349	0.181	0.181	
Left Tilt	UAT	Voice	661	1880.0	30.9	30.9	0.371	0.371	0.188	0.188	
Right Touch	UAT	Voice	661	1880.0	30.9	30.9	0.512	0.512	0.271	0.271	
Right Tilt	UAT	Voice	661	1880.0	30.9	30.9	0.436	0.436	0.228	0.228	
Left Touch	UAT	GPRS 2 slots	661	1880.0	29.9	29.9	0.470	0.470	0.233	0.233	
Left Tilt	UAT	GPRS 2 slots	661	1880.0	29.9	29.9	0.520	0.520	0.262	0.262	
Right Touch	UAT	GPRS 2 slots	661	1880.0	29.9	29.9	0.711	0.711	0.365	0.365	
Right Tilt	UAT	GPRS 2 slots	661	1880.0	29.9	29.9	0.615	0.615	0.317	0.317	
Left Touch	LAT	Voice	661	1880.0	31.5	31.5	0.490	0.490	0.317	0.317	
Left Tilt	LAT	Voice	661	1880.0	31.5	31.5	0.242	0.242	0.148	0.148	
Right Touch	LAT	Voice	512	1850.2	31.5	31.5	0.855	0.855	0.512	0.512	
Right Touch	LAT	Voice	661	1880.0	31.5	31.5	0.831	0.831	0.493	0.493	
Right Touch	LAT	Voice	810	1909.8	31.5	31.5	0.813	0.813	0.482	0.482	
Right Tilt	LAT	Voice	661	1880.0	31.5	31.5	0.223	0.223	0.142	0.142	
Left Touch	LAT	GPRS 2 slots	661	1880.0	29.5	29.5	0.594	0.594	0.393	0.393	
Left Tilt	LAT	GPRS 2 slots	661	1880.0	29.5	29.5	0.281	0.281	0.173	0.173	
Right Touch	LAT	GPRS 2 slots	512	1850.2	29.5	29.4	0.994	1.017	0.599	0.613	
Right Touch	LAT	GPRS 2 slots	661	1880.0	29.5	29.5	0.972	0.972	0.584	0.584	
Right Touch	LAT	GPRS 2 slots	810	1909.8	29.5	29.5	1.050	1.050	0.622	0.622	4
Right Tilt	LAT	GPRS 2 slots	661	1880.0	29.5	29.5	0.271	0.271	0.175	0.175	

12.2.2. Body-worn Accessory Exposure Conditions

Test Position	Antenna	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Rear	UAT	Rel. 99 RMC	5	661	1880.0	30.9	30.9	0.423	0.423	0.223	0.223	
Front	UAT	Rel. 99 RMC	5	661	1880.0	30.9	30.9	0.336	0.336	0.185	0.185	
Rear	LAT	Rel. 99 RMC	5	512	1850.2	31.25	31.20	0.890	0.900	0.516	0.522	
Rear	LAT	Rel. 99 RMC	5	661	1880.0	31.25	31.20	0.938	0.949	0.513	0.519	5
Rear	LAT	Rel. 99 RMC	5	810	1909.8	31.25	31.20	0.910	0.921	0.539	0.545	
Front	LAT	Rel. 99 RMC	5	512	1850.2	31.25	31.20	0.857	0.867	0.525	0.531	
Front	LAT	Rel. 99 RMC	5	661	1880.0	31.25	31.20	0.877	0.887	0.533	0.539	
Front	LAT	Rel. 99 RMC	5	810	1909.8	31.25	31.20	0.905	0.915	0.548	0.554	

12.2.3. Hotspot Exposure Conditions

Test Position	Antenna	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Rear	UAT	GPRS 2 slots	5	512	1850.2	29.9	29.9	0.912	0.912	0.484	0.484	
Rear	UAT	GPRS 2 slots	5	661	1880.0	29.9	29.9	0.878	0.878	0.457	0.457	
Rear	UAT	GPRS 2 slots	5	810	1909.8	29.9	29.9	0.830	0.830	0.421	0.421	
Front	UAT	GPRS 2 slots	5	661	1880.0	29.9	29.9	0.696	0.696	0.381	0.381	
Edge 1	UAT	GPRS 2 slots	5	661	1880.0	29.9	29.9	0.457	0.457	0.199	0.199	
Edge 2	UAT	GPRS 2 slots	5	661	1880.0	29.9	29.9	0.159	0.159	0.085	0.085	
Edge 4	UAT	GPRS 2 slots	5	661	1880.0	29.9	29.9	0.347	0.347	0.189	0.189	
Rear	LAT	GPRS 2 slots	5	512	1850.2	28.5	28.5	1.140	1.140	0.655	0.655	6
Rear	LAT	GPRS 2 slots	5	661	1880.0	28.5	28.5	1.100	1.100	0.643	0.643	
Rear	LAT	GPRS 2 slots	5	810	1909.8	28.5	28.5	1.100	1.100	0.649	0.649	
Front	LAT	GPRS 2 slots	5	512	1850.2	28.5	28.5	1.100	1.100	0.672	0.672	
Front	LAT	GPRS 2 slots	5	661	1880.0	28.5	28.5	1.110	1.110	0.671	0.671	
Front	LAT	GPRS 2 slots	5	810	1909.8	28.5	28.5	1.100	1.100	0.666	0.666	
Edge 2	LAT	GPRS 2 slots	5	512	1850.2	28.5	28.5	0.936	0.936	0.517	0.517	
Edge 2	LAT	GPRS 2 slots	5	661	1880.0	28.5	28.5	0.964	0.964	0.529	0.529	
Edge 2	LAT	GPRS 2 slots	5	810	1909.8	28.5	28.5	1.030	1.030	0.565	0.565	
Edge 3	LAT	GPRS 2 slots	5	661	1880.0	28.5	28.5	0.545	0.545	0.286	0.286	
Edge 4	LAT	GPRS 2 slots	5	661	1880.0	28.5	28.5	0.094	0.094	0.050	0.050	

Note(s):

- Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
 - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
 - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
- With headset attached. According to KDB 648474 Section 2.3, when the reported SAR for body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

12.3. W-CDMA Band 2

12.3.1. Head Exposure Conditions

Test Position	Antenna	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
					Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Left Touch	UAT	Rel. 99 RMC	9400	1880.0	23.0	23.0	0.548	0.548	0.295	0.295	
Left Tilt	UAT	Rel. 99 RMC	9400	1880.0	23.0	23.0	0.585	0.585	0.303	0.303	
Right Touch	UAT	Rel. 99 RMC	9262	1852.4	23.0	22.9	0.710	0.727	0.381	0.390	
Right Touch	UAT	Rel. 99 RMC	9400	1880.0	23.0	23.0	0.863	0.863	0.456	0.456	
Right Touch	UAT	Rel. 99 RMC	9538	1907.6	23.0	23.0	0.971	0.971	0.506	0.506	
Right Tilt	UAT	Rel. 99 RMC	9400	1880.0	23.0	23.0	0.721	0.721	0.378	0.378	
Left Touch	LAT	Rel. 99 RMC	9400	1880.0	23.0	23.0	0.493	0.493	0.334	0.334	
Left Tilt	LAT	Rel. 99 RMC	9400	1880.0	23.0	23.0	0.333	0.333	0.208	0.208	
Right Touch	LAT	Rel. 99 RMC	9262	1852.4	23.0	23.0	0.973	0.973	0.598	0.598	
Right Touch	LAT	Rel. 99 RMC	9400	1880.0	23.0	23.0	1.120	1.120	0.682	0.682	7
Right Touch	LAT	Rel. 99 RMC	9538	1907.6	23.0	22.9	0.976	0.999	0.592	0.606	
Right Tilt	LAT	Rel. 99 RMC	9400	1880.0	23.0	23.0	0.321	0.321	0.203	0.203	

Note(s):

- Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
 - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
 - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
- With headset attached. According to KDB 648474 Section 2.3, when the reported SAR for body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

12.3.2. Body-worn Accessory & Hotspot Exposure Conditions

KDB 941225 D01 – Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit. (pg.12)

Body-worn Accessory & Hotspot Exposure Conditions

Test Position	Antenna	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Rear	UAT	Rel. 99 RMC	5	9262	1852.4	23.9	23.9	0.737	0.737	0.389	0.389	
Rear	UAT	Rel. 99 RMC	5	9400	1880.0	23.9	23.9	0.883	0.883	0.459	0.459	
Rear	UAT	Rel. 99 RMC	5	9538	1907.6	23.9	23.8	0.732	0.749	0.371	0.380	
Front	UAT	Rel. 99 RMC	5	9400	1880.0	23.9	23.9	0.700	0.700	0.379	0.379	
Rear	LAT	Rel. 99 RMC	5	9262	1852.4	21.25	21.25	1.010	1.010	0.580	0.580	
Rear	LAT	Rel. 99 RMC	5	9400	1880.0	21.25	21.25	1.150	1.150	0.664	0.664	8
Rear	LAT	Rel. 99 RMC	5	9538	1907.6	21.25	21.25	1.120	1.120	0.647	0.647	
Front	LAT	Rel. 99 RMC	5	9262	1852.4	21.25	21.25	1.000	1.000	0.608	0.608	
Front	LAT	Rel. 99 RMC	5	9400	1880.0	21.25	21.25	1.040	1.040	0.634	0.634	
Front	LAT	Rel. 99 RMC	5	9538	1907.6	21.25	21.25	1.040	1.040	0.626	0.626	

Hotspot Exposure Conditions

Test Position	Antenna	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Edge 1	UAT	Rel. 99 RMC	5	9400	1880.0	23.9	23.9	0.473	0.473	0.204	0.204	
Edge 2	UAT	Rel. 99 RMC	5	9400	1880.0	23.9	23.9	0.210	0.210	0.112	0.112	
Edge 4	UAT	Rel. 99 RMC	5	9400	1880.0	23.9	23.9	0.431	0.431	0.233	0.233	
Edge 2	LAT	Rel. 99 RMC	5	9262	1852.4	21.25	21.25	0.854	0.854	0.470	0.470	
Edge 2	LAT	Rel. 99 RMC	5	9400	1880.0	21.25	21.25	0.948	0.948	0.522	0.522	
Edge 2	LAT	Rel. 99 RMC	5	9538	1907.6	21.25	21.25	0.918	0.918	0.503	0.503	
Edge 3	LAT	Rel. 99 RMC	5	9400	1880.0	21.25	21.25	0.657	0.657	0.349	0.349	
Edge 4	LAT	Rel. 99 RMC	5	9400	1880.0	21.25	21.25	0.102	0.102	0.055	0.055	

Note(s):

- Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
 - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
 - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
- With headset attached. According to KDB 648474 Section 2.3, when the reported SAR for body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

12.4. W-CDMA Band 5

12.4.1. Head Exposure Conditions

Test Position	Antenna	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
					Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Left Touch	UAT	Rel. 99 RMC	4183	836.6	24.2	24.2	0.700	0.700	0.521	0.521	
Left Tilt	UAT	Rel. 99 RMC	4183	836.6	24.2	24.2	0.354	0.354	0.269	0.269	
Right Touch	UAT	Rel. 99 RMC	4183	836.6	24.2	24.2	0.681	0.681	0.508	0.508	
Right Tilt	UAT	Rel. 99 RMC	4183	836.6	24.2	24.2	0.362	0.362	0.274	0.274	
Left Touch	LAT	Rel. 99 RMC	4183	836.6	24.5	24.5	0.726	0.726	0.538	0.538	9
Left Tilt	LAT	Rel. 99 RMC	4183	836.6	24.5	24.5	0.442	0.442	0.327	0.327	
Right Touch	LAT	Rel. 99 RMC	4183	836.6	24.5	24.5	0.637	0.637	0.471	0.471	
Right Tilt	LAT	Rel. 99 RMC	4183	836.6	24.5	24.5	0.433	0.433	0.321	0.321	

12.4.2. Body-worn Accessory & Hotspot Exposure Conditions

KDB 941225 D01 – Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit. (pg.12)

Body-worn Accessory & Hotspot Exposure Conditions

Test Position	Antenna	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Rear	UAT	Rel. 99 RMC	5	4183	836.6	24.2	24.2	0.124	0.124	0.072	0.072	
Front	UAT	Rel. 99 RMC	5	4183	836.6	24.2	24.2	0.100	0.100	0.059	0.059	
Rear	LAT	Rel. 99 RMC	5	4132	826.4	24.5	24.4	0.946	0.968	0.694	0.710	10
Rear	LAT	Rel. 99 RMC	5	4183	836.6	24.5	24.5	0.905	0.905	0.664	0.664	
Rear	LAT	Rel. 99 RMC	5	4233	846.6	24.5	24.3	0.915	0.958	0.665	0.696	
Front	LAT	Rel. 99 RMC	5	4132	826.4	24.5	24.4	0.898	0.919	0.694	0.710	
Front	LAT	Rel. 99 RMC	5	4183	836.6	24.5	24.5	0.844	0.844	0.651	0.651	
Front	LAT	Rel. 99 RMC	5	4233	846.6	24.5	24.3	0.827	0.866	0.637	0.667	

Hotspot Exposure Conditions

Test Position	Antenna	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Edge 1	UAT	Rel. 99 RMC	5	4183	836.6	24.2	24.2	0.068	0.068	0.030	0.030	
Edge 2	UAT	Rel. 99 RMC	5	4183	836.6	24.2	24.2	0.120	0.120	0.080	0.080	
Edge 4	UAT	Rel. 99 RMC	5	4183	836.6	24.2	24.2	0.116	0.116	0.077	0.077	
Edge 2	LAT	Rel. 99 RMC	5	4183	836.6	24.5	24.5	0.686	0.686	0.454	0.454	
Edge 3	LAT	Rel. 99 RMC	5	4183	836.6	24.5	24.5	0.178	0.178	0.090	0.090	
Edge 4	LAT	Rel. 99 RMC	5	4132	826.4	24.5	24.4	0.981	1.004	0.659	0.674	
Edge 4	LAT	Rel. 99 RMC	5	4183	836.6	24.5	24.5	0.855	0.855	0.572	0.572	
Edge 4	LAT	Rel. 99 RMC	5	4233	846.6	24.5	24.3	1.080	1.131	0.722	0.756	11

Note(s):

- Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
 - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
 - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
- With headset attached. According to KDB 648474 Section 2.3, when the reported SAR for body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

12.5. LTE Band 2 (20MHz Bandwidth)

12.5.1. Head Exposure Conditions

Test Position	Antenna	Mode	UL Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	Meas. Pwr (dBm)	1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
								Meas.	Scaled	Meas.	Scaled	
Left Touch	UAT	QPSK	18900	1880.0	1	49	23.0	0.444	0.444	0.224	0.224	
					50	24	22.0	0.341	0.341	0.173	0.173	
Left Tilt	UAT	QPSK	18900	1880.0	1	49	23.0	0.483	0.483	0.245	0.245	
					50	24	22.0	0.376	0.376	0.189	0.189	
Right Touch	UAT	QPSK	18900	1880.0	1	49	23.0	0.609	0.609	0.323	0.323	
					50	24	22.0	0.474	0.474	0.250	0.250	
Right Tilt	UAT	QPSK	18900	1880.0	1	49	23.0	0.542	0.542	0.287	0.287	
					50	24	22.0	0.421	0.421	0.223	0.223	
Left Touch	LAT	QPSK	18900	1880.0	1	49	23.0	0.693	0.693	0.449	0.449	
					50	24	22.1	0.548	0.548	0.355	0.355	
Left Tilt	LAT	QPSK	18900	1880.0	1	49	23.0	0.506	0.506	0.303	0.303	
					50	24	22.1	0.396	0.396	0.236	0.236	
Right Touch	LAT	QPSK	18700	1860.0	1	49	22.9	1.130	1.156	0.693	0.709	
					50	24	21.9	0.870	0.870	0.534	0.534	
			18900	1880.0	1	49	23.0	1.170	1.170	0.705	0.705	12
					50	24	22.1	0.900	0.900	0.550	0.550	
					100	0	22.1	0.892	0.892	0.543	0.543	
			19100	1900.0	1	49	23.0	1.150	1.150	0.692	0.692	
					50	24	22.2	0.880	0.880	0.531	0.531	
Right Tilt	LAT	QPSK	18900	1880.0	1	49	23.0	0.496	0.496	0.306	0.306	
					50	24	22.1	0.395	0.395	0.243	0.243	

12.5.2. Body-worn Accessory & Hotspot Exposure Conditions

Body-worn Accessory & Hotspot Exposure Conditions

Test Position	Antenna	Mode	Dist. (mm)	UL Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	Meas. Pwr (dBm)	1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
									Meas.	Scaled	Meas.	Scaled	
Rear	UAT	QPSK	5	18900	1880.0	1	49	23.4	0.597	0.597	0.327	0.327	
						50	24	21.9	0.452	0.452	0.246	0.246	
Front	UAT	QPSK	5	18900	1880.0	1	49	23.4	0.509	0.509	0.286	0.286	
						50	24	21.9	0.410	0.410	0.229	0.229	
Rear	LAT	QPSK	5	18700	1860.0	1	49	21.0	0.782	0.782	0.460	0.460	
						50	24	19.9	0.622	0.622	0.364	0.364	
				18900	1880.0	1	49	21.0	0.899	0.899	0.528	0.528	
						50	24	19.9	0.703	0.703	0.417	0.417	
						100	0	19.8	0.686	0.686	0.404	0.404	
				19100	1900.0	1	49	21.0	0.832	0.832	0.493	0.493	
50	24	19.8	0.665			0.665	0.393	0.393					
Front	LAT	QPSK	5	18700	1860.0	1	49	21.0	0.943	0.943	0.577	0.577	
						50	24	19.9	0.741	0.741	0.453	0.453	
				18900	1880.0	1	49	21.0	0.863	0.863	0.530	0.530	
						50	24	19.9	0.823	0.823	0.499	0.499	
						100	0	19.8	0.799	0.799	0.486	0.486	
				19100	1900.0	1	49	21.0	0.951	0.951	0.579	0.579	13
50	24	19.8	0.761			0.761	0.462	0.462					

Hotspot Exposure Conditions

Test Position	Antenna	Mode	Dist. (mm)	UL Ch #	Freq. (MHz)	UL RB Allocation	UL RB Start	Meas. Pwr (dBm)	1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
									Meas.	Scaled	Meas.	Scaled	
Edge 1	UAT	QPSK	5	18900	1880.0	1	49	23.4	0.452	0.452	0.196	0.196	
						50	24	21.9	0.340	0.340	0.146	0.146	
Edge 2	UAT	QPSK	5	18900	1880.0	1	49	23.4	0.123	0.123	0.067	0.067	
						50	24	21.9	0.095	0.095	0.052	0.052	
Edge 4	UAT	QPSK	5	18900	1880.0	1	49	23.4	0.331	0.331	0.180	0.180	
						50	24	21.9	0.246	0.246	0.134	0.134	
Edge 2	LAT	QPSK	5	18900	1880.0	1	49	21.0	0.774	0.774	0.427	0.427	
						50	24	19.9	0.615	0.615	0.338	0.338	
Edge 3	LAT	QPSK	5	18900	1880.0	1	49	21.0	0.447	0.447	0.234	0.234	
						50	24	19.9	0.351	0.351	0.184	0.184	
Edge 4	LAT	QPSK	5	18900	1880.0	1	49	21.0	0.104	0.104	0.055	0.055	
						50	24	19.9	0.082	0.082	0.044	0.044	

