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: A1507

FCC ID: BCG-E2694B

Report Number: 13U15037-23A
Issue Date: 9/5/2013

Prepared for
APPLE INC.
1 INFINITE LOOP, MS 26A
CUPERTINO, CA 95014-2084

Prepared by
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	7/23/2013	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 13U15037-9A to 13U15037-23A 9. Sec. 7.1: Added flowchart and descriptions. 10. Sec. 9: Added note	Sunny Shih

Table of Contents

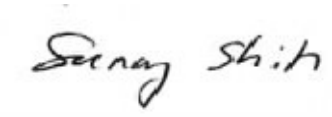
1. Attestation of Test Results

Applicant	Apple Inc.			
DUT description	iPhone			
Model	A1507			
Test device is	An identical prototype			
Device category	Portable			
Exposure category	General Population/Uncontrolled Exposure			
Date tested	6/3/2013 – 7/22/2013			
The highest reported SAR values	RF exposure conditions	Licensed	DTS	UNII
	Head	1.187 W/kg	0.576 W/kg	0.590 W/kg
	Body-worn Accessory	1.167 W/kg	0.536 W/kg	0.561 W/kg
	Wireless Router (Hotspot)	1.167 W/kg	0.536 W/kg	N/A
	Simultaneous Transmission	1.570 W/kg	1.536 W/kg	1.570 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.

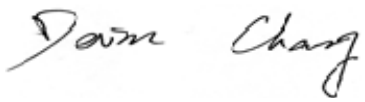
Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. 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:



Sunny Shih
WiSE Operations Manager
UL Verification Services Inc.

Prepared By:



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:

- 447498 D01 General RF Exposure Guidance v05r01
- 648474 D04 SAR Handsets Multi Xmiter and Ant v01r01
- 941225 D01 SAR test for 3G devices v02
- 941225 D02 HSPA and 1x Advanced v02r02
- 941225 D03 SAR Test Reduction GSM GPRS EDGE v01
- 941225 D04 SAR for GSM E GPRS Dual Xfer Mode v01
- 941225 D05 SAR for LTE Devices v02r02
- 941225 D06 Hot Spot SAR v01r01
- 248227 D01 SAR Meas for 802 11abg v01r02
- 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r01
- 865664 D02 SAR Reporting v01r01
- 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	748	2/11/2014
System Validation Dipole	SPEAG	D5GHzV2	1138	10/9/2013
System Validation Dipole	SPEAG	D5GHzV2	1003	9/18/2013

Others

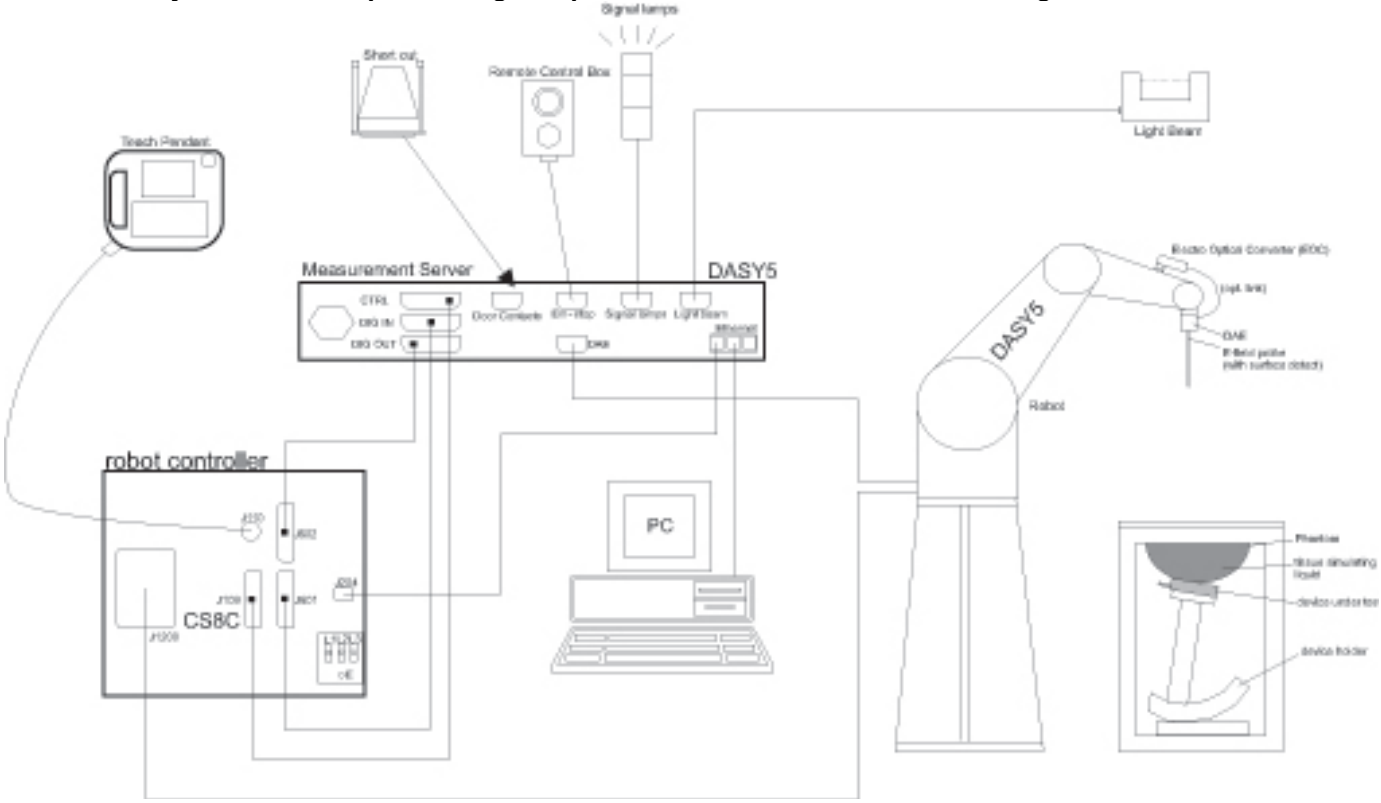
Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Base Station Simulator	Agilent	8960	MY48360200	3/20/2014
Base Station Simulator	R & S	CMU200	106291	8/8/2013
Base Station Simulator	R & S	CMU200	117455	5/20/2014
Base Station Simulator	R & S	CMU200	118715	5/20/2014
Base Station Simulator	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	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{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 ≤ 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: Δx_{Zoom}, Δy_{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: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
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 *reported* SAR from the area scan based *1-g SAR estimation* 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

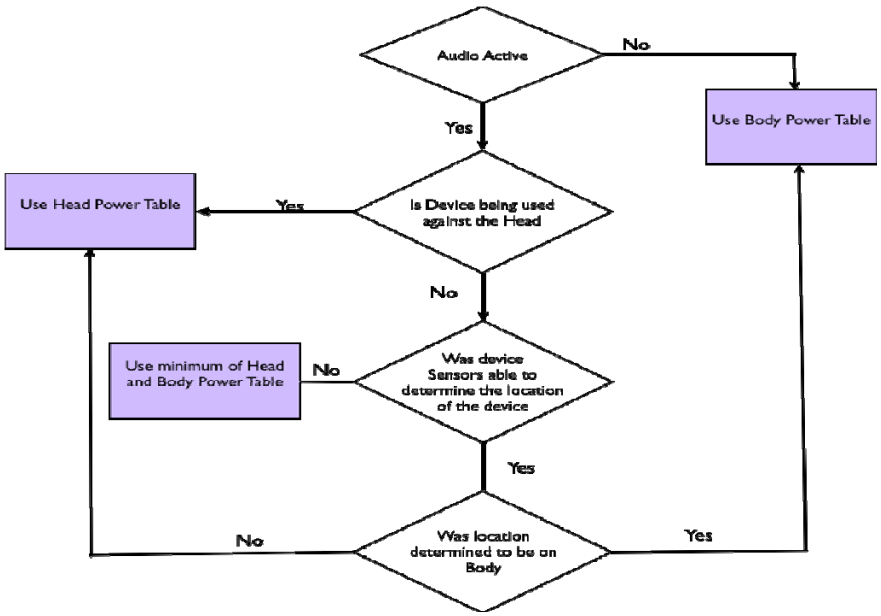
Step 2: Volume Scan
Volume Scans are used to assess peak SAR and averaged SAR measurements in largely extended 3-dimensional volumes within any phantom. This measurement does not need any previous area scan. The grid can be anchored to a user specific point or to the current probe location.

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: A1507 The FCC ID: BCG-E2694B 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

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>Frequency range, Channel Bandwidth, Numbers and Frequencies</td><td>
<table>
<tr><td rowspan="2">Band 2</td><td colspan="6">Frequency range: 1850 - 1910 MHz</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td>18700 /1860</td><td>18675/ 1857.5</td><td>18650/ 1855</td><td>18625/ 1852.5</td><td>18615/ 1851.5</td><td>18607/ 1850.7</td></tr>
<tr><td>Mid</td><td>18900/ 1880</td><td>18900/ 1880</td><td>18900/ 1880</td><td>18900/ 1880</td><td>18900/ 1880</td><td>18900/ 1880</td></tr>
<tr><td>High</td><td>19100/ 1900</td><td>19125/ 1902.5</td><td>19150/ 1905</td><td>19175/ 1907.5</td><td>19185/ 1908.5</td><td>19193/ 1909.3</td></tr>
<tr><td rowspan="2">Band 5</td><td colspan="6">Frequency range: 824 - 849 MHz</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td></td><td></td><td>20450/ 829</td><td>20425/ 826.5</td><td>20415/ 825.5</td><td>20407/ 824.7</td></tr>
<tr><td>Mid</td><td></td><td></td><td>20525/ 836.5</td><td>20525/ 836.5</td><td>20525/ 836.5</td><td>20525/ 836.5</td></tr>
<tr><td>High</td><td></td><td></td><td>20600/ 844</td><td>20625/ 846.5</td><td>20635/ 847.5</td><td>20643/ 848.3</td></tr>
</table>
</td></tr>
<tr><td>LTE transmitter and antenna implementation</td><td>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.</td></tr>
<tr><td>Maximum power reduction (MPR)</td><td>
Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3
<table>
<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
</td></tr>
<tr><td>Power reduction</td><td>No</td></tr>
<tr><td>Spectrum plots for RB configurations</td><td>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.</td></tr>
</table>

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	33.4	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	**32.0**	33.5	**32.4**	33.2	**32.2**	33.5	**31.0**
	190	836.6	33.2	**32.0**	33.5	**32.5**	33.2	**32.2**	33.5	**31.0**
	251	848.8	33.1	**32.0**	33.4	**32.4**	33.2	**32.2**	33.5	**31.0**
Frame Power (dBm)										
850	128	824.2	24.2	26.0	24.5	26.4	24.2	26.2	24.5	25.0
	190	836.6	24.2	26.0	24.5	26.5	24.2	26.2	24.5	25.0
	251	848.8	24.1	26.0	24.4	26.4	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	28.7	28.8	28.9	28.6	28.6	29.0	29.0
	190	836.6	28.6	28.7	29.0	29.0	28.7	28.7	28.9	29.0
	251	848.8	28.7	28.6	28.9	28.8	28.6	28.7	28.8	29.9
Frame Power (dBm)										
850	128	824.2	19.6	22.7	19.8	22.9	19.6	22.6	20.0	23.0
	190	836.6	19.6	22.7	20.0	23.0	19.7	22.7	19.9	23.0
	251	848.8	19.7	22.6	19.9	22.8	19.6	22.7	19.8	23.9

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	30.7	31.3	30.9	31.20
	661	1880.0	30.8	31.3	30.9	31.20
	810	1909.8	30.8	31.4	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	30.7	**29.9**	31.3	**29.5**	30.9	**29.9**	31.20	**28.5**
	661	1880.0	30.8	**29.9**	31.3	**29.3**	30.9	**29.9**	31.20	**28.5**
	810	1909.8	30.8	**29.7**	31.4	**29.5**	30.9	**29.9**	31.20	**28.5**
			Frame Power (dBm)				Frame Power (dBm)			
1900	512	1850.2	21.7	23.9	22.3	23.5	21.9	23.9	22.17	22.5
	661	1880.0	21.8	23.8	22.3	23.3	21.9	23.9	22.17	22.5
	810	1909.8	21.8	23.7	22.4	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	28.0	28.0	27.3	27.4	27.8	28.0
	661	1880.0	27.3	27.3	27.9	27.9	27.3	27.4	28.0	27.8
	810	1909.8	27.3	27.3	27.9	27.8	27.3	27.3	27.9	27.8
			Frame Power (dBm)				Frame Power (dBm)			
1900	512	1850.2	18.4	21.4	19.0	22.0	18.3	21.4	18.8	22.0
	661	1880.0	18.3	21.3	18.9	21.9	18.3	21.4	19.0	21.8
	810	1909.8	18.3	21.3	18.9	21.8	18.3	21.3	18.9	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
	βc/βd	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	22.8	23.9	21.25
		9400	1880.0	22.9	23.0	23.9	21.25
		9538	1907.6	22.7	22.9	23.8	21.25
W-CDMA Band 5	Rel 99 (RMC, 12.2 kbps)	4132	826.4	24.2	24.5	24.2	24.5
		4183	836.6	24.2	24.5	24.2	24.5
		4233	846.6	24.2	24.4	24.2	24.4

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			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	βc/βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	MPR (dB)	0	1	1.5	1.5
HSDPA Specific Settings	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			
	Ahs =βhs/βc	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	22.8	22.8	23.8	21.2
		9400	1880.0	22.7	22.9	23.7	21.1
		9538	1907.6	22.7	22.8	23.7	21.1
	Subtest 2	9262	1852.4	21.9	22.0	22.8	20.3
		9400	1880.0	21.8	21.8	22.9	20.2
		9538	1907.6	21.8	21.9	22.9	20.2
	Subtest 3	9262	1852.4	21.4	21.6	22.3	19.8
		9400	1880.0	21.4	21.5	22.4	19.6
		9538	1907.6	21.4	21.5	22.3	19.6
	Subtest 4	9262	1852.4	21.4	21.7	22.2	19.7
		9400	1880.0	21.3	21.5	22.3	19.7
		9538	1907.6	21.5	21.5	22.4	19.6
W-CDMA Band 5	Subtest 1	4132	826.4	24.1	24.3	24.1	24.3
		4183	836.6	24.2	24.3	24.0	24.4
		4233	846.6	24.2	24.4	24.0	24.3
	Subtest 2	4132	826.4	23.2	23.6	23.1	23.3
		4183	836.6	23.1	23.5	23.0	23.4
		4233	846.6	23.2	23.5	23.0	23.2
	Subtest 3	4132	826.4	22.7	23.0	22.8	22.9
		4183	836.6	22.8	22.9	22.7	23.1
		4233	846.6	22.8	23.1	22.9	23.0
	Subtest 4	4132	826.4	22.8	23.1	22.8	22.9
		4183	836.6	22.8	23.0	22.8	22.9
		4233	846.6	22.6	22.9	22.7	23.0

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				
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	15/15
	βec	209/225	12/15	30/15	2/15	24/15
	βc/βd	11/15	6/15	15/9	2/15	15/15
	βhs	22/15	12/15	30/15	4/15	30/15
	βed	1309/225	94/75	47/15 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 = βhs/βc	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	22.8	22.7	23.8	21.1
		9400	1880.0	22.8	22.9	23.8	21.2
		9538	1907.6	22.7	22.9	23.7	21.2
	Subtest 2	9262	1852.4	20.9	20.9	21.8	19.1
		9400	1880.0	21.0	20.8	21.9	19.2
		9538	1907.6	21.0	20.8	22.0	19.1
	Subtest 3	9262	1852.4	21.9	22.8	22.7	20.3
		9400	1880.0	21.9	22.8	22.8	20.2
		9538	1907.6	21.8	22.7	22.8	20.3
	Subtest 4	9262	1852.4	20.8	20.8	21.7	19.3
		9400	1880.0	20.8	20.7	21.8	19.1
		9538	1907.6	20.9	20.7	21.8	19.1
	Subtest 5	9262	1852.4	22.8	22.8	23.8	21.2
		9400	1880.0	22.8	22.9	23.7	21.1
		9538	1907.6	22.8	22.8	23.7	21.1
W-CDMA Band 5	Subtest 1	4132	826.4	24.1	24.2	24.1	24.3
		4183	836.6	24.1	24.3	24.2	24.3
		4233	846.6	24.0	24.4	24.2	24.3
	Subtest 2	4132	826.4	22.1	22.3	22.2	22.3
		4183	836.6	22.2	22.4	22.3	22.2
		4233	846.6	22.0	22.3	22.1	22.4
	Subtest 3	4132	826.4	23.2	23.3	23.2	23.2
		4183	836.6	23.1	23.2	23.2	23.4
		4233	846.6	23.2	23.2	23.1	23.2
	Subtest 4	4132	826.4	22.2	22.3	22.1	22.4
		4183	836.6	22.2	22.3	22.2	22.3
		4233	846.6	22.1	22.2	22.3	22.3
	Subtest 5	4132	826.4	24.2	24.3	24.2	24.2
		4183	836.6	24.2	24.3	24.1	24.3
		4233	846.6	24.1	24.4	24.1	24.3

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	Proces ses	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.		

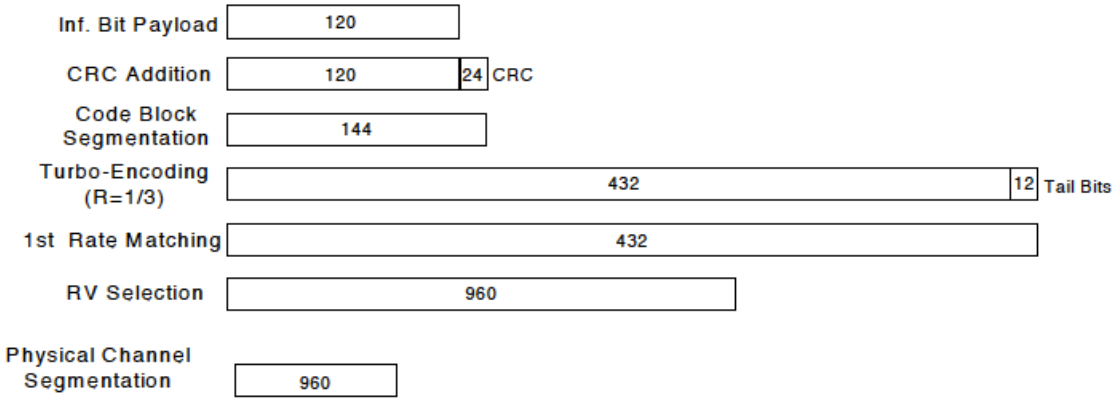


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βd (SF)	64			
	βc/βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	MPR (dB)	0	0	0.5	0.5
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack Repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	Ahs = βhs/ βc	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	22.8	22.7	23.7	21.0
		9400	1880.0	22.7	22.9	23.8	21.2
		9538	1907.6	22.7	22.8	23.6	21.1
	Subtest 2	9262	1852.4	22.8	22.8	23.8	21.0
		9400	1880.0	22.7	22.6	23.7	21.1
		9538	1907.6	22.7	22.7	23.7	21.1
	Subtest 3	9262	1852.4	22.4	22.4	23.5	20.6
		9400	1880.0	22.5	22.4	23.6	20.6
		9538	1907.6	22.4	22.4	23.6	20.5
	Subtest 4	9262	1852.4	22.5	22.4	23.4	24.0
		9400	1880.0	22.5	22.3	23.5	23.9
		9538	1907.6	22.3	22.3	23.5	23.8
W-CDMA Band 5	Subtest 1	4132	826.4	24.1	24.3	24.1	24.3
		4183	836.6	24.0	24.3	24.1	24.3
		4233	846.6	24.0	24.2	24.0	24.4
	Subtest 2	4132	826.4	24.2	24.2	24.1	24.3
		4183	836.6	24.0	24.3	24.2	24.4
		4233	846.6	24.2	24.4	24.0	24.3
	Subtest 3	4132	826.4	23.6	23.9	23.8	24.0
		4183	836.6	23.7	24.1	23.7	24.1
		4233	846.6	23.7	24.0	23.6	24.1
	Subtest 4	4132	826.4	23.5	23.8	23.9	24.1
		4183	836.6	23.7	23.9	23.7	24.0
		4233	846.6	23.7	24.1	23.7	24.0

