SAR EVALUATION REPORT

FCC 47 CFR § 2.1093
IEEE Std 1528-2013

The model FCC ID: A3LSMP555 shares the same enclosure and circuit board as model FCC ID: A3LSMP555M. The WLAN/Bluetooth circuitry and layout, including antenna, are almost identical between the two units. The WLAN/Bluetooth antenna and surrounding circuitry is the same between these two units, and tune up power targets are identical for WLAN and Bluetooth operations. For this reason the SAR data for the WLAN and Bluetooth operations for FCC ID: A3LSMP555 is considered representative for FCC ID: A3LSMP555M.

For
GSM/WCDMA/LTE Tablet + Bluetooth & DTS/UNII a/b/g/n & ANT+

FCC ID: A3LSMP555M
Model Name: SM-P555M

Report Number: 15K20096-S1
Issue Date: 3/22/2015

Prepared for
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ACCREDITED
TL-637

Revision History

Rev.	Date	Revisions	Revised By
--	3/22/2015	Initial Issue	Justin Park

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1. Attestation of Test Results

Applicant Name	SAMSUNG ELECTRONICS.,LTD.			
FCC ID	A3LSMP555M			
Model Name	SM-P555M			
Applicable Standards	FCC 47 CFR § 2.1093 Published RF exposure KDB procedures IEEE Std 1528-2013			
SAR Limits (W/Kg)				
Exposure Category	Peak spatial-average(1g of tissue)			
General population / Uncontrolled exposure	1.6			
The Highest Reported SAR (W/kg)				
RF Exposure Conditions	**Equipment Class**			
	Licensed	**DTS**	**U-NII**	**DSS (BT)**
Standalone	1.038	0.969	0.893	0.469
Simultaneous TX	1.598	1.598	1.522	1.098
Date Tested	2/26/2015 to 3/7/2015			
Test Results	Pass			

Note(s): The Wi-Fi (DTS/U-NII) and Bluetooth SAR measurement results from the original filling can be found in SAR test report 15I19961-S1A, FCC ID A3LSMP555 The standalone Wi-Fi and Bluetooth results from the original filling were used for Simultaneous Transmission Analysis purposes. Both models contain identical Wi-Fi/BT modules and antennas. Spot checks for 802.11a/b were performed to ensure that the SAR measurements for both devices are the same.

UL Korea, Ltd. 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 Korea, Ltd. 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 Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. 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 IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released By:	Prepared By:
	
JiHo Choi Operations Manager UL Korea, Ltd Suwon Laboratory	Justin Park Engineer UL Korea, Ltd Suwon Laboratory

2. Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1093, IEEE STD 1528-2013, the following FCC Published RF exposure KDB procedures:

- 248227 D01 SAR meas for 802.11 v02
- 447498 D01 General RF Exposure Guidance v05r02
- 447498 D03 Supplement C Cross-Reference
- 616217 D04 SAR for laptop and tablets v01r01
- 690783 D01 SAR Listings on Grants v01r03
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03
- 865664 D02 RF Exposure Reporting v01r01
- 941225 D01 3G SAR Procedures v03
- 941225 D05 SAR for LTE Devices v02r03
- 941225 D06 Hotspot Mode v02

3. Facilities and Accreditation

The test sites and measurement facilities used to collect data are located at

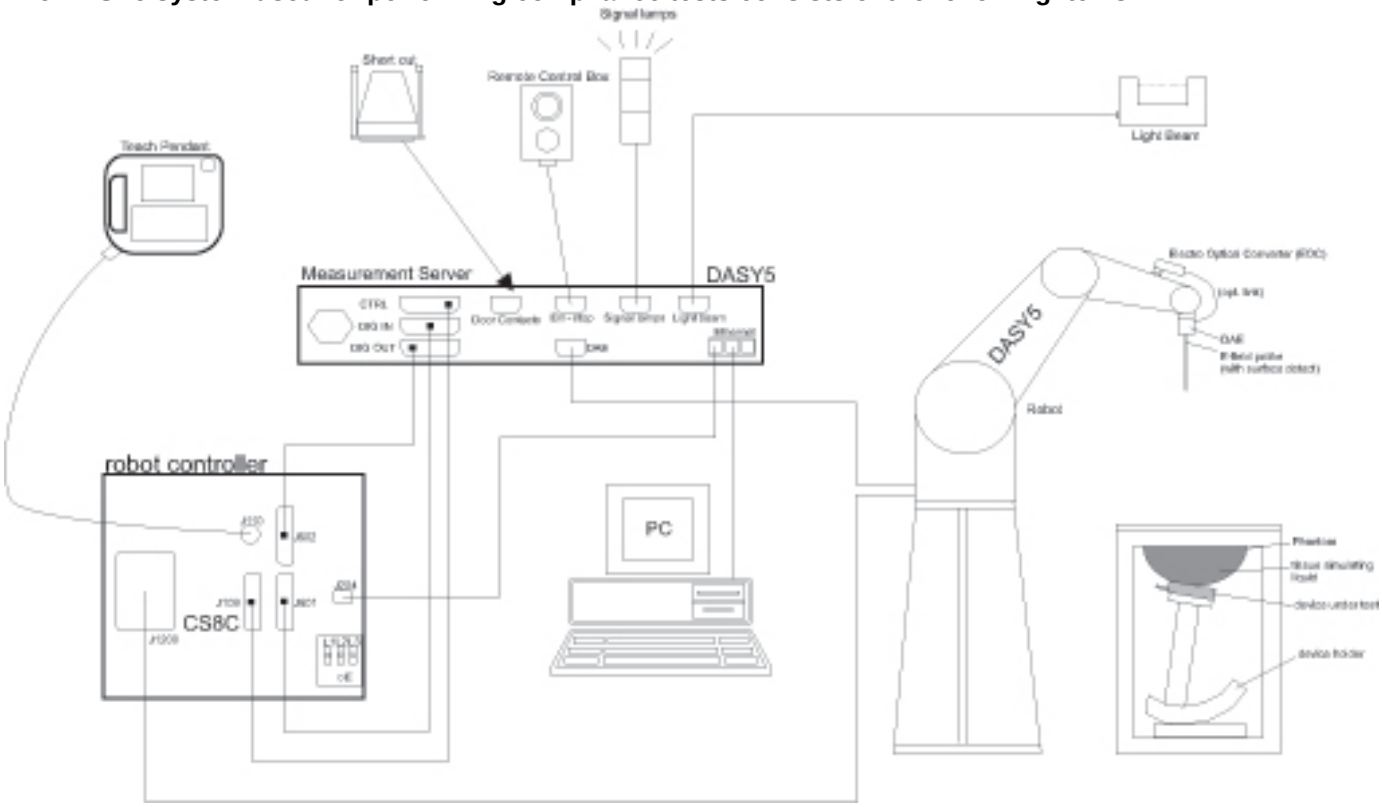
Suwon
SAR 2 Room
SAR 3 Room

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637.
The full scope of accreditation can be viewed at http://www.iasonline.org/PDF/TL/TL-637.pdf.

4. SAR Measurement System & Test Equipment

4.1. SAR Measurement System

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.

4.2. SAR Scan Procedures

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

	≤ 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

			≤ 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.

4.3. Test Equipment

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.

Dielectric Property Measurements

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Network Analyzer	Agilent	E5071C	MY46522054	2015-09-23
Dielectronic Probe kit	SPEAG	DAK-3.5	1196	2015-08-05
Dielectronic Probe kit	SPEAG	DAK-3.5 Short	SM DAK 200 BA	N/A
Thermometer	LKM	DTM3000	3424	2015-11-13

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
MXG Analog Signal Generator	Agilent	N5181A	MY50145882	2015-09-23
Power Sensor	Agilent	U2000A	MY54260010	2015-09-23
Power Sensor	Agilent	U2000A	MY54260007	2015-09-23
Power Amplifier	EXODUS	1410025-AMP2027-10003	10003	2015-11-07
Directional Coupler	Agilent	772D	MY52180193	2015-09-22
Directional Coupler	Agilent	778D	MY52180432	2015-09-22
Low Pass Filter	MICROLAB	LA-15N	03943	2015-11-04
Low Pass Filter	FILTRON	L14012FL	1410003S	2015-11-04
Low Pass Filter	MICROLAB	LA-60N	03942	2015-11-05
Attenuator	Agilent	8491B/003	MY39269292	2015-09-22
Attenuator	Agilent	8491B/010	MY39269315	2015-09-22
Attenuator	Agilent	8491B/020	MY39269298	2015-09-22
E-Field Probe (SAR 2)	SPEAG	EX3DV4	7313	2015-08-27
E-Field Probe (SAR 3)	SPEAG	EX3DV4	7314	2015-08-27
Data Acquisition Electronics (SAR 2)	SPEAG	DAE4	1447	2015-08-25
Data Acquisition Electronics (SAR 3)	SPEAG	DAE4	1446	2015-08-27
System Validation Dipole	SPEAG	D750V2	1122	2015-08-13
System Validation Dipole	SPEAG	D835V2	4d174	2015-08-13
System Validation Dipole	SPEAG	D1900V2	5d190	2015-08-12
System Validation Dipole	SPEAG	D1750V2	1125	2015-08-12
Thermometer (SAR 2)	Lutron	MHB-382SD	AH.50215	2015-11-18

Others

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Base Station Simulator	R & S	CMW500	150313	2015-08-13
Base Station Simulator	R & S	CMW500	150314	2015-08-13

5. Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, 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 1528-2013 is not required in SAR reports submitted for equipment approval.

6. Device Under Test (DUT) Information

6.1. DUT Description

Device Dimension	Overall (Length x Width): 243 mm x 166.5 mm Overall Diagonal: 285.52 mm Display Diagonal: 246.38 mm
Back Cover	☒ The rechargeable battery is not user accessible.
Battery Options	☒ The rechargeable battery is not user accessible.
Wireless Router (Hotspot)	Wi-Fi Hotspot mode permits the device to share its cellular data connection with other Wi-Fi-enabled devices. ☒ Mobile Hotspot (Wi-Fi 2.4 GHz) ☐ Mobile Hotspot (Wi-Fi 5 GHz)
Wi-Fi Direct	Wi-Fi Direct enabled devices transfer data directly between each other ☒ Wi-Fi Direct (Wi-Fi 2.4 GHz) ☒ Wi-Fi Direct (Limited to Wi-Fi 5.2 and 5.8 GHz)

6.2. Wireless Technologies

Wireless technologies	Frequency bands	Operating mode		Duty Cycle used for SAR testing
GSM	850 1900	Voice (GMSK) GPRS (GMSK) EGPRS (8PSK)	GPRS Multi-Slot Class: ☐ Class 8 - One Up ☐ Class 10 - Two Up ☐ Class 12 - Four Up ☒ Class 33 - Four Up	GSM Voice: 12.5% (E)GPRS: 1 Slot: 12.5% 2 Slots: 25% 3 Slots: 37.5% 4 Slots: 50%
	Does this device support DTM (Dual Transfer Mode)? ☐ Yes ☒ No			
W-CDMA (UMTS)	Band II Band IV Band V	UMTS Rel. 99 (Voice & Data) HSDPA (Rel. 5) HSUPA (Rel. 6) DC-HSDPA (Rel. 8) HSPA+ (Rel. 6)		100%
LTE (FDD)	Band 2 Band 4 Band 5 Band 17	QPSK 16QAM (Rel. 10) ☒ Does not support Carrier Aggregation (CA)		100%
	Does this device support SV-LTE (1xRTT-LTE)? ☐ Yes ☒ No			
Wi-Fi	2.4 GHz	802.11b 802.11g 802.11n (HT20)		100%
	5 GHz	802.11a 802.11n (HT20) 802.11n (HT40)		100%
	Does this device support bands 5.60 ~ 5.65 GHz? ☐ Yes ☒ No			
	Does this device support Band gap channel? ☐ Yes ☒ No			
Bluetooth	2.4 GHz	Version 4.1 LE		77.5% (DH5)

6.3. Nominal and Maximum Output Power

KDB 447498 sec.4.1.(3) at the maximum rated output power and within the tune-up tolerance range specified for the product, but not more than 2 dB lower than the maximum tune-up tolerance limit