Note(s):

- Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
 - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
 - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
- Per KDB 941225 D05 SAR for LTE Devices, SAR test reduction is applied using the following criteria:
 - Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
 - Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are ≥ 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
 - Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
 - Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.
- With headset attached. According to KDB 648474 Section 2.3, when the reported SAR for body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

12.6. LTE Band 5 (10MHz Bandwidth)

12.6.1. Head Exposure Conditions

Test Position	Antenna	Mode	UL Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	Meas. Pwr (dBm)	1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
								Meas.	Scaled	Meas.	Scaled	
Left Touch	UAT	QPSK	20525	836.6	1	24	23.7	0.166	0.166	0.117	0.117	
					25	12	22.7	0.136	0.136	0.094	0.094	
Left Tilt	UAT	QPSK	20525	836.6	1	24	23.7	0.110	0.110	0.063	0.063	
					25	12	22.7	0.096	0.096	0.056	0.056	
Right Touch	UAT	QPSK	20525	836.6	1	24	23.7	0.147	0.147	0.096	0.096	
					25	12	22.7	0.116	0.116	0.075	0.075	
Right Tilt	UAT	QPSK	20525	836.6	1	24	23.7	0.089	0.089	0.049	0.049	
					25	12	22.7	0.071	0.071	0.038	0.038	
Left Touch	LAT	QPSK	20525	836.6	1	24	24.0	0.566	0.566	0.424	0.424	
					25	12	22.7	0.529	0.529	0.394	0.394	
Left Tilt	LAT	QPSK	20525	836.6	1	24	24.0	0.362	0.362	0.270	0.270	
					25	12	22.7	0.324	0.324	0.241	0.241	
Right Touch	LAT	QPSK	20525	836.6	1	24	24.0	0.591	0.591	0.435	0.435	14
					25	12	22.7	0.519	0.519	0.382	0.382	
Right Tilt	LAT	QPSK	20525	836.6	1	24	24.0	0.396	0.396	0.295	0.295	
					25	12	22.7	0.310	0.310	0.231	0.231	

12.6.2. Body-worn Accessory & Hotspot Exposure Conditions

Body-worn Accessory & Hotspot Exposure Conditions

Test Position	Antenna	Mode	Dist. (mm)	UL Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	Meas. Pwr (dBm)	1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
									Meas.	Scaled	Meas.	Scaled	
Rear	UAT	QPSK	5	20525	836.6	1	24	23.7	0.117	0.117	0.071	0.071	
						25	12	22.7	0.089	0.089	0.054	0.054	
Front	UAT	QPSK	5	20525	836.6	1	24	23.7	0.075	0.075	0.047	0.047	
						25	12	22.7	0.057	0.057	0.036	0.036	
Rear	LAT	QPSK	5	20450	829.0	1	24	24.0	0.707	0.707	0.519	0.519	
				20525	836.6	1	24	24.0	0.926	0.926	0.679	0.679	15
						25	12	23.0	0.722	0.722	0.528	0.528	
						50	0	23.0	0.709	0.709	0.518	0.518	
				20600	844.0	1	24	23.7	0.765	0.765	0.554	0.554	
Front	LAT	QPSK	5	20450	829.0	1	24	24.0	0.689	0.689	0.531	0.531	
				20525	836.6	1	24	24.0	0.863	0.863	0.665	0.665	
						25	12	23.0	0.687	0.687	0.528	0.528	
						50	0	23.0	0.665	0.665	0.513	0.513	
				20600	844.0	1	24	23.7	0.912	0.912	0.703	0.703	

Hotspot Exposure Conditions

Test Position	Antenna	Mode	Dist. (mm)	UL Ch #	Freq. (MHz)	UL RB Allocation	UL RB Start	Meas. Pwr (dBm)	1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
									Meas.	Scaled	Meas.	Scaled	
Edge 1	UAT	QPSK	5	20525	836.6	1	24	23.7	0.054	0.054	0.024	0.024	
						25	12	22.7	0.042	0.042	0.018	0.018	
Edge 2	UAT	QPSK	5	20525	836.6	1	24	23.7	0.121	0.121	0.081	0.081	
						25	12	22.7	0.091	0.091	0.061	0.061	
Edge 4	UAT	QPSK	5	20525	836.6	1	24	23.7	0.024	0.024	0.015	0.015	
						25	12	22.7	0.020	0.020	0.011	0.011	
Edge 2	LAT	QPSK	5	20525	836.6	1	24	24.0	0.675	0.675	0.448	0.448	
						25	12	23.0	0.516	0.516	0.341	0.341	
Edge 3	LAT	QPSK	5	20525	836.6	1	24	24.0	0.201	0.201	0.104	0.104	
						25	12	23.0	0.159	0.159	0.082	0.082	
Edge 4	LAT	QPSK	5	20450	829.0	1	24	24.0	0.923	0.923	0.619	0.619	
				20525	836.6	1	24	24.0	0.920	0.920	0.615	0.615	
						25	12	23.0	0.711	0.711	0.476	0.476	
						50	0	23.0	0.719	0.719	0.480	0.480	
				20600	844.0	1	24	23.7	0.826	0.826	0.551	0.551	

Note(s):

- Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
 - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
 - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
- Per KDB 941225 D05 SAR for LTE Devices, SAR test reduction is applied using the following criteria:
 - Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
 - Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are ≥ 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
 - Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
 - Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.
- With headset attached. According to KDB 648474 Section 2.3, when the reported SAR for body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

12.7. Wi-Fi (DTS Band)

12.7.1. Head Exposure Conditions

WiFi Vendor	Band	Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Vendor A	2.4GHz	Left Touch	802.11b	6	2437	17.0	17.0	0.256	0.256	0.129	0.129	16
		Left Tilt	802.11b	6	2437	17.0	17.0	0.155	0.155	0.079	0.079	
		Right Touch	802.11b	6	2437	17.0	17.0	0.576	0.576	0.270	0.270	
		Right Tilt	802.11b	6	2437	17.0	17.0	0.327	0.327	0.161	0.161	
Vendor B	2.4GHz	Left Touch	802.11b	6	2437	17.0	17.0	0.222	0.222	0.110	0.110	
		Left Tilt	802.11b	6	2437	17.0	17.0	0.124	0.124	0.063	0.063	
		Right Touch	802.11b	6	2437	17.0	17.0	0.494	0.494	0.233	0.233	
		Right Tilt	802.11b	6	2437	17.0	17.0	0.256	0.256	0.124	0.124	
Vendor A	5.8GHz	Left Touch	802.11a	157	5785	14.5	14.5	0.223	0.223	0.079	0.079	
		Left Tilt	802.11a	157	5785	14.5	14.5	0.231	0.231	0.127	0.127	
		Right Touch	802.11a	157	5785	14.5	14.5	0.207	0.207	0.054	0.054	
		Right Tilt	802.11a	157	5785	14.5	14.5	0.150	0.150	0.040	0.040	
Vendor B	5.8GHz	Left Touch	802.11a	157	5785	14.5	14.5	0.465	0.465	0.143	0.143	17
		Left Tilt	802.11a	157	5785	14.5	14.5	0.403	0.403	0.125	0.125	
		Right Touch	802.11a	157	5785	14.5	14.5	0.270	0.270	0.062	0.062	
		Right Tilt	802.11a	157	5785	14.5	14.5	0.235	0.235	0.060	0.060	

12.7.2. Body-worn Accessory & Hotspot Mode Exposure Conditions

Body-worn Accessory & Hotspot Mode Exposure Conditions

WiFi Vendor	Band	Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
							Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Vendor A	2.4GHz	Rear	802.11b	5	6	2437	17.0	17.0	0.451	0.451	0.189	0.189	
		Front	802.11b	5	6	2437	17.0	17.0	0.155	0.155	0.080	0.080	
Vendor B	2.4GHz	Rear	802.11b	5	6	2437	17.0	17.0	0.536	0.536	0.225	0.225	18
		Front	802.11b	5	6	2437	17.0	17.0	0.186	0.186	0.096	0.096	

Body-worn Accessory Exposure Conditions

WiFi Vendor	Band	Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
							Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Vendor A	5.8GHz	Rear	802.11a	5	157	5785	14.5	14.5	0.405	0.405	0.140	0.140	
		Front	802.11a	5	157	5785	14.5	14.5	0.275	0.275	0.092	0.092	
Vendor B	5.8GHz	Rear	802.11a	5	157	5785	14.5	14.5	0.518	0.518	0.177	0.177	19
		Front	802.11a	5	157	5785	14.5	14.5	0.264	0.264	0.089	0.089	

Hotspot Mode Exposure Conditions

WiFi Vendor	Band	Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
							Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Vendor A	2.4GHz	Edge 1	802.11b	5	6	2437	17.0	17.0	0.088	0.088	0.041	0.041	
		Edge 2	802.11b	5	6	2437	17.0	17.0	0.029	0.029	0.010	0.010	
		Edge 4	802.11b	5	6	2437	17.0	17.0	0.300	0.300	0.150	0.150	
Vendor B	2.4GHz	Edge 1	802.11b	5	6	2437	17.0	17.0	0.079	0.079	0.037	0.037	
		Edge 2	802.11b	5	6	2437	17.0	17.0	0.017	0.017	0.006	0.006	
		Edge 4	802.11b	5	6	2437	17.0	17.0	0.288	0.288	0.143	0.143	

Note(s):

- Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
 - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
 - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

12.8. Wi-Fi (UNII Bands)

12.8.1. Head Exposure Conditions

WiFi Vendor	Band	Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Vendor A	5.2GHz	Left Touch	802.11a	48	5240	14.0	14.0	0.255	0.255	0.075	0.075	20
		Left Tilt	802.11a	48	5240	14.0	14.0	0.135	0.135	0.041	0.041	
		Right Touch	802.11a	48	5240	14.0	14.0	0.338	0.338	0.094	0.094	
		Right Tilt	802.11a	48	5240	14.0	14.0	0.220	0.220	0.063	0.063	
	5.3GHz	Left Touch	802.11a	52	5260	16.0	16.0	0.383	0.383	0.110	0.110	21
		Left Tilt	802.11a	52	5260	16.0	16.0	0.207	0.207	0.062	0.062	
		Right Touch	802.11a	52	5260	16.0	16.0	0.521	0.521	0.149	0.149	
		Right Tilt	802.11a	52	5260	16.0	16.0	0.342	0.342	0.100	0.100	
	5.5GHz	Left Touch	802.11a	104	5520	14.0	14.0	0.228	0.228	0.076	0.076	
				116	5580	14.0	14.0	0.208	0.208	0.067	0.067	
				124	5620	14.0	14.0	0.212	0.212	0.075	0.075	
				136	5680	14.0	14.0	0.245	0.245	0.085	0.085	
		Left Tilt	802.11a	104	5520	14.0	14.0	0.215	0.215	0.073	0.073	
				116	5580	14.0	14.0	0.215	0.215	0.063	0.063	
				124	5620	14.0	14.0	0.204	0.204	0.073	0.073	
				136	5680	14.0	14.0	0.208	0.208	0.063	0.063	
		Right Touch	802.11a	104	5520	14.0	14.0	0.386	0.386	0.111	0.111	
				116	5580	14.0	14.0	0.372	0.372	0.109	0.109	
				124	5620	14.0	14.0	0.545	0.545	0.155	0.155	
				136	5680	14.0	14.0	0.439	0.439	0.119	0.119	
		Right Tilt	802.11a	104	5520	14.0	14.0	0.315	0.315	0.092	0.092	
				116	5580	14.0	14.0	0.297	0.297	0.090	0.090	
				124	5620	14.0	14.0	0.389	0.389	0.108	0.108	
				136	5680	14.0	14.0	0.351	0.351	0.099	0.099	

WiFi Vendor	Band	Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Vendor B	5.2GHz	Left Touch	802.11a	48	5240	14.0	14.0	0.204	0.204	0.056	0.056	
		Left Tilt	802.11a	48	5240	14.0	14.0	0.130	0.130	0.035	0.035	
		Right Touch	802.11a	48	5240	14.0	14.0	0.156	0.156	0.041	0.041	
		Right Tilt	802.11a	48	5240	14.0	14.0	0.158	0.158	0.041	0.041	
	5.3GHz	Left Touch	802.11a	52	5260	16.0	16.0	0.331	0.331	0.092	0.092	
		Left Tilt	802.11a	52	5260	16.0	16.0	0.178	0.178	0.049	0.049	
		Right Touch	802.11a	52	5260	16.0	16.0	0.432	0.432	0.110	0.110	
		Right Tilt	802.11a	52	5260	16.0	16.0	0.238	0.238	0.062	0.062	
	5.5GHz	Left Touch	802.11a	104	5520	14.0	14.0	0.285	0.285	0.088	0.088	
				116	5580	14.0	14.0	0.305	0.305	0.159	0.159	
				124	5620	14.0	14.0	0.282	0.282	0.090	0.090	
				136	5680	14.0	14.0	0.334	0.334	0.112	0.112	
		Left Tilt	802.11a	104	5520	14.0	14.0	0.211	0.211	0.068	0.068	
				116	5580	14.0	14.0	0.199	0.199	0.099	0.099	
				124	5620	14.0	14.0	0.302	0.302	0.100	0.100	
				136	5680	14.0	14.0	0.307	0.307	0.095	0.095	
		Right Touch	802.11a	104	5520	14.0	14.0	0.520	0.520	0.139	0.139	
				116	5580	14.0	14.0	0.459	0.459	0.145	0.145	
				124	5620	14.0	14.0	0.590	0.590	0.156	0.156	22
				136	5680	14.0	14.0	0.503	0.503	0.136	0.136	
		Right Tilt	802.11a	104	5520	14.0	14.0	0.374	0.374	0.101	0.101	
				116	5580	14.0	14.0	0.383	0.383	0.119	0.119	
				124	5620	14.0	14.0	0.434	0.434	0.116	0.116	
				136	5680	14.0	14.0	0.393	0.393	0.112	0.112	

12.8.2. Body-worn Accessory Exposure Conditions

WiFi Vendor	Band	Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
							Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Vendor A	5.2GHz	Rear	802.11a	5	48	5240	14.0	14.0	0.326	0.326	0.091	0.091	23
		Front	802.11a	5	48	5240	14.0	14.0	0.141	0.141	0.038	0.038	
	5.3GHz	Rear	802.11a	5	52	5260	16.0	16.0	0.529	0.529	0.153	0.153	
		Front	802.11a	5	52	5260	16.0	16.0	0.194	0.194	0.057	0.057	
	5.5GHz	Rear	802.11a	5	104	5520	14.0	14.0	0.506	0.506	0.170	0.170	
					116	5580	14.0	14.0	0.369	0.369	0.128	0.128	
					124	5620	14.0	14.0	0.508	0.508	0.161	0.161	24
					136	5680	14.0	14.0	0.503	0.503	0.165	0.165	
		Front	802.11a	5	124	5620	14.0	14.0	0.208	0.208	0.071	0.071	
Vendor B	5.2GHz	Rear	802.11a	5	48	5240	14.0	14.0	0.321	0.321	0.092	0.092	
		Front	802.11a	5	48	5240	14.0	14.0	0.095	0.095	0.026	0.026	
	5.3GHz	Rear	802.11a	5	52	5260	16.0	16.0	0.561	0.561	0.160	0.160	25
		Front	802.11a	5	52	5260	16.0	16.0	0.170	0.170	0.047	0.047	
	5.5GHz	Rear	802.11a	5	104	5520	14.0	14.0	0.469	0.469	0.154	0.154	
					116	5580	14.0	14.0	0.465	0.465	0.158	0.158	
					124	5620	14.0	14.0	0.416	0.416	0.137	0.137	
					136	5680	14.0	14.0	0.493	0.493	0.146	0.146	
		Front	802.11a	5	124	5620	14.0	14.0	0.198	0.198	0.065	0.065	

12.9. Bluetooth

12.9.1. Body-worn Accessory Exposure Considerations

WiFi Vendor	Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Vendor A	Rear	GFSK	5	39	2441	13.0	12.8	0.012	0.013	0.003	0.003	
	Front	GFSK	5	39	2441	13.0	12.8	0.004	0.005	0.001	0.001	
Vendor B	Rear	GFSK	5	39	2441	13.0	12.8	0.015	0.016	0.004	0.005	26
	Front	GFSK	5	39	2441	13.0	12.8	0.005	0.005	0.001	0.001	

Note(s):

- Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
 - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
 - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

13. SAR Measurement Variability

In accordance with published RF Exposure KDB procedure 865664 D01 SAR measurement 100 MHz to 6 GHz v01. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

- 1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.
- 2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
- 3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
- 4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

13.1. The Highest Measured SAR Configuration in Each Frequency Band

Frequency Band (MHz)	Air Interface	Head	Body-worn Accessory	Hotspot
850	GSM 850	1.190 W/kg		
	W-CDMA Band 5			
	LTE Band 5			
1900	GSM 1900			
	W-CDMA Band 2			
	LTE Band 2	1.170 W/kg		
2400	WiFi 802.11b/g/n	< 0.80 W/kg	< 0.80 W/kg	< 0.80 W/kg
	Bluetooth	< 0.80 W/kg	< 0.80 W/kg	< 0.80 W/kg
5000	WiFi 802.11a/n	< 0.80 W/kg	< 0.80 W/kg	< 0.80 W/kg

13.2. Repeated Measurement Results

Head Exposure Condition

Frequency band	Test Position	Antenna	Mode	Ch #.	Freq. (MHz)	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio	Note
						Original	Repeated		
GSM850	Left Touch	LAT	GPRS 2 slots	251	848.8	1.190	1.150	1.03	1
LTE Band 2	Right Touch	LAT	QPSK RB1/49	18900	1880.0	1.170	1.140	1.03	1

Body-worn Accessory Exposure Condition

N/A

Hotspot Exposure Condition

N/A

Note(s):

1. Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the original and first repeated measurement is not > 1.20.