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	23.0	23.0	23.4	20.7
				1	49	0	22.8	23.0	23.4	20.8
				1	99	0	22.9	23.0	23.3	20.8
				50	0	1	21.8	21.8	22.0	20.0
				50	24	1	21.8	21.9	22.0	20.0
				50	49	1	21.9	21.9	22.0	20.0
				100	0	1	21.9	21.9	22.1	20.0
			16QAM	1	0	1	22.0	21.8	22.2	20.0
				1	49	1	21.8	21.9	22.3	19.9
				1	99	1	21.9	21.9	22.3	19.8
				50	0	2	20.8	21.0	21.4	18.8
				50	24	2	20.9	21.0	21.3	18.9
				50	49	2	20.9	20.8	21.3	19.0
				100	0	2	20.9	20.9	21.3	19.0
	18900	1880.0	QPSK	1	0	0	22.9	22.8	23.4	21.0
				1	49	0	23.0	23.0	23.4	21.0
				1	99	0	23.0	23.0	23.4	21.0
				50	0	1	21.8	22.0	22.3	20.0
				50	24	1	21.8	22.0	22.4	20.0
				50	49	1	22.0	21.9	22.4	20.0
				100	0	1	22.0	21.9	22.4	20.0
			16QAM	1	0	1	21.8	21.9	22.3	19.9
				1	49	1	21.9	21.8	22.2	20.0
				1	99	1	22.0	22.0	22.3	19.8
				50	0	2	21.0	21.1	21.1	18.9
				50	24	2	20.9	21.0	21.3	18.8
				50	49	2	20.9	21.1	21.3	18.9
				100	0	2	21.0	19.9	21.2	18.8
	19100	1900.0	QPSK	1	0	0	23.0	22.9	23.4	21.0
				1	49	0	23.0	22.9	23.4	21.0
				1	99	0	23.0	22.8	23.4	21.0
				50	0	1	22.4	21.9	22.5	20.2
				50	24	1	22.4	22.0	22.4	20.1
				50	49	1	22.3	21.8	22.4	20.0
				100	0	1	22.3	21.8	22.4	20.0
			16QAM	1	0	1	21.9	21.8	22.3	20.0
				1	49	1	22.0	21.9	22.2	19.9
				1	99	1	22.1	21.9	22.4	19.9
				50	0	2	20.9	21.0	21.3	18.8
				50	24	2	21.0	21.1	21.4	19.0
				50	49	2	20.8	20.9	21.3	19.0
				100	0	2	21.0	21.0	21.4	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
15	18675	1857.5	QPSK	1	0	0	22.9	22.9	23.2	20.7
				1	37	0	22.8	23.0	23.4	20.7
				1	74	0	22.9	22.8	23.3	20.7
				36	0	1	21.8	21.8	22.0	19.9
				36	16	1	21.8	21.8	22.1	20.0
				36	35	1	21.9	21.9	22.0	20.1
				75	0	1	21.8	21.7	22.0	20.0
			16QAM	1	0	1	21.9	21.8	22.1	20.0
				1	37	1	21.8	21.9	22.0	19.9
				1	74	1	21.9	21.8	22.2	19.8
				36	0	2	20.7	21.0	21.3	18.8
				36	16	2	20.8	20.9	21.3	18.8
				36	35	2	20.9	20.8	21.2	18.9
				75	0	2	20.9	20.9	21.2	19.0
	18900	1880.0	QPSK	1	0	0	22.9	22.9	23.3	20.9
				1	37	0	22.9	23.0	23.3	20.9
				1	74	0	22.8	22.8	23.2	20.7
				36	0	1	21.8	22.0	22.3	20.1
				36	16	1	21.8	21.9	22.4	20.0
				36	35	1	21.9	21.9	22.3	20.0
				75	0	1	22.0	21.8	22.3	20.0
			16QAM	1	0	1	21.8	21.9	22.3	19.9
				1	37	1	21.8	21.8	22.2	19.8
				1	74	1	22.0	21.8	22.3	19.9
				36	0	2	21.0	21.1	21.0	18.9
				36	16	2	20.8	20.9	21.2	19.0
				36	35	2	20.9	21.0	21.2	18.9
				75	0	2	21.0	21.0	21.2	19.0
	19125	1902.5	QPSK	1	0	0	22.9	22.9	23.3	20.8
				1	37	0	22.8	22.9	23.2	20.9
				1	74	0	22.9	22.7	23.2	21.0
				36	0	1	22.2	21.9	22.3	20.1
				36	16	1	22.2	21.8	22.3	20.1
				36	35	1	22.3	21.8	22.4	19.9
				75	0	1	22.3	21.8	22.4	20.0
			16QAM	1	0	1	21.9	21.8	22.4	20.0
				1	37	1	21.8	21.7	22.2	19.9
				1	74	1	22.0	21.9	22.4	19.9
				36	0	2	20.9	21.0	21.3	18.9
				36	16	2	20.9	21.1	21.4	19.0
				36	35	2	20.8	20.9	21.3	19.0
				75	0	2	21.0	21.0	21.3	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
10	18650	1855.0	QPSK	1	0	0	22.9	22.9	23.2	20.8
				1	24	0	22.8	23.0	23.4	20.9
				1	49	0	22.8	22.8	23.3	20.7
				25	0	1	21.9	21.8	22.0	19.9
				25	12	1	21.8	21.8	22.1	20.0
				25	24	1	21.9	21.9	22.0	20.1
				50	0	1	21.8	21.7	22.0	20.2
			16QAM	1	0	1	21.8	21.8	22.1	20.0
				1	24	1	21.8	21.9	22.0	20.0
				1	49	1	21.7	21.8	22.2	19.8
				25	0	2	20.7	21.0	21.3	18.8
				25	12	2	20.9	20.9	21.3	18.9
				25	24	2	20.7	20.8	21.2	18.9
				50	0	2	20.7	20.9	21.2	18.8
	18900	1880.0	QPSK	1	0	0	22.8	22.9	23.3	20.8
				1	24	0	22.7	23.0	23.3	20.9
				1	49	0	22.8	22.8	23.2	20.7
				25	0	1	21.8	22.0	22.3	20.1
				25	12	1	21.9	21.9	22.4	20.1
				25	24	1	21.8	21.9	22.3	20.0
				50	0	1	21.9	21.8	22.3	19.9
			16QAM	1	0	1	21.8	21.9	22.3	19.9
				1	24	1	21.8	21.8	22.2	19.7
				1	49	1	22.0	21.8	22.3	19.8
				25	0	2	21.0	21.1	21.0	18.9
				25	12	2	20.8	20.9	21.2	19.0
				25	24	2	20.8	21.0	21.2	18.9
				50	0	2	20.8	21.0	21.2	19.0
	19150	1905.0	QPSK	1	0	0	22.9	22.9	23.3	20.8
				1	24	0	22.8	22.9	23.2	20.9
				1	49	0	22.9	22.7	23.2	20.9
				25	0	1	22.1	21.9	22.3	20.0
				25	12	1	22.1	21.8	22.3	20.0
				25	24	1	22.3	21.8	22.4	19.9
				50	0	1	22.3	21.8	22.4	20.0
			16QAM	1	0	1	21.9	21.8	22.4	20.0
				1	24	1	21.8	21.7	22.2	19.9
				1	49	1	21.7	21.9	22.4	19.8
				25	0	2	20.9	21.0	21.3	18.9
				25	12	2	20.9	21.1	21.4	19.0
				25	24	2	20.7	20.9	21.3	19.0
				50	0	2	20.9	21.0	21.3	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	22.9	22.9	23.2	20.7
				1	12	0	22.9	22.9	23.3	20.8
				1	24	0	22.8	22.8	23.3	20.7
				12	0	1	21.8	21.8	22.0	20.0
				12	6	1	21.7	21.9	22.1	20.0
				12	11	1	21.7	21.9	22.1	19.9
				25	0	1	21.8	21.7	22.0	20.1
			16QAM	1	0	1	21.8	21.8	22.1	19.8
				1	12	1	21.8	21.7	22.1	20.0
				1	24	1	21.7	21.8	22.2	19.8
				12	0	2	20.7	21.0	21.3	18.7
				12	6	2	20.8	20.7	21.2	18.9
				12	11	2	20.7	20.8	21.2	18.9
				25	0	2	20.8	20.9	21.0	18.9
	18900	1880.0	QPSK	1	0	0	22.8	22.8	23.3	20.8
				1	12	0	22.7	22.9	23.4	20.9
				1	24	0	22.7	22.8	23.2	20.7
				12	0	1	21.8	22.0	22.3	20.1
				12	6	1	21.9	21.9	22.2	20.2
				12	11	1	21.9	21.7	22.3	20.0
				25	0	1	21.9	21.8	22.3	19.9
			16QAM	1	0	1	21.8	21.9	22.3	20.0
				1	12	1	21.7	21.8	22.2	19.7
				1	24	1	21.8	21.8	22.3	19.8
				12	0	2	21.0	21.1	21.0	18.9
				12	6	2	20.9	20.8	21.3	19.0
				12	11	2	20.8	20.9	21.3	18.9
				25	0	2	20.8	21.0	21.3	19.0
	19175	1907.5	QPSK	1	0	0	22.9	22.7	23.3	20.7
				1	12	0	22.8	22.8	23.3	20.8
				1	24	0	22.9	22.7	23.2	20.7
				12	0	1	22.0	21.8	22.3	20.1
				12	6	1	22.2	21.8	22.4	20.1
				12	11	1	22.3	21.7	22.3	19.9
				25	0	1	22.2	21.8	22.4	20.1
			16QAM	1	0	1	21.9	21.8	22.3	20.0
				1	12	1	21.8	21.7	22.2	19.9
				1	24	1	21.7	21.7	22.4	19.9
				12	0	2	21.0	21.0	21.4	18.9
				12	6	2	20.9	21.1	21.3	19.1
				12	11	2	20.8	21.0	21.3	19.0
				25	0	2	20.9	21.0	21.3	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
3	18615	1851.5	QPSK	1	0	0	22.7	22.8	23.3	20.8
				1	7	0	22.8	22.8	23.3	20.8
				1	14	0	22.8	22.8	23.2	20.7
				8	0	1	21.8	21.9	22.0	20.1
				8	4	1	21.7	21.9	22.2	20.0
				8	7	1	21.8	21.7	22.1	19.9
				15	0	1	21.8	21.7	22.0	20.1
			16QAM	1	0	1	21.8	21.9	22.1	19.9
				1	7	1	21.8	21.7	22.2	20.0
				1	14	1	21.9	21.8	22.2	19.8
				8	0	2	20.7	21.1	21.3	18.9
				8	4	2	20.9	20.9	21.1	18.9
				8	7	2	20.7	20.8	21.2	18.8
				15	0	2	20.8	21.0	21.0	18.9
	18900	1880.0	QPSK	1	0	0	22.8	22.8	23.3	20.8
				1	7	0	22.7	22.8	23.3	20.9
				1	14	0	22.8	22.8	23.3	20.7
				8	0	1	21.8	22.0	22.3	20.1
				8	4	1	21.7	21.7	22.4	20.2
				8	7	1	21.9	21.7	22.2	20.1
				15	0	1	21.9	21.8	22.3	20.0
			16QAM	1	0	1	21.8	21.9	22.3	19.8
				1	7	1	21.8	21.8	22.2	19.7
				1	14	1	21.8	21.9	22.3	19.8
				8	0	2	21.0	21.1	21.0	19.0
				8	4	2	20.7	20.8	21.4	18.8
				8	7	2	20.8	20.8	21.3	18.9
				15	0	2	20.9	20.9	21.3	18.9
	19185	1908.5	QPSK	1	0	0	22.9	22.7	23.4	20.7
				1	7	0	22.9	22.8	23.3	20.8
				1	14	0	22.8	22.7	23.2	20.7
				8	0	1	22.1	21.8	22.3	20.2
				8	4	1	22.2	21.9	22.4	20.1
				8	7	1	22.2	21.7	22.4	19.9
				15	0	1	22.1	21.8	22.3	20.2
			16QAM	1	0	1	21.9	21.9	22.3	20.0
				1	7	1	21.8	21.7	22.2	19.9
				1	14	1	21.7	21.7	22.4	19.9
				8	0	2	21.0	21.0	21.3	18.8
				8	4	2	20.9	19.9	21.4	19.1
				8	7	2	20.8	21.0	21.3	19.0
				15	0	2	20.7	21.0	21.3	19.0

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	22.9	22.8	23.3	20.8
				1	2	0	23.0	22.9	23.4	20.8
				1	5	0	22.8	22.8	23.3	20.7
				3	0	0	22.9	22.8	23.2	20.7
				3	1	0	22.9	22.8	23.3	20.8
				3	2	0	22.8	22.9	23.3	20.8
				6	0	1	21.9	21.8	22.2	19.8
			16QAM	1	0	1	21.8	21.7	22.3	19.9
				1	2	1	21.9	21.8	22.4	19.9
				1	5	1	21.8	21.8	22.4	19.8
				3	0	1	21.8	21.8	22.3	20.0
				3	1	1	21.7	21.9	22.3	19.8
				3	2	1	21.9	21.7	22.4	19.9
				6	0	2	21.2	20.8	21.4	18.8
	18900	1880.0	QPSK	1	0	0	22.8	22.9	23.3	20.8
				1	2	0	22.9	22.8	23.2	20.8
				1	5	0	22.9	22.8	23.3	20.7
				3	0	0	22.9	22.7	23.2	20.8
				3	1	0	22.8	22.8	23.3	20.7
				3	2	0	22.9	22.8	23.2	20.7
				6	0	1	21.8	21.9	22.4	19.9
			16QAM	1	0	1	21.9	21.8	22.5	19.9
				1	2	1	21.8	21.8	22.3	19.8
				1	5	1	21.8	21.8	22.5	19.7
				3	0	1	21.7	21.7	22.4	19.7
				3	1	1	21.8	21.8	22.3	19.6
				3	2	1	21.9	21.7	22.3	19.8
				6	0	2	21.0	20.9	21.4	18.6
	19193	1909.3	QPSK	1	0	0	22.9	22.9	23.4	20.8
				1	2	0	22.8	22.8	23.3	20.7
				1	5	0	22.8	22.8	23.3	20.7
				3	0	0	22.8	22.8	23.2	20.6
				3	1	0	22.7	22.7	23.3	20.8
				3	2	0	22.8	22.8	23.3	20.7
				6	0	1	21.8	21.7	22.4	19.7
			16QAM	1	0	1	21.7	21.8	22.3	19.8
				1	2	1	21.7	21.7	22.4	19.9
				1	5	1	21.8	21.8	22.4	19.8
				3	0	1	21.8	21.9	22.5	19.7
				3	1	1	21.8	21.8	22.4	19.8
				3	2	1	21.8	21.8	22.3	19.7
				6	0	2	20.9	21.7	21.5	18.7

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	23.5	23.8	23.5	23.8
				1	24	0	23.7	23.8	23.7	24.0
				1	49	0	23.4	23.8	23.7	23.8
				25	0	1	22.4	22.8	22.5	22.6
				25	12	1	22.6	22.8	22.6	22.7
				25	24	1	22.7	22.8	22.6	22.8
				50	0	1	22.5	22.6	22.5	22.7
			16QAM	1	0	1	22.6	22.7	22.5	22.7
				1	24	1	22.5	22.6	22.6	22.6
				1	49	1	22.5	22.6	22.6	22.6
				25	0	2	21.5	21.6	21.5	21.5
				25	12	2	21.4	21.5	21.6	21.6
				25	24	2	21.4	21.5	21.6	21.6
				50	0	2	21.5	21.5	21.6	21.5
	20525	836.5	QPSK	1	0	0	23.7	23.8	23.7	23.9
				1	24	0	23.7	23.9	23.7	23.9
				1	49	0	23.7	23.8	23.7	23.9
				25	0	1	22.6	23.0	22.6	22.7
				25	12	1	22.7	23.0	22.6	22.8
				25	24	1	22.7	23.0	22.6	22.8
				50	0	1	22.5	22.9	22.5	22.7
			16QAM	1	0	1	22.5	22.8	22.5	22.6
				1	24	1	22.4	22.7	22.4	22.7
				1	49	1	22.5	22.9	22.4	22.5
				25	0	2	21.5	21.8	21.5	21.5
				25	12	2	21.6	21.9	21.6	21.6
				25	24	2	21.5	21.8	21.4	21.5
				50	0	2	21.4	21.7	21.4	21.6
	20600	844.0	QPSK	1	0	0	23.7	23.9	23.7	24.0
				1	24	0	23.7	24.0	23.7	24.0
				1	49	0	23.7	24.0	23.7	22.9
				25	0	1	22.6	22.9	22.7	22.9
				25	12	1	22.7	23.0	22.7	23.0
				25	24	1	22.7	23.0	22.5	22.9
				50	0	1	22.6	22.9	22.6	22.9
			16QAM	1	0	1	22.6	22.9	22.7	22.9
				1	24	1	22.5	22.8	22.6	22.8
				1	49	1	22.5	22.8	22.6	22.9
				25	0	2	21.6	21.8	22.5	21.9
				25	12	2	21.5	21.9	22.6	21.8
				25	24	2	21.5	21.7	22.5	21.8
				50	0	2	21.6	21.8	22.5	21.8

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	23.6	23.8	23.6	23.9
				1	12	0	23.6	23.7	23.7	23.9
				1	24	0	23.5	23.8	23.7	23.8
				12	0	1	22.6	22.9	22.6	22.6
				12	6	1	22.7	22.7	22.6	22.8
				12	11	1	22.6	22.8	22.7	22.8
				25	0	1	22.6	22.7	22.5	22.7
			16QAM	1	0	1	22.5	22.7	22.5	22.9
				1	12	1	22.6	22.7	22.6	22.6
				1	24	1	22.6	22.6	22.7	22.7
				12	0	2	21.4	21.5	21.5	21.7
				12	6	2	21.5	21.5	21.6	21.6
				12	11	2	21.4	21.7	21.8	21.6
				25	0	2	21.5	21.5	21.6	21.6
	20525	836.5	QPSK	1	0	0	23.6	23.8	23.7	23.8
				1	12	0	23.5	23.8	23.6	23.8
				1	24	0	23.5	23.8	23.7	23.9
				12	0	1	22.6	23.1	22.7	22.7
				12	6	1	22.7	23.0	22.6	22.8
				12	11	1	22.8	23.0	22.8	22.8
				25	0	1	22.5	23.0	22.5	22.6
			16QAM	1	0	1	22.6	22.8	22.5	22.7
				1	12	1	22.5	22.8	22.5	22.7
				1	24	1	22.5	22.9	22.4	22.5
				12	0	2	21.5	21.8	21.6	21.5
				12	6	2	21.4	21.8	21.6	21.7
				12	11	2	21.4	21.7	21.5	21.5
				25	0	2	21.5	21.7	21.5	21.6
	20625	846.5	QPSK	1	0	0	23.5	23.8	23.7	23.8
				1	12	0	23.6	23.9	23.8	23.7
				1	24	0	23.6	23.8	23.8	22.9
				12	0	1	22.5	22.9	22.8	22.9
				12	6	1	22.6	23.0	22.7	23.0
				12	11	1	22.7	22.8	22.5	22.9
				25	0	1	22.6	22.9	22.6	22.8
			16QAM	1	0	1	22.6	22.8	22.7	22.9
				1	12	1	22.5	22.8	22.7	22.8
				1	24	1	22.4	22.8	22.6	22.9
				12	0	2	21.6	21.8	22.5	21.8
				12	6	2	21.4	21.8	22.5	21.8
				12	11	2	21.5	21.7	22.5	21.8
				25	0	2	21.5	21.8	22.7	21.7

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	23.7	23.7	23.6	23.8
				1	7	0	23.7	23.7	23.6	23.9
				1	14	0	23.6	23.8	23.7	23.8
				8	0	1	22.6	23.0	22.7	22.7
				8	4	1	22.8	22.8	22.6	22.8
				8	7	1	22.6	22.8	22.7	22.8
				15	0	1	22.6	22.9	22.5	22.7
			16QAM	1	0	1	22.6	22.8	22.6	22.8
				1	7	1	22.6	22.7	22.6	22.6
				1	14	1	22.7	22.6	22.7	22.7
				8	0	2	21.4	21.6	21.6	21.7
				8	4	2	21.6	21.5	21.6	21.8
				8	7	2	21.4	21.6	21.9	21.6
				15	0	2	21.5	21.5	21.6	21.6
	20525	836.5	QPSK	1	0	0	23.6	23.8	23.7	23.7
				1	7	0	23.7	23.7	23.6	23.8
				1	14	0	23.5	23.7	23.7	23.9
				8	0	1	22.6	23.1	22.7	22.7
				8	4	1	22.8	22.8	22.7	22.9
				8	7	1	22.8	22.9	22.8	22.8
				15	0	1	22.5	22.8	22.5	22.6
			16QAM	1	0	1	22.7	22.8	22.6	22.7
				1	7	1	22.6	22.9	22.5	22.8
				1	14	1	22.5	22.9	22.4	22.5
				8	0	2	21.5	21.8	21.6	21.5
				8	4	2	21.4	21.9	21.7	21.8
				8	7	2	21.5	21.7	21.5	21.5
				15	0	2	21.5	21.8	21.5	21.6
	20635	847.5	QPSK	1	0	0	23.5	23.8	23.7	23.9
				1	7	0	23.7	23.8	23.7	23.7
				1	14	0	23.6	23.8	23.6	22.9
				8	0	1	22.6	22.9	22.8	22.9
				8	4	1	22.6	23.1	22.7	23.1
				8	7	1	22.7	22.9	22.7	22.9
				15	0	1	22.7	22.9	22.6	22.8
			16QAM	1	0	1	22.6	22.9	22.7	22.8
				1	7	1	22.5	22.8	22.5	22.8
				1	14	1	22.5	22.8	22.6	22.9
				8	0	2	21.6	21.8	22.5	21.8
				8	4	2	21.6	21.9	22.6	21.8
				8	7	2	21.5	21.8	22.5	21.6
				15	0	2	21.7	21.9	22.8	21.8

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	23.7	23.7	23.7	23.8
				1	2	0	23.6	23.9	23.6	23.9
				1	5	0	23.6	23.8	23.6	23.8
				3	0	0	23.6	23.8	23.7	23.8
				3	1	0	23.5	23.8	23.6	23.7
				3	2	0	23.6	23.7	23.5	23.7
				6	0	1	22.7	22.8	22.6	22.7
			16QAM	1	0	1	22.6	22.8	22.7	22.8
				1	2	1	22.7	22.7	22.8	22.6
				1	5	1	22.6	22.7	22.6	22.6
				3	0	1	22.6	22.8	22.7	22.7
				3	1	1	22.5	22.8	22.6	22.6
				3	2	1	22.6	22.7	22.5	22.7
				6	0	2	21.6	21.8	21.7	21.8
	20525	836.5	QPSK	1	0	0	23.6	23.8	23.6	23.8
				1	2	0	23.7	23.9	23.7	23.9
				1	5	0	23.5	23.7	23.5	23.8
				3	0	0	23.3	23.8	23.5	23.7
				3	1	0	23.6	23.8	23.5	23.8
				3	2	0	23.5	23.7	23.6	23.8
				6	0	1	22.6	22.8	22.5	22.9
			16QAM	1	0	1	22.7	22.9	22.6	22.8
				1	2	1	22.6	22.8	22.6	22.7
				1	5	1	22.6	22.7	22.5	22.8
				3	0	1	22.7	22.7	22.6	22.6
				3	1	1	22.5	22.6	22.4	22.7
				3	2	1	22.6	22.8	22.5	22.7
				6	0	2	21.5	21.8	21.6	21.8
	20643	848.3	QPSK	1	0	0	23.6	23.7	23.5	23.8
				1	2	0	23.5	23.8	23.6	23.8
				1	5	0	23.7	23.8	23.6	23.7
				3	0	0	23.5	23.7	23.5	23.7
				3	1	0	23.6	23.7	23.6	23.6
				3	2	0	23.6	23.6	23.6	23.7
				6	0	1	22.6	22.7	22.6	21.7
			16QAM	1	0	1	22.7	22.8	22.7	21.8
				1	2	1	22.5	22.7	22.6	21.6
				1	5	1	22.6	22.9	22.7	21.8
				3	0	1	22.6	22.8	22.5	21.7
				3	1	1	22.5	22.7	22.6	21.8
				3	2	1	22.6	22.8	22.7	21.6
				6	0	2	21.6	21.8	21.7	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 ¼ 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):

1. 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.
2. 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):

1. 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^2O	Water, 35 – 58%
Sucrese	Sugar, white, refined, 40-60%
NaCl	Sodium Chloride, 0-6%
Hydroxyethel-cellulsoe	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-methyyl-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^2O	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 ± 2°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 ±(%)
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
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
7/15/2013	Head 835	e'	41.7800	Relative Permittivity (ε_r):	41.78	41.50	0.67	5
		e"	19.8700	Conductivity (σ):	0.92	0.90	2.50	5
	Head 820	e'	41.9300	Relative Permittivity (ε_r):	41.93	41.60	0.79	5
		e"	19.9200	Conductivity (σ):	0.91	0.90	1.09	5
	Head 850	e'	41.6200	Relative Permittivity (ε_r):	41.62	41.50	0.29	5
		e"	19.8300	Conductivity (σ):	0.94	0.92	2.43	5
7/18/2013	Head 835	e'	41.5700	Relative Permittivity (ε_r):	41.57	41.50	0.17	5
		e"	19.9800	Conductivity (σ):	0.93	0.90	3.07	5
	Head 820	e'	42.2600	Relative Permittivity (ε_r):	42.26	41.60	1.58	5
		e"	20.2300	Conductivity (σ):	0.92	0.90	2.66	5
	Head 850	e'	41.8600	Relative Permittivity (ε_r):	41.86	41.50	0.87	5
		e"	20.1200	Conductivity (σ):	0.95	0.92	3.93	5

SAR Room B

	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
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
7/15/2013	Head 1900	e'	41.4800	Relative Permittivity (ϵ_r):	41.48	40.00	3.70	5
		e"	13.6400	Conductivity (σ):	1.44	1.40	2.93	5
	Head 1850	e'	41.6800	Relative Permittivity (ϵ_r):	41.68	40.00	4.20	5
		e"	13.5200	Conductivity (σ):	1.39	1.40	-0.66	5
	Head 1910	e'	41.4400	Relative Permittivity (ϵ_r):	41.44	40.00	3.60	5
		e"	13.6700	Conductivity (σ):	1.45	1.40	3.70	5
7/22/2013	Head 1900	e'	38.6200	Relative Permittivity (ϵ_r):	38.62	40.00	-3.45	5
		e"	13.3800	Conductivity (σ):	1.41	1.40	0.97	5
	Head 1850	e'	38.7900	Relative Permittivity (ϵ_r):	38.79	40.00	-3.03	5
		e"	13.2200	Conductivity (σ):	1.36	1.40	-2.87	5
	Head 1910	e'	38.5800	Relative Permittivity (ϵ_r):	38.58	40.00	-3.55	5
		e"	13.4000	Conductivity (σ):	1.42	1.40	1.65	5

SAR Room C

	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
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
	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
7/9/2013	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
	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
7/12/2013	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
	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
7/12/2013	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
	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 ±(%)
7/12/2013	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
7/15/2013	Body 835	e'	52.9900	Relative Permittivity (ϵ_r):	52.99	55.20	-4.00	5
		e"	21.5200	Conductivity (σ):	1.00	0.97	3.00	5
	Body 820	e'	53.1000	Relative Permittivity (ϵ_r):	53.10	55.28	-3.94	5
		e"	21.5800	Conductivity (σ):	0.98	0.97	1.60	5
	Body 850	e'	52.8400	Relative Permittivity (ϵ_r):	52.84	55.16	-4.20	5
		e"	21.4700	Conductivity (σ):	1.01	0.99	2.79	5
7/18/2013	Body 835	e'	56.1100	Relative Permittivity (ϵ_r):	56.11	55.20	1.65	5
		e"	21.8700	Conductivity (σ):	1.02	0.97	4.68	5
	Body 820	e'	55.9500	Relative Permittivity (ϵ_r):	55.95	55.28	1.22	5
		e"	21.8100	Conductivity (σ):	0.99	0.97	2.68	5
	Body 850	e'	55.8000	Relative Permittivity (ϵ_r):	55.80	55.16	1.17	5
		e"	21.7400	Conductivity (σ):	1.03	0.99	4.09	5

SAR Room E

	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
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
	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
6/24/2013	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
	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
6/27/2013	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
	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
6/27/2013	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
	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 ±(%)
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
	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
7/1/2013	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
	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
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
7/15/2013	Body 1900	e'	52.4200	Relative Permittivity (ϵ_r):	52.42	53.30	-1.65	5
		e"	14.6500	Conductivity (σ):	1.55	1.52	1.82	5
	Body 1850	e'	52.5800	Relative Permittivity (ϵ_r):	52.58	53.30	-1.35	5
		e"	14.5400	Conductivity (σ):	1.50	1.52	-1.60	5
	Body 1910	e'	52.3900	Relative Permittivity (ϵ_r):	52.39	53.30	-1.71	5
		e"	14.6700	Conductivity (σ):	1.56	1.52	2.50	5
7/18/2013	Body 1900	e'	51.8300	Relative Permittivity (ϵ_r):	51.83	53.30	-2.76	5
		e"	14.6500	Conductivity (σ):	1.55	1.52	1.82	5
	Body 1850	e'	51.9900	Relative Permittivity (ϵ_r):	51.99	53.30	-2.46	5
		e"	14.6000	Conductivity (σ):	1.50	1.52	-1.19	5
	Body 1910	e'	51.8100	Relative Permittivity (ϵ_r):	51.81	53.30	-2.80	5
		e"	14.6700	Conductivity (σ):	1.56	1.52	2.50	5