Upper limit (dB): -1.5 ~ 0.5		Max. RF Output Power (dBm)		Reduce RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit	Target	Max. tune-up tolerance limit
GSM850	Voice	33.0	**33.5**	29.5	**30.0**
	GPRS 1 slot	33.0	**33.5**	29.5	**30.0**
	GPRS 2 slots	29.5	**30.0**	25.5	**26.0**
	GPRS 3 slots	28.5	**29.0**	23.0	**23.5**
	GPRS 4 slots	26.5	**27.0**	22.5	**23.0**
	EGPRS 1 slot	26.0	**26.5**	26.0	**26.5**
	EGPRS 2 slots	25.0	**25.5**	25.0	**25.5**
	EGPRS 3 slots	24.0	**24.5**	24.0	**24.5**
	EGPRS 4 slots	23.0	**23.5**	23.0	**23.5**
GSM1900	Voice	30.0	**30.5**	22.6	**23.1**
	GPRS 1 slot	30.0	**30.5**	22.6	**23.1**
	GPRS 2 slots	27.5	**28.0**	18.5	**19.0**
	GPRS 3 slots	25.5	**26.0**	16.5	**17.0**
	GPRS 4 slots	24.5	**25.0**	15.5	**16.0**
	EGPRS 1 slot	25.0	**25.5**	23.0	**23.5**
	EGPRS 2 slots	24.0	**24.5**	21.0	**21.5**
	EGPRS 3 slots	23.0	**23.5**	19.0	**19.5**
	EGPRS 4 slots	22.0	**22.5**	18.0	**18.5**
W-CDMA Band V	R99	22.5	**23.0**	20.0	**20.5**
	HSDPA	22.0	**22.5**	19.5	**20.0**
	HSUPA	22.0	**22.5**	20.0	**20.5**
	DC-HSDPA	21.5	**22.0**	19.5	**20.0**
W-CDMA Band Ⅳ	R99	23.5	**24.0**	13.0	**13.5**
	HSDPA	23.5	**24.0**	13.0	**13.5**
	HSUPA	23.5	**24.0**	13.0	**13.5**
	DC-HSDPA	23.5	**24.0**	13.0	**13.5**
W-CDMA Band Ⅱ	R99	21.5	**22.0**	13.0	**13.5**
	HSDPA	21.0	**21.5**	12.5	**13.0**
	HSUPA	21.5	**22.0**	13.0	**13.5**
	DC-HSDPA	21.5	**22.0**	12.5	**13.0**
LTE Band 2	QPSK	23.5	**24.0**	15.0	**15.5**
LTE Band 4	QPSK	23.1	**23.6**	15.0	**15.5**
LTE Band 5	QPSK	23.6	**24.1**	20.6	**21.1**
LTE Band 17	QPSK	22.5	**23.0**	19.5	**20.0**

6.4. 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="3">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="3">Band 4</td><td colspan="6">Frequency range: 1710 - 1755 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>20050/ 1720</td><td>20025/ 1717.5</td><td>20000/ 1715</td><td>19975/ 1712.5</td><td>19965/ 1711.5</td><td>19957/ 1710.7</td></tr>
<tr><td>Mid</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td></tr>
<tr><td>High</td><td>20300/ 1745</td><td>20325/ 1747.5</td><td>20350/ 1750</td><td>20375/ 1752.5</td><td>20385/ 1753.5</td><td>20393/ 1754.3</td></tr>
<tr><td rowspan="3">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>
<tr><td rowspan="3">Band 17</td><td colspan="6">Frequency range: 704 - 716 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></td><td>23755/ 706.5</td><td></td><td></td></tr>
<tr><td>Mid</td><td></td><td></td><td>23790/ 710</td><td>23790/ 710</td><td></td><td></td></tr>
<tr><td>High</td><td></td><td></td><td></td><td>23825/ 713.5</td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>LTE transmitter and antenna implementation</td><td>LTE has one (1) TX/RX antennas and one (1) RX antennas
Refer to Appendix A.</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>Yes. This device uses a capacitive proximity sensor that is same metallic component as the transmitting antenna to facilitate triggering in typical user interactivity with the device.</td></tr>
<tr><td>Spectrum plots for RB configurations</td><td>A properly configured base station simulator was used for the SAR and power measurements; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.</td></tr>
</table>

6.5. Power Reduction by Proximity Sensing

Due to the operating configurations and exposure conditions required by tablets, proximity sensors are used in this device to reduce the maximum output power in specific wireless and operating modes to ensure SAR compliance. This device uses a capacitive proximity sensor that is same metallic component as the transmitting antenna to facilitate triggering in typical user interactivity with the device.

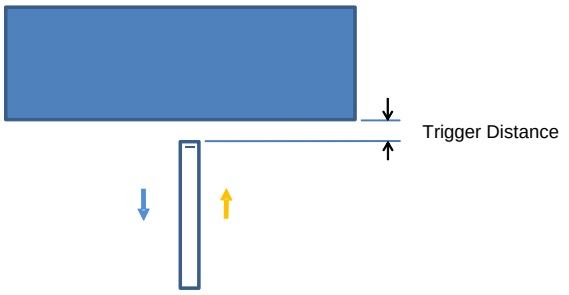
6.5.1. Proximity Sensor Triggering Distance (KDB 616217 §6.2)

Rear of the DUT was placed directly below the flat phantom. The DUT was moved toward the phantom in accordance with the steps outlined in KDB 616217 §6.2 to determine the trigger distance for enabling power reduction. The DUT was moved away from the phantom to determine the trigger distance for resuming full power.

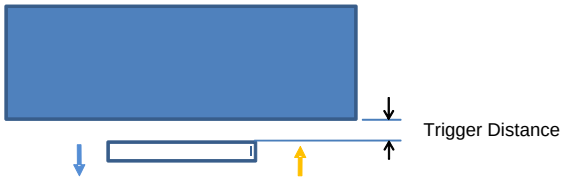
The measurement was then repeated for the surface of Edge 3.

The DUT featured a visual indicator on its display that showed the status of the proximity sensor (Triggered or not triggered). This was used to determine the status of the sensor during the proximity sensor assessment as monitoring the output power directly was not practical without affecting the measurement.

It was confirmed separately that the output power was altered according to the proximity sensor status indication. This was achieved by observing the proximity sensor status at the same time as monitoring the conducted power. Section 9 contains both the full and reduced conducted power measurements.



Proximity Sensor Trigger Distance Assessment
KDB 616217 §6.2 , **Edge 3**



Proximity Sensor Trigger Distance Assessment
KDB 616217 §6.2, **Rear**

LEGEND

Direction of DUT travel for determination of power reduction triggering point

Direction of DUT travel for determination of full power resumption triggering point

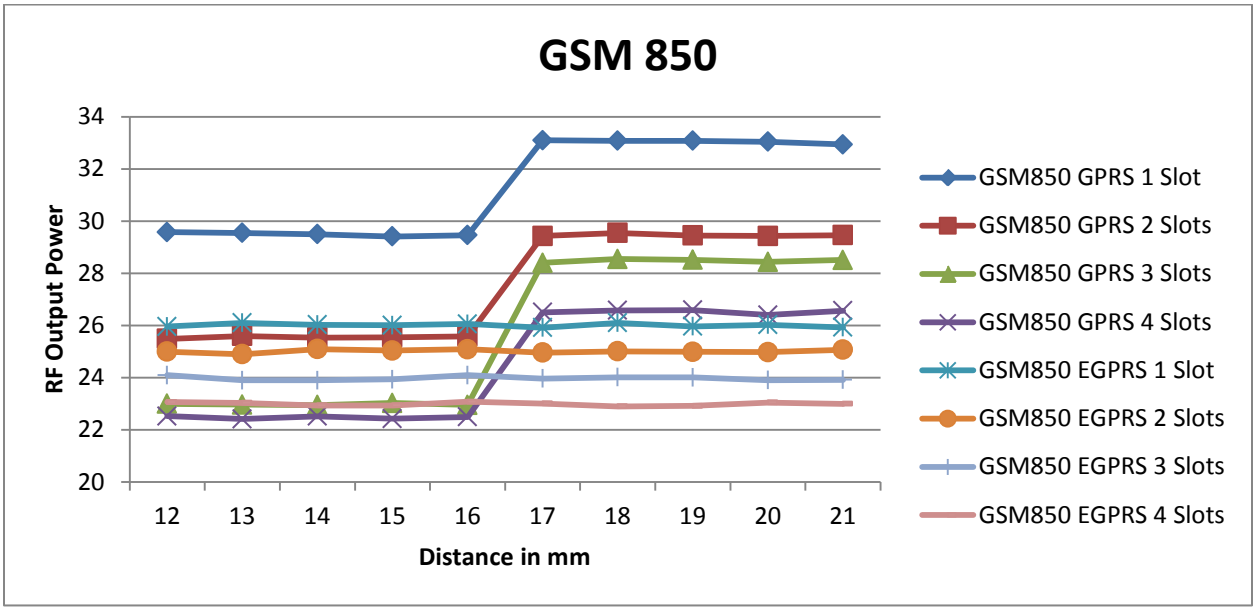
Summary of Trigger Distances

Tissue simulating liquid	Trigger distance - Edge 3		Trigger distance - Rear	
	Moving toward phantom	Moving from phantom	Moving toward phantom	Moving from phantom
750 muscle	6mm	6mm	16mm	16mm
850 muscle	6mm	6mm	16mm	16mm
1750 muscle	6mm	6mm	16mm	16mm
1900 muscle	6mm	6mm	16mm	16mm