14. 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:

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

14.1. Sum of the SAR for GSM850 (UAT) + WiFi DTS & UNII Band & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		GSM 850	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.445	0.465			0.910	No
		0.445		0.383		0.828	No
	Left Tilt	0.247	0.403			0.650	No
		0.247		0.307		0.554	No
	Right Touch	0.366	0.576			0.942	No
		0.366		0.590		0.956	No
	Right Tilt	0.223	0.327			0.550	No
		0.223		0.434		0.657	No
Body-worn Accessory & Hotspot	Rear	0.251	0.536			0.787	No
		0.251		0.561		0.812	No
		0.251			0.016	0.267	No
	Front	0.200	0.275			0.475	No
		0.200		0.208		0.408	No
		0.200			0.005	0.205	No
Hotspot	Edge 1	0.115	0.088			0.203	No
	Edge 2	0.217	0.029			0.246	No
	Edge 3	0	0			0	No
	Edge 4	0.100	0.300			0.400	No

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.2. Sum of the SAR for GSM850 (LAT) + WiFi DTS & UNII Band & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		GSM 850	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	1.190	0.465			1.655	Yes
		1.190		0.383		1.573	No
	Left Tilt	0.529	0.403			0.932	No
		0.529		0.307		0.836	No
	Right Touch	1.160	0.576			1.736	Yes
		1.160		0.590		1.750	Yes
	Right Tilt	0.540	0.327			0.867	No
		0.540		0.434		0.974	No
Body-worn Accessory & Hotspot	Rear	1.180	0.536			1.716	Yes
		1.180		0.561		1.741	Yes
		1.180			0.016	1.196	No
	Front	1.060	0.275			1.335	No
		1.060		0.208		1.268	No
		1.060			0.005	1.065	No
Hotspot	Edge 1	0	0.088			0.088	No
	Edge 2	0.800	0.029			0.829	No
	Edge 3	0.188	0			0.188	No
	Edge 4	1.020	0.300			1.320	No

SAR to Peak Location Separation Ratio (SPLSR)

Case #	RF Exposure conditions	Test Position	Worst-case combination			Σ 1-g SAR (mW/g)	Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
			GSM 1900	WiFi DTS Band	WiFi UNII Band					
1	Head	Left Touch	1.190	0.465		1.655	69.9	0.030	No	1
		Right Touch	1.160	0.576		1.736	58.0	0.039	No	2
			1.160		0.590	1.750	71.1	0.033	No	3
	Body-worn Accessory & Hotspot	Rear	1.180	0.536		1.716	86.9	0.026	No	4
			1.180		0.561	1.741	81.0	0.028	No	5

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.

Figure (1)

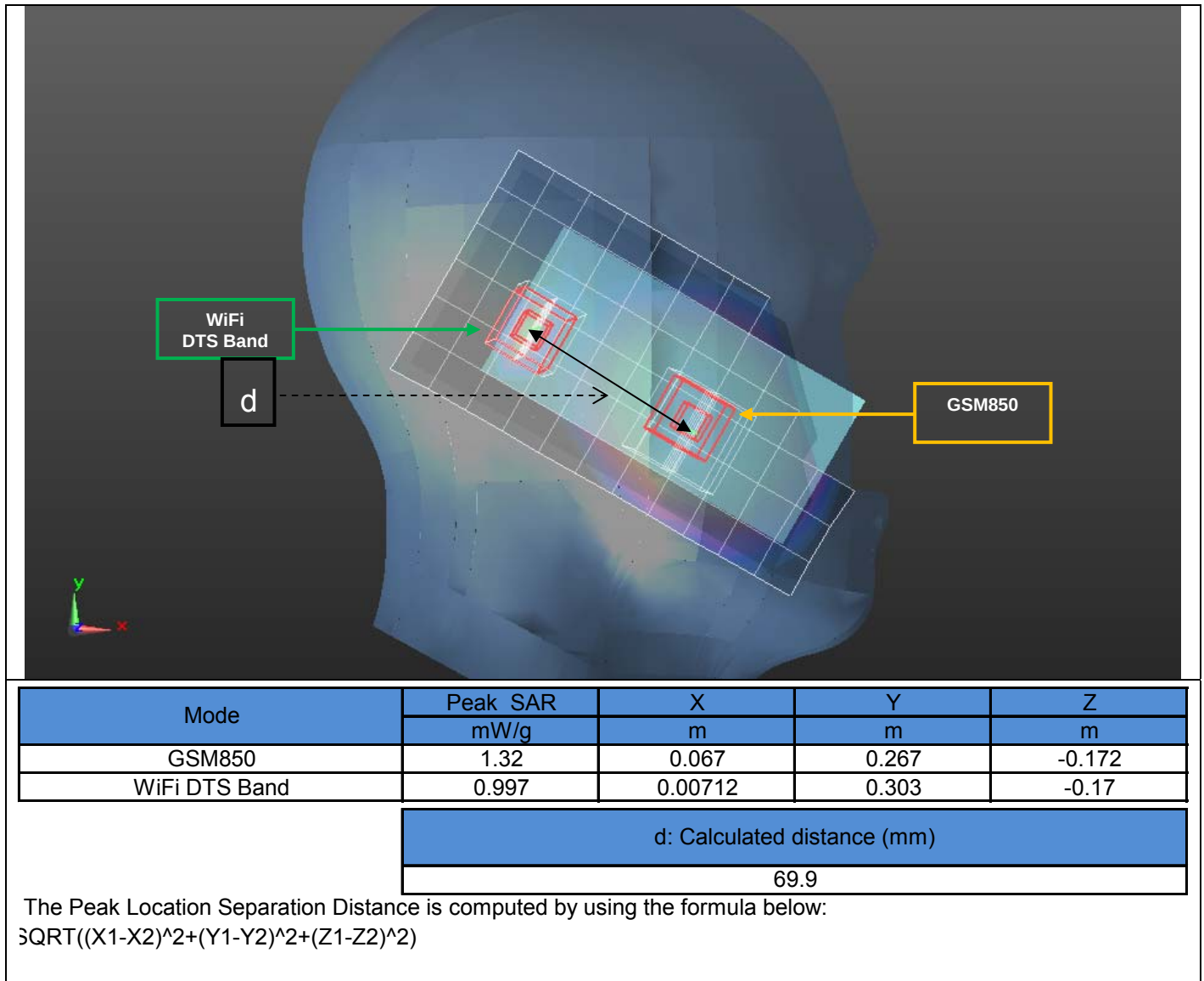


Figure (2)

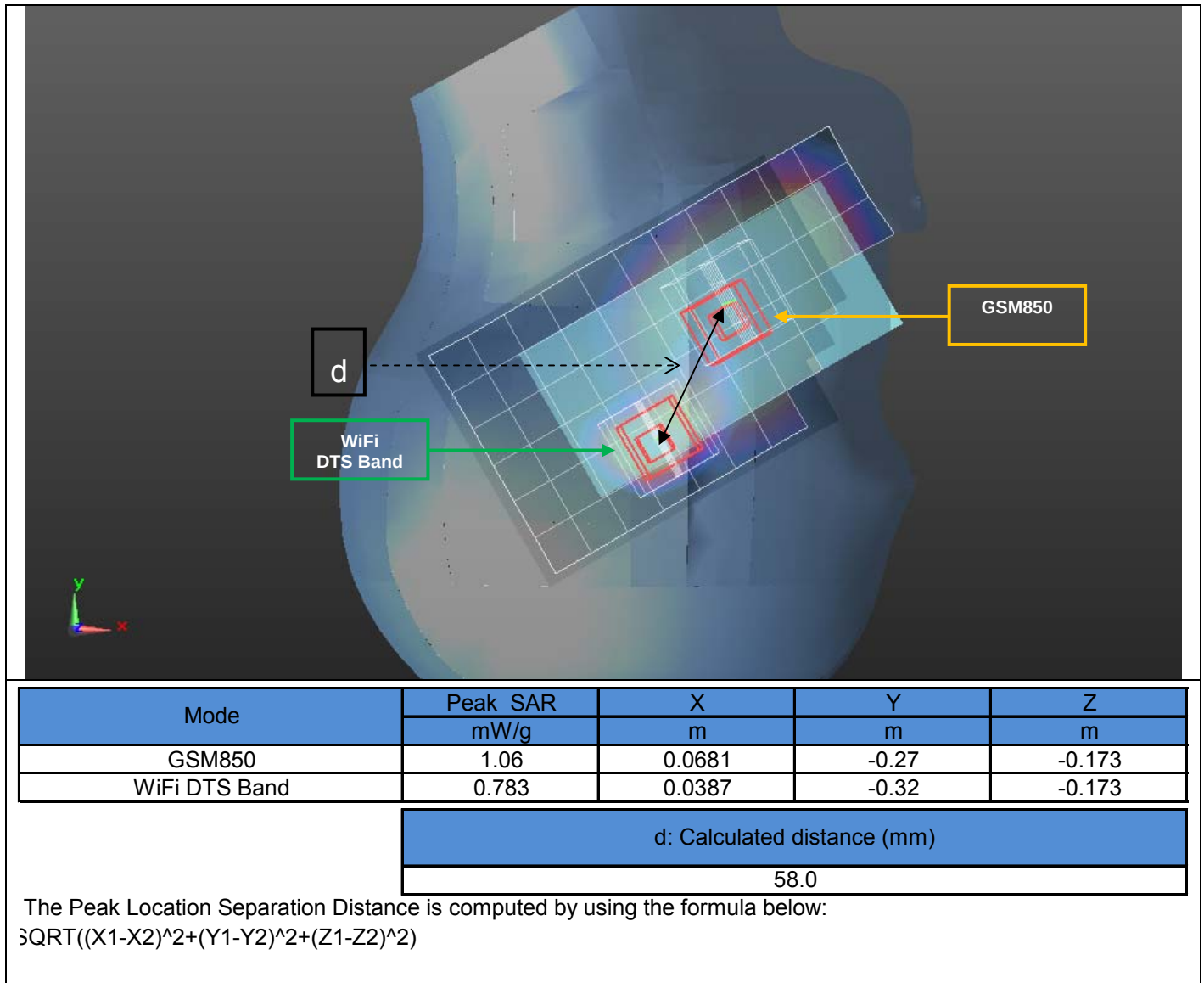


Figure (3)

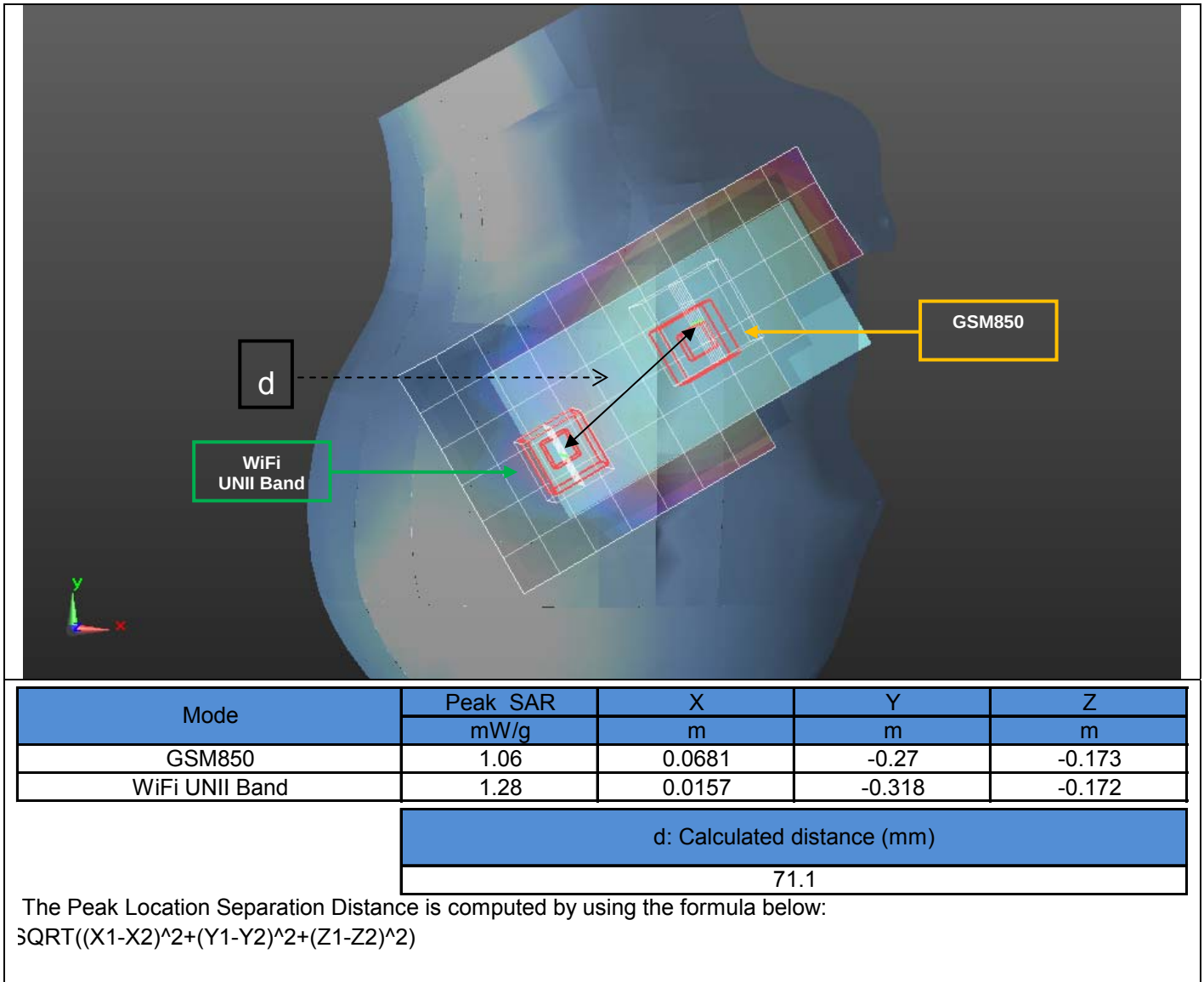
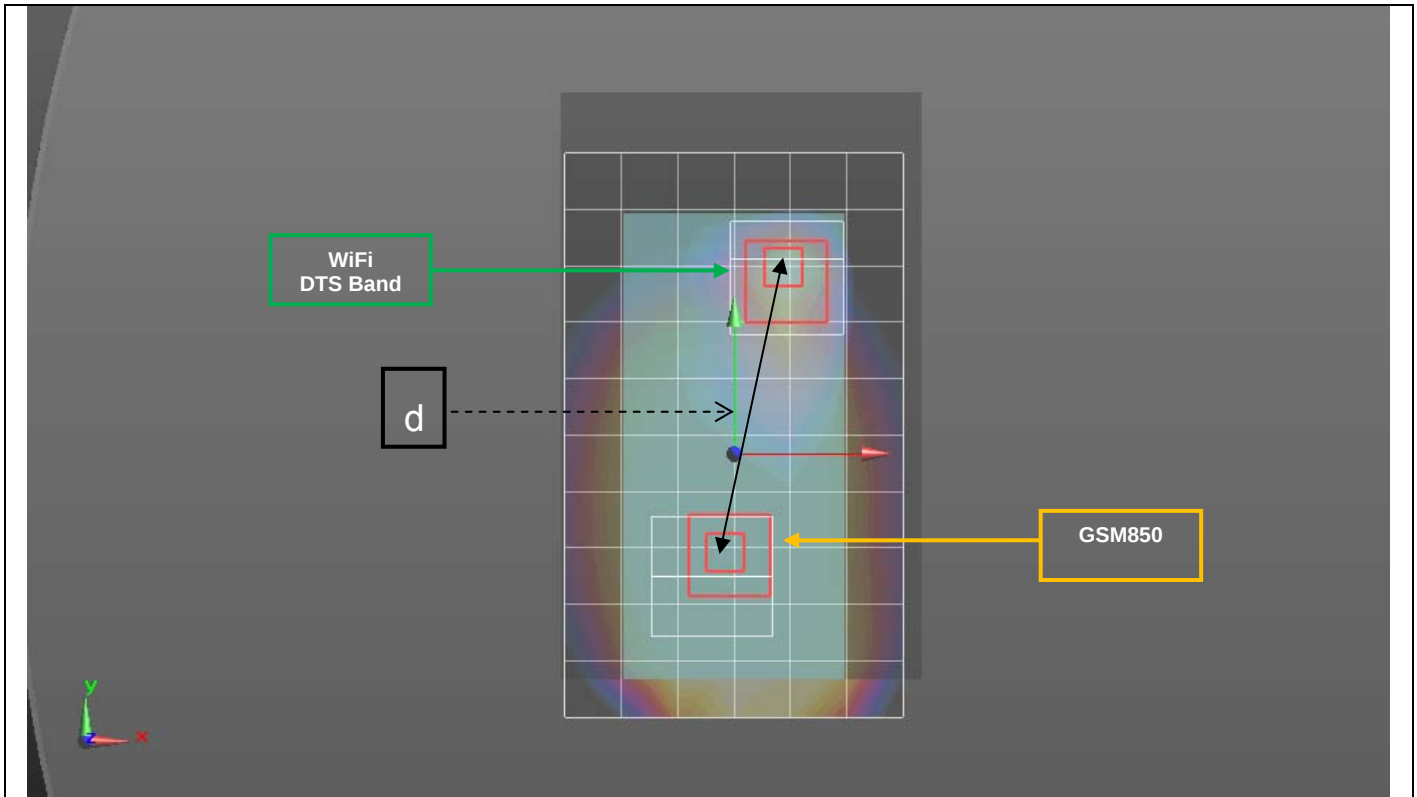


Figure (4)



Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
GSM850	1.34	-0.006	-0.0325	-0.19
WiFi DTS Band	0.82	0.014	0.0518	-0.183