SAR Room F

	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 (εr):	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 (εr):	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 (εr):	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 (εr):	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 (εr):	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
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
	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

Tissue Dielectric Parameter Check Results (SAR Room F continued)

	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
7/1/2013	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
	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
7/9/2013	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
	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
7/12/2013	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
	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
	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
7/22/2013	Body 835	e'	53.8100	Relative Permittivity (ϵ_r):	53.81	55.20	-2.52	5
		e"	21.7700	Conductivity (σ):	1.01	0.97	4.20	5
	Body 820	e'	53.9300	Relative Permittivity (ϵ_r):	53.93	55.28	-2.44	5
		e"	21.8700	Conductivity (σ):	1.00	0.97	2.96	5
	Body 850	e'	53.6500	Relative Permittivity (ϵ_r):	53.65	55.16	-2.73	5
		e"	21.6700	Conductivity (σ):	1.02	0.99	3.75	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	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 ±10 %	Est./Zoom Ratio ±3 %	Plot No.
	Type	Serial #			Area Scan	Zoom Scan	Normalize to 1 W				
7/11/2013	D2450V2	748	Body	1g	5.29	5.33	53.30	49.90	**6.81**	-0.76	1,2
				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		
7/15/2013	D835V2	4d142	Head	1g	1.01	1.00	10.00	9.45	**5.82**	0.99	3,4
				10g	0.68	0.65	6.53	6.23	4.82		
7/18/2013	D835V2	4d142	Head	1g	0.95	0.94	9.43	9.45	-0.21	0.53	
				10g	0.64	0.62	6.18	6.23	-0.80		

SAR Room B

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				
7/12/2013	D1900V2	5d163	Head	1g	4.35	4.13	41.30	39.40	**4.82**	5.06	5,6
				10g	2.29	2.14	21.40	20.70	3.38		
7/15/2013	D1900V2	5d163	Head	1g	4.18	4.09	40.90	39.40	3.81	2.15	
				10g	2.17	2.11	21.10	20.70	1.93		
7/22/2013	D1900V2	5d163	Head	1g	3.91	3.82	38.20	39.40	-3.05	2.30	
				10g	2.02	1.99	19.90	20.70	-3.86		

SAR Room C

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				
7/9/2013	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	7,8
				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				
7/12/2013	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		
7/15/2013	D835V2	4d002	Body	1g	0.97	0.96	9.57	9.48	0.95	1.24	
				10g	0.65	0.63	6.30	6.26	0.64		
7/18/2013	D835V2	4d142	Body	1g	0.98	0.92	9.23	9.50	**-2.84**	6.10	9,10
				10g	0.66	0.61	6.09	6.29	-3.18		

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	11,12
				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	13,14
				10g	2.12	2.29	22.90	20.90	9.57		
7/12/2013	D1900V2	5d043	Body	1g	4.01	3.98	39.80	40.90	**-2.69**	0.75	15,16
				10g	2.00	2.09	20.90	21.60	-3.24		
7/15/2013	D1900V2	5d163	Body	1g	4.09	4.05	40.50	39.60	2.27	0.98	
				10g	2.04	2.12	21.20	21.10	0.47		
7/18/2013	D1900V2	5d163	Body	1g	3.90	3.86	38.60	39.60	**-2.53**	1.03	17,18
				10g	1.96	2.02	20.20	21.10	-4.27		

SAR Room F

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	19,20
				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	21,22
				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		
7/22/2013	D835V2	4d142	Body	1g	1.02	1.00	9.99	9.50	**5.16**	2.06	23,24
				10g	0.68	0.66	6.57	6.29	4.45		

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	0.317	0.317	0.222	0.222	
Left Tilt	UAT	Voice	190	836.6	33.2	33.2	0.160	0.160	0.102	0.102	
Right Touch	UAT	Voice	190	836.6	33.2	33.2	0.272	0.272	0.190	0.190	
Right Tilt	UAT	Voice	190	836.6	33.2	33.2	0.145	0.145	0.089	0.089	
Left Touch	UAT	GPRS 2 slots	190	836.6	32.2	32.2	0.496	0.496	0.349	0.349	
Left Tilt	UAT	GPRS 2 slots	190	836.6	32.2	32.2	0.227	0.227	0.145	0.145	
Right Touch	UAT	GPRS 2 slots	190	836.6	32.2	32.2	0.387	0.387	0.268	0.268	
Right Tilt	UAT	GPRS 2 slots	190	836.6	32.2	32.2	0.210	0.210	0.128	0.128	
Left Touch	LAT	Voice	128	824.2	33.5	33.5	0.779	0.779	0.578	0.578	
Left Touch	LAT	Voice	190	836.6	33.5	33.5	0.921	0.921	0.680	0.680	
Left Touch	LAT	Voice	251	848.8	33.5	33.4	0.948	0.970	0.698	0.714	
Left Tilt	LAT	Voice	190	836.6	33.5	33.5	0.559	0.559	0.418	0.418	
Right Touch	LAT	Voice	128	824.2	33.5	33.5	0.723	0.723	0.532	0.532	
Right Touch	LAT	Voice	190	836.6	33.5	33.5	0.876	0.876	0.643	0.643	
Right Touch	LAT	Voice	251	848.8	33.5	33.4	0.927	0.949	0.679	0.695	
Right Tilt	LAT	Voice	190	836.6	33.5	33.5	0.569	0.569	0.424	0.424	
Left Touch	LAT	GPRS 2 slots	128	824.2	32.5	32.4	1.020	1.044	0.760	0.778	
Left Touch	LAT	GPRS 2 slots	190	836.6	32.5	32.5	1.150	1.150	0.854	0.854	
Left Touch	LAT	GPRS 2 slots	251	848.8	32.5	32.4	1.160	**1.187**	0.863	0.883	1
Left Tilt	LAT	GPRS 2 slots	190	836.6	32.5	32.5	0.756	0.756	0.564	0.564	
Right Touch	LAT	GPRS 2 slots	128	824.2	32.5	32.4	0.995	1.018	0.729	0.746	
Right Touch	LAT	GPRS 2 slots	190	836.6	32.5	32.5	1.100	1.100	0.743	0.743	
Right Touch	LAT	GPRS 2 slots	251	848.8	32.5	32.4	1.150	1.177	0.843	0.863	
Right Tilt	LAT	GPRS 2 slots	190	836.6	32.5	32.5	0.547	0.547	0.412	0.412	

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	0.157	0.157	0.110	0.110	
Front	UAT	Voice	5	190	836.6	33.2	33.2	0.124	0.124	0.089	0.089	
Rear	LAT	Voice	5	128	824.2	33.5	33.5	0.838	0.838	0.624	0.624	
Rear	LAT	Voice	5	190	836.6	33.5	33.5	0.980	0.980	0.724	0.724	
Rear	LAT	Voice	5	251	848.8	33.5	33.5	1.040	1.040	0.776	0.776	2
Front	LAT	Voice	5	128	824.2	33.5	33.5	0.811	0.811	0.625	0.625	
Front	LAT	Voice	5	190	836.6	33.5	33.5	0.865	0.865	0.668	0.668	
Front	LAT	Voice	5	251	848.8	33.5	33.5	0.983	0.983	0.755	0.755	

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	0.217	0.217	0.155	0.155	
Front	UAT	GPRS 2 slots	5	190	836.6	32.2	32.2	0.171	0.171	0.124	0.124	
Edge 1	UAT	GPRS 2 slots	5	190	836.6	32.2	32.2	0.095	0.095	0.044	0.044	
Edge 2	UAT	GPRS 2 slots	5	190	836.6	32.2	32.2	0.259	0.259	0.174	0.174	
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	0.990	0.990	0.736	0.736	
Rear	LAT	GPRS 2 slots	5	190	836.6	31.0	31.0	1.060	1.060	0.793	0.793	
Rear	LAT	GPRS 2 slots	5	251	848.8	31.0	31.0	1.080	1.080	0.812	0.812	
Front	LAT	GPRS 2 slots	5	128	824.2	31.0	31.0	0.916	0.916	0.703	0.703	
Front	LAT	GPRS 2 slots	5	190	836.6	31.0	31.0	0.992	0.992	0.762	0.762	
Front	LAT	GPRS 2 slots	5	251	848.8	31.0	31.0	0.949	0.949	0.729	0.729	
Edge 2	LAT	GPRS 2 slots	5	190	836.6	31.0	31.0	0.685	0.685	0.451	0.451	
Edge 3	LAT	GPRS 2 slots	5	190	836.6	31.0	31.0	0.183	0.183	0.099	0.099	
Edge 4	LAT	GPRS 2 slots	5	128	824.2	31.0	31.0	1.080	1.080	0.729	0.729	
Edge 4	LAT	GPRS 2 slots	5	190	836.6	31.0	31.0	1.080	1.080	0.729	0.729	
Edge 4	LAT	GPRS 2 slots	5	251	848.8	31.0	31.0	1.160	1.160	0.781	0.781	3

Note(s):

1. 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
2. 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	30.8	0.366	0.375	0.191	0.195	
Left Tilt	UAT	Voice	661	1880.0	30.9	30.8	0.426	0.436	0.217	0.222	
Right Touch	UAT	Voice	661	1880.0	30.9	30.8	0.559	0.572	0.293	0.300	
Right Tilt	UAT	Voice	661	1880.0	30.9	30.8	0.491	0.502	0.256	0.262	
Left Touch	UAT	GPRS 2 slots	661	1880.0	29.9	29.9	0.658	0.658	0.344	0.344	
Left Tilt	UAT	GPRS 2 slots	661	1880.0	29.9	29.9	0.722	0.722	0.370	0.370	
Right Touch	UAT	GPRS 2 slots	512	1850.2	29.9	29.9	0.891	0.891	0.472	0.472	
Right Touch	UAT	GPRS 2 slots	661	1880.0	29.9	29.9	0.960	0.960	0.500	0.500	
Right Touch	UAT	GPRS 2 slots	810	1909.8	29.9	29.7	0.828	0.867	0.432	0.452	
Right Tilt	UAT	GPRS 2 slots	661	1880.0	29.9	29.9	0.870	0.870	0.455	0.455	
Left Touch	LAT	Voice	661	1880.0	31.5	31.3	0.405	0.424	0.264	0.276	
Left Tilt	LAT	Voice	661	1880.0	31.5	31.3	0.252	0.264	0.151	0.158	
Right Touch	LAT	Voice	661	1880.0	31.5	31.3	0.722	0.756	0.443	0.464	
Right Tilt	LAT	Voice	661	1880.0	31.5	31.3	0.395	0.414	0.242	0.253	
Left Touch	LAT	GPRS 2 slots	661	1880.0	29.5	29.3	0.578	0.605	0.374	0.392	
Left Tilt	LAT	GPRS 2 slots	661	1880.0	29.5	29.3	0.377	0.395	0.227	0.238	
Right Touch	LAT	GPRS 2 slots	512	1850.2	29.5	29.5	1.090	1.090	0.682	0.682	
Right Touch	LAT	GPRS 2 slots	661	1880.0	29.5	29.3	1.070	1.120	0.655	0.686	
Right Touch	LAT	GPRS 2 slots	810	1909.8	29.5	29.5	1.180	1.180	0.717	0.717	4
Right Tilt	LAT	GPRS 2 slots	661	1880.0	29.5	29.3	0.389	0.407	0.239	0.250	

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	0.509	0.509	0.261	0.261	
Front	UAT	Rel. 99 RMC	5	661	1880.0	30.9	30.9	0.410	0.410	0.220	0.220	
Rear	LAT	Rel. 99 RMC	5	512	1850.2	31.25	31.20	0.916	0.927	0.515	0.521	
Rear	LAT	Rel. 99 RMC	5	661	1880.0	31.25	31.20	0.949	0.960	0.532	0.538	
Rear	LAT	Rel. 99 RMC	5	810	1909.8	31.25	31.20	1.030	1.042	0.574	0.581	5
Front	LAT	Rel. 99 RMC	5	512	1850.2	31.25	31.20	0.734	0.742	0.450	0.455	
Front	LAT	Rel. 99 RMC	5	661	1880.0	31.25	31.20	0.783	0.792	0.478	0.484	
Front	LAT	Rel. 99 RMC	5	810	1909.8	31.25	31.20	0.832	0.842	0.505	0.511	

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	661	1880.0	29.9	29.9	0.669	0.669	0.344	0.344	
Front	UAT	GPRS 2 slots	5	661	1880.0	29.9	29.9	0.526	0.526	0.284	0.284	
Edge 1	UAT	GPRS 2 slots	5	661	1880.0	29.9	29.9	0.342	0.342	0.148	0.148	
Edge 2	UAT	GPRS 2 slots	5	661	1880.0	29.9	29.9	0.153	0.153	0.081	0.081	
Edge 4	UAT	GPRS 2 slots	5	661	1880.0	29.9	29.9	0.326	0.326	0.176	0.176	
Rear	LAT	GPRS 2 slots	5	512	1850.2	28.5	28.5	1.110	1.110	0.625	0.625	6
Rear	LAT	GPRS 2 slots	5	661	1880.0	28.5	28.5	1.070	1.070	0.604	0.604	
Rear	LAT	GPRS 2 slots	5	810	1909.8	28.5	28.5	1.090	1.090	0.609	0.609	
Front	LAT	GPRS 2 slots	5	512	1850.2	28.5	28.5	0.988	0.988	0.597	0.597	
Front	LAT	GPRS 2 slots	5	661	1880.0	28.5	28.5	0.990	0.990	0.597	0.597	
Front	LAT	GPRS 2 slots	5	810	1909.8	28.5	28.5	1.010	1.010	0.610	0.610	
Edge 2	LAT	GPRS 2 slots	5	512	1850.2	28.5	28.5	0.941	0.941	0.510	0.510	
Edge 2	LAT	GPRS 2 slots	5	661	1880.0	28.5	28.5	0.972	0.972	0.527	0.527	
Edge 2	LAT	GPRS 2 slots	5	810	1909.8	28.5	28.5	1.030	1.030	0.560	0.560	
Edge 3	LAT	GPRS 2 slots	5	661	1880.0	28.5	28.5	0.431	0.431	0.223	0.223	
Edge 4	LAT	GPRS 2 slots	5	661	1880.0	28.5	28.5	0.079	0.079	0.042	0.042	

Note(s):

1. 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
2. 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	22.9	0.695	0.710	0.369	0.377	
Left Tilt	UAT	Rel. 99 RMC	9400	1880.0	23.0	22.9	0.737	0.752	0.381	0.389	
Right Touch	UAT	Rel. 99 RMC	9262	1852.4	23.0	22.9	0.823	0.842	0.464	0.475	
Right Touch	UAT	Rel. 99 RMC	9400	1880.0	23.0	22.9	0.863	0.881	0.574	0.586	
Right Touch	UAT	Rel. 99 RMC	9538	1907.6	23.0	22.7	0.850	0.911	0.470	0.504	
Right Tilt	UAT	Rel. 99 RMC	9262	1852.4	23.0	22.9	0.672	0.688	0.366	0.375	
Right Tilt	UAT	Rel. 99 RMC	9400	1880.0	23.0	22.9	0.844	0.862	0.450	0.459	
Right Tilt	UAT	Rel. 99 RMC	9538	1907.6	23.0	22.7	0.714	0.765	0.388	0.416	
Left Touch	LAT	Rel. 99 RMC	9400	1880.0	23.0	23.0	0.632	0.632	0.413	0.413	
Left Tilt	LAT	Rel. 99 RMC	9400	1880.0	23.0	23.0	0.441	0.441	0.257	0.257	
Right Touch	LAT	Rel. 99 RMC	9262	1852.4	23.0	22.8	0.909	0.952	0.548	0.574	
Right Touch	LAT	Rel. 99 RMC	9400	1880.0	23.0	23.0	1.070	1.070	0.641	0.641	
Right Touch	LAT	Rel. 99 RMC	9538	1907.6	23.0	22.9	1.050	1.074	0.620	0.634	7
Right Tilt	LAT	Rel. 99 RMC	9400	1880.0	23.0	23.0	0.450	0.450	0.269	0.269	

Note(s):

1. 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
2. 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	9400	1880.0	23.9	23.9	0.686	0.686	0.360	0.360	
Front	UAT	Rel. 99 RMC	5	9400	1880.0	23.9	23.9	0.545	0.545	0.297	0.297	
Rear	LAT	Rel. 99 RMC	5	9262	1852.4	21.25	21.25	0.895	0.895	0.502	0.502	
Rear	LAT	Rel. 99 RMC	5	9400	1880.0	21.25	21.25	1.070	1.070	0.618	0.618	8
Rear	LAT	Rel. 99 RMC	5	9538	1907.6	21.25	21.25	1.030	1.030	0.595	0.595	
Front	LAT	Rel. 99 RMC	5	9262	1852.4	21.25	21.25	0.900	0.900	0.547	0.547	
Front	LAT	Rel. 99 RMC	5	9400	1880.0	21.25	21.25	1.020	1.020	0.616	0.616	
Front	LAT	Rel. 99 RMC	5	9538	1907.6	21.25	21.25	0.975	0.975	0.585	0.585	

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	0.407	0.407	0.175	0.175	
Edge 2	UAT	Rel. 99 RMC	5	9400	1880.0	23.9	23.9	0.152	0.152	0.081	0.081	
Edge 4	UAT	Rel. 99 RMC	5	9400	1880.0	23.9	23.9	0.374	0.374	0.205	0.205	
Edge 2	LAT	Rel. 99 RMC	5	9262	1852.4	21.25	21.25	0.812	0.812	0.442	0.442	
Edge 2	LAT	Rel. 99 RMC	5	9400	1880.0	21.25	21.25	0.953	0.953	0.517	0.517	
Edge 2	LAT	Rel. 99 RMC	5	9538	1907.6	21.25	21.25	0.926	0.926	0.503	0.503	
Edge 3	LAT	Rel. 99 RMC	5	9400	1880.0	21.25	21.25	0.441	0.441	0.228	0.228	
Edge 4	LAT	Rel. 99 RMC	5	9400	1880.0	21.25	21.25	0.096	0.096	0.051	0.051	

Note(s):

1. 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
2. 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	0.264	0.264	0.187	0.187	
Left Tilt	UAT	Rel. 99 RMC	4183	836.6	24.2	24.2	0.136	0.136	0.084	0.084	
Right Touch	UAT	Rel. 99 RMC	4183	836.6	24.2	24.2	0.195	0.195	0.130	0.130	
Right Tilt	UAT	Rel. 99 RMC	4183	836.6	24.2	24.2	0.127	0.127	0.072	0.072	
Left Touch	LAT	Rel. 99 RMC	4132	826.4	24.5	24.5	0.900	0.900	0.663	0.663	
Left Touch	LAT	Rel. 99 RMC	4183	836.6	24.5	24.5	1.010	1.010	0.738	0.738	9
Left Touch	LAT	Rel. 99 RMC	4233	846.6	24.5	24.5	0.902	0.902	0.661	0.661	
Left Tilt	LAT	Rel. 99 RMC	4183	836.6	24.5	24.5	0.637	0.637	0.473	0.473	
Right Touch	LAT	Rel. 99 RMC	4132	826.4	24.5	24.5	0.852	0.852	0.624	0.624	
Right Touch	LAT	Rel. 99 RMC	4183	836.6	24.5	24.5	0.938	0.938	0.687	0.687	
Right Touch	LAT	Rel. 99 RMC	4233	846.6	24.5	24.5	0.841	0.841	0.614	0.614	
Right Tilt	LAT	Rel. 99 RMC	4183	836.6	24.5	24.5	0.534	0.534	0.398	0.398	

Note(s):

1. 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
2. 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.

12.4.2. 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	0.153	0.153	0.089	0.089	
Front	UAT	Rel. 99 RMC	5	4183	836.6	24.2	24.2	0.130	0.130	0.076	0.076	
Rear	LAT	Rel. 99 RMC	5	4132	826.4	24.5	24.5	1.060	1.060	0.786	0.786	
Rear	LAT	Rel. 99 RMC	5	4183	836.6	24.5	24.5	1.090	1.090	0.800	0.800	
Rear	LAT	Rel. 99 RMC	5	4233	846.6	24.5	24.4	1.140	**1.167**	0.840	0.860	10
Front	LAT	Rel. 99 RMC	5	4132	826.4	24.5	24.5	1.010	1.010	0.776	0.776	
Front	LAT	Rel. 99 RMC	5	4183	836.6	24.5	24.5	1.030	1.030	0.786	0.786	
Front	LAT	Rel. 99 RMC	5	4233	846.6	24.5	24.4	1.020	1.044	0.780	0.798	

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	0.065	0.065	0.030	0.030	
Edge 2	UAT	Rel. 99 RMC	5	4183	836.6	24.2	24.2	0.099	0.099	0.065	0.065	
Edge 4	UAT	Rel. 99 RMC	5	4183	836.6	24.2	24.2	0.031	0.031	0.018	0.018	
Edge 2	LAT	Rel. 99 RMC	5	4183	836.6	24.5	24.5	0.506	0.506	0.332	0.332	
Edge 3	LAT	Rel. 99 RMC	5	4183	836.6	24.5	24.5	0.146	0.146	0.075	0.075	
Edge 4	LAT	Rel. 99 RMC	5	4183	836.6	24.5	24.5	0.521	0.521	0.357	0.357	

Note(s):

1. 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
2. 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	Tune-up Limit	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	23.0	0.592	0.592	0.300	0.300	
					50	24	21.8	21.8	0.460	0.460	0.233	0.233	
Left Tilt	UAT	QPSK	18900	1880.0	1	49	23.0	23.0	0.610	0.610	0.310	0.310	
					50	24	21.8	21.8	0.473	0.473	0.239	0.239	
Right Touch	UAT	QPSK	18700	1860.0	1	49	23.0	22.8	0.625	0.654	0.335	0.351	
			18900	1880.0	1	49	23.0	23.0	0.898	0.898	0.479	0.479	
					50	24	21.8	21.8	0.691	0.691	0.369	0.369	
					100	0	22.0	22.0	0.661	0.661	0.354	0.354	
			19100	1900.0	1	49	23.0	23.0	0.887	0.887	0.467	0.467	
Right Tilt	UAT	QPSK	18900	1880.0	1	49	23.0	23.0	0.758	0.758	0.399	0.399	
					50	24	21.8	21.8	0.586	0.586	0.308	0.308	
Left Touch	LAT	QPSK	18900	1880.0	1	49	23.0	23.0	0.720	0.720	0.464	0.464	
					50	24	22.0	22.0	0.552	0.552	0.359	0.359	
Left Tilt	LAT	QPSK	18900	1880.0	1	49	23.0	23.0	0.404	0.404	0.245	0.245	
					50	24	22.0	22.0	0.321	0.321	0.194	0.194	
Right Touch	LAT	QPSK	18700	1860.0	1	49	23.0	23.0	1.110	1.110	0.678	0.678	
					50	24	21.9	21.9	0.815	0.815	0.500	0.500	
			18900	1880.0	1	49	23.0	23.0	1.180	1.180	0.717	0.717	11
					50	24	22.0	22.0	0.947	0.947	0.577	0.577	
					100	0	21.9	21.9	0.905	0.905	0.553	0.553	
			19100	1900.0	1	49	23.0	22.9	1.100	1.126	0.658	0.673	
					50	24	22.0	22.0	0.842	0.842	0.506	0.506	
Right Tilt	LAT	QPSK	18900	1880.0	1	49	23.0	23.0	0.342	0.342	0.220	0.220	
					50	24	22.0	22.0	0.275	0.275	0.177	0.177	

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	Tune-up Limit	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	23.4	0.662	0.662	0.352	0.352	
						50	24	22.4	22.4	0.509	0.509	0.268	0.268	
Front	UAT	QPSK	5	18900	1880.0	1	49	23.4	23.4	0.566	0.566	0.303	0.303	
						50	24	22.4	22.4	0.432	0.432	0.231	0.231	
Rear	LAT	QPSK	5	18700	1860.0	1	49	20.8	21.0	0.825	0.788	0.473	0.452	
				18900	1880.0	1	49	21.0	21.0	0.943	0.943	0.550	0.550	
						50	24	20.0	20.0	0.742	0.742	0.427	0.427	
						100	0	20.0	20.0	0.731	0.731	0.418	0.418	
				19100	1900.0	1	49	21.0	21.0	0.969	0.969	0.558	0.558	
Front	LAT	QPSK	5	18700	1860.0	1	49	20.8	21.0	0.803	0.767	0.488	0.466	
				18900	1880.0	1	49	21.0	21.0	0.903	0.903	0.547	0.547	
						50	24	20.0	20.0	0.687	0.687	0.416	0.416	
						100	0	20.0	20.0	0.679	0.679	0.411	0.411	
				19100	1900.0	1	49	21.0	21.0	1.070	1.070	0.635	0.635	12