6.5.2. Proximity Sensor Triggering Distance Measurement Results

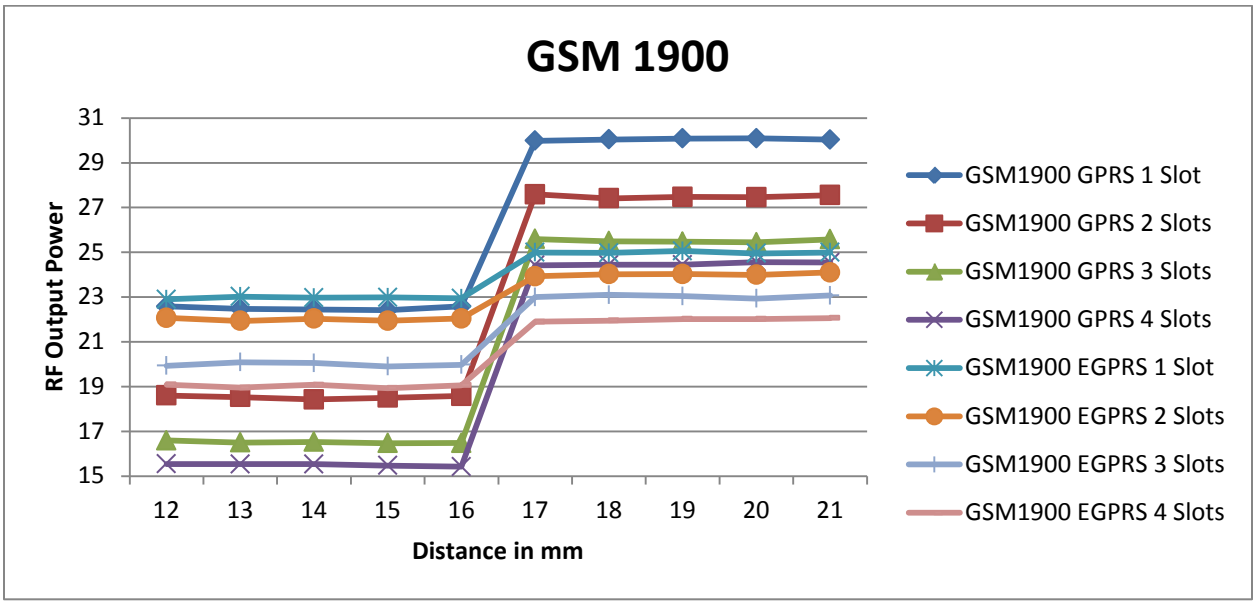
GSM850

Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom



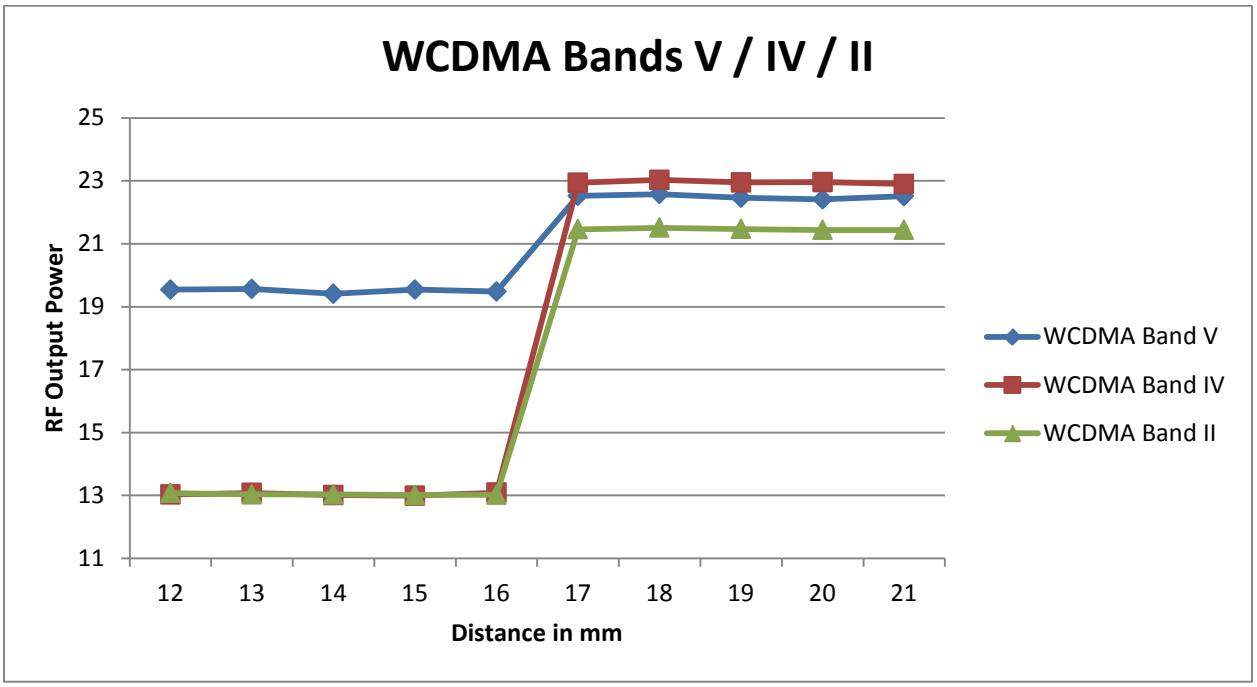
GSM1900

Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom



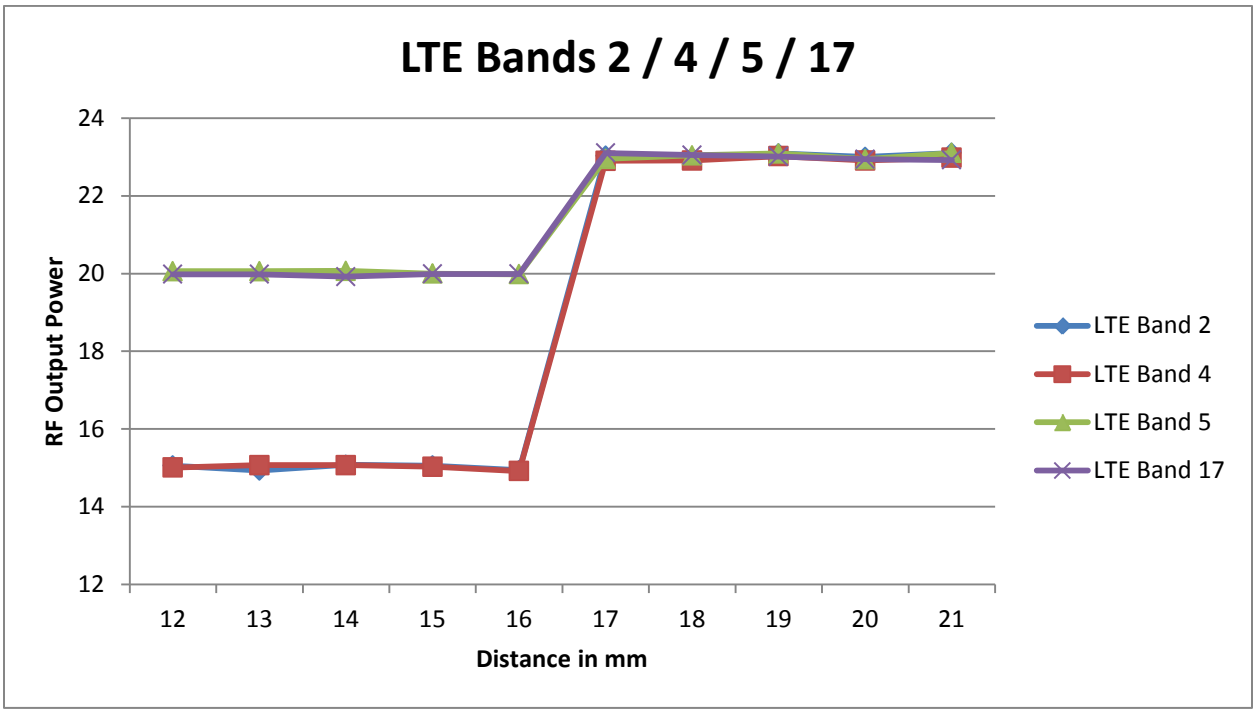
WCDMA Bands V / IV / II

Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom



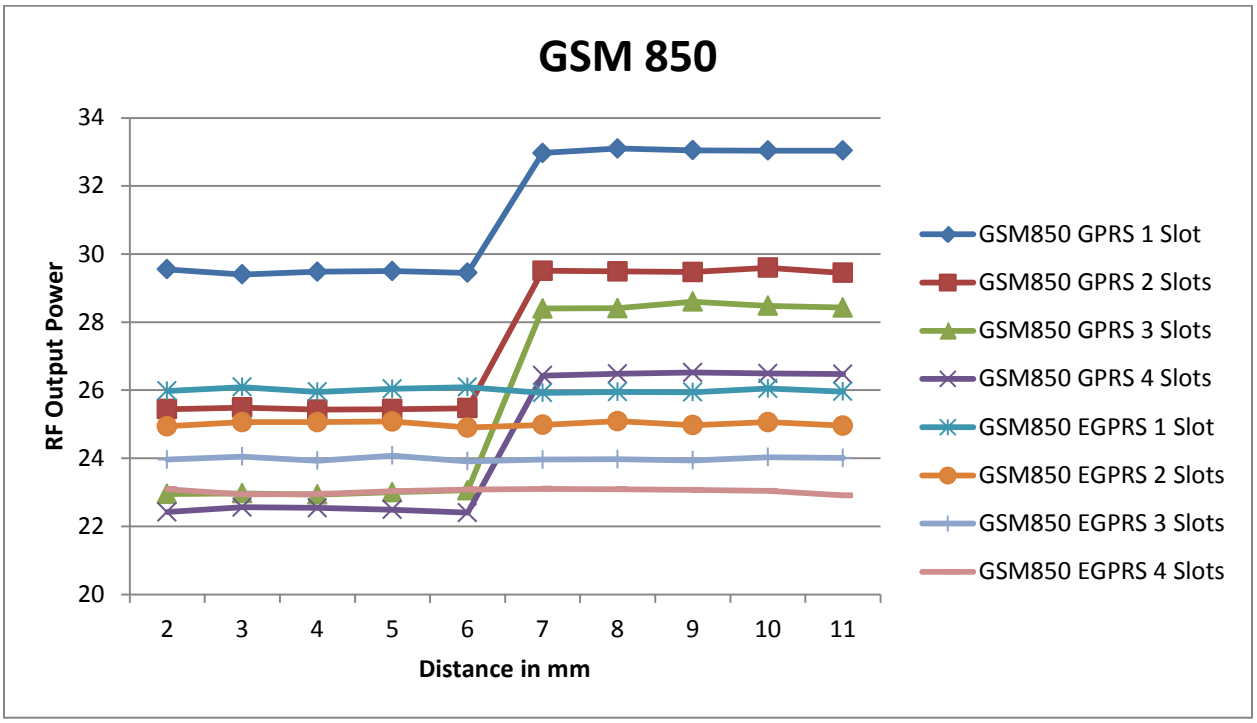
LTE Bands 2 / 4 / 5 / 17

Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom



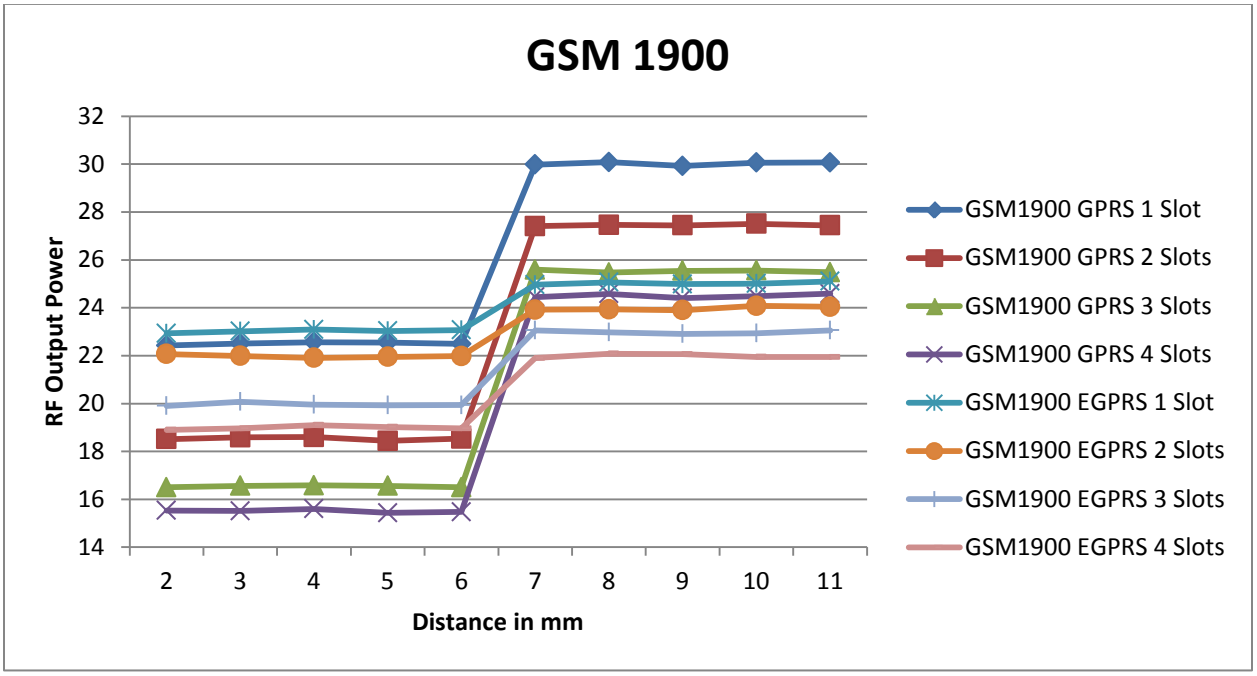
GSM850

Edge 3, DUT Moving Toward (Trigger) and Away (Release) from the Phantom



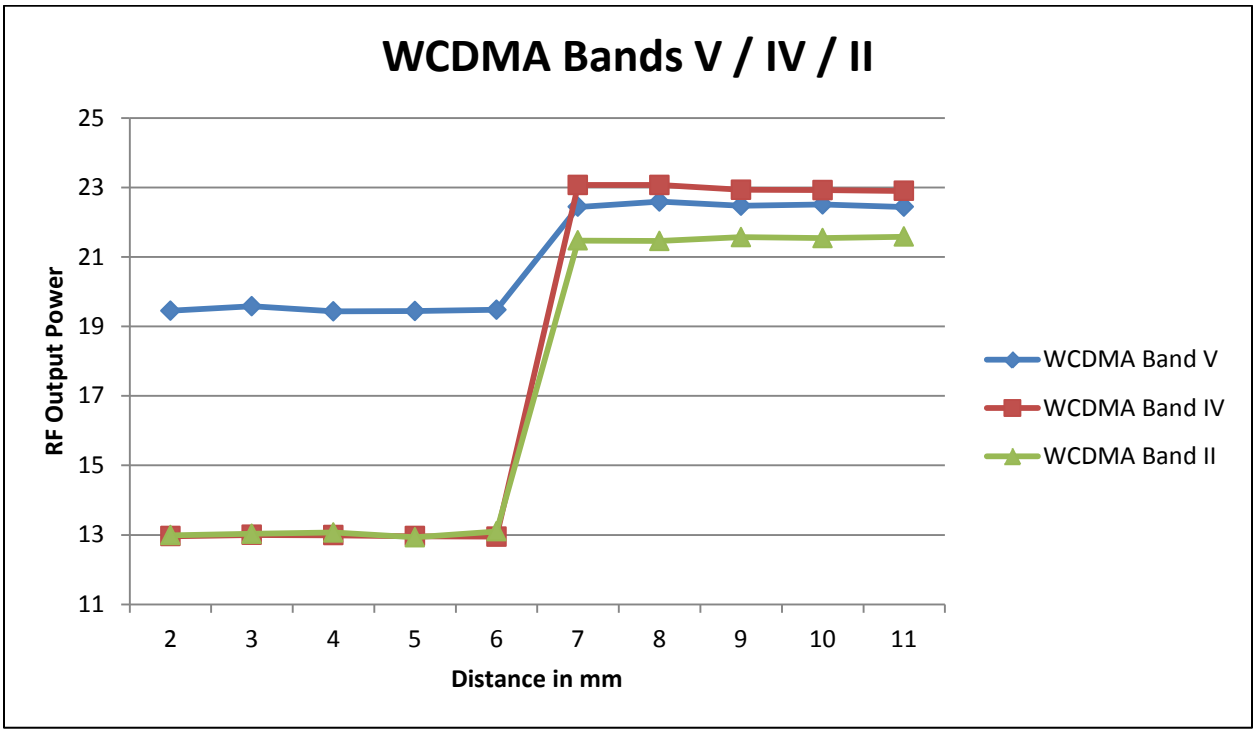
GSM1900

Edge 3, DUT Moving Toward (Trigger) and Away (Release) from the Phantom



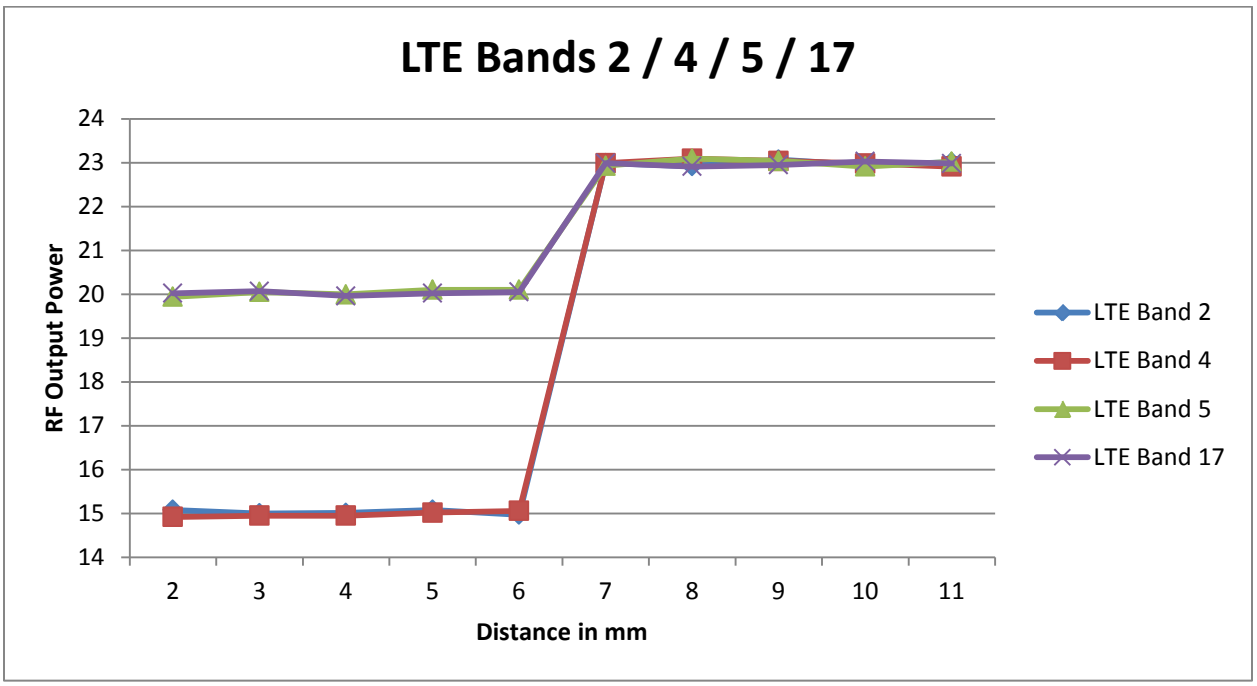
W-CDMA Bands V / IV / II

Edge 3, DUT Moving Toward (Trigger) and Away (Release) from the Phantom



LTE Bands 2 / 4 / 5 / 17

Edge 3, DUT Moving Toward (Trigger) and Away (Release) from the Phantom



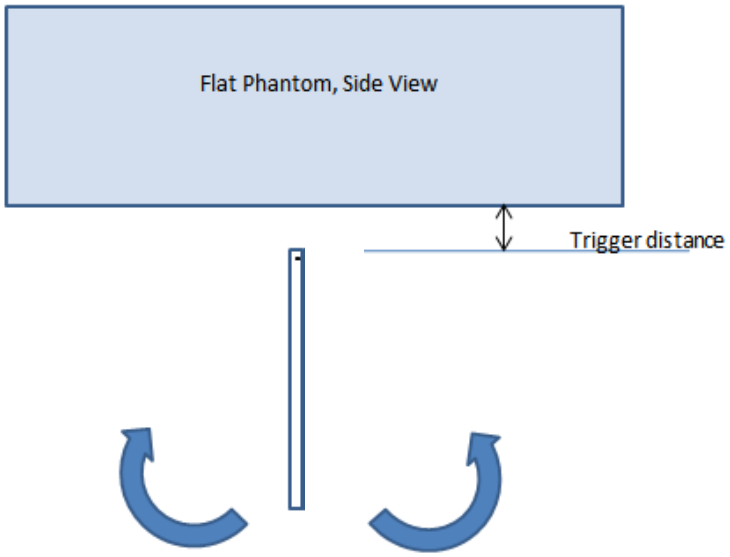
6.5.3. Proximity Sensor Coverage (KDB 616217 §6.3)

As there is no spatial offset between the antenna and the proximity sensor element, proximity sensor coverage did not need to be assessed.

6.5.4. Proximity Sensor Tilt Angle Assessment (KDB 616217 §6.4)

The DUT was positioned directly below the flat phantom at the minimum measured trigger distance with Edge 3 parallel to the base of the flat phantom for each band.

The EUT was rotated about Edge 3 for angles up to +/- 45°. If the output power increased during the rotation the DUT was moved 1mm toward the phantom and the rotation repeated. This procedure was repeated until the power remained reduced for all angles up to +/- 45°.



Proximity sensor tilt angle assessment (Edge 3) KDB 616217 §6.4

Summary of Tablet Tilt Angle Influence to Proximity Sensor Triggering for Edge 3

Band (MHz)	Minimum trigger distance measured according to KDB 616217 §6.2	Minimum distance at which power reduction was maintained over +/-45°	Power reduction status										
			-45°	-40°	-30°	-20°	-10°	0°	10°	20°	30°	40°	45°
750	6 mm	6 mm	On	On	On	On	On	On	On	On	On	On	On
850	6 mm	6 mm	On	On	On	On	On	On	On	On	On	On	On
1750	6 mm	6 mm	On	On	On	On	On	On	On	On	On	On	On
1900	6 mm	6 mm	On	On	On	On	On	On	On	On	On	On	On

6.5.5. Resulting test positions for SAR measurements

Wireless technologies	Position	§6.2 Triggering Distance	§6.3 Coverage	§6.4 Tilt Angle	Worst case distance for SAR
WWAN	Rear	16 mm	N/A	N/A	15 mm
	Edge 3	6 mm	N/A	6 mm	5 mm

7. RF Exposure Conditions (Test Configurations)

Refer to “SAR Photos and Ant locations” Appendix for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

7.1. Standalone SAR Test Exclusion Considerations

Since the *Dedicated Host Approach* is applied, the standalone SAR test exclusion procedure in KDB 447498 § 4.3.1 is applied in conjunction with KDB 616217 § 4.3 to determine the minimum test separation distance:

- When the separation distance from the antenna to an adjacent edge is ≤ 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.
- When the separation distance from the antenna to an adjacent edge is > 5 mm, the actual antenna-to-edge separation distance is applied to determine SAR test exclusion.

SAR Test Exclusion Calculations for WWAN

Antennas < 50mm to adjacent edges

Antenna	Tx Interface	Frequency (MHz)	Output Power		Separation Distances (mm)						Calculated Threshold Value					
			dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Full Power, Proximity Sensor Off																
Cellular	GPRS 3 Slots	848.8	29.00	298	1.28	204.95	6.37	5.75	102.37		54.9 -MEASURE-	> 50 mm	45.8 -MEASURE-	45.8 -MEASURE-	> 50 mm	
Cellular	GPRS 2 Slots	1909.8	26.00	100	1.28	204.95	6.37	5.75	102.37		27.6 -MEASURE-	> 50 mm	23 -MEASURE-	23 -MEASURE-	> 50 mm	
Cellular	W-CDMA 2	1907.6	22.00	158	1.28	204.95	6.37	5.75	102.37		43.6 -MEASURE-	> 50 mm	36.4 -MEASURE-	36.4 -MEASURE-	> 50 mm	
Cellular	W-CDMA 4	1752.6	24.00	251	1.28	204.95	6.37	5.75	102.37		66.5 -MEASURE-	> 50 mm	55.4 -MEASURE-	55.4 -MEASURE-	> 50 mm	
Cellular	W-CDMA 5	846.6	23.00	200	1.28	204.95	6.37	5.75	102.37		36.8 -MEASURE-	> 50 mm	30.7 -MEASURE-	30.7 -MEASURE-	> 50 mm	
Cellular	LTE Band 2	1900	24.00	251	1.28	204.95	6.37	5.75	102.37		69.2 -MEASURE-	> 50 mm	57.7 -MEASURE-	57.7 -MEASURE-	> 50 mm	
Cellular	LTE Band 4	1754.3	23.60	229	1.28	204.95	6.37	5.75	102.37		60.7 -MEASURE-	> 50 mm	50.6 -MEASURE-	50.6 -MEASURE-	> 50 mm	
Cellular	LTE Band 5	844	24.10	257	1.28	204.95	6.37	5.75	102.37		47.2 -MEASURE-	> 50 mm	39.4 -MEASURE-	39.4 -MEASURE-	> 50 mm	
Cellular	LTE Band 17	710	23.00	200	1.28	204.95	6.37	5.75	102.37		33.7 -MEASURE-	> 50 mm	28.1 -MEASURE-	28.1 -MEASURE-	> 50 mm	
Power Back-off, Proximity Sensor On																
Cellular	GPRS 1 Slots	848.8	30.00	125	1.28	204.95	6.37	5.75	102.37		23 -MEASURE-	> 50 mm	19.2 -MEASURE-	19.2 -MEASURE-	> 50 mm	
Cellular	GPRS 1 Slots	1909.8	23.10	26	1.28	204.95	6.37	5.75	102.37		7.2 -MEASURE-	> 50 mm	6 -MEASURE-	6 -MEASURE-	> 50 mm	
Cellular	W-CDMA 2	1907.6	13.50	22	1.28	204.95	6.37	5.75	102.37		6.1 -MEASURE-	> 50 mm	5.1 -MEASURE-	5.1 -MEASURE-	> 50 mm	
Cellular	W-CDMA 4	1752.6	13.50	22	1.28	204.95	6.37	5.75	102.37		5.8 -MEASURE-	> 50 mm	4.9 -MEASURE-	4.9 -MEASURE-	> 50 mm	
Cellular	W-CDMA 5	846.6	20.50	112	1.28	204.95	6.37	5.75	102.37		20.6 -MEASURE-	> 50 mm	17.2 -MEASURE-	17.2 -MEASURE-	> 50 mm	
Cellular	LTE Band 2	1900	15.50	35	1.28	204.95	6.37	5.75	102.37		9.6 -MEASURE-	> 50 mm	8 -MEASURE-	8 -MEASURE-	> 50 mm	
Cellular	LTE Band 4	1754.3	15.50	35	1.28	204.95	6.37	5.75	102.37		9.3 -MEASURE-	> 50 mm	7.7 -MEASURE-	7.7 -MEASURE-	> 50 mm	
Cellular	LTE Band 5	844	21.10	129	1.28	204.95	6.37	5.75	102.37		23.7 -MEASURE-	> 50 mm	19.8 -MEASURE-	19.8 -MEASURE-	> 50 mm	
Cellular	LTE Band 17	710	20.00	100	1.28	204.95	6.37	5.75	102.37		16.9 -MEASURE-	> 50 mm	14 -MEASURE-	14 -MEASURE-	> 50 mm	

Note(s):