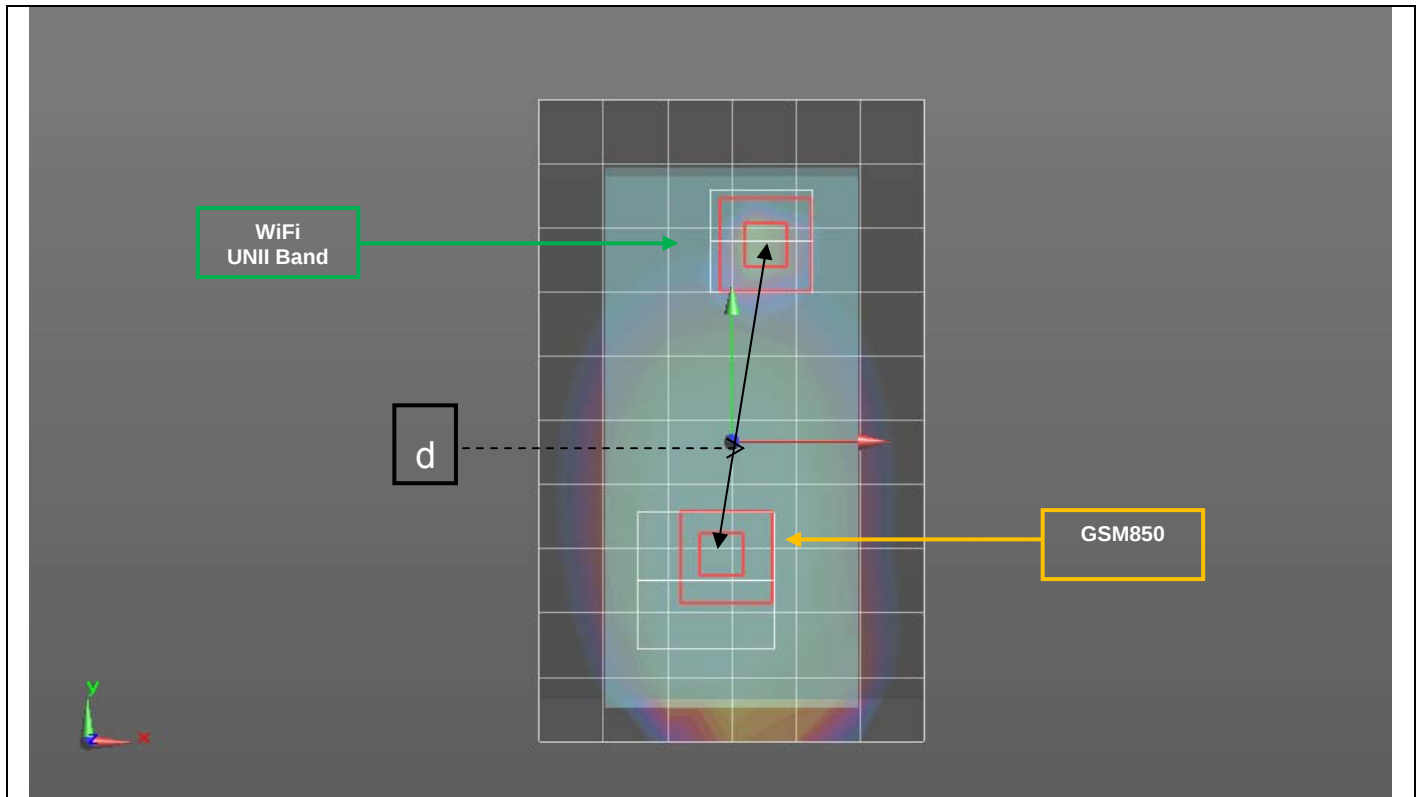
d: Calculated distance (mm)

86.9

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

$$\sqrt[3]{(X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2}$$

Figure (5)



Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
GSM850	1.34	-0.006	-0.0325	-0.19
WiFi UNII Band	1.14	0.007	0.047	-0.182

d: Calculated distance (mm)
81.0

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

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

14.3. Sum of the SAR for GSM1900 (UAT) + WiFi DTS & UNII Band & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		GSM 1900	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.470	0.465			0.935	No
		0.470		0.383		0.853	No
	Left Tilt	0.520	0.403			0.923	No
		0.520		0.307		0.827	No
	Right Touch	0.711	0.576			1.287	No
		0.711		0.590		1.301	No
	Right Tilt	0.615	0.327			0.942	No
		0.615		0.434		1.049	No
Body-worn Accessory & Hotspot	Rear	0.912	0.536			1.448	No
		0.912		0.561		1.473	No
		0.912			0.016	0.928	No
	Front	0.696	0.275			0.971	No
		0.696		0.208		0.904	No
		0.696			0.005	0.701	No
Hotspot	Edge 1	0.457	0.088			0.545	No
	Edge 2	0.159	0.029			0.188	No
	Edge 3	0	0			0	No
	Edge 4	0.347	0.300			0.647	No

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.4. Sum of the SAR for GSM1900 (LAT) + WiFi DTS & UNII Band & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		GSM 1900	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.594	0.465			1.059	No
		0.594		0.383		0.977	No
	Left Tilt	0.281	0.403			0.684	No
		0.281		0.307		0.588	No
	Right Touch	1.050	0.576			1.626	Yes
		1.050		0.590		1.640	Yes
	Right Tilt	0.271	0.327			0.598	No
		0.271		0.434		0.705	No
Body-worn Accessory & Hotspot	Rear	1.140	0.536			1.676	Yes
		1.140		0.561		1.701	Yes
		1.140			0.016	1.156	No
	Front	1.110	0.275			1.385	No
		1.110		0.208		1.318	No
		1.110			0.005	1.115	No
Hotspot	Edge 1	0	0.088			0.088	No
	Edge 2	1.030	0.029			1.059	No
	Edge 3	0.545	0			0.545	No
	Edge 4	0.094	0.300			0.394	No

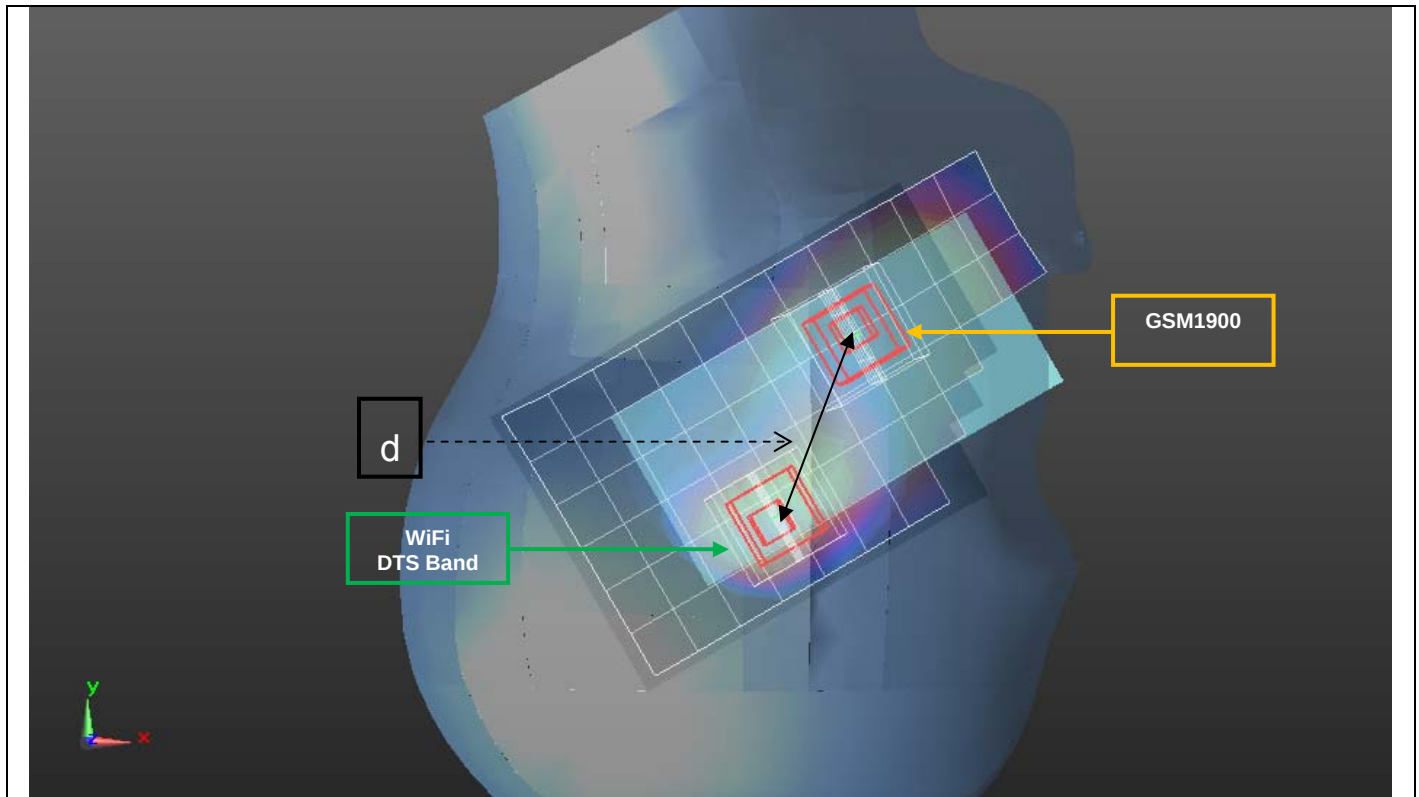
SAR to Peak Location Separation Ratio (SPLSR)

Case #	RF Exposure conditions	Test Position	Worst-case combination			Σ 1-g SAR (mW/g)	Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
			GSM 1900	WiFi DTS Band	WiFi UNII Band					
2	Head	Right Touch	1.050	0.576		1.626	62.0	0.033	No	1
			1.050		0.590	1.640	73.4	0.029	No	2
	Body-worn Accessory & Hotspot	Rear	1.140	0.536		1.676	111.0	0.020	No	3
			1.140		0.561	1.701	105.0	0.021	No	4

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.

Figure (1)



Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
GSM1900	1.28	0.0654	-0.264	-0.172
WiFi DTS Band	0.783	0.0387	-0.32	-0.173
d: Calculated distance (mm)				
62.0				

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

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

Figure (2)

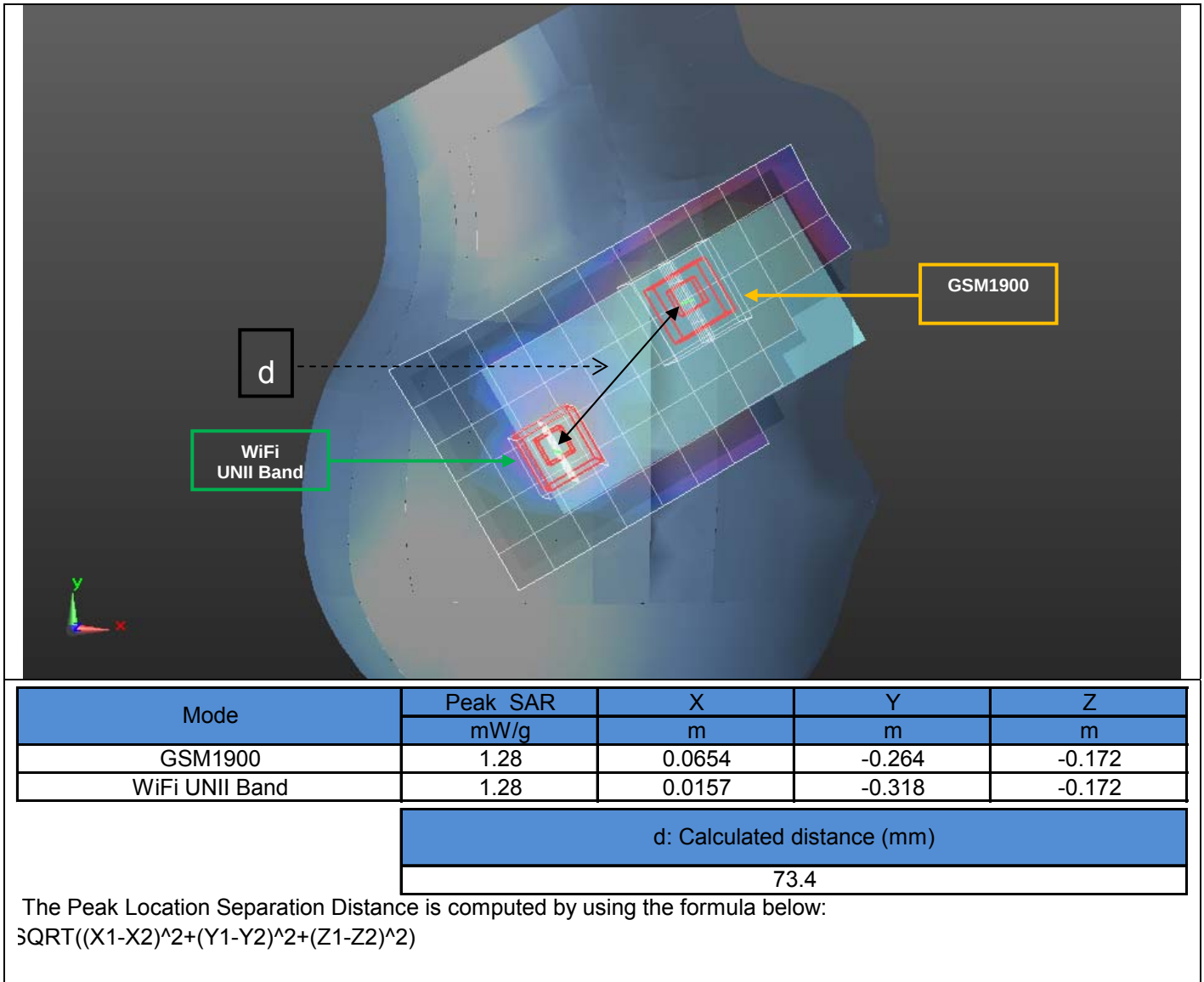
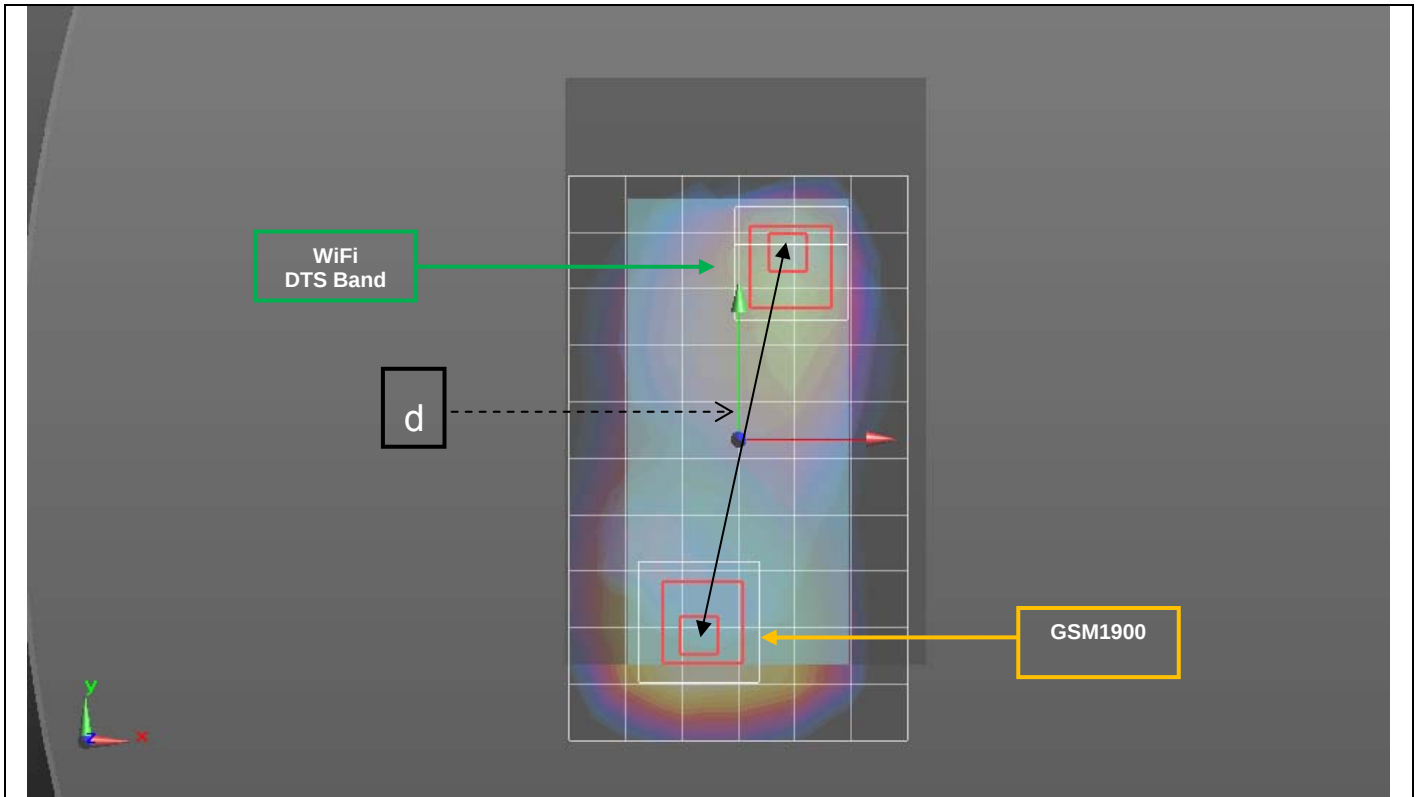


Figure (3)

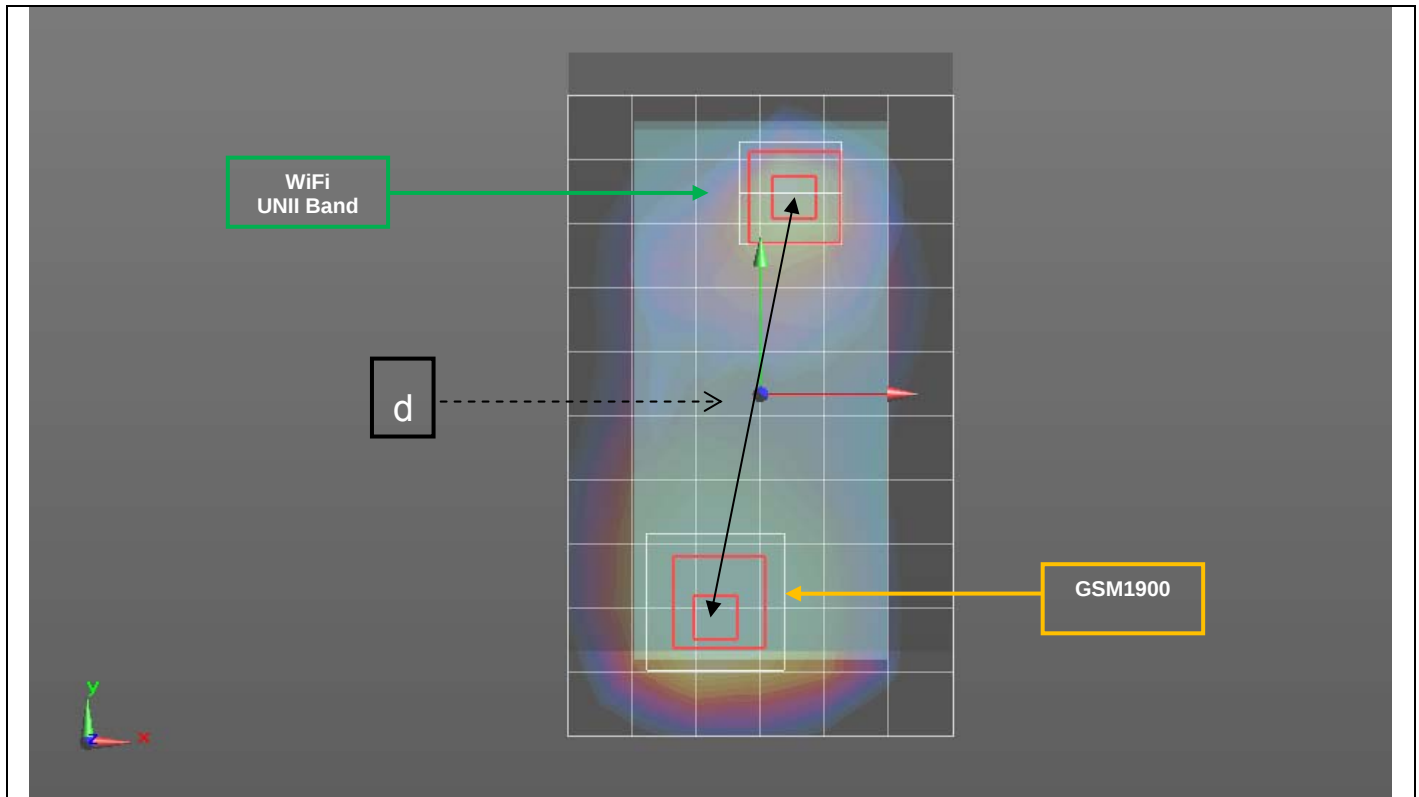


Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
GSM1900	1.45	-0.0105	-0.0565	-0.183
WiFi DTS Band	0.82	0.014	0.0518	-0.183

d: Calculated distance (mm)
111.0

The Peak Location Separation Distance is computed by using the formula below:
 $\sqrt{(X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2}$