Hotspot Exposure Conditions

Test Position	Antenna	Mode	Dist. (mm)	UL Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	Tune-up Limit	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	23.4	0.324	0.324	0.138	0.138	
						50	24	22.4	22.4	0.251	0.251	0.106	0.106	
Edge 2	UAT	QPSK	5	18900	1880.0	1	49	23.4	23.4	0.130	0.130	0.068	0.068	
						50	24	22.4	22.4	0.091	0.091	0.049	0.049	
Edge 4	UAT	QPSK	5	18900	1880.0	1	49	23.4	23.4	0.331	0.331	0.184	0.184	
						50	24	22.4	22.4	0.264	0.264	0.142	0.142	
Edge 2	LAT	QPSK	5	18700	1860.0	1	49	20.8	21.0	0.853	0.815	0.461	0.440	
				18900	1880.0	1	49	21.0	21.0	0.966	0.966	0.520	0.520	
						50	24	20.0	20.0	0.740	0.740	0.398	0.398	
						100	0	20.0	20.0	0.741	0.741	0.397	0.397	
				19100	1900.0	1	49	21.0	21.0	0.992	0.992	0.533	0.533	
Edge 3	LAT	QPSK	5	18900	1880.0	1	49	21.0	21.0	0.456	0.456	0.236	0.236	
						50	24	20.0	20.0	0.349	0.349	0.180	0.180	
Edge 4	LAT	QPSK	5	18900	1880.0	1	49	21.0	21.0	0.086	0.086	0.045	0.045	
						50	24	20.0	20.0	0.063	0.063	0.033	0.033	

Note(s):

1. 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
2. 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.
3. 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	Tune-up Limit	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	23.7	0.178	0.178	0.125	0.125	
					25	12	22.7	22.7	0.139	0.139	0.099	0.099	
Left Tilt	UAT	QPSK	20525	836.6	1	24	23.7	23.7	0.087	0.087	0.054	0.054	
					25	12	22.7	22.7	0.069	0.069	0.042	0.042	
Right Touch	UAT	QPSK	20525	836.6	1	24	23.7	23.7	0.185	0.185	0.121	0.121	
					25	12	22.7	22.7	0.143	0.143	0.094	0.094	
Right Tilt	UAT	QPSK	20525	836.6	1	24	23.7	23.7	0.093	0.093	0.053	0.053	
					25	12	22.7	22.7	0.072	0.072	0.042	0.042	
Left Touch	LAT	QPSK	20525	836.6	1	24	24.0	23.9	0.770	0.788	0.574	0.587	13
					25	12	23.0	23.0	0.594	0.594	0.442	0.442	
Left Tilt	LAT	QPSK	20525	836.6	1	24	24.0	23.9	0.364	0.372	0.275	0.281	
					25	12	23.0	23.0	0.288	0.288	0.218	0.218	
Right Touch	LAT	QPSK	20525	836.6	1	24	24.0	23.9	0.742	0.759	0.547	0.560	
					25	12	23.0	23.0	0.591	0.591	0.437	0.437	
Right Tilt	LAT	QPSK	20525	836.6	1	24	24.0	23.9	0.398	0.407	0.301	0.308	
					25	12	23.0	23.0	0.316	0.316	0.239	0.239	

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	Tune-up Limit	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	23.7	0.108	0.108	0.065	0.065	
						25	12	22.6	22.6	0.083	0.083	0.050	0.050	
Front	UAT	QPSK	5	20525	836.6	1	24	23.7	23.7	0.087	0.087	0.051	0.051	
						25	12	22.6	22.6	0.066	0.066	0.039	0.039	
Rear	LAT	QPSK	5	20450	829.0	1	24	24.0	24.0	0.699	0.699	0.512	0.512	
				20525	836.6	1	24	24.0	23.9	0.883	0.904	0.644	0.659	14
						25	12	22.8	22.8	0.690	0.690	0.507	0.507	
						50	0	22.7	22.7	0.682	0.682	0.498	0.498	
				20600	844.0	1	24	23.7	24.0	0.775	0.723	0.565	0.527	
Front	LAT	QPSK	5	20525	836.6	1	24	24.0	23.9	0.641	0.656	0.490	0.501	
						25	12	22.8	22.8	0.629	0.629	0.482	0.482	

Hotspot Exposure Conditions

Test Position	Antenna	Mode	Dist. (mm)	UL Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	Tune-up Limit	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	23.7	0.061	0.061	0.027	0.027	
						25	12	22.6	22.6	0.046	0.046	0.020	0.020	
Edge 2	UAT	QPSK	5	20525	836.6	1	24	23.7	23.7	0.132	0.132	0.071	0.071	
						25	12	22.6	22.6	0.082	0.082	0.055	0.055	
Edge 4	UAT	QPSK	5	20525	836.6	1	24	23.7	23.7	0.017	0.017	0.010	0.010	
						25	12	22.6	22.6	0.010	0.010	0.006	0.006	
Edge 2	LAT	QPSK	5	20525	836.6	1	24	24.0	23.9	0.578	0.591	0.382	0.391	
						25	12	22.8	22.8	0.447	0.447	0.295	0.295	
Edge 3	LAT	QPSK	5	20525	836.6	1	24	24.0	23.9	0.182	0.186	0.092	0.094	
						25	12	22.8	22.8	0.145	0.145	0.073	0.073	
Edge 4	LAT	QPSK	5	20525	836.6	1	24	24.0	23.9	0.652	0.667	0.451	0.462	
						25	12	22.8	22.8	0.601	0.601	0.402	0.402	

Note(s):

1. 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
2. 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.
3. 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	
		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	15
		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	16
		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	17
		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	18
		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):

1. 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	
		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	19
		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	
		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	20
		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	21
				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	22
		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	23
					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	24
		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	25
	Front	GFSK	5	39	2441	13.0	12.8	0.005	0.005	0.001	0.001	

Note(s):

1. 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	1.160 W/kg		1.160 W/kg
	W-CDMA Band 5			
	LTE Band 5			
1900	GSM 1900	1.180 W/kg		
	W-CDMA Band 2			
	LTE Band 2	1.180 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	1.160	1.150	1.01	1
GSM1900	Right Touch	LAT	GPRS 2 slots	810	1909.8	1.180	1.140	1.04	1
LTE Band 2	Right Touch	LAT	QPSK RB1/49	18900	1880.0	1.180	1.130	1.04	1

Body-worn Accessory Exposure Condition

N/A

Hotspot Exposure Condition

Frequency band	Test Position	Antenna	Mode	Ch #.	Freq. (MHz)	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio	Note
						Original	Repeated		
GSM850	Edge 4	LAT	GPRS 2 slots	251	848.8	1.160	1.120	1.04	1

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:

SAR_1 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

SAR_2 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				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		GSM 850	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.496	0.465			0.961	No
		0.496		0.383		0.879	No
	Left Tilt	0.227	0.403			0.630	No
		0.227		0.307		0.534	No
	Right Touch	0.387	0.576			0.963	No
		0.387		0.590		0.977	No
	Right Tilt	0.210	0.327			0.537	No
		0.210		0.434		0.644	No
Body-worn Accessory & Hotspot	Rear	0.217	0.536			0.753	No
		0.217		0.561		0.778	No
		0.217			0.016	0.233	No
	Front	0.171	0.275			0.446	No
		0.171		0.208		0.379	No
		0.171			0.005	0.176	No
Hotspot	Edge 1	0.095	0.088			0.183	No
	Edge 2	0.259	0.029			0.288	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				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		GSM 850	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	1.187	0.465			1.652	**Yes**
		1.187		0.383		**1.570**	No
	Left Tilt	0.756	0.403			1.159	No
		0.756		0.307		1.063	No
	Right Touch	1.177	0.576			1.753	**Yes**
		1.177		0.590		1.767	**Yes**
	Right Tilt	0.547	0.327			0.874	No
		0.547		0.434		0.981	No
Body-worn Accessory & Hotspot	Rear	1.080	0.536			1.616	**Yes**
		1.080		0.561		1.641	**Yes**
		1.080			0.016	1.096	No
	Front	0.992	0.275			1.267	No
		0.992		0.208		1.200	No
		0.992			0.005	0.997	No
Hotspot	Edge 1	0	0.088			0.088	No
	Edge 2	0.685	0.029			0.714	No
	Edge 3	0.183	0			0.183	No
	Edge 4	1.160	0.300			1.460	No

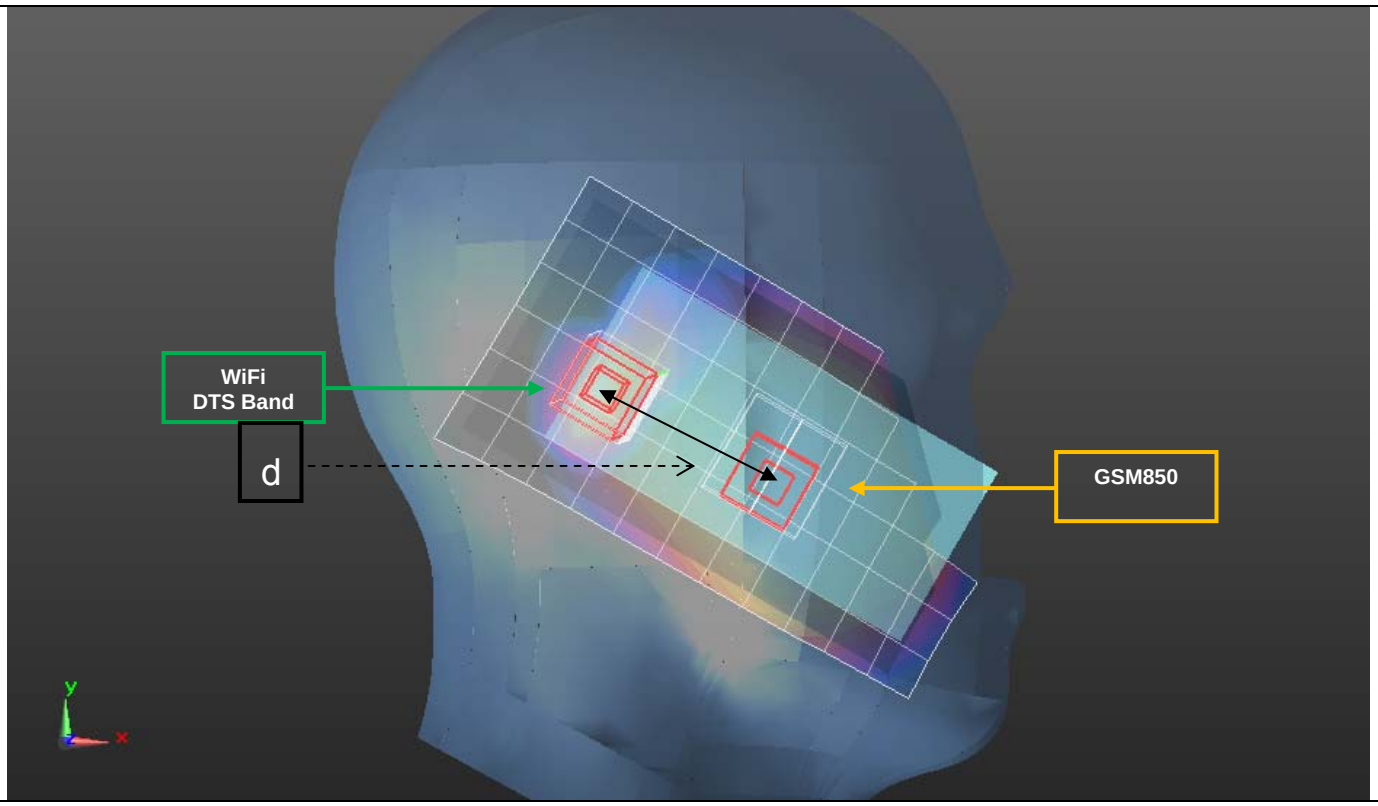
SAR to Peak Location Separation Ratio (SPLSR)

Case #	RF Exposure conditions	Test Position	Worst-case combination			∑ 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	Lefht Touch	1.187	0.465		1.652	57.0	0.037	No	1
		Right Touch	1.177	0.576		1.753	60.0	0.039	No	2
			1.177		0.590	1.767	71.5	0.033	No	3
	Body-worn Accessory & Hotspot	Rear	1.080	0.536		1.616	80.4	0.026	No	4
			1.080		0.561	1.641	74.6	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)

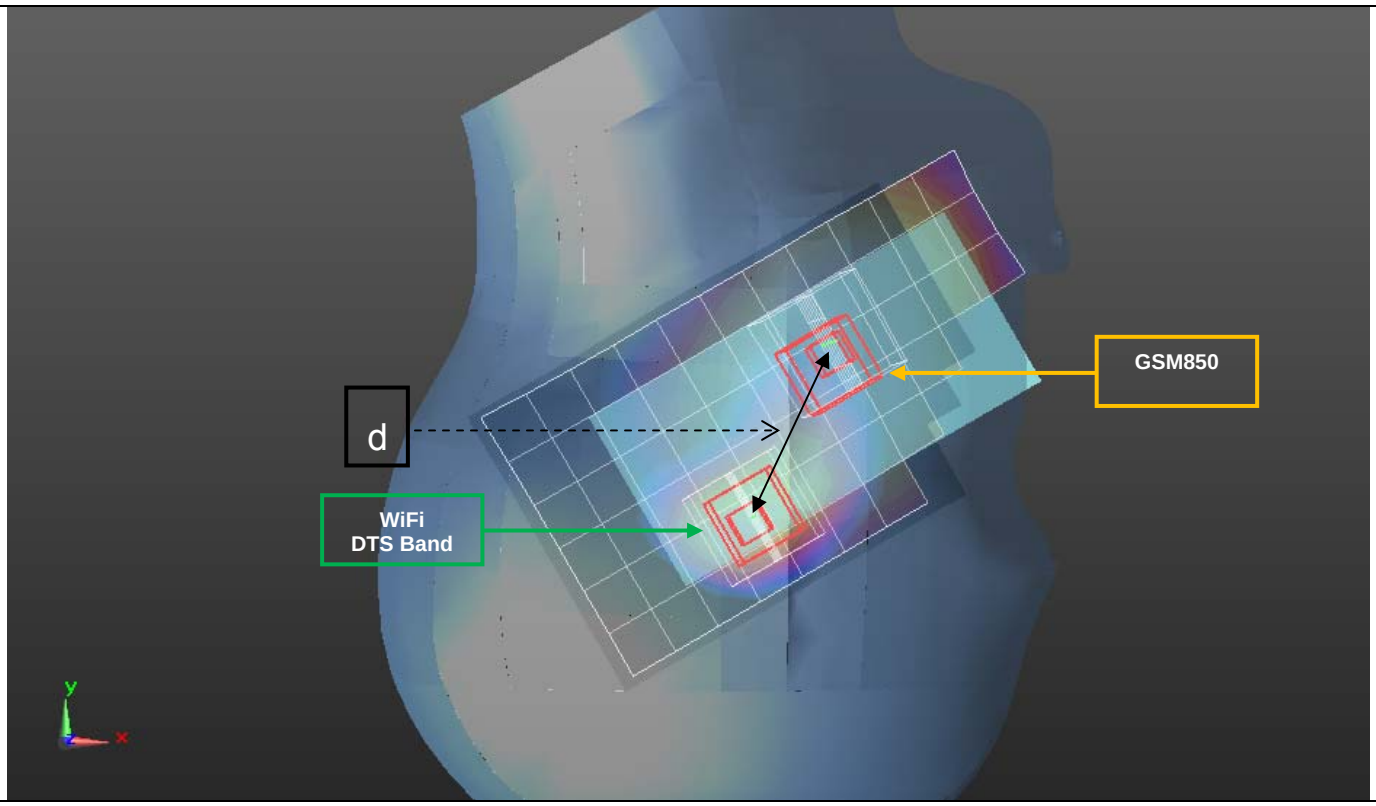


Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
GSM850	1.31	0.0554	0.273	-0.174
WiFi DTS Band	0.997	0.00712	0.303	-0.17

d: Calculated distance (mm)
57.0

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

Figure (2)

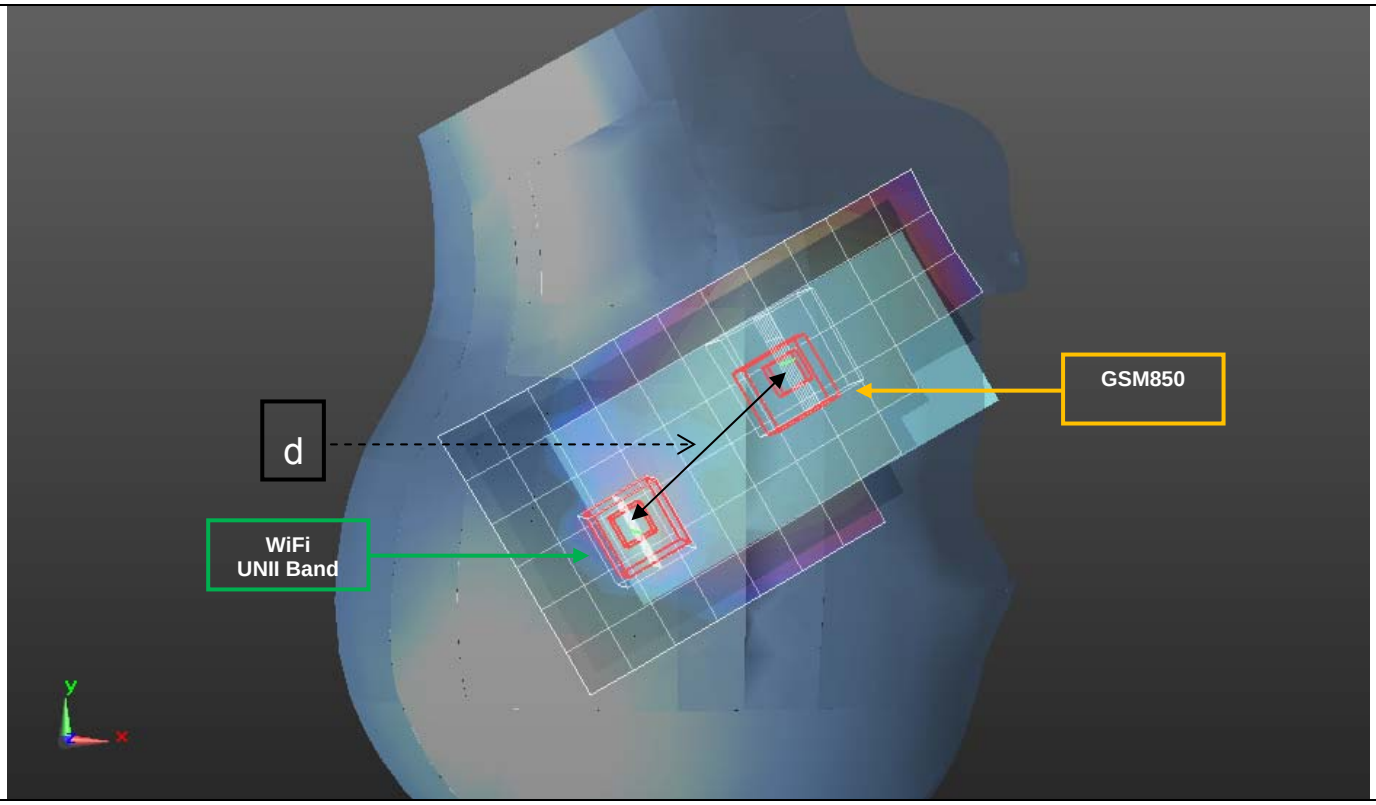


Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
GSM850	1.29	0.0648	-0.266	-0.173
WiFi DTS Band	0.783	0.0387	-0.32	-0.173

d: Calculated distance (mm)
60.0

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

Figure (3)

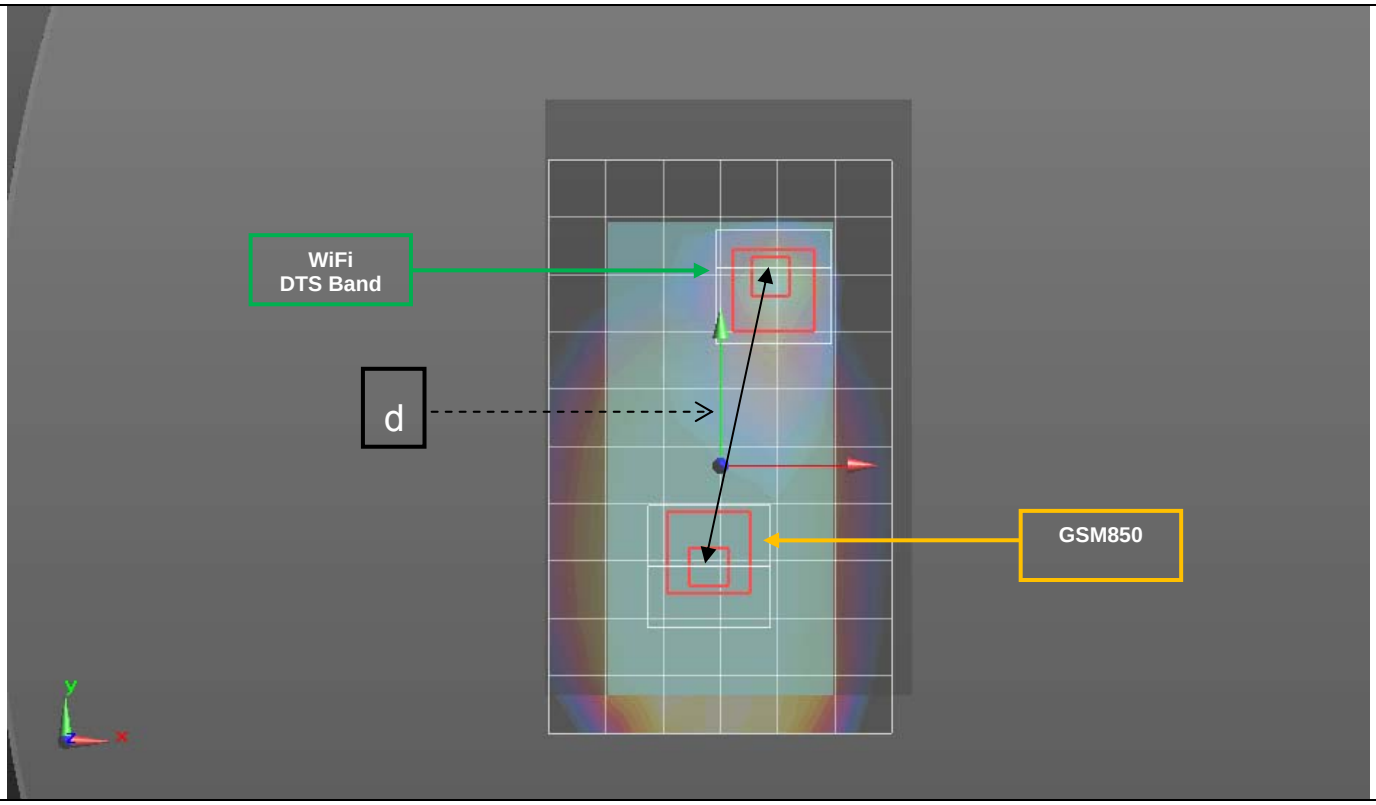


Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
GSM850	1.29	0.0648	-0.266	-0.173
WiFi UNII Band	1.28	0.0157	-0.318	-0.172

d: Calculated distance (mm)
71.5

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

Figure (4)