1. According to KDB 447498, if the calculated threshold value is >3 then SAR testing is required.

Antennas > 50mm to adjacent edges

Antenna	Tx Interface	Frequency (MHz)	Output Power		Separation Distances (mm)						Calculated Threshold Value					
			dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Full Power, Proximity Sensor Off																
Cellular	GPRS 3 Slots	848.8	29.00	298	1.28	204.95	6.37	5.75	102.37		< 50 mm	1039.6 mW -EXEMPT-	< 50 mm	< 50 mm	459.2 mW -EXEMPT-	
Cellular	GPRS 2 Slots	1909.8	26.00	100	1.28	204.95	6.37	5.75	102.37		< 50 mm	1658 mW -EXEMPT-	< 50 mm	< 50 mm	632.2 mW -EXEMPT-	
Cellular	W-CDMA 2	1907.6	22.00	158	1.28	204.95	6.37	5.75	102.37		< 50 mm	1658.1 mW -EXEMPT-	< 50 mm	< 50 mm	632.3 mW -EXEMPT-	
Cellular	W-CDMA 4	1752.6	24.00	251	1.28	204.95	6.37	5.75	102.37		< 50 mm	1662.8 mW -EXEMPT-	< 50 mm	< 50 mm	637 mW -EXEMPT-	
Cellular	W-CDMA 5	846.6	23.00	200	1.28	204.95	6.37	5.75	102.37		< 50 mm	1037.6 mW -EXEMPT-	< 50 mm	< 50 mm	458.6 mW -EXEMPT-	
Cellular	LTE Band 2	1900	24.00	251	1.28	204.95	6.37	5.75	102.37		< 50 mm	1658.3 mW -EXEMPT-	< 50 mm	< 50 mm	632.5 mW -EXEMPT-	
Cellular	LTE Band 4	1754.3	23.60	229	1.28	204.95	6.37	5.75	102.37		< 50 mm	1662.8 mW -EXEMPT-	< 50 mm	< 50 mm	637 mW -EXEMPT-	
Cellular	LTE Band 5	844	24.10	257	1.28	204.95	6.37	5.75	102.37		< 50 mm	1035.1 mW -EXEMPT-	< 50 mm	< 50 mm	457.9 mW -EXEMPT-	
Cellular	LTE Band 17	710	23.00	200	1.28	204.95	6.37	5.75	102.37		< 50 mm	911.4 mW -EXEMPT-	< 50 mm	< 50 mm	425.9 mW -EXEMPT-	
Power Back-off, Proximity Sensor On																
Cellular	GPRS 1 Slots	848.8	30.00	125	1.28	204.95	6.37	5.75	102.37		< 50 mm	1039.6 mW -EXEMPT-	< 50 mm	< 50 mm	459.2 mW -EXEMPT-	
Cellular	GPRS 1 Slots	1909.8	23.10	26	1.28	204.95	6.37	5.75	102.37		< 50 mm	1658 mW -EXEMPT-	< 50 mm	< 50 mm	632.2 mW -EXEMPT-	
Cellular	W-CDMA 2	1907.6	13.50	22	1.28	204.95	6.37	5.75	102.37		< 50 mm	1658.1 mW -EXEMPT-	< 50 mm	< 50 mm	632.3 mW -EXEMPT-	
Cellular	W-CDMA 4	1752.6	13.50	22	1.28	204.95	6.37	5.75	102.37		< 50 mm	1662.8 mW -EXEMPT-	< 50 mm	< 50 mm	637 mW -EXEMPT-	
Cellular	W-CDMA 5	846.6	20.50	112	1.28	204.95	6.37	5.75	102.37		< 50 mm	1037.6 mW -EXEMPT-	< 50 mm	< 50 mm	458.6 mW -EXEMPT-	
Cellular	LTE Band 2	1900	15.50	35	1.28	204.95	6.37	5.75	102.37		< 50 mm	1658.3 mW -EXEMPT-	< 50 mm	< 50 mm	632.5 mW -EXEMPT-	
Cellular	LTE Band 4	1754.3	15.50	35	1.28	204.95	6.37	5.75	102.37		< 50 mm	1662.8 mW -EXEMPT-	< 50 mm	< 50 mm	637 mW -EXEMPT-	
Cellular	LTE Band 5	844	21.10	129	1.28	204.95	6.37	5.75	102.37		< 50 mm	1035.1 mW -EXEMPT-	< 50 mm	< 50 mm	457.9 mW -EXEMPT-	
Cellular	LTE Band 17	710	20.00	100	1.28	204.95	6.37	5.75	102.37		< 50 mm	911.4 mW -EXEMPT-	< 50 mm	< 50 mm	425.9 mW -EXEMPT-	

Note(s):

1. According to KDB 447498, if the calculated Power threshold is less than the output power then SAR testing is required.

SAR Test Exclusion Calculations for WLAN

Though this device is capable of simultaneous transmission between WLAN and WWAN, standalone SAR test exclusion is, along with the associated SAR Estimation, only considered for the WWAN antenna in the body of this report, with WLAN-related considerations and test results being leveraged from SAR report 15I19961-S1A, submitted under **FCC ID A3LSMT555.**

7.2. Required Test Configurations

The table below identifies the standalone test configurations required for this device according to the findings in Section 7.1:

Test Configurations	Rear	Edge 1 (Top Edge)	Edge 2 (Right Edge)	Edge 3 (Bottom Edge)	Edge 4 (Left Edge)
GSM850 Full Power	Yes	No	Yes	Yes	No
GSM850 w/ Power Reduction	Yes	No	Yes	Yes	No
GSM1900 Full Power	Yes	No	Yes	Yes	No
GSM1900 w/ Power Reduction	Yes	No	Yes	Yes	No
W-CDMA Band 2 Full Power	Yes	No	Yes	Yes	No
W-CDMA Band 2 w/ Power Reduction	Yes	No	Yes	Yes	No
W-CDMA Band 4 Full Power	Yes	No	Yes	Yes	No
W-CDMA Band 4 w/ Power Reduction	Yes	No	Yes	Yes	No
W-CDMA Band 5 Full Power	Yes	No	Yes	Yes	No
W-CDMA Band 5 w/ Power Reduction	Yes	No	Yes	Yes	No
LTE Band 2 Full Power	Yes	No	Yes	Yes	No
LTE Band 2 w/ Power Reduction	Yes	No	Yes	Yes	No
LTE Band 4 Full Power	Yes	No	Yes	Yes	No
LTE Band 4 w/ Power Reduction	Yes	No	Yes	Yes	No
LTE Band 5 Full Power	Yes	No	Yes	Yes	No
LTE Band 5 w/ Power Reduction	Yes	No	Yes	Yes	No
LTE Band 17 Full Power	Yes	No	Yes	Yes	No
LTE Band 17 w/ Power Reduction	Yes	No	Yes	Yes	No

Note(s):

1. Yes = Testing is required.
2. No = Testing is not required.

8. Dielectric Property Measurements & System Check

8.1. Dielectric Property Measurements

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.

Tissue Dielectric Parameters

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

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

IEEE Std 1528-2013

Refer to Table 3 within the IEEE Std 1528-2013

Dielectric Property Measurements Results:

SAR 2 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
2015-02-23	Body 835	e'	55.3500	Relative Permittivity (ϵ_r):	55.35	55.20	0.27	5
		e''	21.7900	Conductivity (σ):	1.01	0.97	4.30	5
	Body 820	e'	55.4700	Relative Permittivity (ϵ_r):	55.47	55.28	0.35	5
		e''	21.8400	Conductivity (σ):	1.00	0.97	2.82	5
	Body 850	e'	55.2100	Relative Permittivity (ϵ_r):	55.21	55.16	0.10	5
		e''	21.7400	Conductivity (σ):	1.03	0.99	4.09	5
2015-02-26	Body 750	e'	55.0800	Relative Permittivity (ϵ_r):	55.08	55.55	-0.84	5
		e''	23.2800	Conductivity (σ):	0.97	0.96	0.81	5
	Body 700	e'	55.7000	Relative Permittivity (ϵ_r):	55.70	55.74	-0.07	5
		e''	23.5700	Conductivity (σ):	0.92	0.96	-4.36	5
	Body 790	e'	54.5800	Relative Permittivity (ϵ_r):	54.58	55.39	-1.47	5
		e''	23.0500	Conductivity (σ):	1.01	0.97	4.80	5
2015-02-27	Body 835	e'	54.1000	Relative Permittivity (ϵ_r):	54.10	55.20	-1.99	5
		e''	21.8500	Conductivity (σ):	1.01	0.97	4.58	5
	Body 820	e'	54.2300	Relative Permittivity (ϵ_r):	54.23	55.28	-1.89	5
		e''	21.9400	Conductivity (σ):	1.00	0.97	3.29	5
	Body 850	e'	53.9700	Relative Permittivity (ϵ_r):	53.97	55.16	-2.15	5
		e''	21.7700	Conductivity (σ):	1.03	0.99	4.23	5
2015-03-05	Body 835	e'	53.4100	Relative Permittivity (ϵ_r):	53.41	55.20	-3.24	5
		e''	21.3100	Conductivity (σ):	0.99	0.97	2.00	5
	Body 820	e'	53.5500	Relative Permittivity (ϵ_r):	53.55	55.28	-3.12	5
		e''	21.3500	Conductivity (σ):	0.97	0.97	0.51	5
	Body 850	e'	53.2700	Relative Permittivity (ϵ_r):	53.27	55.16	-3.42	5
		e''	21.2600	Conductivity (σ):	1.00	0.99	1.79	5
2015-03-05	Body 1900	e'	52.3700	Relative Permittivity (ϵ_r):	52.37	53.30	-1.74	5
		e''	14.7000	Conductivity (σ):	1.55	1.52	2.17	5
	Body 1850	e'	52.5900	Relative Permittivity (ϵ_r):	52.59	53.30	-1.33	5
		e''	14.5900	Conductivity (σ):	1.50	1.52	-1.26	5
	Body 1910	e'	52.3400	Relative Permittivity (ϵ_r):	52.34	53.30	-1.80	5
		e''	14.7200	Conductivity (σ):	1.56	1.52	2.85	5

SAR 3 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
2015-02-23	Body 1750	e'	55.7200	Relative Permittivity (ε_r):	55.72	53.44	4.26	5
		e''	14.9400	Conductivity (σ):	1.45	1.49	-2.18	5
	Body 1710	e'	55.7900	Relative Permittivity (ε_r):	55.79	53.54	4.20	5
		e''	14.8900	Conductivity (σ):	1.42	1.46	-3.13	5
	Body 1755	e'	55.7100	Relative Permittivity (ε_r):	55.71	53.43	4.27	5
		e''	14.9400	Conductivity (σ):	1.46	1.49	-2.10	5
2015-02-27	Body 1750	e'	51.8600	Relative Permittivity (ε_r):	51.86	53.44	-2.96	5
		e''	14.7400	Conductivity (σ):	1.43	1.49	-3.49	5
	Body 1710	e'	51.9600	Relative Permittivity (ε_r):	51.96	53.54	-2.96	5
		e''	14.7100	Conductivity (σ):	1.40	1.46	-4.30	5
	Body 1755	e'	51.8500	Relative Permittivity (ε_r):	51.85	53.43	-2.95	5
		e''	14.7500	Conductivity (σ):	1.44	1.49	-3.35	5
2015-02-27	Body 1900	e'	51.3900	Relative Permittivity (ε_r):	51.39	53.30	-3.58	5
		e''	14.8400	Conductivity (σ):	1.57	1.52	3.14	5
	Body 1850	e'	51.5400	Relative Permittivity (ε_r):	51.54	53.30	-3.30	5
		e''	14.8200	Conductivity (σ):	1.52	1.52	0.29	5
	Body 1910	e'	51.3700	Relative Permittivity (ε_r):	51.37	53.30	-3.62	5
		e''	14.8500	Conductivity (σ):	1.58	1.52	3.76	5
2015-03-05	Body 1750	e'	51.3700	Relative Permittivity (ε_r):	51.37	53.44	-3.88	5
		e''	14.7300	Conductivity (σ):	1.43	1.49	-3.56	5
	Body 1710	e'	51.4800	Relative Permittivity (ε_r):	51.48	53.54	-3.85	5
		e''	14.6800	Conductivity (σ):	1.40	1.46	-4.50	5
	Body 1755	e'	51.3600	Relative Permittivity (ε_r):	51.36	53.43	-3.87	5
		e''	14.7300	Conductivity (σ):	1.44	1.49	-3.48	5
2015-03-05	Body 1900	e'	50.9000	Relative Permittivity (ε_r):	50.90	53.30	-4.50	5
		e''	14.8400	Conductivity (σ):	1.57	1.52	3.14	5
	Body 1850	e'	51.0600	Relative Permittivity (ε_r):	51.06	53.30	-4.20	5
		e''	14.8000	Conductivity (σ):	1.52	1.52	0.16	5
	Body 1910	e'	50.8700	Relative Permittivity (ε_r):	50.87	53.30	-4.56	5
		e''	14.8500	Conductivity (σ):	1.58	1.52	3.76	5

8.2. System 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 re-measured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

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 for SAR measurements ≤ 3 GHz and ≥ 10.0 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.