Figure (4)



Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
GSM1900	1.45	-0.0105	-0.0565	-0.183
WiFi UNII Band	1.14	0.007	0.047	-0.182

d: Calculated distance (mm)
105.0

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

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

14.5. Sum of the SAR for W-CDMA Band 2 (UAT) + WiFi DTS & UNII Band & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		W-CDMA Band 2	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.548	0.465			1.013	No
		0.548		0.383		0.931	No
	Left Tilt	0.585	0.403			0.988	No
		0.585		0.307		0.892	No
	Right Touch	0.971	0.576			1.547	No
		0.971		0.590		1.561	No
	Right Tilt	0.721	0.327			1.048	No
		0.721		0.434		1.155	No
Body-worn Accessory & Hotspot	Rear	0.883	0.536			1.419	No
		0.883		0.561		1.444	No
		0.883			0.016	0.899	No
	Front	0.700	0.275			0.975	No
		0.700		0.208		0.908	No
		0.700			0.005	0.705	No
Hotspot	Edge 1	0.473	0.088			0.561	No
	Edge 2	0.210	0.029			0.239	No
	Edge 3	0	0			0	No
	Edge 4	0.431	0.300			0.731	No

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.6. Sum of the SAR for W-CDMA Band 2 (LAT) + WiFi DTS & UNII Band & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		W-CDMA Band 2	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.493	0.465			0.958	No
		0.493		0.383		0.876	No
	Left Tilt	0.333	0.403			0.736	No
		0.333		0.307		0.640	No
	Right Touch	1.120	0.576			1.696	Yes
		1.120		0.590		1.710	Yes
	Right Tilt	0.321	0.327			0.648	No
		0.321		0.434		0.755	No
Body-worn Accessory & Hotspot	Rear	1.150	0.536			1.686	Yes
		1.150		0.561		1.711	Yes
		1.150			0.016	1.166	No
	Front	1.040	0.275			1.315	No
		1.040		0.208		1.248	No
		1.040			0.005	1.045	No
Hotspot	Edge 1	0	0.088			0.088	No
	Edge 2	0.948	0.029			0.977	No
	Edge 3	0.657	0			0.657	No
	Edge 4	0.102	0.300			0.402	No

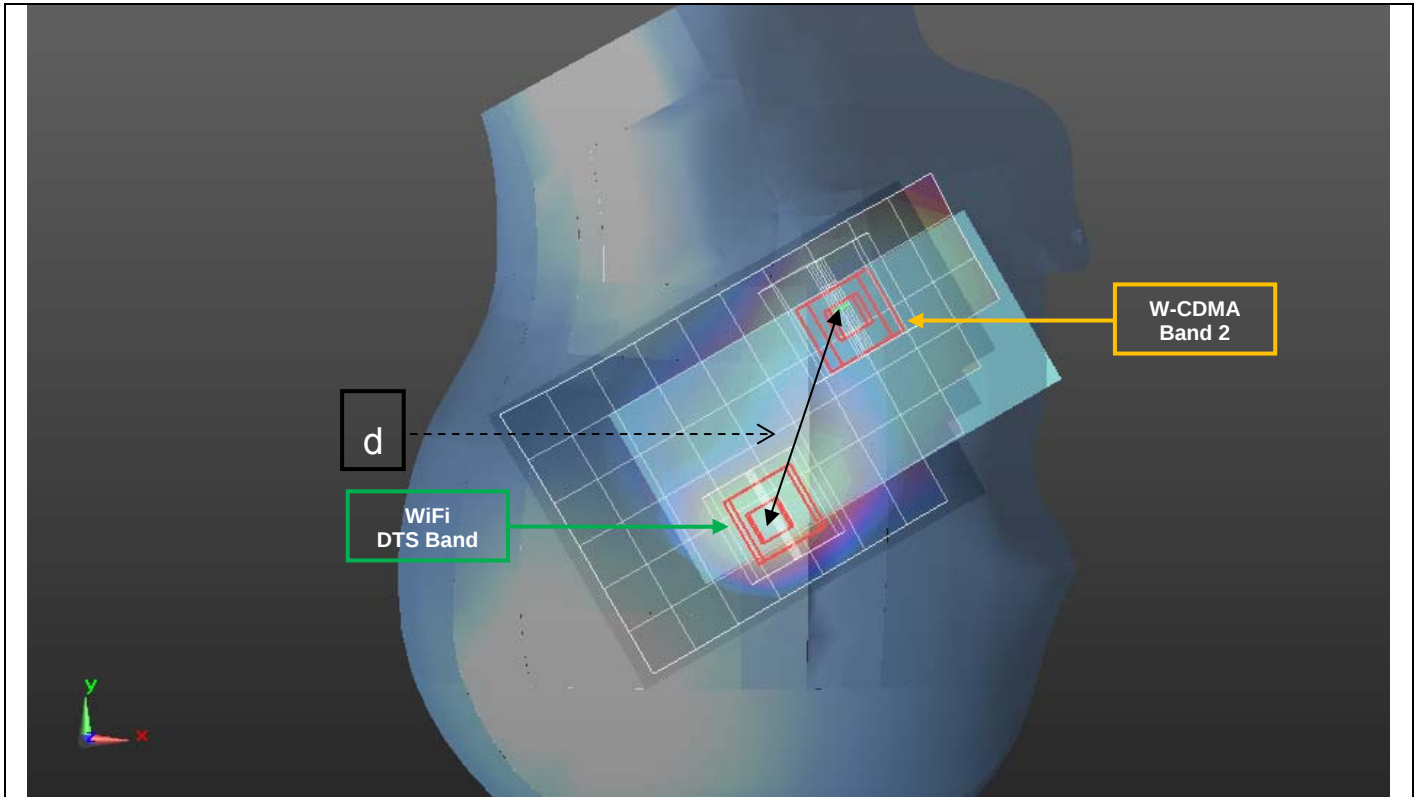
SAR to Peak Location Separation Ratio (SPLSR)

Case #	RF Exposure conditions	Test Position	Worst-case combination			Σ 1-g SAR (mW/g)	Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
			W-CDMA Band 2	WiFi DTS Band	WiFi UNII Band					
3	Head	Right Touch	1.120	0.576		1.696	68.2	0.032	No	1
			1.120		0.590	1.710	77.4	0.029	No	2
	Body-worn Accessory & Hotspot	Rear	1.150	0.536		1.686	103.4	0.021	No	3
			1.150		0.561	1.711	96.9	0.023	No	4

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.

Figure (1)



Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
W-CDMA Band 2	1.36	0.0621	-0.256	-0.172
WiFi DTS Band	0.783	0.0387	-0.32	-0.173
d: Calculated distance (mm)				
68.2				

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

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

Figure (2)

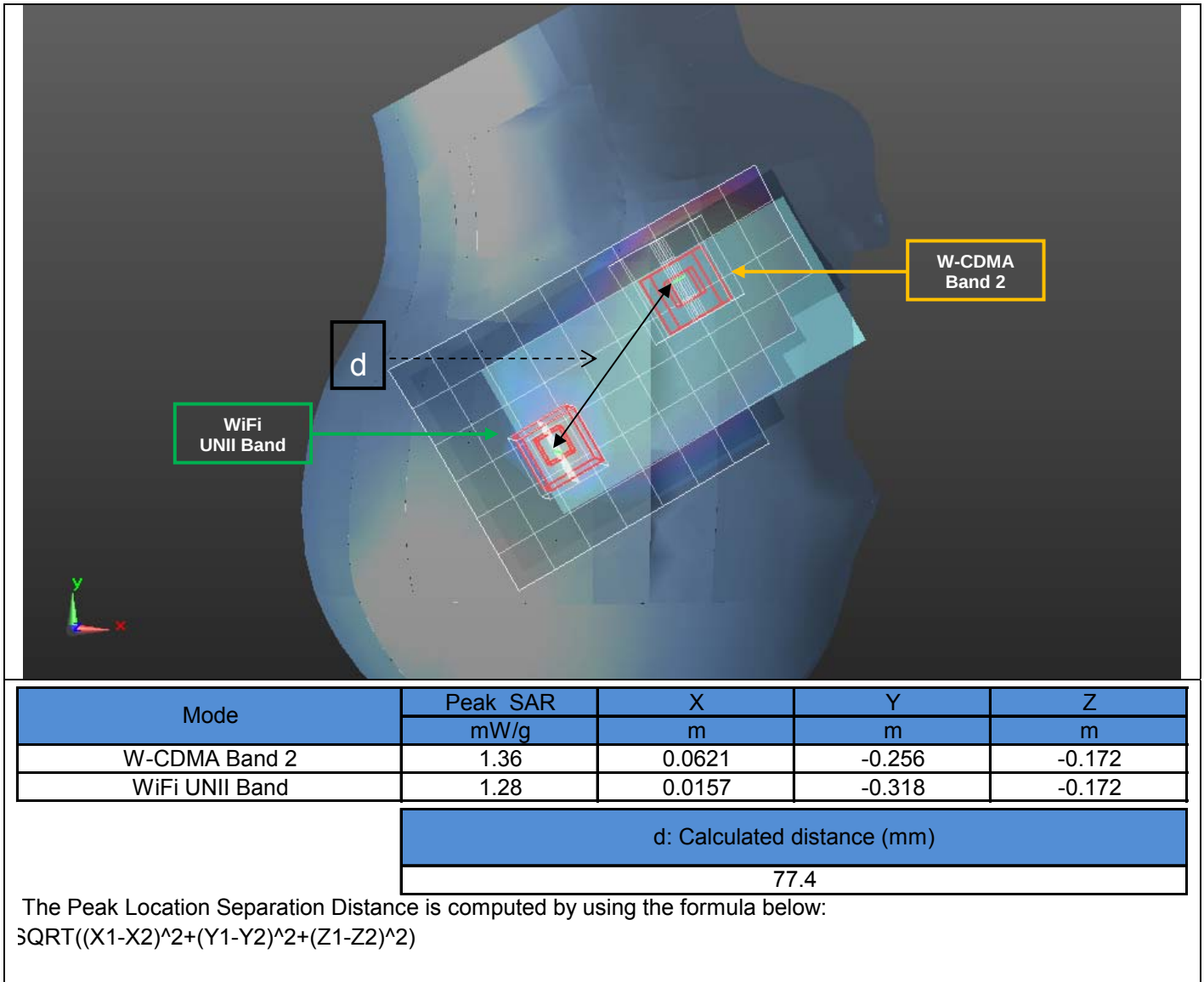
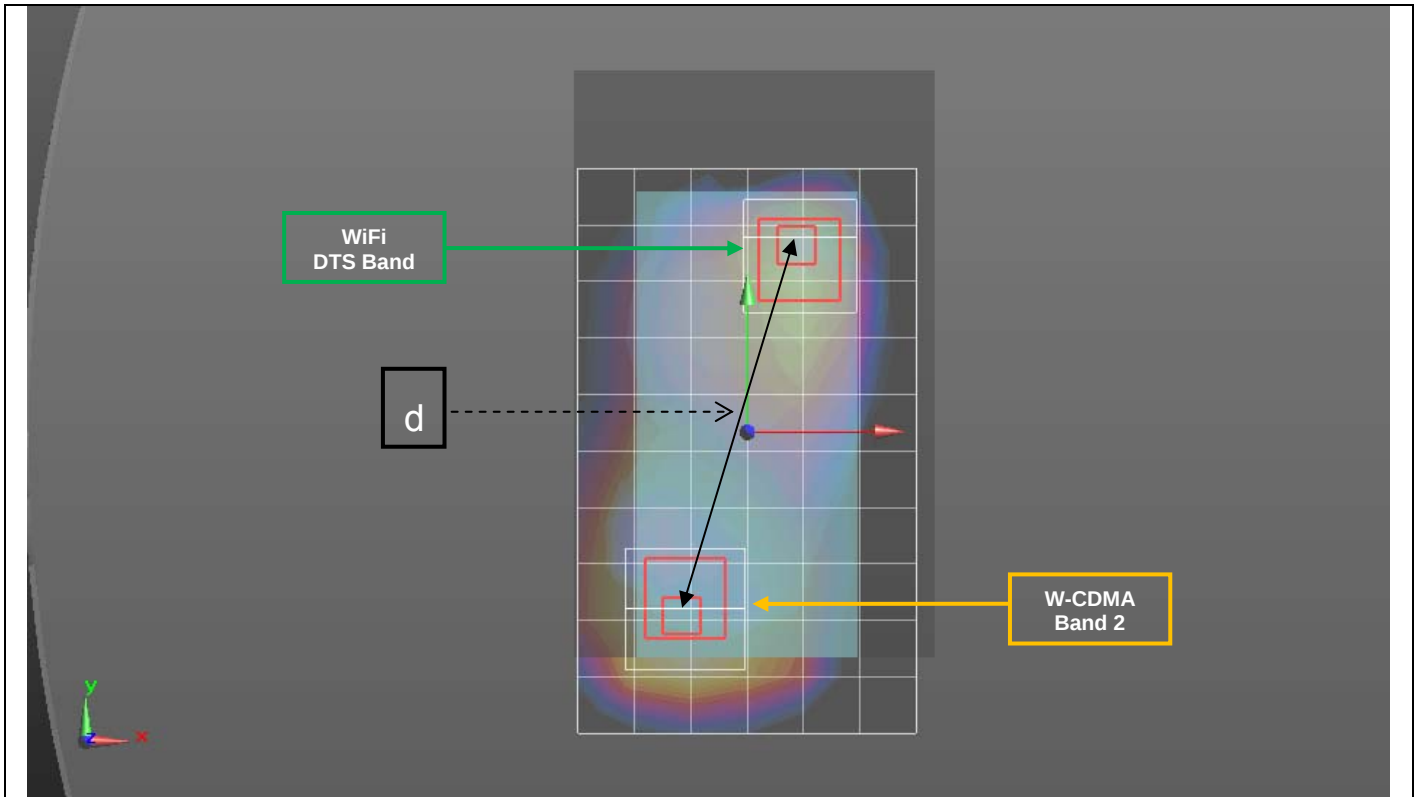


Figure (3)



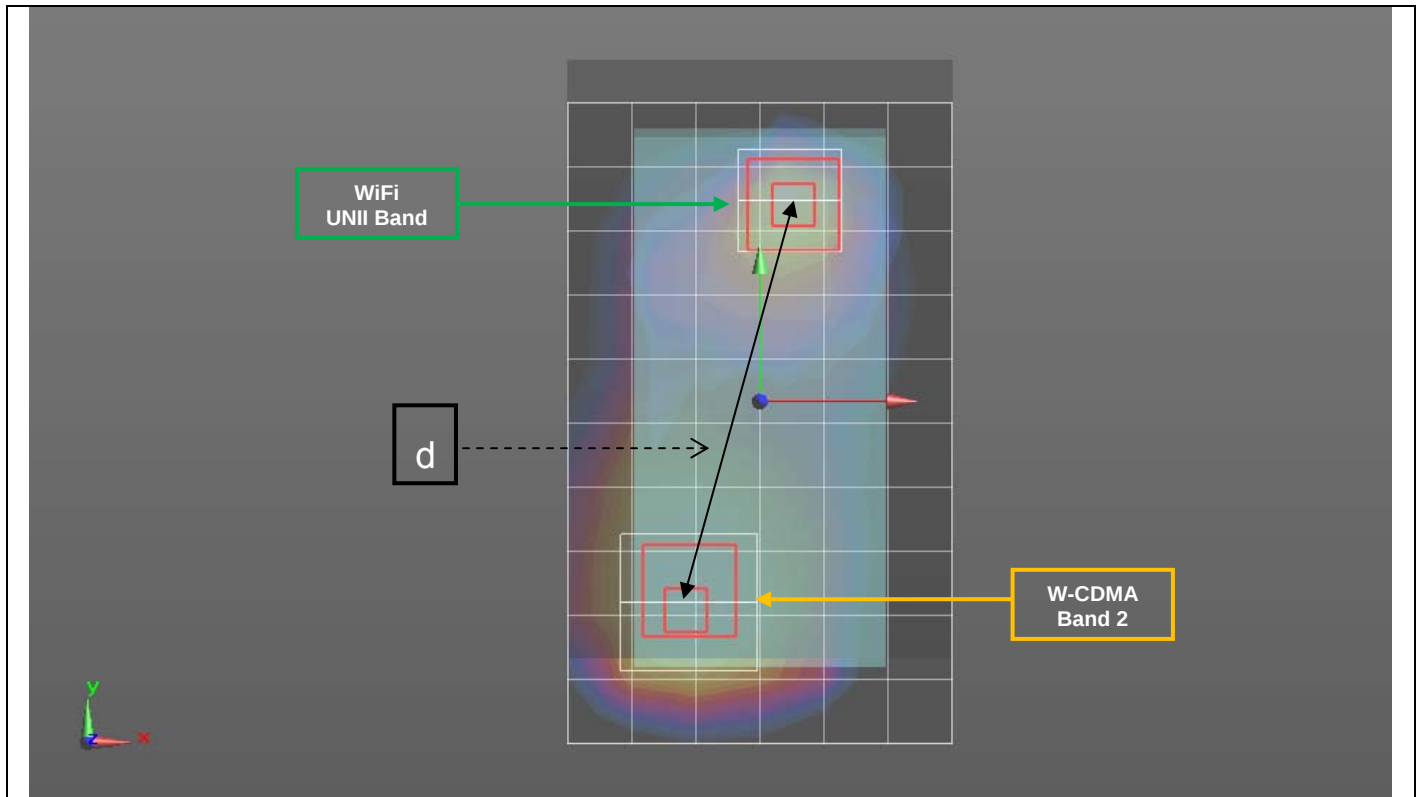
Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
W-CDMA Band 2	1.47	-0.0165	-0.047	-0.183
WiFi DTS Band	0.82	0.014	0.0518	-0.183

d: Calculated distance (mm)