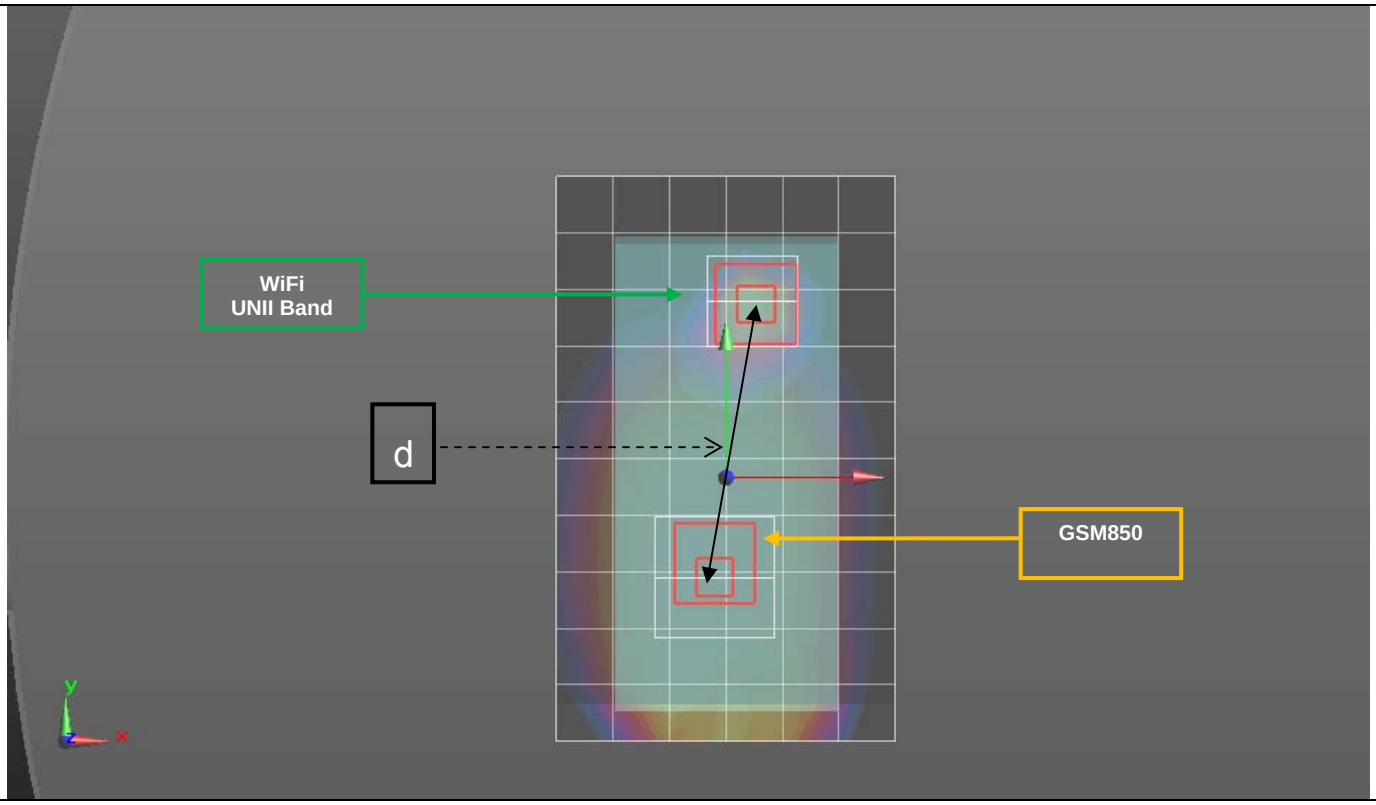


Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
GSM850	1.22	-0.003	-0.0265	-0.19
WiFi DTS Band	0.82	0.014	0.0518	-0.183

d: Calculated distance (mm)
80.4

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

Figure (5)



Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
GSM850	1.22	-0.003	-0.0265	-0.19
WiFi UNII Band	1.14	0.007	0.047	-0.182

d: Calculated distance (mm)
74.6

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				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		GSM 1900	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.658	0.465			1.123	No
		0.658		0.383		1.041	No
	Left Tilt	0.722	0.403			1.125	No
		0.722		0.307		1.029	No
	Right Touch	0.960	0.576			**1.536**	No
		0.960		0.590		1.550	No
	Right Tilt	0.870	0.327			1.197	No
		0.870		0.434		1.304	No
Body-worn Accessory & Hotspot	Rear	0.669	0.536			1.205	No
		0.669		0.561		1.230	No
		0.669			0.016	0.685	No
	Front	0.526	0.275			0.801	No
		0.526		0.208		0.734	No
		0.526			0.005	0.531	No
Hotspot	Edge 1	0.342	0.088			0.430	No
	Edge 2	0.153	0.029			0.182	No
	Edge 3	0	0			0	No
	Edge 4	0.326	0.300			0.626	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				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		GSM 1900	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.605	0.465			1.070	No
		0.605		0.383		0.988	No
	Left Tilt	0.395	0.403			0.798	No
		0.395		0.307		0.702	No
	Right Touch	1.180	0.576			1.756	**Yes**
		1.180		0.590		1.770	**Yes**
	Right Tilt	0.414	0.327			0.741	No
		0.414		0.434		0.848	No
Body-worn Accessory & Hotspot	Rear	1.110	0.536			1.646	**Yes**
		1.110		0.561		1.671	**Yes**
		1.110			0.016	1.126	No
	Front	1.010	0.275			1.285	No
		1.010		0.208		1.218	No
		1.010			0.005	1.015	No
Hotspot	Edge 1	0	0.088			0.088	No
	Edge 2	1.030	0.029			1.059	No
	Edge 3	0.431	0			0.431	No
	Edge 4	0.079	0.300			0.379	No

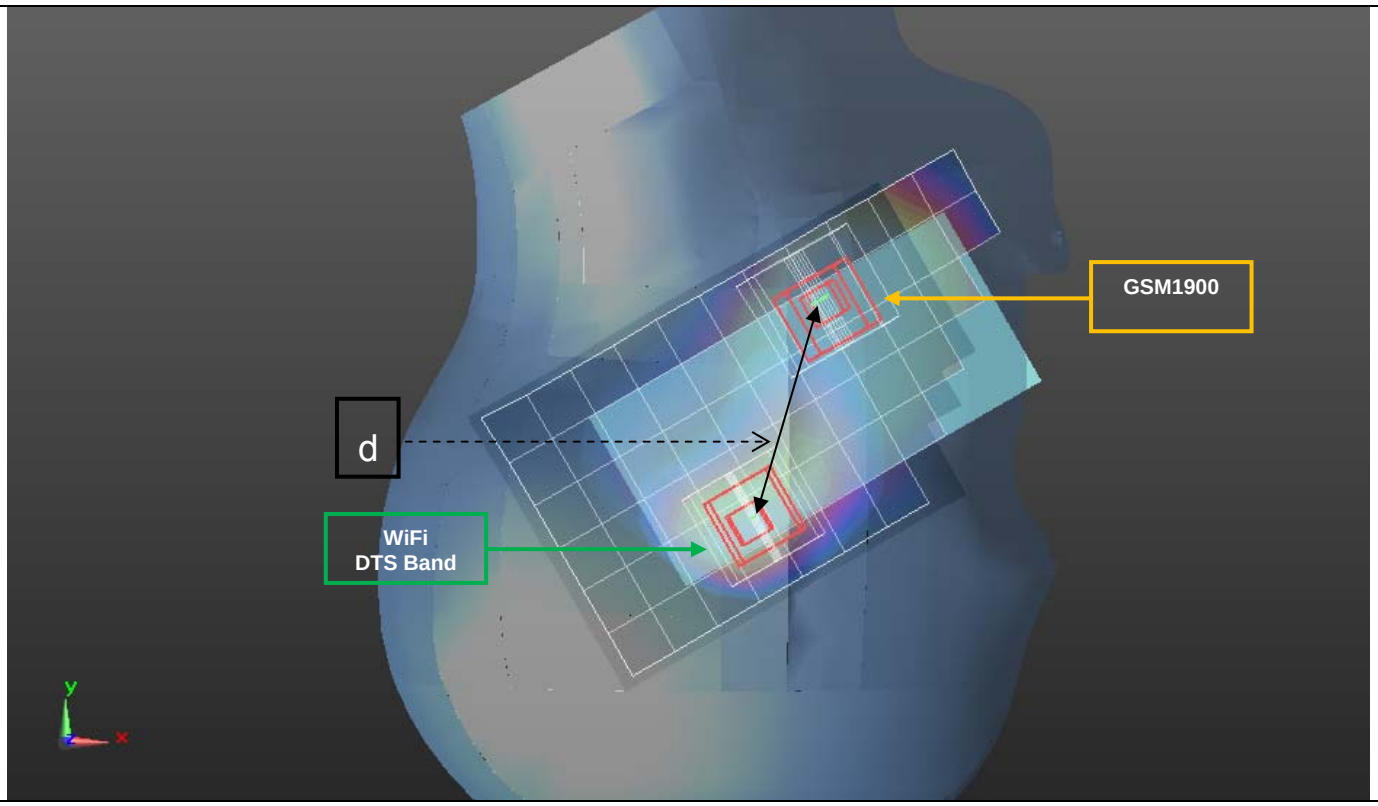
SAR to Peak Location Separation Ratio (SPLSR)

Case #	RF Exposure conditions	Test Position	Worst-case combination			∑ 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	1.180	0.576		1.756	71.9	0.032	No	1
			1.180		0.590	1.770	80.6	0.029	No	2
	Body-worn Accessory & Hotspot	Rear	1.110	0.536		1.646	114.2	0.018	No	3
			1.110		0.561	1.671	108.0	0.020	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)

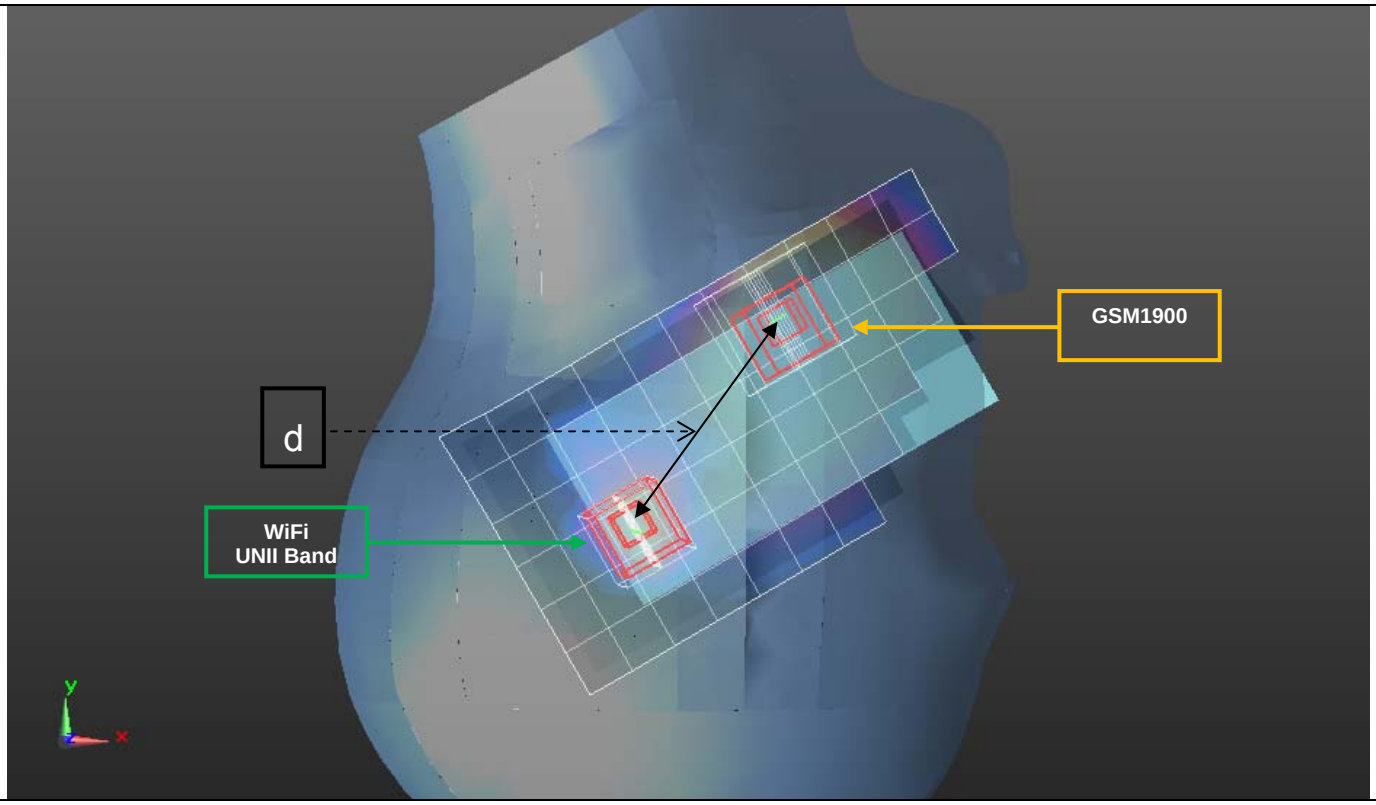


Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
GSM1900	1.45	0.062	-0.252	-0.172
WiFi DTS Band	0.783	0.0387	-0.32	-0.173

d: Calculated distance (mm)
71.9

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

Figure (2)

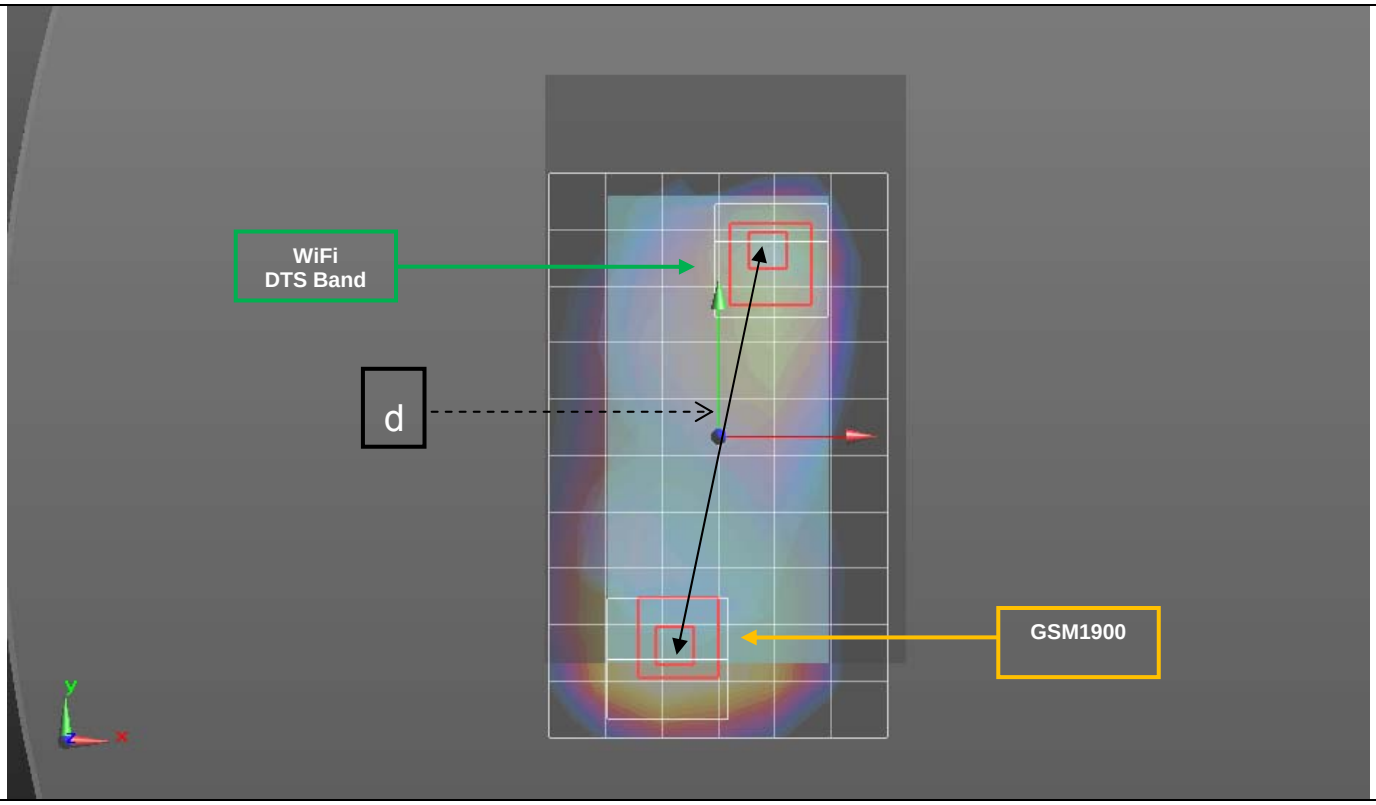


Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
GSM1900	1.45	0.062	-0.252	-0.172
WiFi UNII Band	1.28	0.0157	-0.318	-0.172

d: Calculated distance (mm)
80.6

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

Figure (3)

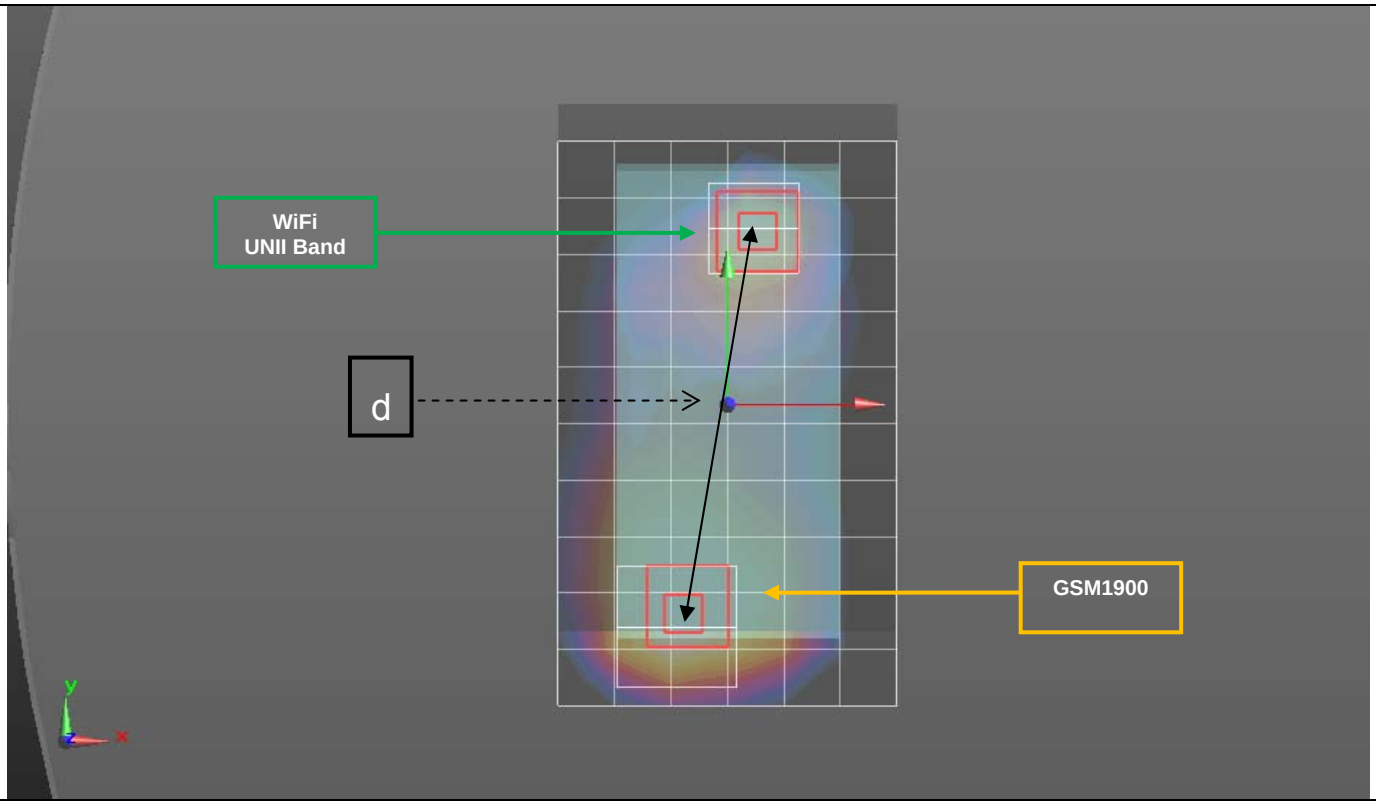


Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
GSM1900	1.48	-0.0135	-0.059	-0.184
WiFi DTS Band	0.82	0.014	0.0518	-0.183

d: Calculated distance (mm)
114.2

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	1.48	-0.0135	-0.059	-0.184
WiFi UNII Band	1.14	0.007	0.047	-0.182

d: Calculated distance (mm)
108.0

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				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		W-CDMA Band 2	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.710	0.465			1.175	No
		0.710		0.383		1.093	No
	Left Tilt	0.752	0.403			1.155	No
		0.752		0.307		1.059	No
	Right Touch	0.911	0.576			1.487	No
		0.911		0.590		1.501	No
	Right Tilt	0.862	0.327			1.189	No
		0.862		0.434		1.296	No
Body-worn Accessory & Hotspot	Rear	0.686	0.536			1.222	No
		0.686		0.561		1.247	No
		0.686			0.016	0.702	No
	Front	0.545	0.275			0.820	No
		0.545		0.208		0.753	No
		0.545			0.005	0.550	No
Hotspot	Edge 1	0.407	0.088			0.495	No
	Edge 2	0.152	0.029			0.181	No
	Edge 3	0	0			0	No
	Edge 4	0.374	0.300			0.674	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				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		W-CDMA Band 2	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.632	0.465			1.097	No
		0.632		0.383		1.015	No
	Left Tilt	0.441	0.403			0.844	No
		0.441		0.307		0.748	No
	Right Touch	1.074	0.576			1.650	**Yes**
		1.074		0.590		1.664	**Yes**
	Right Tilt	0.450	0.327			0.777	No
		0.450		0.434		0.884	No
Body-worn Accessory & Hotspot	Rear	1.070	0.536			1.606	**Yes**
		1.070		0.561		1.631	**Yes**
		1.070			0.016	1.086	No
	Front	1.020	0.275			1.295	No
		1.020		0.208		1.228	No
		1.020			0.005	1.025	No
Hotspot	Edge 1	0	0.088			0.088	No
	Edge 2	0.953	0.029			0.982	No
	Edge 3	0.441	0			0.441	No
	Edge 4	0.096	0.300			0.396	No

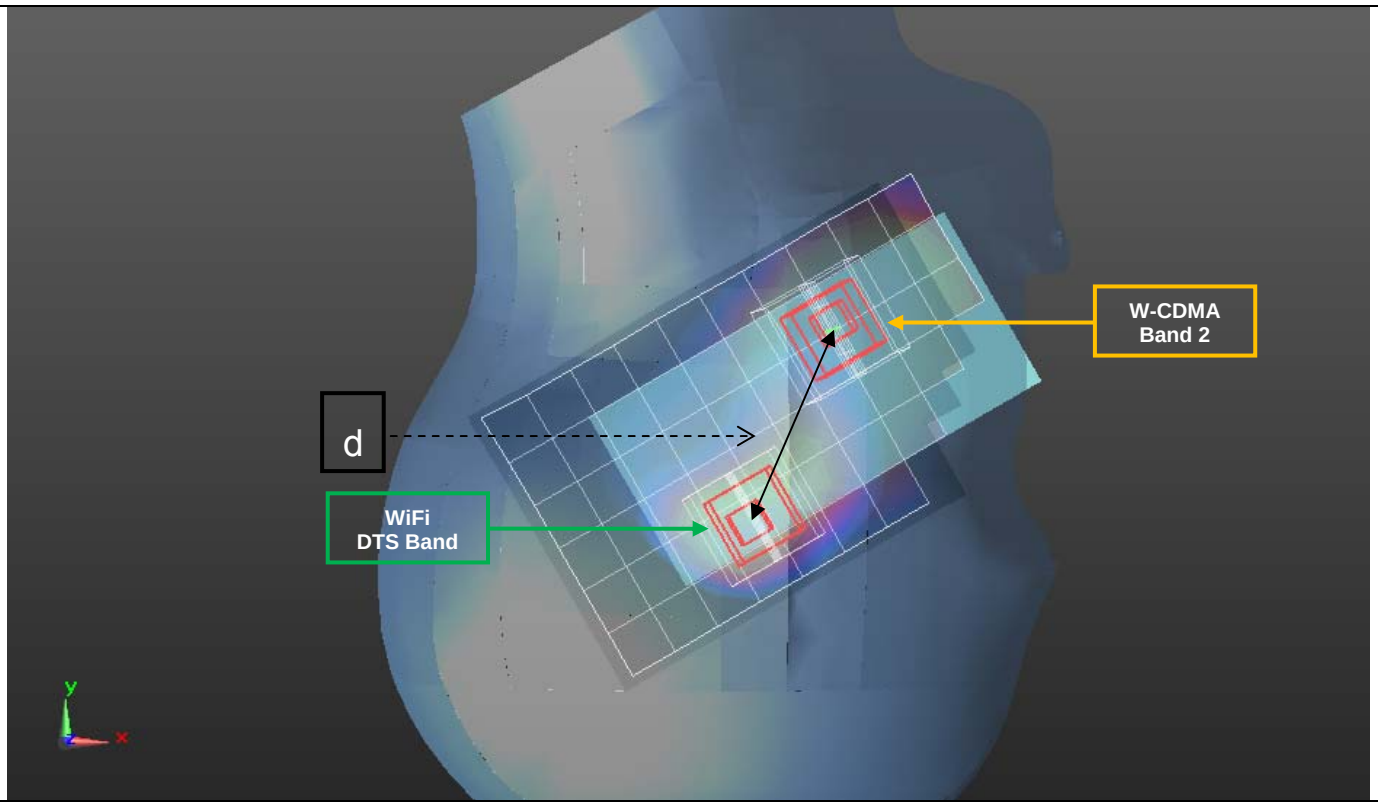
SAR to Peak Location Separation Ratio (SPLSR)