Reference Target SAR Values

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 (W/kg)		
				1g/10g	Head	Body
D750V3	1122	2014-08-13	750	1g	8.31	8.71
				10g	5.45	5.81
D835V2	4d174	2014-08-12	835	1g	9.32	9.62
				10g	6.09	6.37
D1750V2	1125	2014-08-12	1750	1g	36.60	36.70
				10g	19.50	19.70
D1900V2	5d190	2014-08-12	1900	1g	40.20	40.40
				10g	21.00	21.30

System 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 2 Room

Date Tested	System Dipole		T.S. Liquid		Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.
	Type	Serial #			Zoom Scan to 100 mW	Normalize to 1 W			
2-23-2015	D835V2	4d174	Body	1g	0.98	9.77	9.62	1.56	1,2
				10g	0.64	6.43	6.37	0.94	
2-26-2015	D750V3	1122	Body	1g	0.88	8.79	8.71	0.92	3,4
				10g	0.58	5.84	5.81	0.52	
2-27-2015	D835V2	4d174	Body	1g	0.98	9.77	9.62	1.56	
				10g	0.65	6.45	6.37	1.26	
3-5-2015	D1900V2	5d190	Body	1g	3.89	38.90	40.40	-3.71	
				10g	2.04	20.40	21.30	-4.23	

SAR 3 Room

Date Tested	System Dipole		T.S. Liquid		Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.
	Type	Serial #			Zoom Scan to 100 mW	Normalize to 1 W			
2-23-2015	D1750V2	1125	Body	1g	3.66	36.60	36.70	-0.27	
				10g	1.93	19.30	19.70	-2.03	
2-27-2015	D1900V2	5d190	Body	1g	4.08	40.80	40.40	0.99	5,6
				10g	2.11	21.10	21.30	-0.94	
3-1-2015	D1750V2	1125	Body	1g	3.68	36.80	36.70	0.27	7,8
				10g	1.95	19.50	19.70	-1.02	
3-5-2015	D1750V2	1125	Body	1g	3.63	36.30	36.70	-1.09	
				10g	1.920	19.20	19.70	-2.54	
3-5-2015	D1900V2	5d190	Body	1g	3.84	38.40	40.40	-4.95	
				10g	1.980	19.80	21.30	-7.04	

9. Conducted Output Power Measurements

9.1. GSM

GSM850 Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Max. Power		with Pwr Back-off	
						Burst Pwr (dBm)	Frame Pwr (dBm)	Burst Pwr (dBm)	Frame Pwr (dBm)
850	GSM (Voice)	CS1	1	128	824.2	33.3	24.2	29.8	20.8
				190	836.6	33.4	24.4	29.5	20.5
				251	848.8	33.5	24.5	29.7	20.7
	GPRS (GMSK)	CS1	1	128	824.2	33.3	24.2	29.8	20.8
				190	836.6	33.4	24.4	29.5	20.5
				251	848.8	33.5	24.5	29.7	20.7
			2	128	824.2	29.7	23.7	25.1	19.1
				190	836.6	29.9	23.9	25.0	18.9
				251	848.8	30.0	24.0	25.3	19.3
			3	128	824.2	28.6	24.3	22.4	18.1
				190	836.6	28.7	24.5	22.5	18.3
				251	848.8	28.9	24.6	22.7	18.4
			4	128	824.2	26.2	23.2	22.0	19.0
				190	836.6	26.4	23.4	22.0	19.0
				251	848.8	26.3	23.3	21.9	18.9
	EGPRS (8PSK)	MCS5	1	128	824.2	26.4	17.3	25.7	16.7
				190	836.6	26.4	17.4	25.7	16.7
				251	848.8	26.5	17.5	25.9	16.8
			2	128	824.2	25.1	19.1	24.7	18.7
				190	836.6	25.3	19.3	24.7	18.7
				251	848.8	25.4	19.4	24.9	18.8
			3	128	824.2	24.3	20.0	23.7	19.5
				190	836.6	24.3	20.1	23.8	19.5
				251	848.8	24.4	20.2	23.9	19.6
			4	128	824.2	23.3	20.2	22.5	19.5
				190	836.6	23.3	20.3	22.5	19.5
				251	848.8	23.4	20.4	22.7	19.7

Notes:

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

- Standalone: GMSK (GPRS) mode with 3 time slots for Max power and 1 time slot for Reduced power, 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

GSM1900 Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Max. Power		with Pwr Back-off	
						Burst Pwr (dBm)	Frame Pwr (dBm)	Burst Pwr (dBm)	Frame Pwr (dBm)
1900	GSM (Voice)	CS1	1	512	1850.2	30.1	21.1	23.1	14.1
				661	1880.0	30.4	21.4	22.9	13.9
				810	1909.8	30.3	21.3	23.1	14.1
	GPRS (GMSK)	CS1	1	512	1850.2	29.9	20.9	23.1	14.1
				661	1880.0	30.4	21.4	22.9	13.9
				810	1909.8	30.3	21.3	23.1	14.1
			2	512	1850.2	27.8	21.8	18.7	12.7
				661	1880.0	27.9	21.9	18.0	12.0
				810	1909.8	28.0	22.0	18.8	12.8
			3	512	1850.2	25.6	21.3	16.7	12.4
				661	1880.0	25.7	21.4	16.0	11.7
				810	1909.8	25.8	21.5	16.8	12.5
			4	512	1850.2	24.3	21.3	15.6	12.6
				661	1880.0	24.4	21.4	15.1	12.1
				810	1909.8	24.5	21.5	15.9	12.9
	EGPRS (8PSK)	MCS5	1	512	1850.2	25.2	16.2	22.5	13.5
				661	1880.0	25.5	16.5	22.4	13.4
				810	1909.8	25.5	16.5	22.7	13.6
			2	512	1850.2	24.2	18.2	20.9	14.8
				661	1880.0	24.4	18.4	20.3	14.2
				810	1909.8	24.5	18.5	21.1	15.1
			3	512	1850.2	23.2	18.9	18.9	14.6
				661	1880.0	23.4	19.1	18.3	14.0
				810	1909.8	23.3	19.0	19.1	14.8
			4	512	1850.2	21.5	18.5	17.9	14.9
				661	1880.0	21.7	18.7	17.3	14.2
				810	1909.8	21.7	18.7	18.0	15.0

Notes:

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

- Standalone: GMSK (GPRS) mode with 2 time slots for Max power and 1 time slot for Reduced power, 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 Setup Procedures used to establish the test signals

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 2
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	βc/βd	8/15

HSDPA Setup Procedures used to establish the test signals

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-Set 1			
	Power Control Algorithm	Algorithm 2			
	βc	2/15	11/15	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	0	0.5	0.5
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			

HSPA (HSDPA & HSUPA) Setup Procedures used to establish the test signals

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				
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2 kbps RMC				
	HSDPA FRC	H-Set 1				
	HSUPA Test	HSPA				
	Power Control Algorithm	Algorithm 2				Algorithm 1
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	0
	βec	209/225	12/15	30/15	2/15	5/15
	βc/βd	11/15	6/15	15/9	2/15	15/1
	βhs	22/15	12/15	30/15	4/15	5/15
	βed	1309/225	94/75	47/15	56/75	47/15
	CM (dB)	1	3	2	3	1
	MPR (dB)	0	2	1	2	0
HSDPA Specific Settings	DACK	8				0
	DNAK	8				0
	DCQI	8				0
	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	E-DPDCCH	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	5	5	2	5	1
	Reference E-TFCI	11	11	11	11	67
	Reference E-TFCI PO	4	4	4	4	18
	Reference E-TFCI	67	67	92	67	67
	Reference E-TFCI PO	18	18	18	18	18
	Reference E-TFCI	71	71	71	71	71
	Reference E-TFCI PO	23	23	23	23	23
	Reference E-TFCI	75	75	75	75	75
	Reference E-TFCI PO	26	26	26	26	26
	Reference E-TFCI	81	81	81	81	81
	Reference E-TFCI PO	27	27	27	27	27
	Maximum Channelisation Codes	2xSF2				SF4

DC-HSDPA Setup Procedures used to establish the test signals

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

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

Table E.5.0: Levels for HSDPA connection setup

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

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

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

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

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

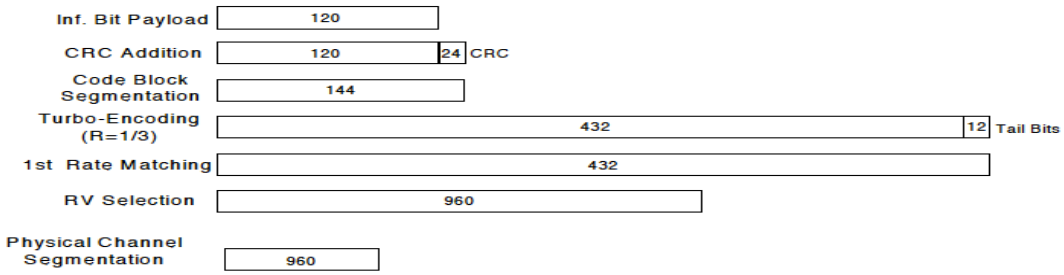


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set 1			
	Power Control Algorithm	Algorithm2			
	βc	2/15	11/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βd (SF)	64			
	βc/βd	2/15	11/15	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			

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.

Measured Results

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Avg Pwr (dBm)	
						Max	Pwr Back-off
W-CDMA Band II	Rel 99	RMC, 12.2 kbps	9262	1852.4	N/A	22.0	13.2
			9400	1880.0	N/A	21.9	13.2
			9538	1907.6	N/A	21.8	12.3
	HSDPA	Subtest 1	9262	1852.4	0	21.4	12.5
			9400	1880.0	0	21.4	12.6
			9538	1907.6	0	21.3	11.3
		Subtest 2	9262	1852.4	0	21.1	12.2
			9400	1880.0	0	20.9	12.2
			9538	1907.6	0	20.9	11.7
		Subtest 3	9262	1852.4	0.5	21.0	12.1
			9400	1880.0	0.5	20.8	12.1
			9538	1907.6	0.5	20.5	11.9
		Subtest 4	9262	1852.4	0.5	20.8	12.1
			9400	1880.0	0.5	20.8	12.1
			9538	1907.6	0.5	20.7	11.9
	HSUPA	Subtest 1	9262	1852.4	0	21.4	12.4
			9400	1880.0	0	21.0	12.5
			9538	1907.6	0	20.5	12.4
		Subtest 2	9262	1852.4	2	19.4	10.9
			9400	1880.0	2	19.3	10.6
			9538	1907.6	2	19.2	9.9
		Subtest 3	9262	1852.4	1	19.5	11.1
			9400	1880.0	1	19.8	10.8
			9538	1907.6	1	19.6	10.6
		Subtest 4	9262	1852.4	2	19.9	11.3
			9400	1880.0	2	19.8	11.2
			9538	1907.6	2	19.6	10.6
		Subtest 5	9262	1852.4	0	21.5	12.4
			9400	1880.0	0	21.4	12.5
			9538	1907.6	0	21.3	12.4
	DC-HSPA	Subtest 1	9262	1852.4	0	21.5	12.6
			9400	1880.0	0	21.3	12.6
			9538	1907.6	0	21.3	11.4
		Subtest 2	9262	1852.4	0	21.2	12.1
			9400	1880.0	0	20.9	12.2
			9538	1907.6	0	21.0	11.8
		Subtest 3	9262	1852.4	0.5	21.0	12.0
			9400	1880.0	0.5	20.9	12.1
			9538	1907.6	0.5	20.8	11.9
		Subtest 4	9262	1852.4	0.5	21.0	11.9
			9400	1880.0	0.5	20.9	12.0
			9538	1907.6	0.5	20.9	11.9

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Avg Pwr (dBm)	
						Max	Pwr Back-off
W-CDMA Band IV	Rel 99	RMC, 12.2 kbps	1312	1712.4	N/A	23.2	13.0
			1413	1732.6	N/A	23.2	13.4
			1513	1752.6	N/A	23.4	13.4
	HSDPA	Subtest 1	1312	1712.4	0	22.8	12.9
			1413	1732.6	0	22.8	13.3
			1513	1752.6	0	22.9	13.2
		Subtest 2	1312	1712.4	0	22.3	11.5
			1413	1732.6	0	22.2	12.0
			1513	1752.6	0	22.6	12.1
		Subtest 3	1312	1712.4	0.5	22.3	11.4
			1413	1732.6	0.5	22.2	11.6
			1513	1752.6	0.5	22.4	11.7
		Subtest 4	1312	1712.4	0.5	22.2	11.1
			1413	1732.6	0.5	22.3	11.8
			1513	1752.6	0.5	22.5	11.7
	HSUPA	Subtest 1	1312	1712.4	0	22.1	11.8
			1413	1732.6	0	22.6	13.2
			1513	1752.6	0	22.7	12.2
		Subtest 2	1312	1712.4	1.5	20.7	10.5
			1413	1732.6	1.5	21.3	10.6
			1513	1752.6	1.5	21.5	10.5
		Subtest 3	1312	1712.4	1	21.4	10.8
			1413	1732.6	1	21.3	10.5
			1513	1752.6	1	21.4	11.0
		Subtest 4	1312	1712.4	1.5	21.7	11.2
			1413	1732.6	1.5	21.3	11.7
			1513	1752.6	1.5	22.1	11.6
		Subtest 5	1312	1712.4	0	22.8	12.9
			1413	1732.6	0	22.8	13.3
			1513	1752.6	0	23.0	13.1
	DC-HSPA	Subtest 1	1312	1712.4	0	22.7	12.7
			1413	1732.6	0	22.7	13.2
			1513	1752.6	0	22.9	13.0
		Subtest 2	1312	1712.4	0	22.4	11.6
			1413	1732.6	0	22.4	12.0
			1513	1752.6	0	22.6	12.0
		Subtest 3	1312	1712.4	0.5	22.3	11.3
			1413	1732.6	0.5	22.3	11.8
			1513	1752.6	0.5	22.3	11.7
		Subtest 4	1312	1712.4	0.5	22.3	11.3
			1413	1732.6	0.5	22.3	11.8
			1513	1752.6	0.5	22.5	11.7