103.4

The Peak Location Separation Distance is computed by using the formula below:
 $\sqrt{((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)}$

Figure (4)



Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
W-CDMA Band 2	1.47	-0.0165	-0.047	-0.183
WiFi UNII Band	1.14	0.007	0.047	-0.182

d: Calculated distance (mm)
96.9

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

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

14.7. Sum of the SAR for W-CDMA Band 5 (UAT) + WiFi DTS & UNII Band & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		W-CDMA Band 5	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.700	0.465			1.165	No
		0.700		0.383		1.083	No
	Left Tilt	0.354	0.403			0.757	No
		0.354		0.307		0.661	No
	Right Touch	0.681	0.576			1.257	No
		0.681		0.590		1.271	No
	Right Tilt	0.362	0.327			0.689	No
		0.362		0.434		0.796	No
Body-worn Accessory & Hotspot	Rear	0.124	0.536			0.660	No
		0.124		0.561		0.685	No
		0.124			0.016	0.140	No
	Front	0.100	0.275			0.375	No
		0.100		0.208		0.308	No
		0.100			0.005	0.105	No
Hotspot	Edge 1	0.068	0.088			0.156	No
	Edge 2	0.120	0.029			0.149	No
	Edge 3	0	0			0	No
	Edge 4	0.116	0.300			0.416	No

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.8. Sum of the SAR for W-CDMA Band 5 (LAT) + WiFi DTS & UNII Band & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		W-CDMA Band 5	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.726	0.465			1.191	No
		0.726		0.383		1.109	No
	Left Tilt	0.442	0.403			0.845	No
		0.442		0.307		0.749	No
	Right Touch	0.637	0.576			1.213	No
		0.637		0.590		1.227	No
	Right Tilt	0.433	0.327			0.760	No
		0.433		0.434		0.867	No
Body-worn Accessory & Hotspot	Rear	0.968	0.536			1.504	No
		0.968		0.561		1.529	No
		0.968			0.016	0.984	No
	Front	0.919	0.275			1.194	No
		0.919		0.208		1.127	No
		0.919			0.005	0.924	No
Hotspot	Edge 1	0	0.088			0.088	No
	Edge 2	0.686	0.029			0.715	No
	Edge 3	0.178	0			0.178	No
	Edge 4	1.131	0.300			1.431	No

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.9. Sum of the SAR for LTE Band 2 (UAT) + WiFi DTS & UNII Band & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		LTE Band 2	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.444	0.465			0.909	No
		0.444		0.383		0.827	No
	Left Tilt	0.483	0.403			0.886	No
		0.483		0.307		0.790	No
	Right Touch	0.609	0.576			1.185	No
		0.609		0.590		1.199	No
	Right Tilt	0.542	0.327			0.869	No
		0.542		0.434		0.976	No
Body-worn Accessory & Hotspot	Rear	0.597	0.536			1.133	No
		0.597		0.561		1.158	No
		0.597			0.016	0.613	No
	Front	0.509	0.275			0.784	No
		0.509		0.208		0.717	No
		0.509			0.005	0.514	No
Hotspot	Edge 1	0.452	0.088			0.540	No
	Edge 2	0.123	0.029			0.152	No
	Edge 3	0	0			0	No
	Edge 4	0.331	0.300			0.631	No

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.10. Sum of the SAR for LTE Band 2 (LAT) + WiFi DTS & UNII Band & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		LTE Band 2	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.693	0.465			1.158	No
		0.693		0.383		1.076	No
	Left Tilt	0.506	0.403			0.909	No
		0.506		0.307		0.813	No
	Right Touch	1.170	0.576			1.746	Yes
		1.170		0.590		1.760	Yes
	Right Tilt	0.496	0.327			0.823	No
		0.496		0.434		0.930	No
Body-worn Accessory & Hotspot	Rear	0.899	0.536			1.435	No
		0.899		0.561		1.460	No
		0.899			0.016	0.915	No
	Front	0.951	0.275			1.226	No
		0.951		0.208		1.159	No
		0.951			0.005	0.956	No
Hotspot	Edge 1	0	0.088			0.088	No
	Edge 2	0.774	0.029			0.803	No
	Edge 3	0.447	0			0.447	No
	Edge 4	0.104	0.300			0.404	No

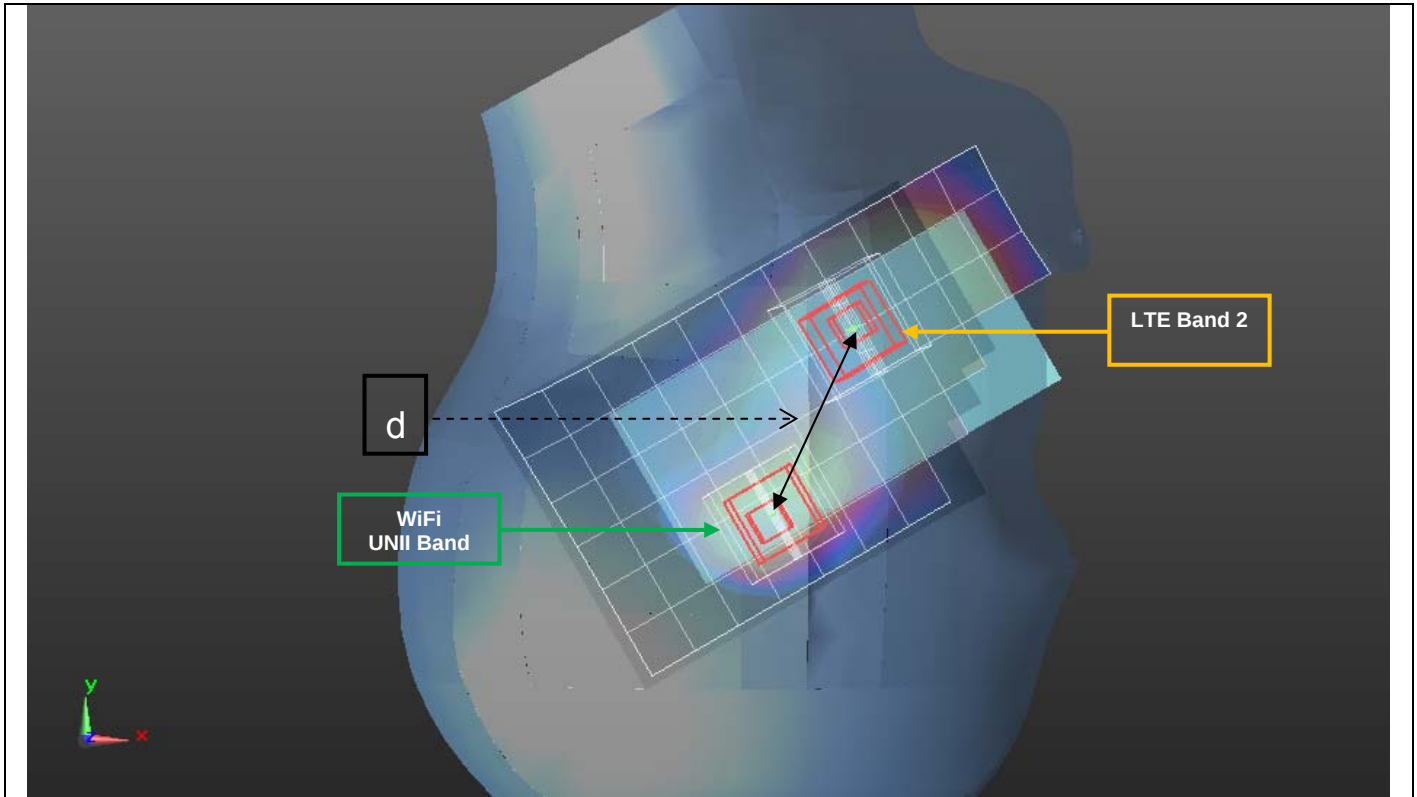
SAR to Peak Location Separation Ratio (SPLSR)

Case #	RF Exposure conditions	Test Position	Worst-case combination			Σ 1-g SAR (mW/g)	Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
			LTE Band 2	WiFi DTS Band	WiFi UNII Band					
4	Head	Right Touch	1.170	0.576		1.746	64.2	0.036	No	1
			1.170		0.590	1.760	75.5	0.031	No	2

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.

Figure (1)

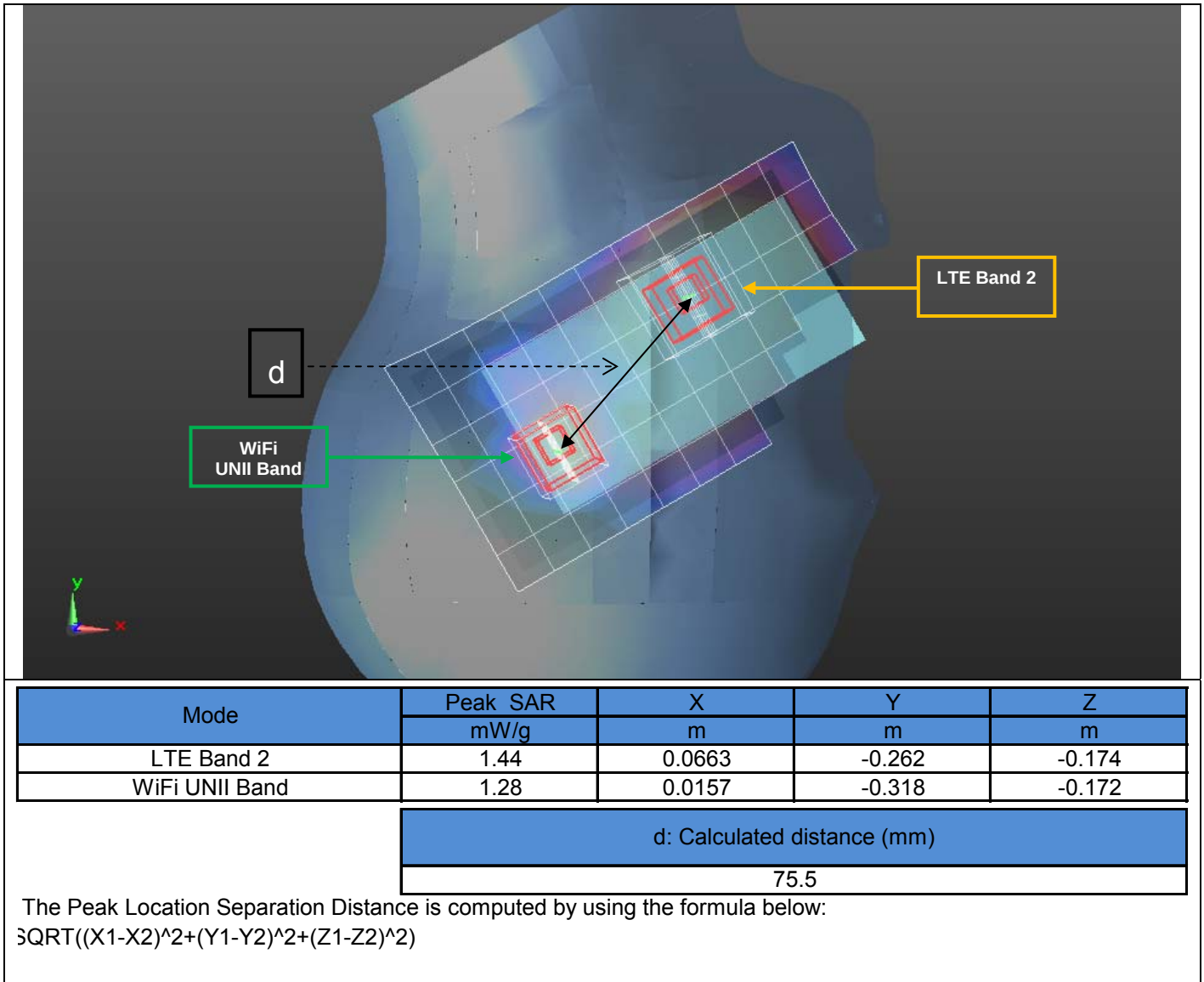


Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
LTE Band 2	1.44	0.0663	-0.262	-0.174
WiFi DTS Band	0.783	0.0387	-0.32	-0.173
d: Calculated distance (mm)				
64.2				

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

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

Figure (2)



14.11. Sum of the SAR for LTE Band 5 (UAT) + WiFi DTS & UNII Band & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		LTE Band 5	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.166	0.465			0.631	No
		0.166		0.383		0.549	No
	Left Tilt	0.110	0.403			0.513	No
		0.110		0.307		0.417	No
	Right Touch	0.147	0.576			0.723	No
		0.147		0.590		0.737	No
	Right Tilt	0.089	0.327			0.416	No
		0.089		0.434		0.523	No
Body-worn Accessory & Hotspot	Rear	0.117	0.536			0.653	No
		0.117		0.561		0.678	No
		0.117			0.016	0.133	No
	Front	0.075	0.275			0.350	No
		0.075		0.208		0.283	No
		0.075			0.005	0.080	No
Hotspot	Edge 1	0.054	0.088			0.142	No
	Edge 2	0.121	0.029			0.150	No
	Edge 3	0	0			0	No
	Edge 4	0.024	0.300			0.324	No

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.12. Sum of the SAR for LTE Band 5 (LAT) + WiFi DTS & UNII Band & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		LTE Band 5	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.566	0.465			1.031	No
		0.566		0.383		0.949	No
	Left Tilt	0.362	0.403			0.765	No
		0.362		0.307		0.669	No
	Right Touch	0.591	0.576			1.167	No
		0.591		0.590		1.181	No
	Right Tilt	0.396	0.327			0.723	No
		0.396		0.434		0.830	No
Body-worn Accessory & Hotspot	Rear	0.926	0.536			1.462	No
		0.926		0.561		1.487	No
		0.926			0.016	0.942	No
	Front	0.912	0.275			1.187	No
		0.912		0.208		1.120	No
		0.912			0.005	0.917	No
Hotspot	Edge 1	0	0.088			0.088	No
	Edge 2	0.675	0.029			0.704	No
	Edge 3	0.201	0			0.201	No
	Edge 4	0.923	0.300			1.223	No

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

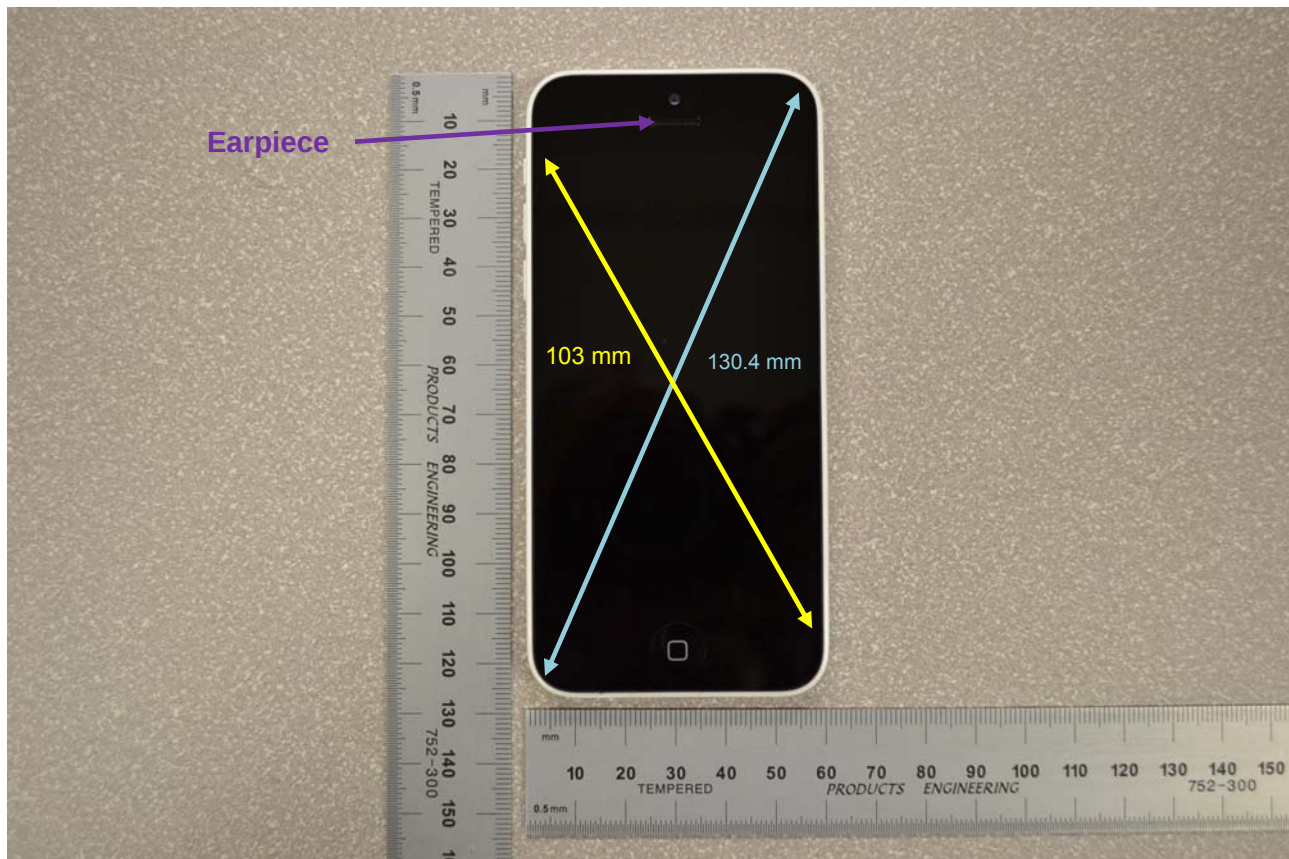
15. Appendixes

Refer to separated files for the following appendixes.