Case #	RF Exposure conditions	Test Position	Worst-case combination			∑ 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	1.074	0.576		1.650	64.1	0.033	No	1
			1.074		0.590	1.664	75.3	0.029	No	2
	Body-worn Accessory & Hotspot	Rear	1.070	0.536		1.606	111.4	0.018	No	3
			1.070		0.561	1.631	105.2	0.020	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)

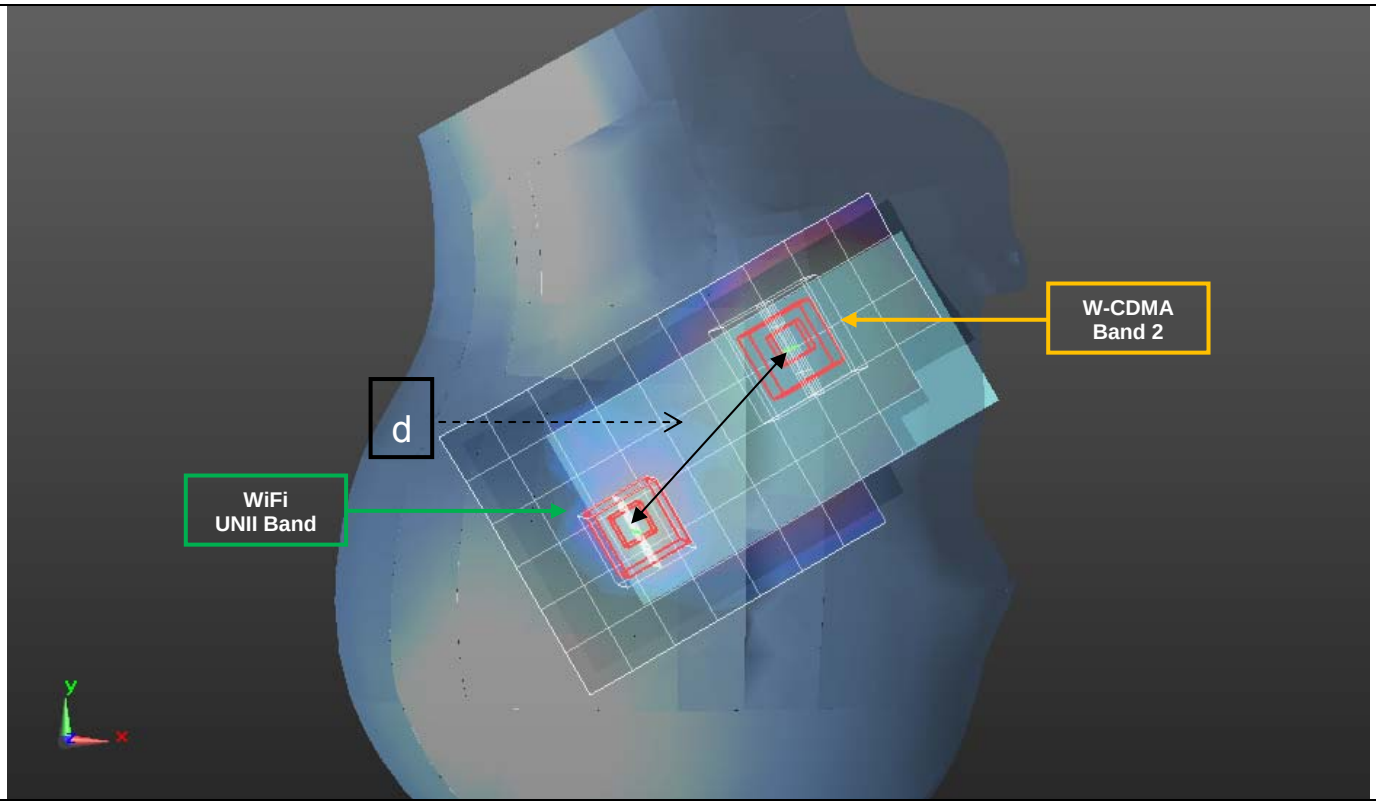


Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
W-CDMA Band 2	1.27	0.066	-0.262	-0.172
WiFi DTS Band	0.783	0.0387	-0.32	-0.173

d: Calculated distance (mm)
64.1

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

Figure (2)

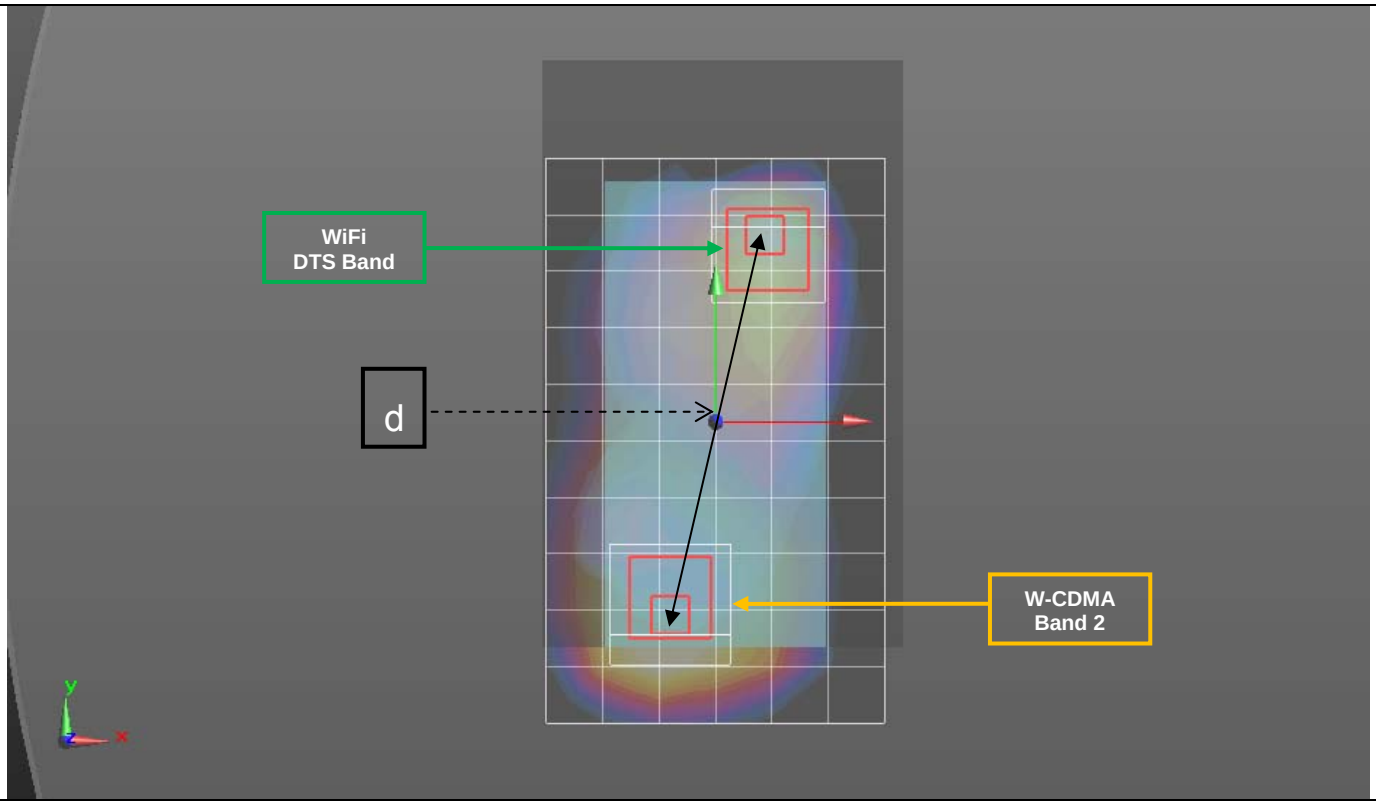


Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
W-CDMA Band 2	1.27	0.066	-0.262	-0.172
WiFi UNII Band	1.28	0.0157	-0.318	-0.172

d: Calculated distance (mm)
75.3

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

Figure (3)

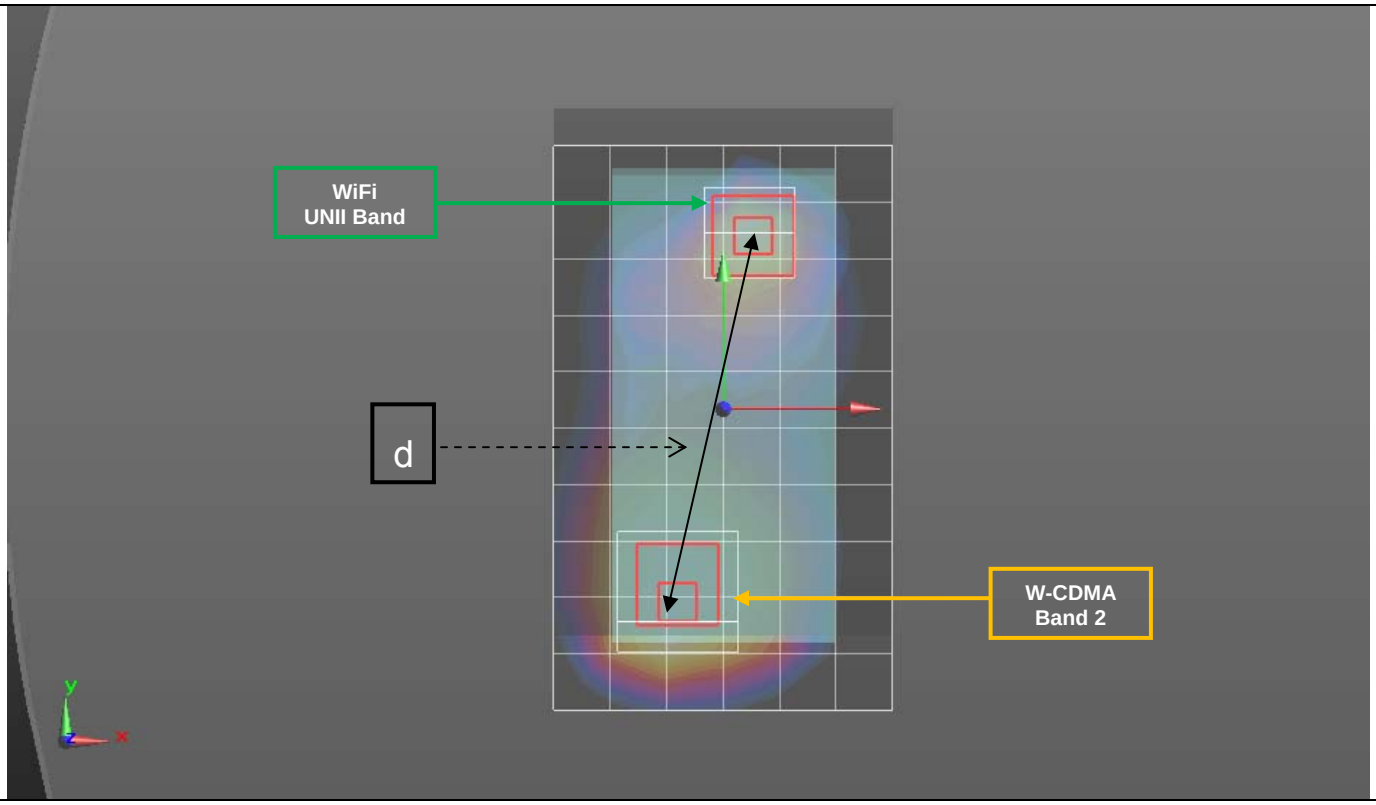


Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
W-CDMA Band 2	1.41	-0.012	-0.0565	-0.184
WiFi DTS Band	0.82	0.014	0.0518	-0.183

d: Calculated distance (mm)
111.4

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	1.41	-0.012	-0.0565	-0.184
WiFi UNII Band	1.14	0.007	0.047	-0.182

d: Calculated distance (mm)
105.2

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				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		W-CDMA Band 5	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.264	0.465			0.729	No
		0.264		0.383		0.647	No
	Left Tilt	0.136	0.403			0.539	No
		0.136		0.307		0.443	No
	Right Touch	0.195	0.576			0.771	No
		0.195		0.590		0.785	No
	Right Tilt	0.127	0.327			0.454	No
		0.127		0.434		0.561	No
Body-worn Accessory & Hotspot	Rear	0.153	0.536			0.689	No
		0.153		0.561		0.714	No
		0.153			0.016	0.169	No
	Front	0.130	0.275			0.405	No
		0.130		0.208		0.338	No
		0.130			0.005	0.135	No
Hotspot	Edge 1	0.065	0.088			0.153	No
	Edge 2	0.099	0.029			0.128	No
	Edge 3	0	0			0	No
	Edge 4	0.031	0.300			0.331	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.

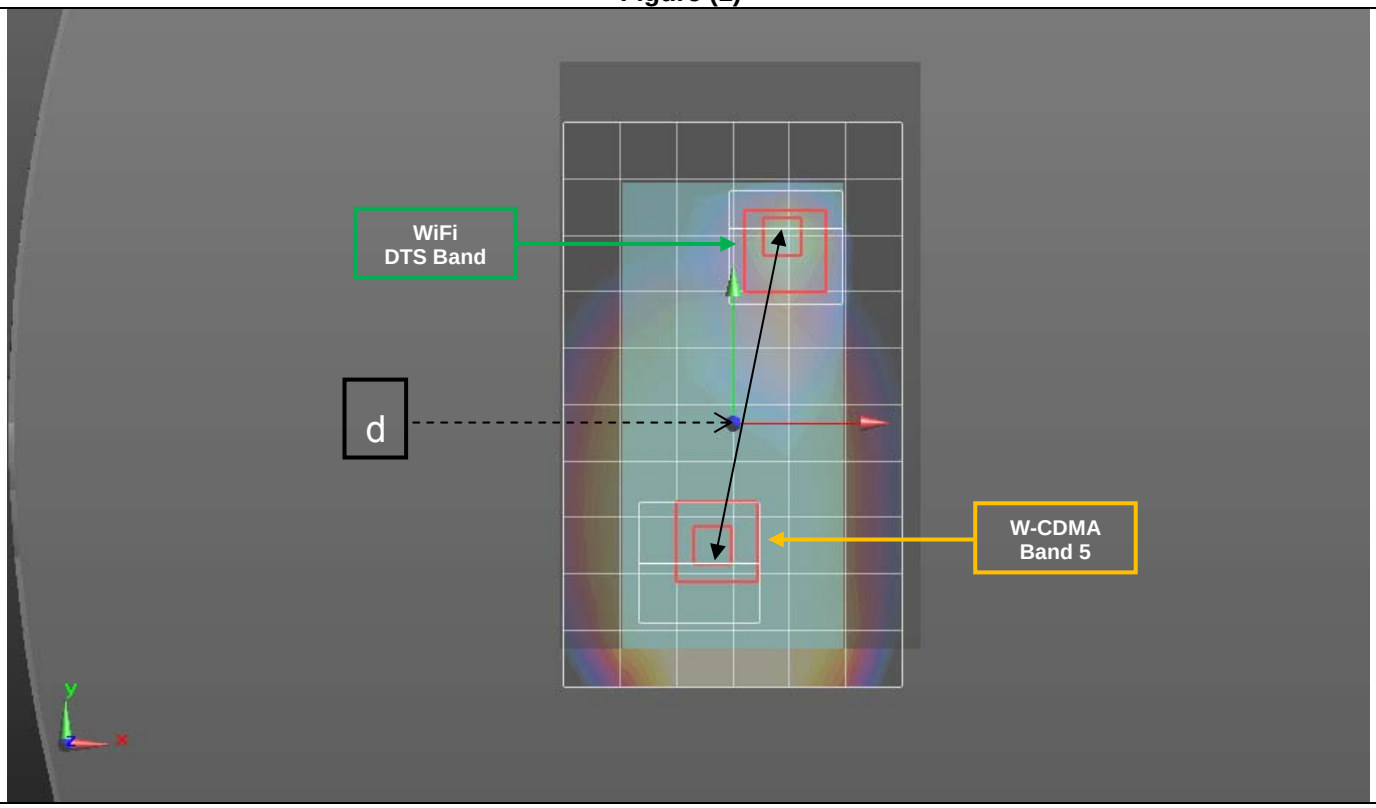
14.8. Sum of the SAR for W-CDMA Band 5 (LAT) + WiFi DTS & UNII Band & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		W-CDMA Band 5	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	1.010	0.465			1.475	No
		1.010		0.383		1.393	No
	Left Tilt	0.637	0.403			1.040	No
		0.637		0.307		0.944	No
	Right Touch	0.938	0.576			1.514	No
		0.938		0.590		1.528	No
	Right Tilt	0.534	0.327			0.861	No
		0.534		0.434		0.968	No
Body-worn Accessory & Hotspot	Rear	1.167	0.536			1.703	**Yes**
		1.167		0.561		1.728	**Yes**
		1.167			0.016	1.183	No
	Front	1.044	0.275			1.319	No
		1.044		0.208		1.252	No
		1.044			0.005	1.049	No
Hotspot	Edge 1	0	0.088			0.088	No
	Edge 2	0.506	0.029			0.535	No
	Edge 3	0.146	0			0.146	No
	Edge 4	0.521	0.300			0.821	No

SAR to Peak Location Separation Ratio (SPLSR)

Case #	RF Exposure conditions	Test Position	Worst-case combination			∑ 1-g SAR (mW/g)	Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
			W-CDMA Band 5	WiFi DTS Band	WiFi UNII Band					
4	Body-worn Accessory & Hotspot	Rear	1.167	0.536		1.703	92.0	0.024	No	1
			1.167		0.561	1.728	85.9	0.026	No	2

Figure (1)

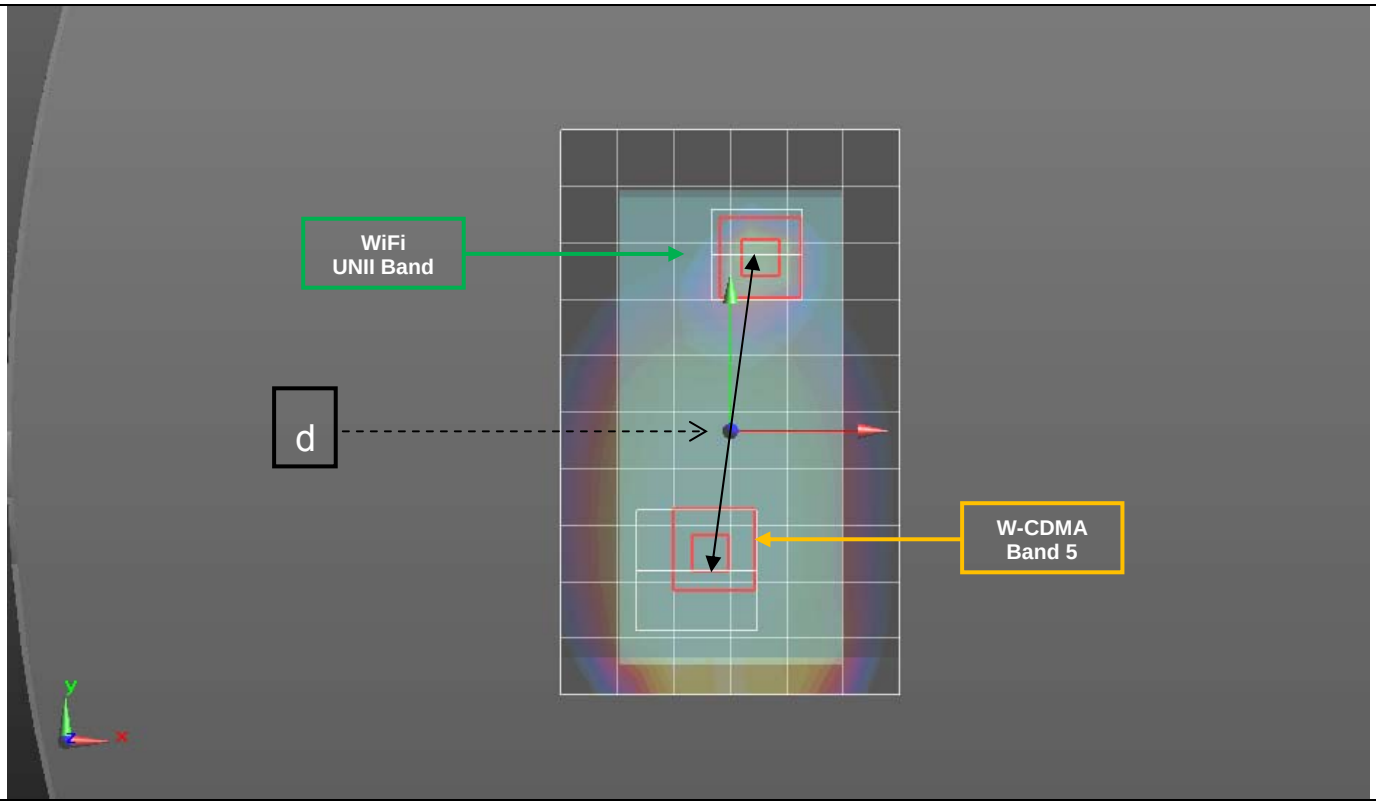


Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
W-CDMA Band 5	1.3	-0.009	-0.037	-0.19
WiFi DTS Band	0.82	0.014	0.0518	-0.183

d: Calculated distance (mm)
92.0

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

Figure (2)



Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
W-CDMA Band 5	1.3	-0.009	-0.037	-0.19
WiFi UNII Band	1.14	0.007	0.047	-0.182

d: Calculated distance (mm)
85.9

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

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

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		LTE Band 2	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.592	0.465			1.057	No
		0.592		0.383		0.975	No
	Left Tilt	0.610	0.403			1.013	No
		0.610		0.307		0.917	No
	Right Touch	0.898	0.576			1.474	No
		0.898		0.590		1.488	No
	Right Tilt	0.758	0.327			1.085	No
		0.758		0.434		1.192	No
Body-worn Accessory & Hotspot	Rear	0.662	0.536			1.198	No
		0.662		0.561		1.223	No
		0.662			0.016	0.678	No
	Front	0.566	0.275			0.841	No
		0.566		0.208		0.774	No
		0.566			0.005	0.571	No
Hotspot	Edge 1	0.324	0.088			0.412	No
	Edge 2	0.130	0.029			0.159	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				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		LTE Band 2	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.720	0.465			1.185	No
		0.720		0.383		1.103	No
	Left Tilt	0.404	0.403			0.807	No
		0.404		0.307		0.711	No
	Right Touch	1.180	0.576			1.756	**Yes**
		1.180		0.590		1.770	**Yes**
	Right Tilt	0.342	0.327			0.669	No
		0.342		0.434		0.776	No
Body-worn Accessory & Hotspot	Rear	0.969	0.536			1.505	No
		0.969		0.561		1.530	No
		0.969			0.016	0.985	No
	Front	1.070	0.275			1.345	No
		1.070		0.208		1.278	No
		1.070			0.005	1.075	No
Hotspot	Edge 1	0	0.088			0.088	No
	Edge 2	0.966	0.029			0.995	No
	Edge 3	0.456	0			0.456	No
	Edge 4	0.086	0.300			0.386	No