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Avg Pwr (dBm)	
						Max	Pwr Back-off
W-CDMA Band V	Rel 99	RMC, 12.2 kbps	4132	826.4	N/A	22.5	20.1
			4183	836.6	N/A	22.6	19.9
			4233	846.6	N/A	22.5	20.1
	HSDPA	Subtest 1	4132	826.4	0	22.0	19.6
			4183	836.6	0	21.9	19.4
			4233	846.6	0	22.0	19.6
		Subtest 2	4132	826.4	0	21.5	19.2
			4183	836.6	0	21.7	19.1
			4233	846.6	0	21.7	19.3
		Subtest 3	4132	826.4	0.5	21.4	19.1
			4183	836.6	0.5	21.6	18.9
			4233	846.6	0.5	21.5	19.1
		Subtest 4	4132	826.4	0.5	21.4	19.1
			4183	836.6	0.5	21.5	18.9
			4233	846.6	0.5	21.4	19.1
	HSUPA	Subtest 1	4132	826.4	0	21.3	19.2
			4183	836.6	0	21.9	19.2
			4233	846.6	0	21.9	19.6
		Subtest 2	4132	826.4	2	19.9	17.7
			4183	836.6	2	19.9	17.5
			4233	846.6	2	20.0	17.6
		Subtest 3	4132	826.4	1	20.3	17.8
			4183	836.6	1	20.0	17.5
			4233	846.6	1	20.1	17.8
		Subtest 4	4132	826.4	2	20.4	18.1
			4183	836.6	2	20.5	18.0
			4233	846.6	2	20.5	18.2
		Subtest 5	4132	826.4	0	21.9	19.6
			4183	836.6	0	22.0	19.5
			4233	846.6	0	21.9	19.6
	DC-HSPA	Subtest 1	4132	826.4	0	22.0	19.4
			4183	836.6	0	21.8	19.3
			4233	846.6	0	22.0	19.5
		Subtest 2	4132	826.4	0	21.6	19.2
			4183	836.6	0	21.5	19.0
			4233	846.6	0	21.6	19.2
		Subtest 3	4132	826.4	0.5	21.4	19.1
			4183	836.6	0.5	21.4	18.9
			4233	846.6	0.5	21.5	19.1
		Subtest 4	4132	826.4	0.5	21.4	19.1
			4183	836.6	0.5	21.5	18.9
			4233	846.6	0.5	21.5	19.1

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”.

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.					

LTE Band 2 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)					
						Max. Power			with Pwr Back-off		
						1860 MHz	1880 MHz	1900 MHz	1860 MHz	1880 MHz	1900 MHz
LTE Band 2	20	QPSK	1	0	0	22.3	23.3	22.7	14.5	14.7	14.5
			1	50	0	22.3	22.9	22.6	14.4	14.6	14.3
			1	99	0	22.3	22.6	22.7	14.5	14.5	14.4
			50	0	1	21.6	21.6	21.7	13.5	13.5	13.2
			50	25	1	21.6	21.6	21.7	13.5	13.2	13.2
			50	50	1	21.5	21.5	21.7	13.5	13.2	13.3
			100	0	1	21.6	21.6	21.7	13.4	13.4	13.3
		16QAM	1	0	1	21.5	21.6	23.3	13.5	14.1	13.7
			1	50	1	21.7	21.6	23.3	13.3	13.8	15.0
			1	99	1	21.4	21.7	23.3	13.5	13.8	15.0
			50	0	2	20.5	20.7	20.6	12.3	12.4	12.1
			50	25	2	20.4	20.6	20.5	12.5	12.1	12.0
			50	50	2	20.5	20.5	20.5	12.6	12.1	12.0
			100	0	2	20.6	20.6	20.6	12.4	12.3	12.1

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)					
						Max. Power			with Pwr Back-off		
						1857.5 MHz	1880 MHz	1902.5 MHz	1857.5 MHz	1880 MHz	1902.5 MHz
LTE Band 2	15	QPSK	1	0	0	22.6	22.7	22.7	14.6	14.6	14.4
			1	36	0	22.6	22.7	22.5	14.4	14.2	14.2
			1	74	0	22.6	22.6	22.5	14.7	14.2	14.2
			36	0	1	21.5	21.7	21.7	13.4	13.4	13.2
			36	18	1	21.5	21.5	21.7	13.4	13.2	13.2
			36	37	1	21.5	21.5	21.7	13.4	13.2	13.2
			75	0	1	21.5	21.6	21.7	13.5	13.2	13.2
		16QAM	1	0	1	22.3	21.8	22.5	13.4	13.9	14.0
			1	36	1	21.8	21.7	22.3	13.2	13.4	13.8
			1	74	1	21.5	21.6	22.5	13.4	13.5	13.9
			36	0	2	20.5	20.9	20.6	12.4	12.5	12.1
			36	18	2	20.5	20.8	20.8	12.3	12.2	12.1
			36	37	2	20.7	20.8	20.9	12.3	12.2	12.2
			75	0	2	20.6	20.8	20.9	12.6	12.3	12.2

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)					
						Max. Power			with Pwr Back-off		
						1855 MHz	1880 MHz	1905 MHz	1855 MHz	1880 MHz	1905 MHz
LTE Band 2	10	QPSK	1	0	0	22.7	22.6	22.6	14.6	14.3	14.3
			1	25	0	22.5	22.5	22.7	14.3	14.2	14.2
			1	49	0	22.5	22.8	22.7	14.5	14.3	14.2
			25	0	1	21.5	21.6	21.7	13.5	13.4	13.2
			25	12	1	21.6	21.6	21.7	13.4	13.1	13.3
			25	25	1	21.5	21.6	21.8	13.4	13.1	13.2
			50	0	1	21.5	21.6	21.7	13.5	13.1	13.2
		16QAM	1	0	1	22.1	22.1	22.7	13.9	14.4	13.0
			1	25	1	22.0	21.8	22.9	14.1	13.4	12.9
			1	49	1	21.2	22.5	21.6	13.8	13.7	14.2
			25	0	2	20.4	20.8	20.9	12.5	12.5	12.5
			25	12	2	20.6	20.8	21.0	12.5	12.2	12.3
			25	25	2	20.5	20.8	20.9	12.4	12.2	12.2
			50	0	2	20.5	20.7	20.9	12.5	12.2	12.3

LTE Band 2 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)					
						Max. Power			with Pwr Back-off		
						1852.5 MHz	1880 MHz	1907.5 MHz	1852.5 MHz	1880 MHz	1907.5 MHz
LTE Band 2	5	QPSK	1	0	0	22.4	22.8	22.8	14.5	14.2	14.3
			1	12	0	22.9	23.0	23.5	14.6	14.1	14.5
			1	24	0	22.1	22.7	22.8	14.1	14.1	14.1
			12	0	1	21.4	21.5	21.6	13.5	13.2	13.2
			12	7	1	21.3	21.5	21.6	13.5	13.1	13.3
			12	13	1	21.4	21.5	21.7	13.5	13.1	13.3
			25	0	1	21.4	21.6	21.6	13.5	13.1	13.3
		16QAM	1	0	1	21.1	21.5	21.8	12.8	13.7	13.7
			1	12	1	21.1	22.1	22.1	13.2	13.1	12.7
			1	24	1	22.3	21.4	21.9	13.1	12.6	13.4
			12	0	2	20.4	20.8	20.5	12.3	12.3	12.2
			12	7	2	20.4	20.8	20.5	12.4	12.2	12.2
			12	13	2	20.2	20.5	20.8	12.6	12.2	12.3
			25	0	2	20.4	20.5	20.9	12.6	12.1	12.1

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)					
						Max. Power			with Pwr Back-off		
						1851.5 MHz	1880 MHz	1908.5 MHz	1851.5 MHz	1880 MHz	1908.5 MHz
LTE Band 2	3	QPSK	1	0	0	22.5	22.7	22.6	14.4	14.2	14.2
			1	8	0	22.5	23.0	22.5	14.4	14.0	14.4
			1	14	0	22.4	22.7	22.5	14.4	14.2	14.2
			8	0	1	21.5	21.5	21.6	13.4	13.1	13.3
			8	4	1	21.4	21.6	21.5	13.3	13.2	13.3
			8	7	1	21.4	21.6	21.8	13.4	13.1	13.4
			15	0	1	21.4	21.6	21.7	13.4	13.1	13.3
		16QAM	1	0	1	21.9	22.2	22.1	13.9	14.2	13.4
			1	8	1	21.1	21.9	22.6	14.1	13.3	12.9
			1	14	1	21.9	22.5	21.8	13.2	14.1	12.8
			8	0	2	20.6	20.5	20.7	12.6	11.8	12.4
			8	4	2	20.4	20.6	20.8	12.4	11.9	12.5
			8	7	2	20.4	20.5	21.0	12.7	12.1	12.3
			15	0	2	20.5	20.8	20.5	12.4	12.0	12.2

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)					
						Max. Power			with Pwr Back-off		
						1850.7 MHz	1880 MHz	1909.3 MHz	1850.7 MHz	1880 MHz	1909.3 MHz
LTE Band 2	1.4	QPSK	1	0	0	22.5	22.7	22.6	14.3	14.2	14.5
			1	3	0	22.4	22.8	22.6	14.4	14.1	14.4
			1	5	0	22.5	22.4	22.6	14.4	14.0	14.3
			3	0	0	22.5	22.6	22.8	14.6	14.3	14.2
			3	1	0	22.6	22.6	22.9	14.4	14.2	14.4
			3	3	0	22.5	22.7	22.8	14.4	14.1	14.4
			6	0	1	21.5	21.5	21.7	13.5	13.1	13.3
		16QAM	1	0	1	22.2	22.5	22.4	13.4	13.6	14.3
			1	3	1	22.1	21.8	22.0	14.7	13.5	13.8
			1	5	1	21.6	22.2	21.9	13.0	13.6	13.6
			3	0	1	21.5	21.4	21.5	14.3	12.8	13.3
			3	1	1	21.4	21.5	21.3	13.6	13.3	13.6
			3	3	1	21.6	22.1	21.8	13.5	12.9	13.2
			6	0	2	20.4	20.6	20.9	12.5	11.9	11.9

LTE Band 4 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)					
						Max. Power			with Pwr Back-off		
						1720 MHz	1732.5 MHz	1745 MHz	1720 MHz	1732.5 MHz	1745 MHz
LTE Band 4	20	QPSK	1	0	0	23.0	23.2	23.3	14.4	14.8	14.7
			1	49	0	23.5	23.1	23.3	14.2	14.4	14.8
			1	99	0	23.2	23.1	23.3	14.2	14.4	14.8
			50	0	1	22.1	22.3	22.3	13.3	13.2	13.2
			50	24	1	22.1	22.2	22.3	13.4	13.2	13.3
			50	50	1	22.2	22.2	22.4	13.2	13.1	13.4
			100	0	1	22.1	22.2	22.3	13.3	13.2	13.3
		16QAM	1	0	1	22.1	23.1	22.9	13.3	13.3	12.7
			1	49	1	22.0	23.1	22.9	13.1	13.0	13.8
			1	99	1	21.9	23.1	22.9	13.0	13.2	13.7
			50	0	2	21.1	21.3	21.2	12.4	12.3	12.2
			50	24	2	21.0	21.2	21.2	12.4	12.2	12.2
			50	50	2	21.0	21.3	21.2	12.3	12.1	12.4
			100	0	2	21.1	21.1	21.3	12.4	12.1	12.3