- 15.1. System Performance Check Plots**
- 15.2. Highest SAR Test Plots**
- 15.3. Calibration Certificate for E-Field Probe EX3DV4 - SN 3749**
- 15.4. Calibration Certificate for E-Field Probe EX3DV4 - SN 3751**
- 15.5. Calibration Certificate for E-Field Probe EX3DV4 - SN 3772**
- 15.6. Calibration Certificate for E-Field Probe EX3DV4 - SN 3686**
- 15.7. Calibration Certificate for E-Field Probe EX3DV4 - SN 3901**
- 15.8. Calibration Certificate for E-Field Probe EX3DV4 - SN 3885**
- 15.9. Calibration Certificate for D835V2 - SN 4d002**
- 15.10. Calibration Certificate for D835V2 - SN 4d142**
- 15.11. Calibration Certificate for D1900V2- SN 5d043**
- 15.12. Calibration Certificate for D1900V2- SN 5d163**
- 15.13. Calibration Certificate for D2450V2 - SN 748**
- 15.14. Calibration Certificate for D2450V2 - SN 899**
- 15.15. Calibration Certificate for D5GHzV2 - SN 1003**
- 15.16. Calibration Certificate for D5GHzV2 - SN 1138**

16. External Photos

Overall Dimensions



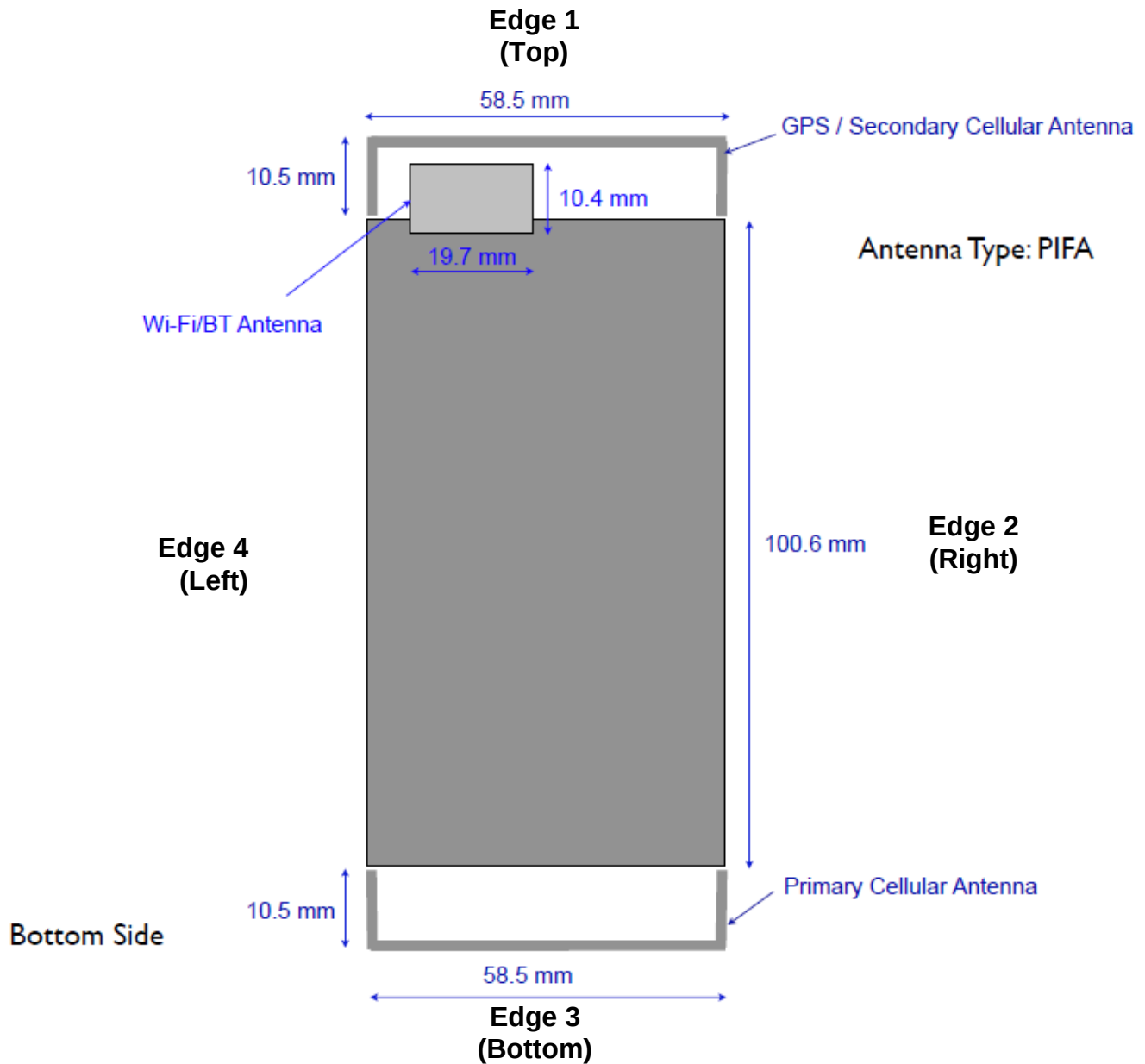
Front View of the DUT



Rear View of the DUT

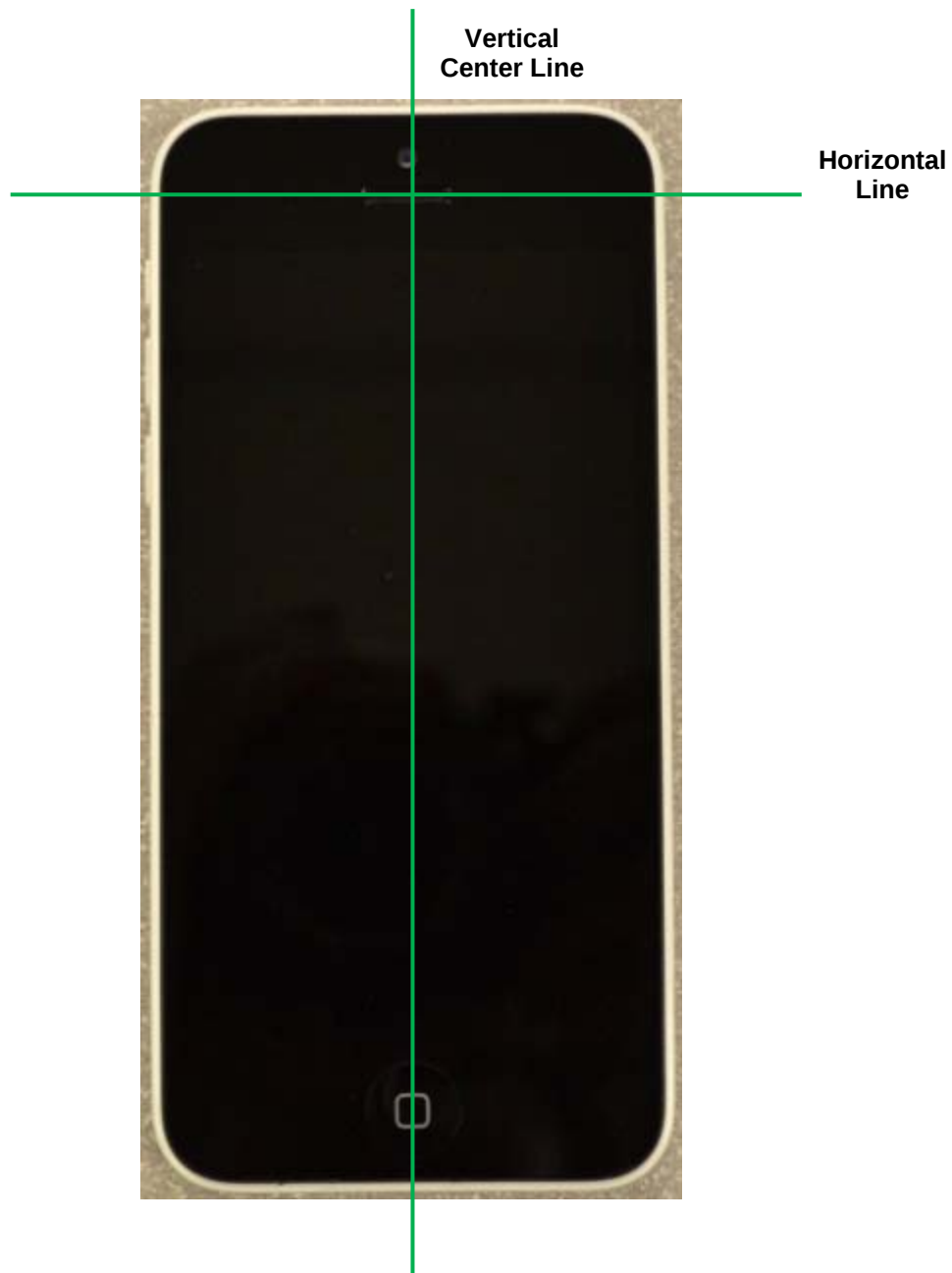


17. Antenna Locations & Separation Distances



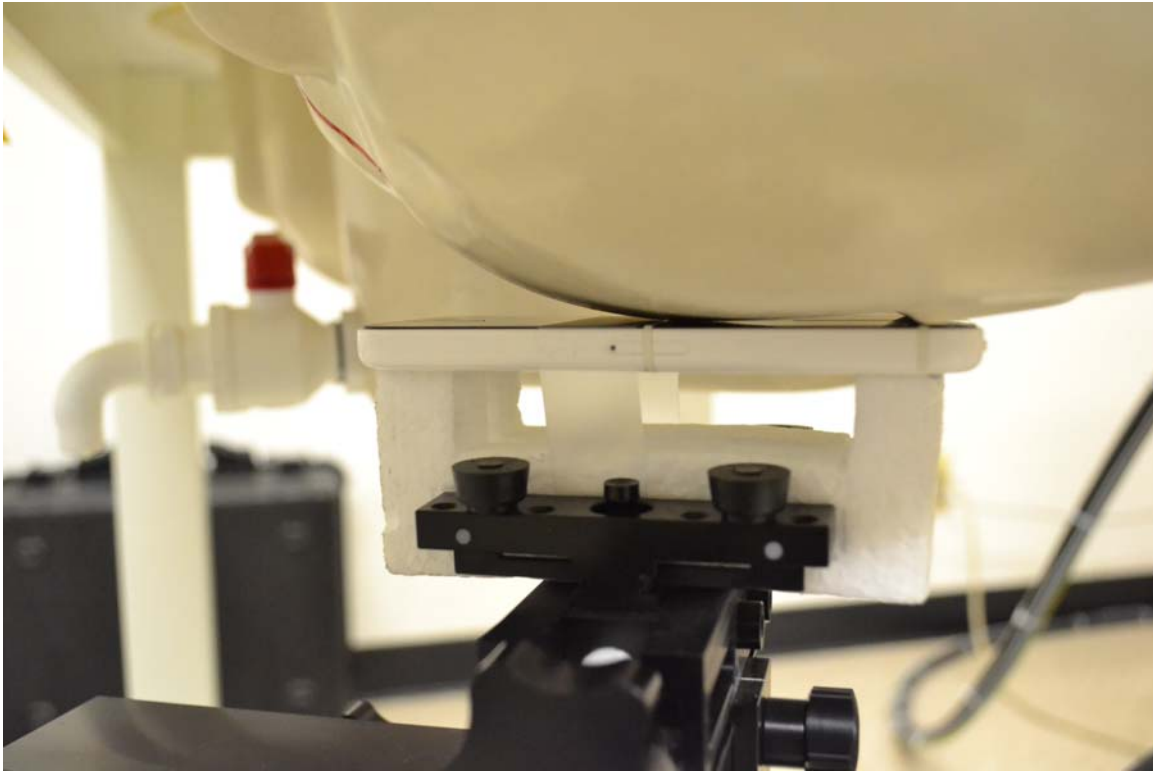
18. Setup Photos

Handset Vertical and Horizontal Reference Lines

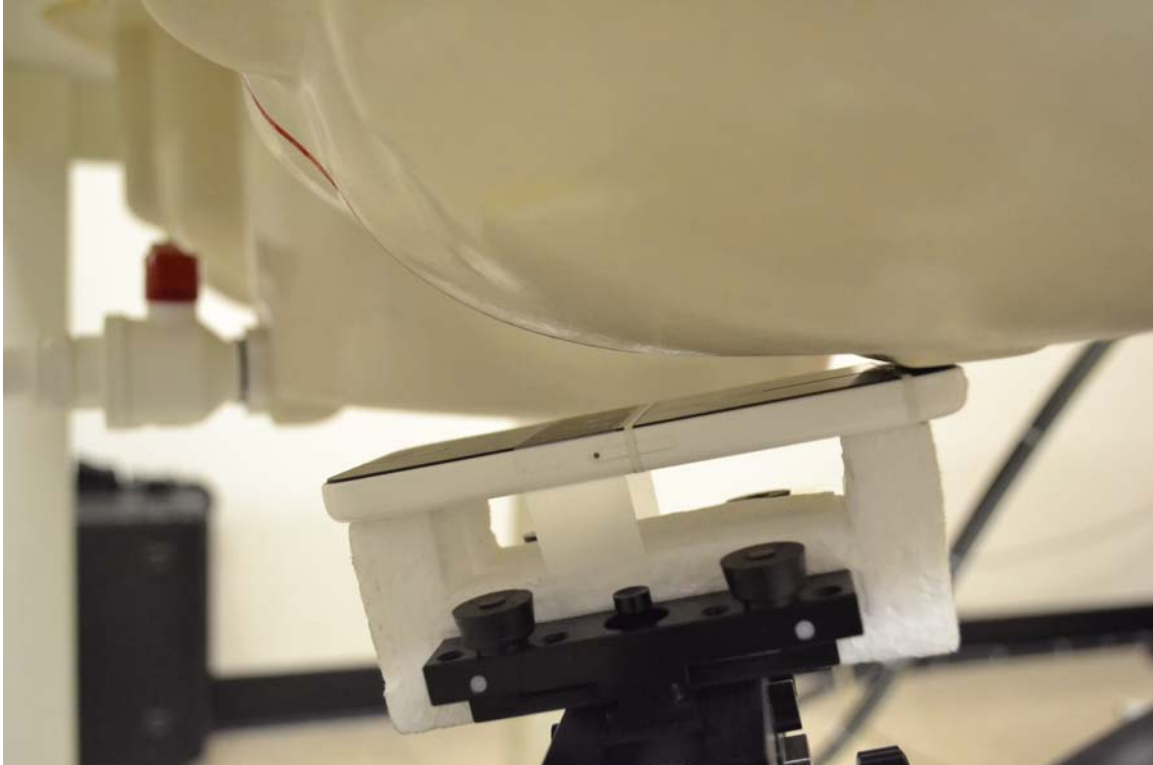


19. Head Exposure Conditions

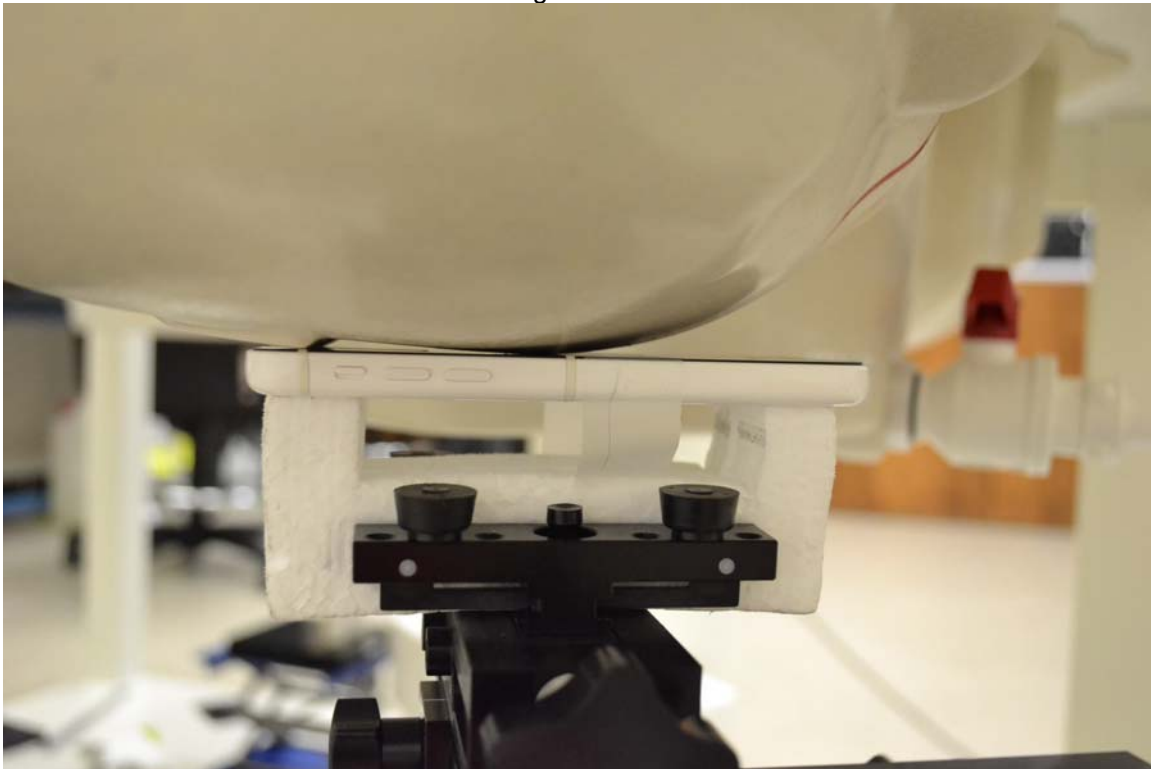
Left Touch



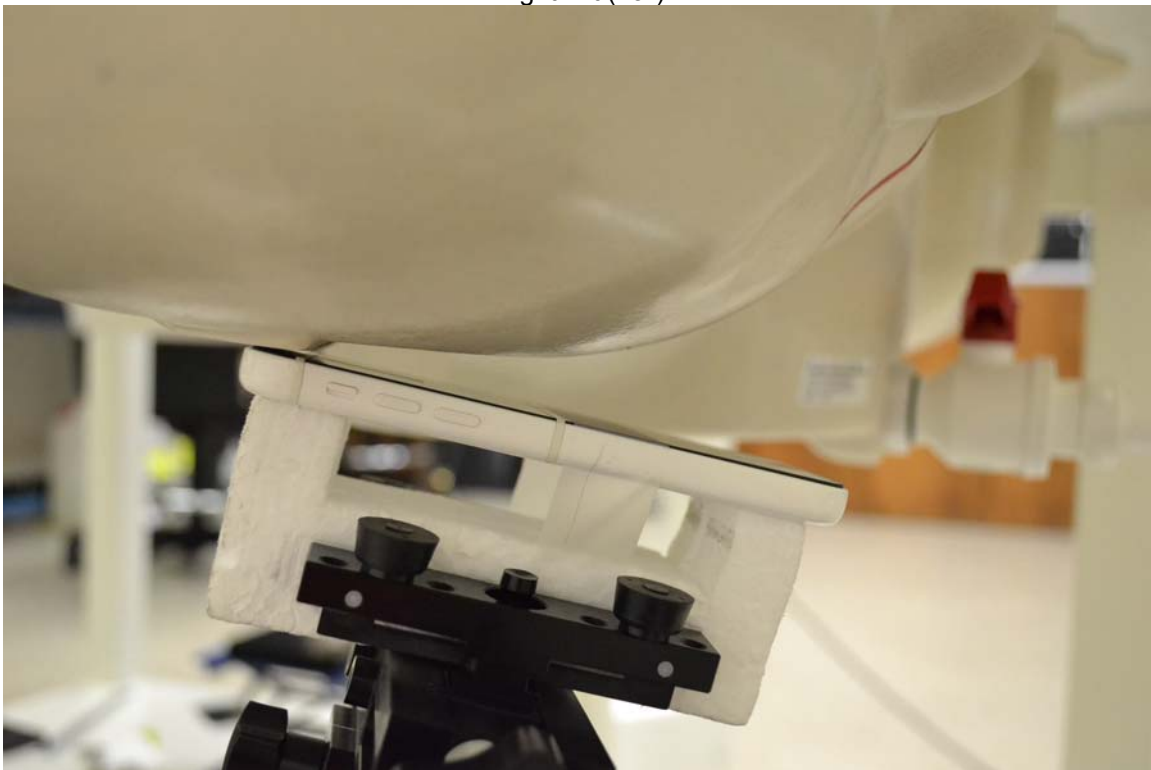
Left Tilt (15°)