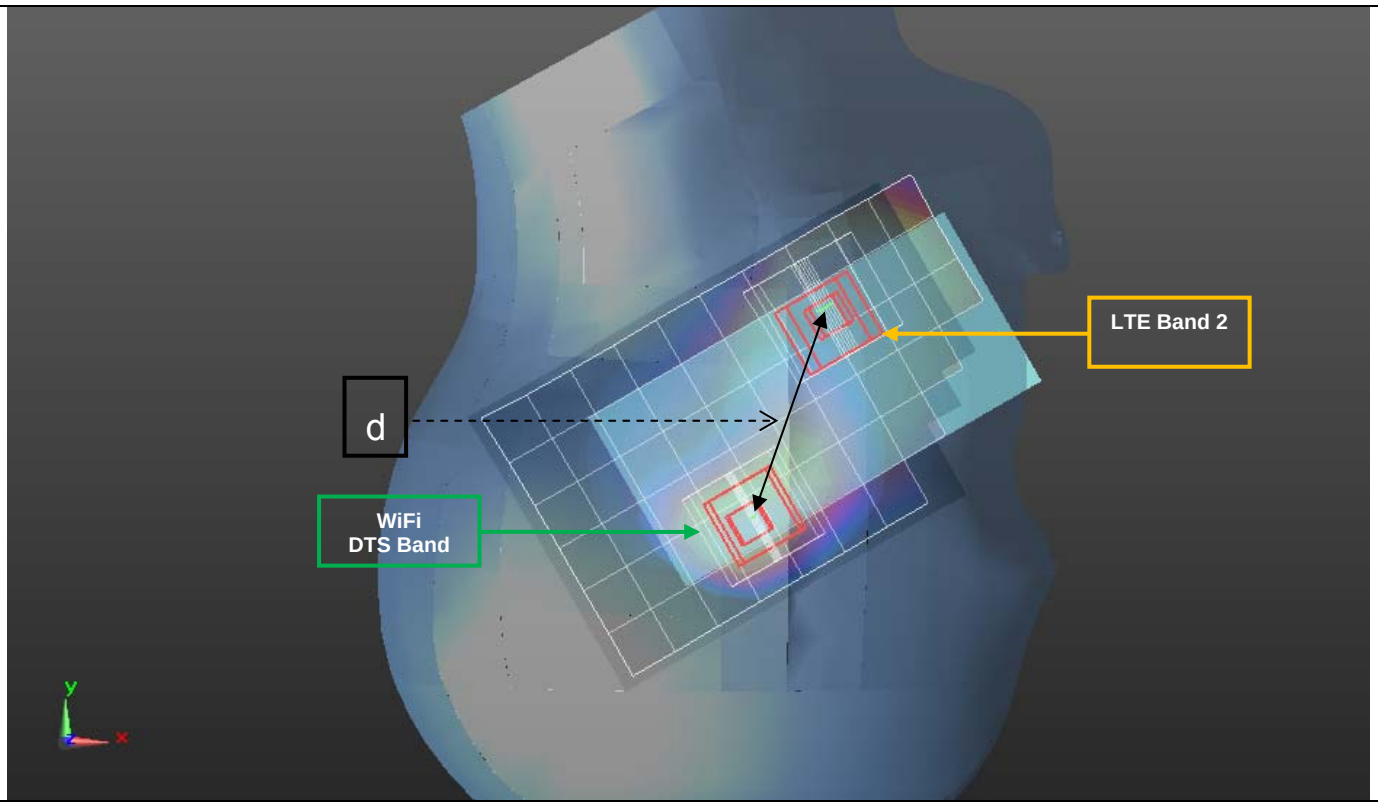
SAR to Peak Location Separation Ratio (SPLSR)

Case #	RF Exposure conditions	Test Position	Worst-case combination			∑ 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	1.180	0.576		1.756	69.6	0.033	No	1
			1.180		0.590	1.770	79.1	0.030	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)

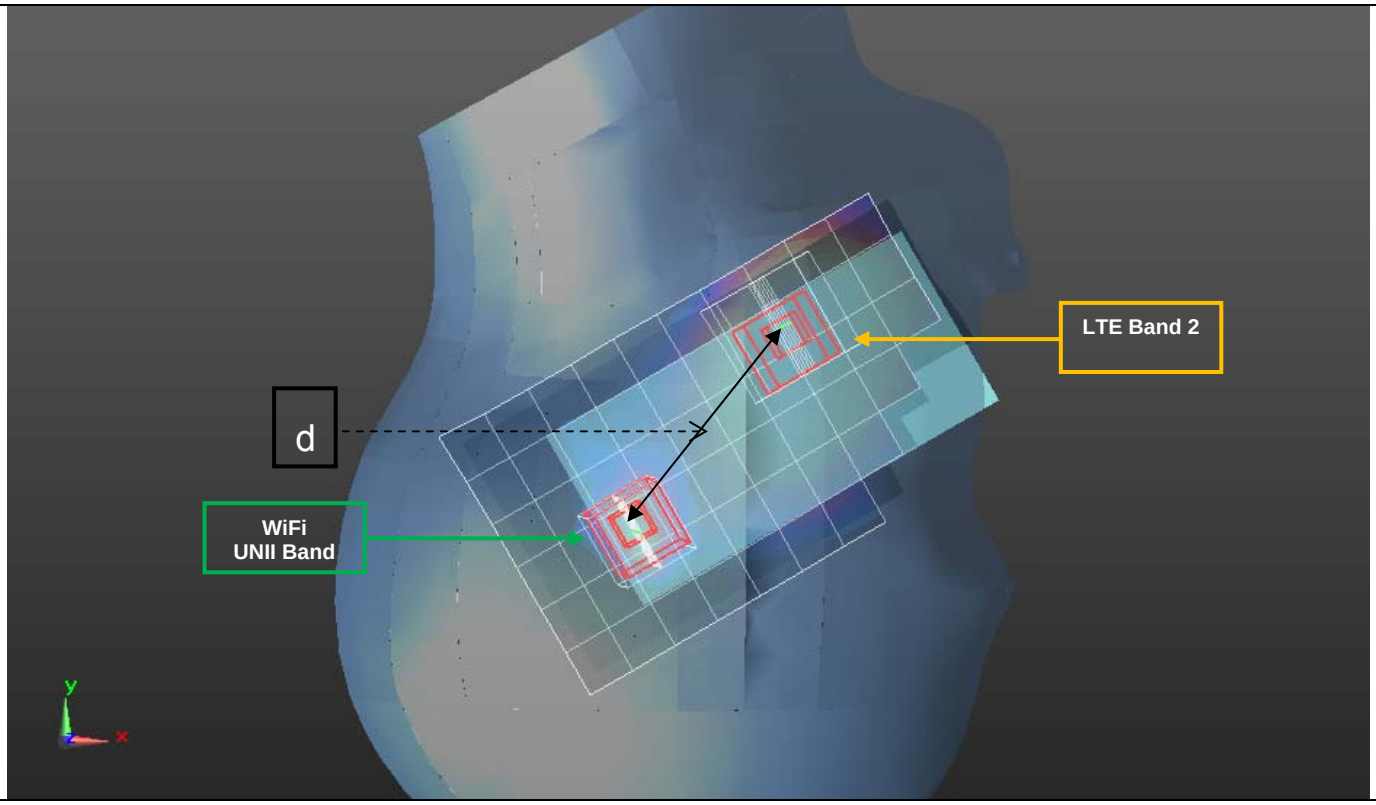


Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
LTE Band 2	1.46	0.0635	-0.255	-0.172
WiFi DTS Band	0.783	0.0387	-0.32	-0.173

d: Calculated distance (mm)
69.6

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

Figure (2)



Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
LTE Band 2	1.46	0.0635	-0.255	-0.172
WiFi UNII Band	1.28	0.0157	-0.318	-0.172

d: Calculated distance (mm)
79.1

The Peak Location Separation Distance is computed by using the formula below:
SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^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				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		LTE Band 5	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.178	0.465			0.643	No
		0.178		0.383		0.561	No
	Left Tilt	0.087	0.403			0.490	No
		0.087		0.307		0.394	No
	Right Touch	0.185	0.576			0.761	No
		0.185		0.590		0.775	No
	Right Tilt	0.093	0.327			0.420	No
		0.093		0.434		0.527	No
Body-worn Accessory & Hotspot	Rear	0.108	0.536			0.644	No
		0.108		0.561		0.669	No
		0.108			0.016	0.124	No
	Front	0.087	0.275			0.362	No
		0.087		0.208		0.295	No
		0.087			0.005	0.092	No
Hotspot	Edge 1	0.061	0.088			0.149	No
	Edge 2	0.046	0.029			0.075	No
	Edge 3	0	0			0	No
	Edge 4	0.017	0.300			0.317	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				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		LTE Band 5	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.788	0.465			1.253	No
		0.788		0.383		1.171	No
	Left Tilt	0.372	0.403			0.775	No
		0.372		0.307		0.679	No
	Right Touch	0.759	0.576			1.335	No
		0.759		0.590		1.349	No
	Right Tilt	0.407	0.327			0.734	No
		0.407		0.434		0.841	No
Body-worn Accessory & Hotspot	Rear	0.904	0.536			1.440	No
		0.904		0.561		1.465	No
		0.904			0.016	0.920	No
	Front	0.656	0.275			0.931	No
		0.656		0.208		0.864	No
		0.656			0.005	0.661	No
Hotspot	Edge 1	0	0.088			0.088	No
	Edge 2	0.591	0.029			0.620	No
	Edge 3	0.186	0			0.186	No
	Edge 4	0.667	0.300			0.967	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

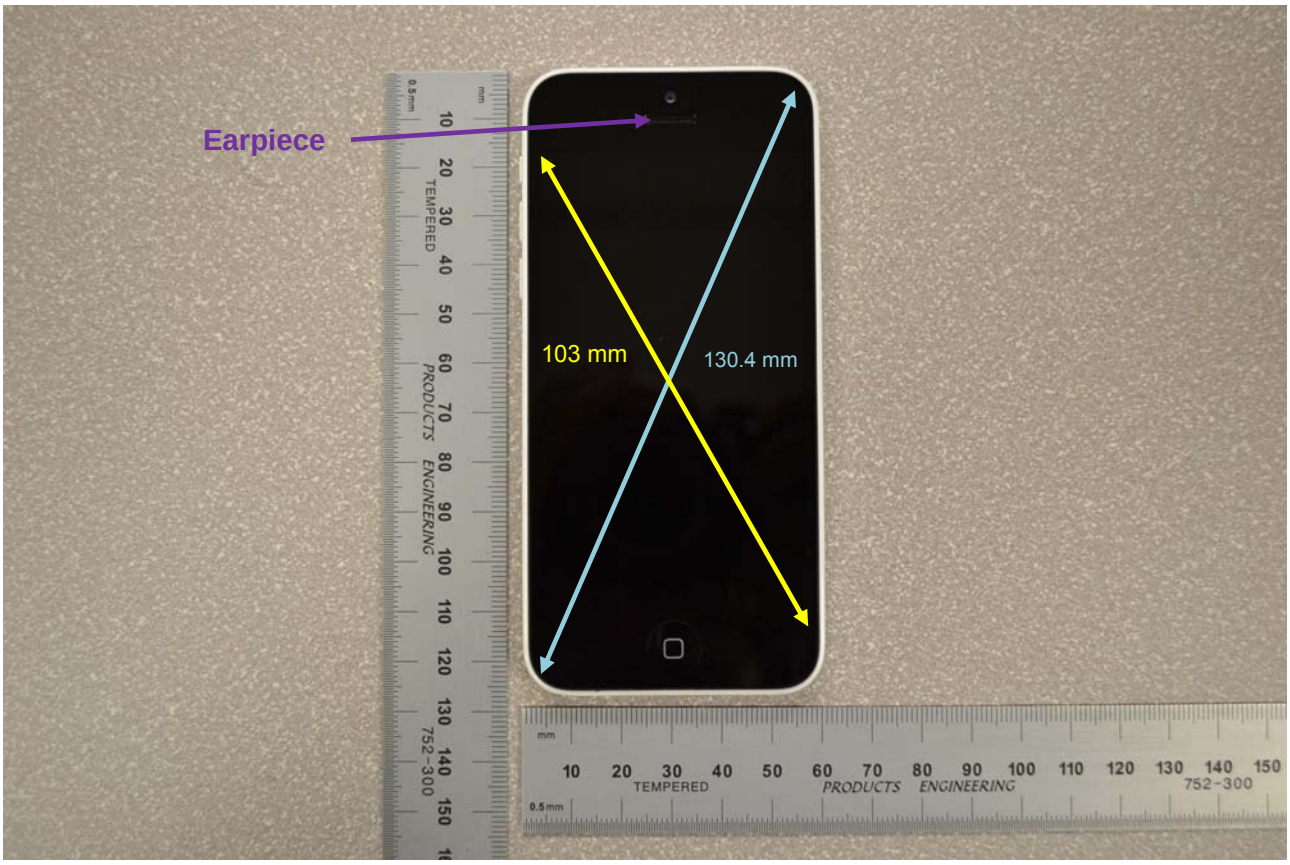
15.13. Calibration Certificate for D2450V2 - SN 748

15.14. Calibration Certificate for D5GHzV2 - SN 1003

15.15. Calibration Certificate for D5GHzV2 - SN 1138

16. External Photos

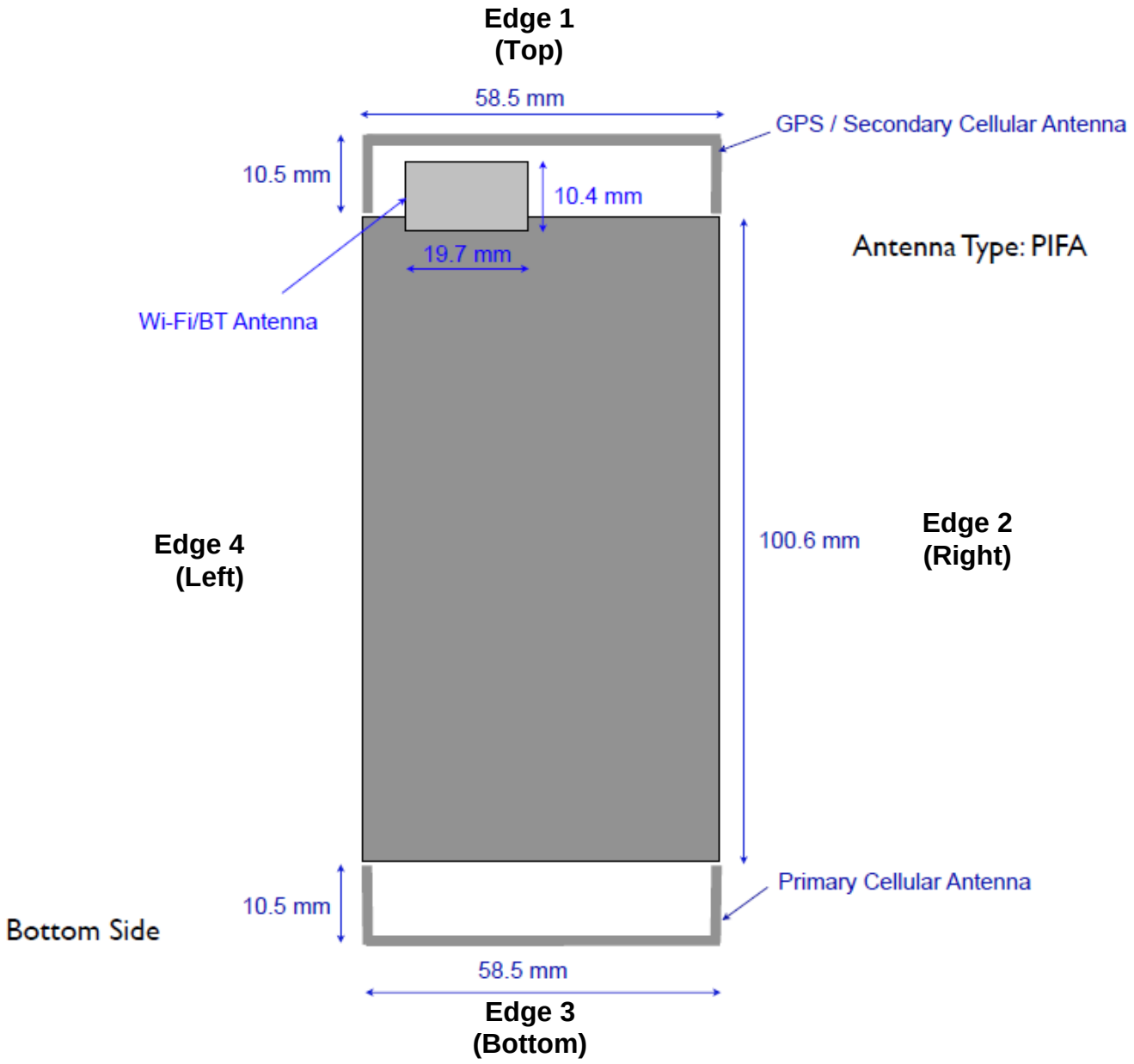
Overall Dimensions



Front View of the DUT

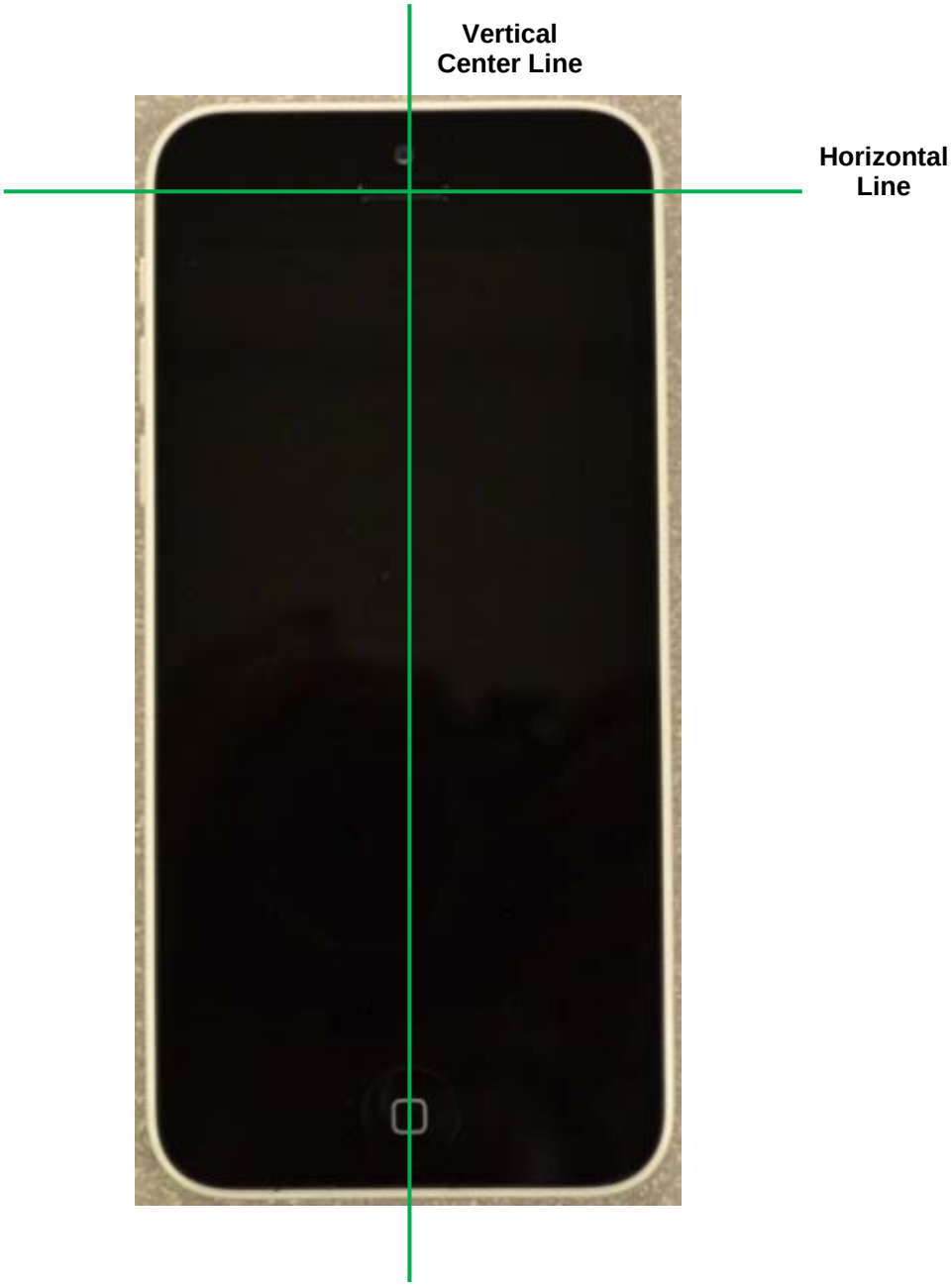
Rear View of the DUT

17. Antenna Locations & Separation Distances



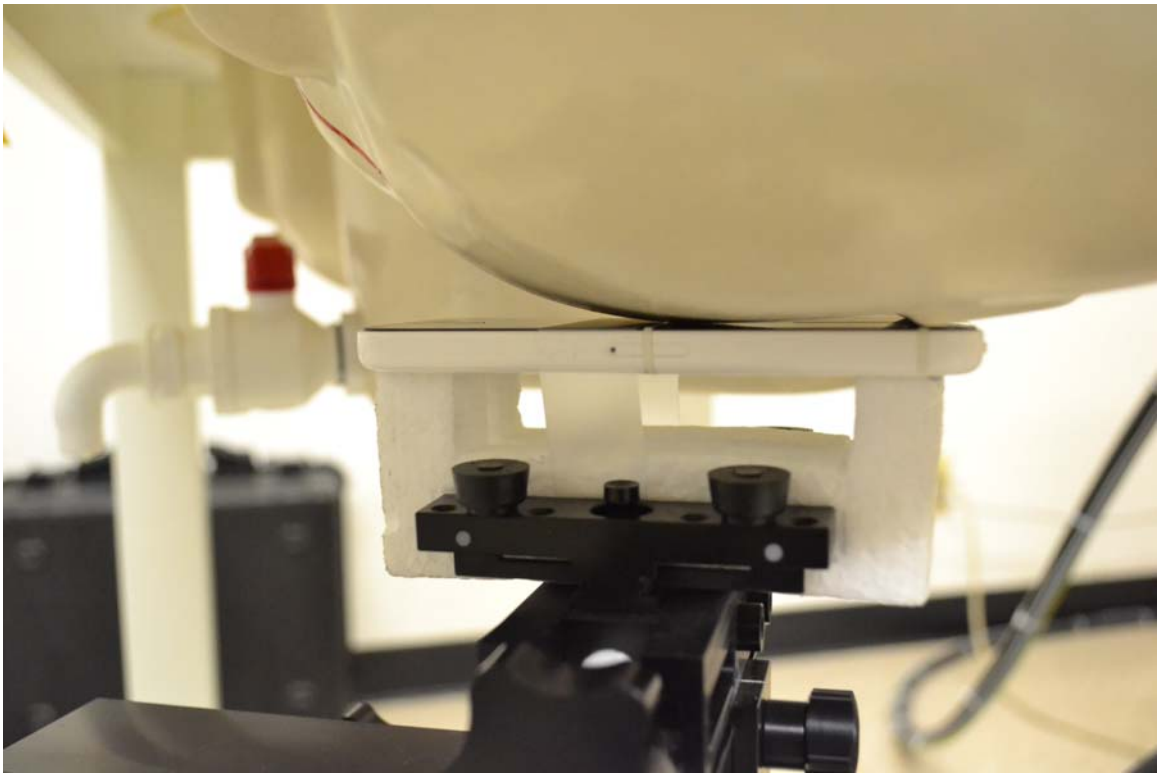
18. Setup Photos

Handset Vertical and Horizontal Reference Lines

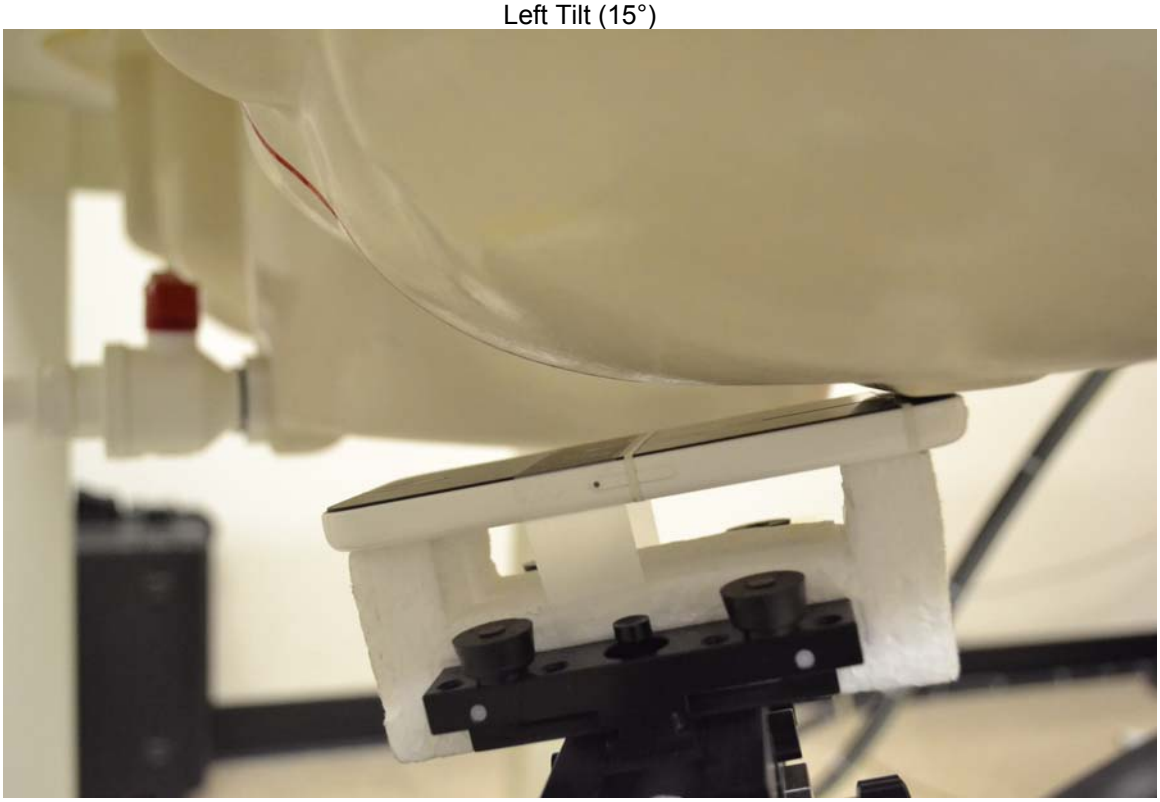


19. Head Exposure Conditions

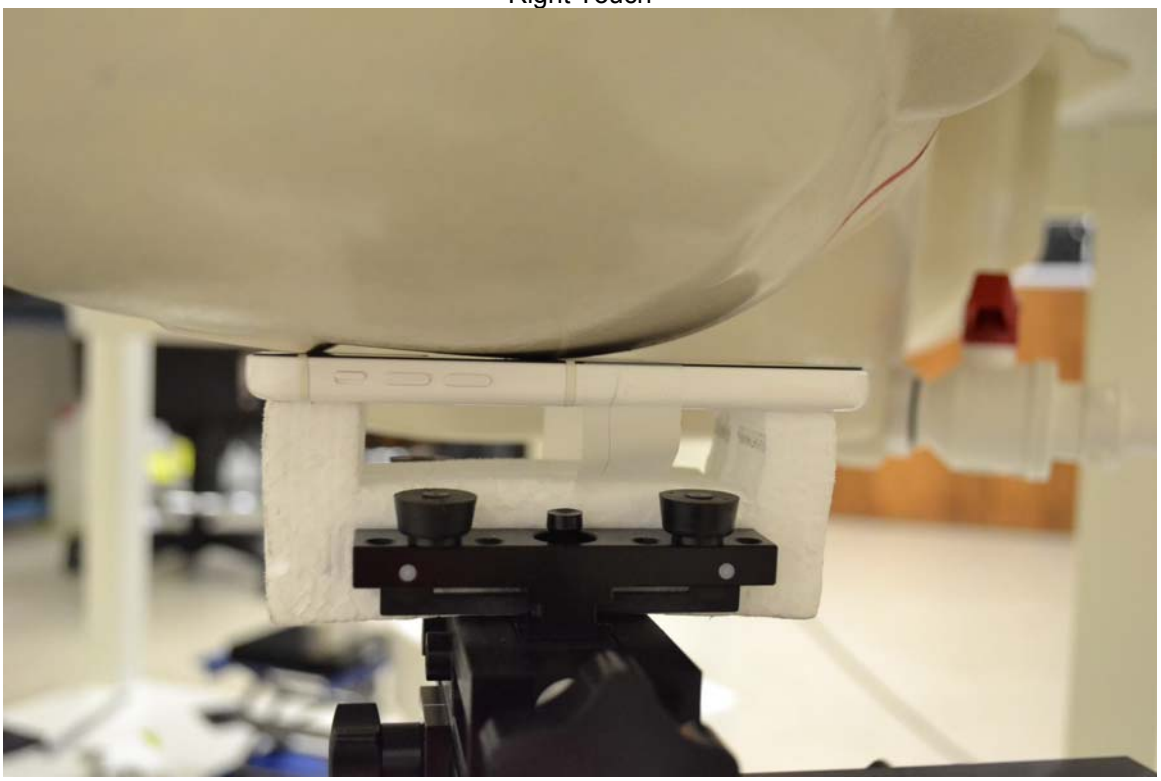
Left Touch



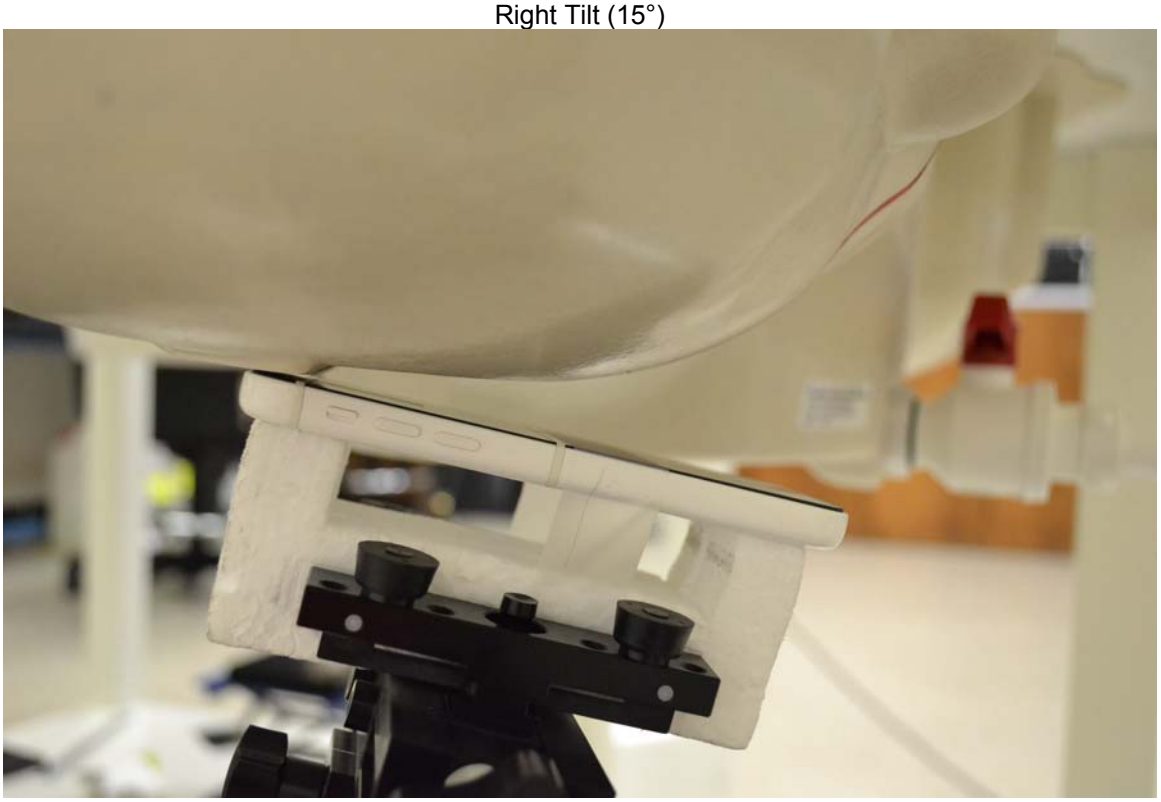
Left Tilt (15°)



Right Touch

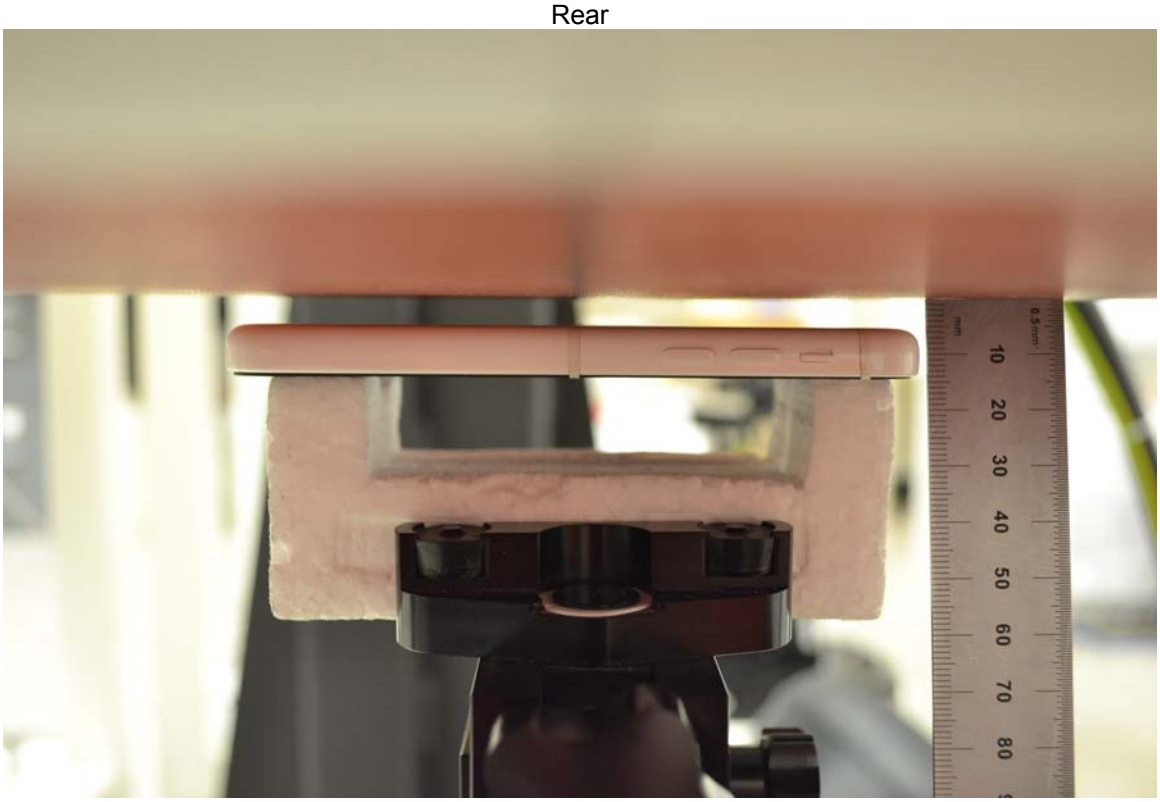


Right Tilt (15°)

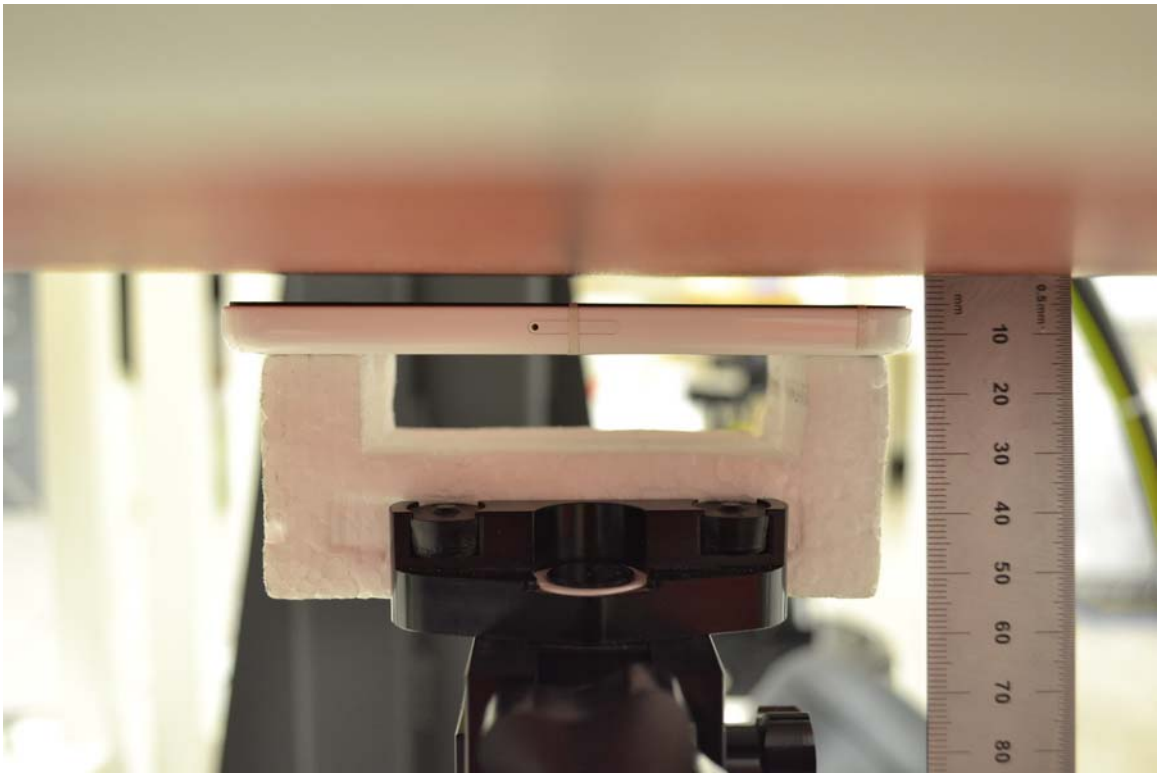


19.1. Body-worn Accessory & Hotspot Exposure Conditions

Rear

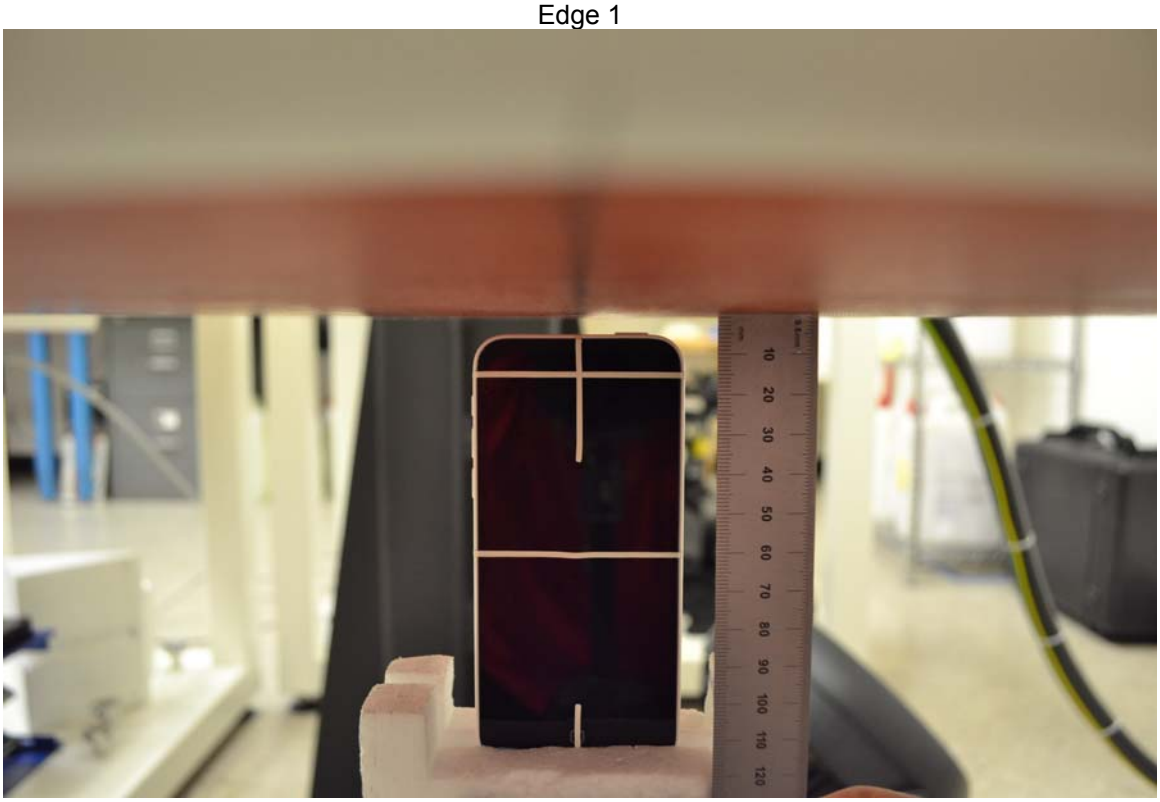


Front

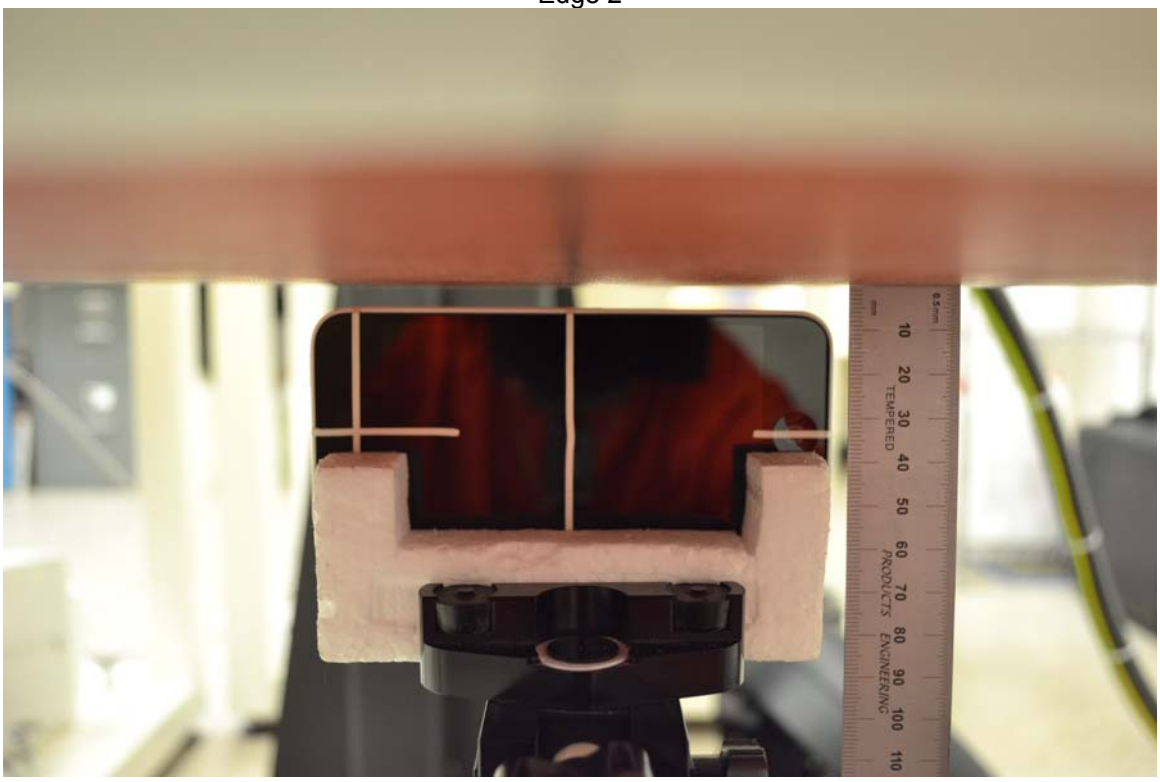


19.2. Hotspot Exposure Conditions

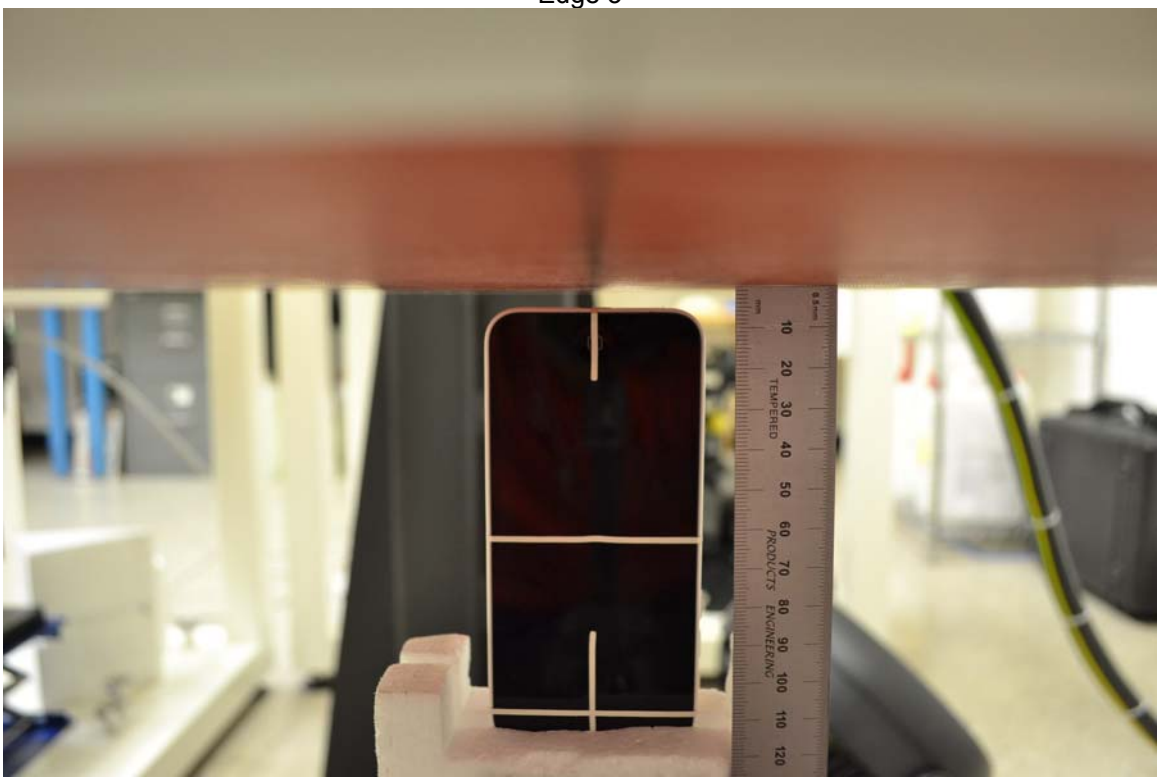
Edge 1



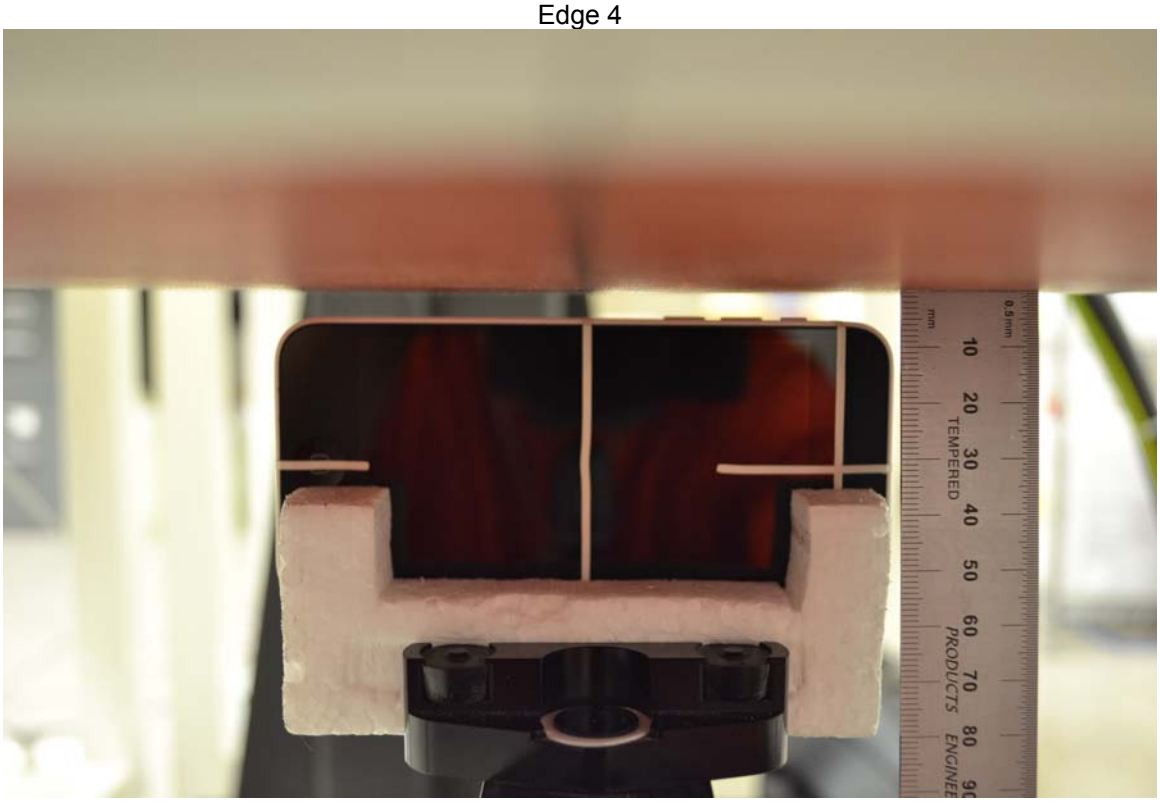
Edge 2



Edge 3



Edge 4



END OF REPORT