Right Touch

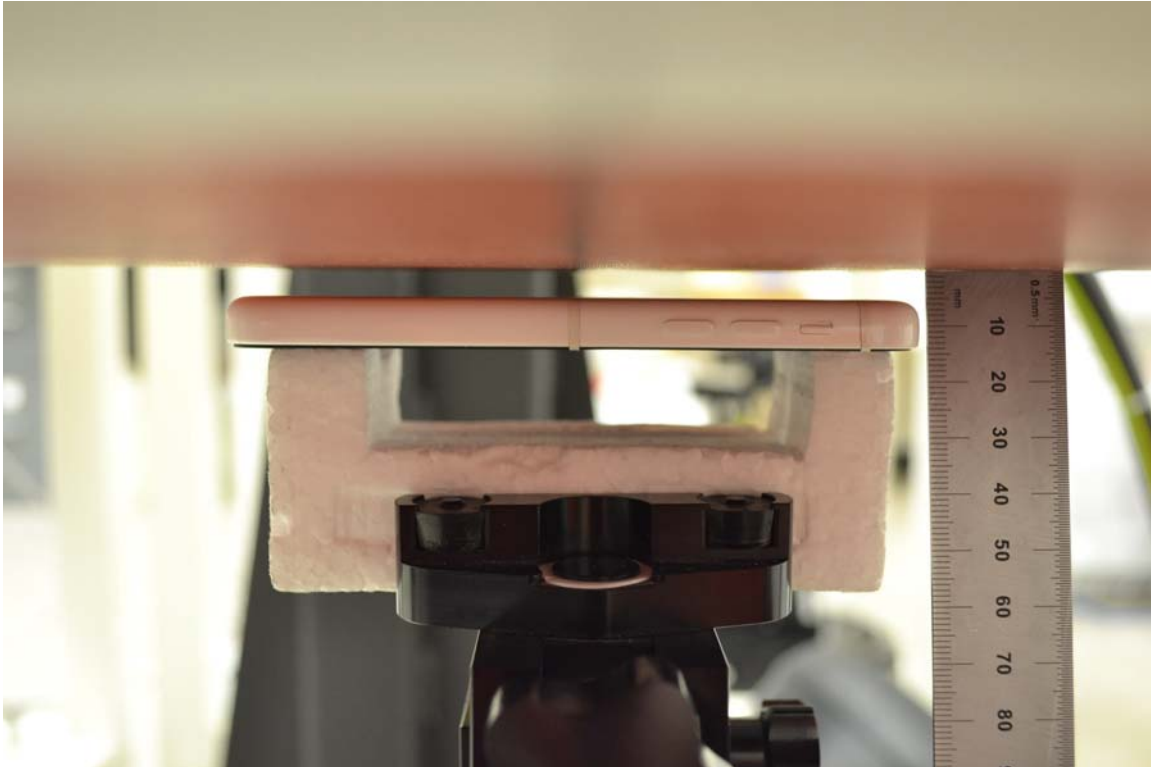


Right Tilt (15°)

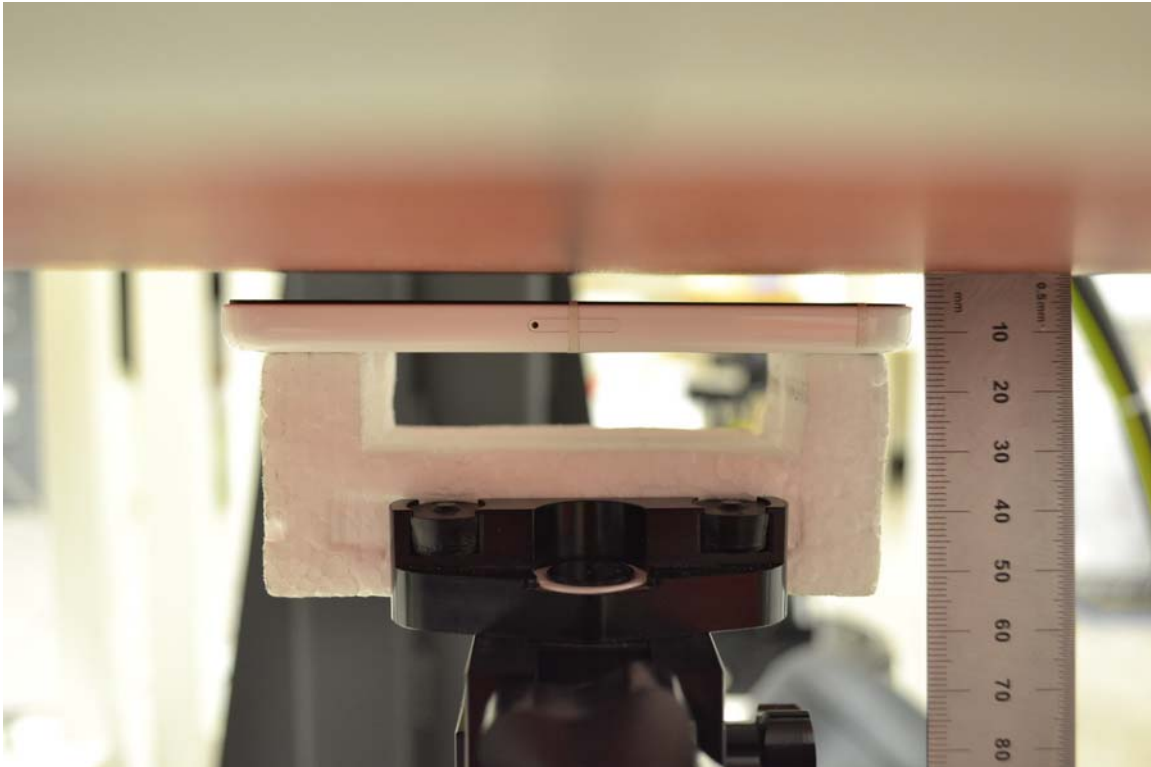


19.1. Body-worn Accessory & Hotspot Exposure Conditions

Rear

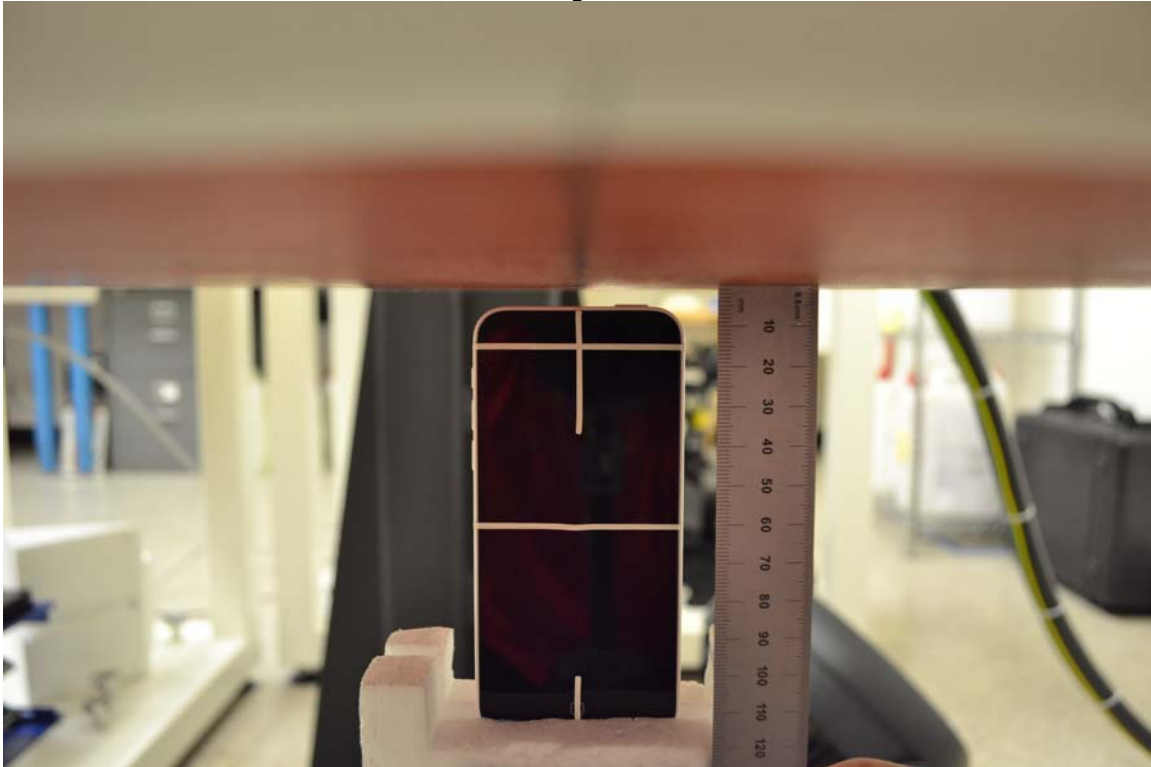


Front

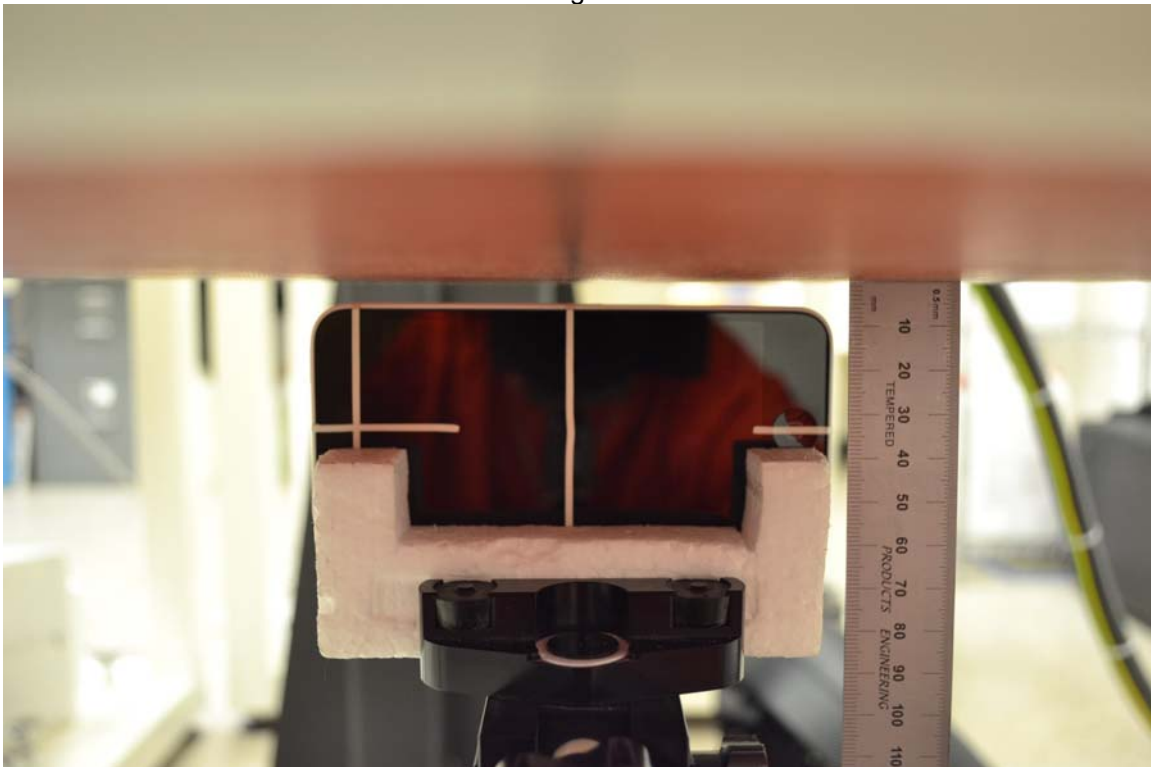


19.2. Hotspot Exposure Conditions

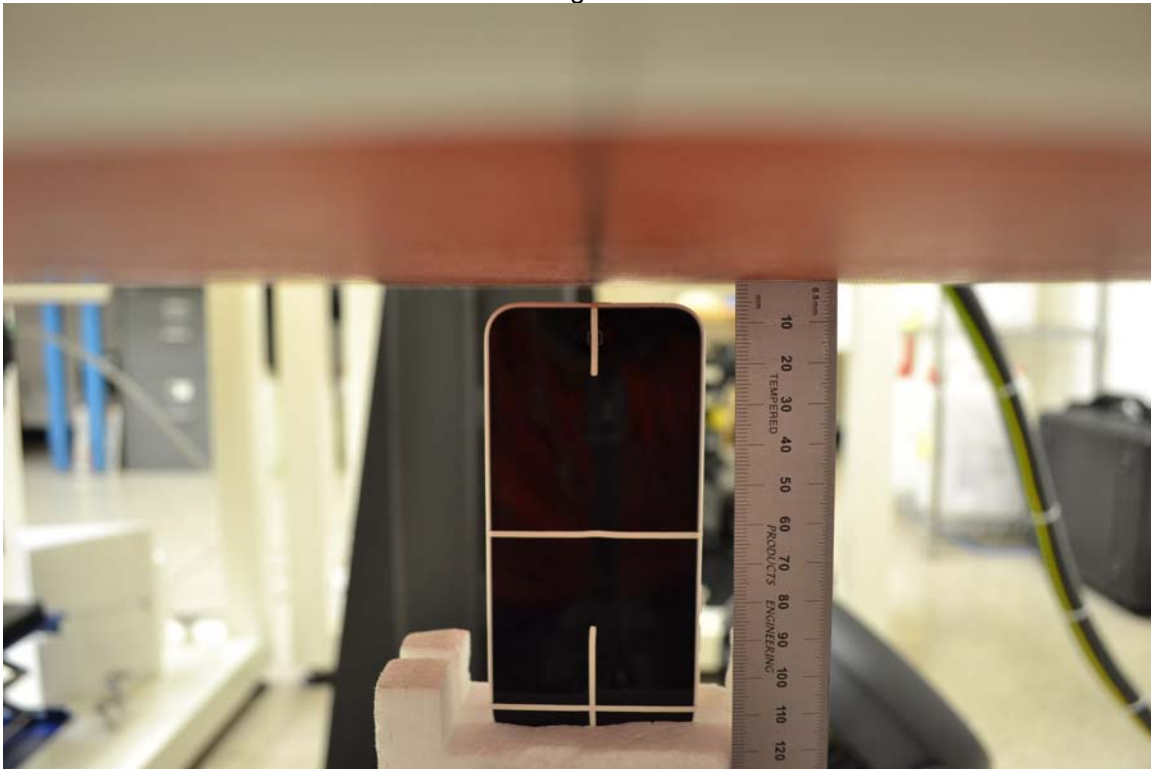
Edge 1



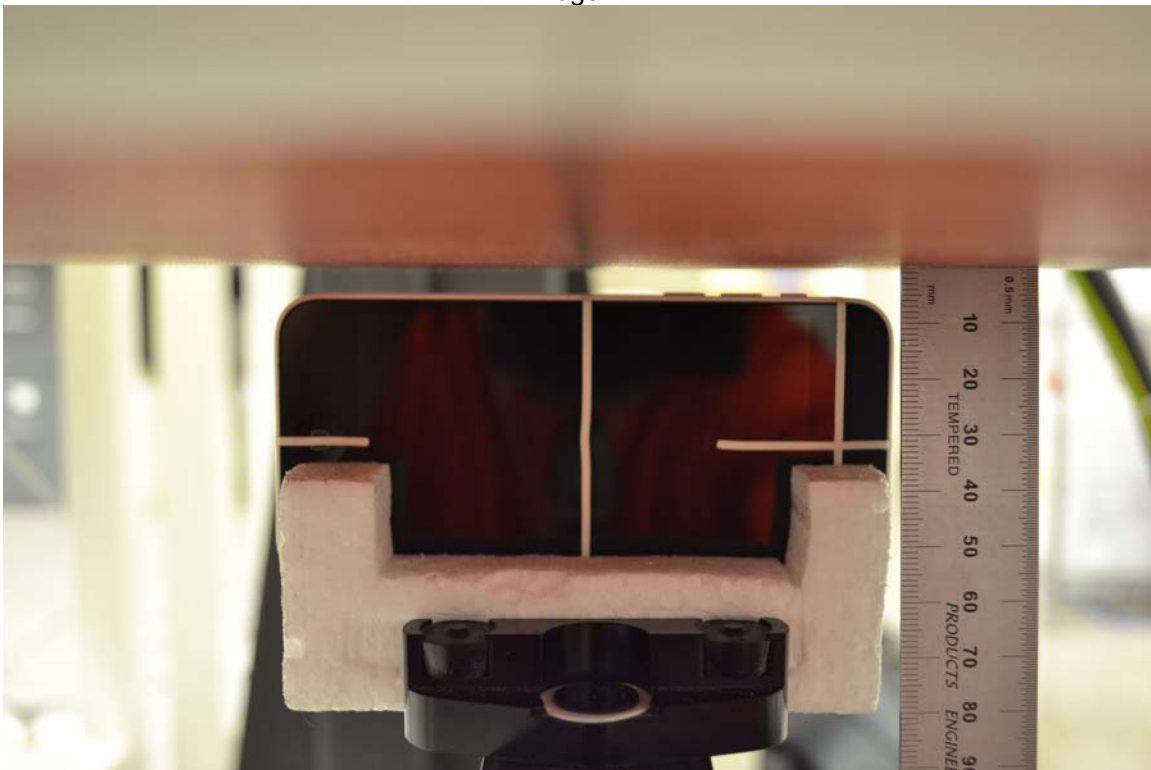
Edge 2



Edge 3



Edge 4



END OF REPORT