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)					
						Max. Power			with Pwr Back-off		
						1717.5 MHz	1732.5 MHz	1747.5 MHz	1717.5 MHz	1732.5 MHz	1747.5 MHz
LTE Band 4	15	QPSK	1	0	0	23.0	23.3	23.2	14.7	14.3	14.5
			1	37	0	23.0	23.2	23.0	14.4	14.7	14.7
			1	74	0	23.0	23.2	23.2	14.5	14.5	14.4
			36	0	1	22.2	22.3	22.3	13.3	13.2	13.3
			36	20	1	22.2	22.2	22.3	13.3	13.1	13.4
			36	39	1	22.2	22.2	22.3	13.3	13.1	13.5
			75	0	1	22.1	22.3	22.3	13.2	13.1	13.4
		16QAM	1	0	1	22.7	22.5	23.4	13.3	14.5	14.3
			1	37	1	22.6	22.5	23.4	13.1	14.1	14.7
			1	74	1	22.7	22.3	23.3	13.1	13.3	14.9
			36	0	2	21.1	21.2	21.2	12.2	12.3	12.3
			36	20	2	21.0	21.1	21.2	12.2	12.3	12.3
			36	39	2	21.0	21.0	21.2	12.2	12.3	12.5
			75	0	2	21.1	21.3	21.1	12.5	12.4	12.4

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)					
						Max. Power			with Pwr Back-off		
						1715 MHz	1732.5 MHz	1750 MHz	1715 MHz	1732.5 MHz	1750 MHz
LTE Band 4	10	QPSK	1	0	0	23.3	23.4	23.2	14.6	14.4	14.4
			1	25	0	22.9	23.0	23.2	14.3	14.3	14.5
			1	49	0	23.1	23.0	23.3	14.2	14.3	14.5
			25	0	1	22.1	22.2	22.3	13.3	13.2	13.5
			25	12	1	22.2	22.2	22.3	13.3	13.1	13.5
			25	25	1	22.1	22.2	22.4	13.3	13.1	13.5
			50	0	1	22.2	22.3	22.4	13.3	13.2	13.5
		16QAM	1	0	1	22.4	23.1	22.2	13.6	13.8	13.7
			1	25	1	22.1	22.9	22.4	13.2	14.0	13.6
			1	49	1	21.9	22.6	21.7	13.5	14.1	13.0
			25	0	2	21.2	21.3	21.3	12.3	12.3	12.8
			25	12	2	21.1	21.3	21.6	12.3	12.2	12.7
			25	25	2	21.1	21.4	21.6	12.2	12.3	12.7
			50	0	2	21.0	21.2	21.3	12.3	12.2	12.6

LTE Band 4 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Meas. MPR	Avg Pwr (dBm)					
						Max. Power			with Pwr Back-off		
						1712.5 MHz	1732.5 MHz	1752.5 MHz	1712.5 MHz	1732.5 MHz	1752.5 MHz
LTE Band 4	5	QPSK	1	0	0	23.1	23.1	23.2	14.4	14.0	14.3
			1	12	0	22.5	23.1	23.5	14.8	14.1	14.8
			1	24	0	22.8	23.0	23.1	14.2	14.0	14.2
			12	0	1	22.0	22.2	22.2	13.4	13.1	13.5
			12	7	1	22.0	22.2	22.2	13.2	13.1	13.4
			12	13	1	22.0	22.3	22.3	13.3	13.2	13.4
			25	0	1	22.1	22.2	22.4	13.2	13.1	13.5
		16QAM	1	0	0	21.7	21.8	23.2	13.4	13.2	13.3
			1	12	2	21.6	21.9	21.7	13.2	13.5	13.6
			1	24	1	21.9	22.0	22.8	12.9	13.3	13.7
			12	0	2	20.9	21.2	21.3	12.3	12.2	12.7
			12	7	2	20.8	21.2	21.3	12.2	12.1	12.7
			12	13	2	21.1	21.3	21.3	12.4	12.0	12.6
			25	0	2	21.1	21.1	21.3	12.4	12.1	12.7

Band	BW (MHz)	Mode	RB Allocation	RB offset	Meas. MPR	Avg Pwr (dBm)					
						Max. Power			with Pwr Back-off		
						1711.5 MHz	1732.5 MHz	1753.5 MHz	1711.5 MHz	1732.5 MHz	1753.5 MHz
LTE Band 4	3	QPSK	1	0	0	23.1	23.1	23.1	14.3	14.3	14.5
			1	8	0	23.4	23.0	23.6	14.9	14.6	14.4
			1	14	0	23.1	23.2	23.1	14.4	14.0	14.4
			8	0	1	22.2	22.1	22.2	13.6	13.1	13.5
			8	4	1	22.2	22.1	22.3	13.4	13.1	13.5
			8	7	1	22.1	22.2	22.3	13.3	13.1	13.4
			15	0	1	22.1	22.3	22.3	13.4	13.2	13.5
		16QAM	1	0	1	22.4	22.5	22.0	14.2	13.8	13.6
			1	8	1	22.9	22.4	22.6	14.0	13.8	13.5
			1	14	1	22.8	23.1	22.5	13.8	13.1	13.0
			8	0	2	21.3	20.8	21.5	12.8	11.7	12.7
			8	4	2	21.0	21.1	21.5	12.4	11.9	12.7
			8	7	2	20.8	21.1	21.6	12.5	12.1	12.8
			15	0	2	21.1	21.0	21.2	12.3	12.3	12.5

Band	BW (MHz)	Mode	RB Allocation	RB offset	Meas. MPR	Avg Pwr (dBm)					
						Max. Power			with Pwr Back-off		
						1710.7 MHz	1732.5 MHz	1754.3 MHz	1710.7 MHz	1732.5 MHz	1754.3 MHz
LTE Band 4	1.4	QPSK	1	0	0	23.2	23.1	23.2	14.5	14.2	14.4
			1	3	0	23.0	23.0	23.2	14.6	14.1	14.5
			1	5	0	23.0	23.0	23.0	14.4	14.3	14.4
			3	0	0	23.1	23.1	23.2	14.6	14.2	14.5
			3	1	0	23.1	23.3	23.3	14.6	14.2	14.6
			3	3	0	23.0	23.1	23.3	14.5	14.3	14.6
			6	0	1	22.1	22.2	22.2	13.4	13.0	13.5
		16QAM	1	0	0	22.5	22.3	23.4	14.3	13.9	13.8
			1	3	0	23.0	22.2	22.6	13.3	13.5	14.7
			1	5	0	22.8	22.2	23.3	13.9	13.1	13.6
			3	0	1	21.7	22.3	22.8	13.2	12.9	13.5
			3	1	1	22.5	22.1	22.5	13.6	13.2	13.3
			3	3	0	22.1	22.2	23.0	13.3	13.0	13.4
			6	0	2	21.3	20.9	21.2	12.2	11.9	12.5

LTE Band 5 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)					
						Max. Power			with Pwr Back-off		
						829 MHz	836.5 MHz	844 MHz	829 MHz	836.5 MHz	844 MHz
LTE Band 5	10	QPSK	1	0	0	23.2	23.5	23.2	20.0	20.2	20.1
			1	25	0	23.3	23.0	23.3	19.8	19.9	19.8
			1	49	0	23.3	23.5	23.2	19.8	20.2	19.9
			25	0	1	22.2	22.4	22.5	19.0	19.2	19.3
			25	12	1	22.2	22.3	22.4	19.0	19.1	19.0
			25	25	1	22.3	22.2	22.4	19.0	19.0	19.0
			50	0	1	22.3	22.2	22.4	19.1	19.0	19.1
		16QAM	1	0	1	22.4	23.6	22.7	19.7	20.9	19.6
			1	25	1	22.9	22.6	22.1	19.5	20.8	19.7
			1	49	1	23.0	22.8	22.6	19.6	19.4	19.5
			25	0	2	21.1	21.4	21.5	17.9	18.2	18.2
			25	12	2	21.2	21.2	21.5	17.9	18.1	18.0
			25	25	2	21.1	21.2	21.3	17.9	18.0	18.0
			50	0	2	21.1	21.2	21.3	17.9	18.1	18.1

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)					
						Max. Power			with Pwr Back-off		
						826.5 MHz	836.5 MHz	846.5 MHz	826.5 MHz	836.5 MHz	846.5 MHz
LTE Band 5	5	QPSK	1	0	0	22.9	23.2	23.2	19.7	20.1	20.2
			1	12	0	23.4	23.2	23.5	20.6	20.8	20.2
			1	24	0	23.1	23.0	23.1	19.7	20.1	20.2
			12	0	1	22.2	22.3	22.3	19.0	19.2	19.2
			12	7	1	22.1	22.2	22.2	19.0	19.1	19.0
			12	13	1	22.2	22.1	22.3	18.9	19.1	19.1
			25	0	1	22.1	22.1	22.3	19.0	19.1	19.0
		16QAM	1	0	1	21.5	22.4	22.4	19.3	19.2	19.9
			1	12	1	21.9	22.2	21.9	20.0	19.2	19.3
			1	24	1	22.9	22.3	21.5	19.9	19.0	19.2
			12	0	2	21.1	21.3	21.0	18.1	18.2	18.1
			12	7	2	21.1	21.1	21.1	18.2	18.2	18.1
			12	13	2	21.2	21.1	21.2	17.7	18.2	18.0
			25	0	2	21.1	21.1	21.3	18.0	17.9	18.1

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)					
						Max. Power			with Pwr Back-off		
						825.5 MHz	836.5 MHz	847.5 MHz	825.5 MHz	836.5 MHz	847.5 MHz
LTE Band 5	3	QPSK	1	0	0	23.1	23.5	23.2	20.0	20.0	20.1
			1	8	0	23.1	23.3	23.2	19.9	20.0	20.0
			1	14	0	23.1	23.3	23.1	19.9	20.0	19.9
			8	0	1	22.2	22.2	22.3	19.1	19.1	19.0
			8	4	1	22.2	22.2	22.4	19.0	19.1	19.1
			8	7	1	22.2	22.1	22.3	18.9	19.0	19.1
			15	0	1	22.2	22.1	22.3	19.0	19.1	19.1
		16QAM	1	0	1	22.3	22.6	23.3	19.7	19.9	19.6
			1	8	1	22.3	22.5	23.1	18.9	19.7	19.9
			1	14	1	22.3	23.1	23.2	18.7	19.0	19.7
			8	0	2	21.1	20.8	21.3	18.0	17.9	18.2
			8	4	2	21.2	20.8	21.2	18.0	18.0	18.3
			8	7	2	21.3	20.6	21.2	17.9	17.9	18.2
			15	0	2	21.1	21.3	21.1	18.0	18.0	17.9

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)					
						Max. Power			with Pwr Back-off		
						824.7 MHz	836.5 MHz	848.3 MHz	824.7 MHz	836.5 MHz	848.3 MHz
LTE Band 5	1.4	QPSK	1	0	0	23.2	23.4	23.1	19.8	19.9	19.9
			1	3	0	23.0	23.2	23.2	20.0	20.0	20.1
			1	5	0	23.2	23.0	23.2	20.1	20.1	20.0
			3	0	0	23.2	23.1	23.0	20.1	19.9	20.2
			3	1	0	23.3	23.1	23.2	20.1	20.1	20.1
			3	3	0	23.2	23.1	23.1	19.9	20.0	20.2
			6	0	1	22.0	22.2	22.1	18.9	19.0	19.1
		16QAM	1	0	1	21.8	24.0	23.4	19.9	19.2	19.2
			1	3	1	21.8	22.2	23.7	19.3	19.2	19.9
			1	5	1	21.9	22.3	22.9	20.2	20.1	19.2
			3	0	1	22.4	21.7	21.9	18.8	19.1	19.3
			3	1	1	21.9	22.3	22.3	19.2	19.1	19.4
			3	3	1	22.2	21.7	22.4	19.2	20.0	19.7
			6	0	2	20.8	20.6	20.8	18.4	17.9	18.1

LTE Band 17 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)	
						Max. Power	with Pwr Back-off
						710 MHz	710 MHz
LTE Band 17	10	QPSK	1	0	0	22.9	19.8
			1	25	0	22.8	19.5
			1	49	0	22.7	20.0
			25	0	1	20.6	17.3
			25	12	1	20.5	17.3
			25	25	1	20.5	17.3
			50	0	1	20.5	17.3
		16QAM	1	0	1	22.5	19.0
			1	25	1	22.4	18.9
			1	49	1	22.5	19.1
			25	0	2	19.6	16.4
			25	12	2	19.6	16.1
			25	25	2	19.5	16.1
			50	0	2	19.4	16.4

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)	
						Max. Power	with Pwr Back-off
						710 MHz	710 MHz
LTE Band 17	5	QPSK	1	0	0	22.8	19.3
			1	12	0	22.8	19.7
			1	24	0	22.6	19.5
			12	0	1	22.0	18.8
			12	6	1	22.0	18.8
			12	11	1	22.0	18.8
			25	0	1	22.0	18.7
		16QAM	1	0	1	21.9	19.0
			1	12	1	22.0	19.0
			1	24	1	21.7	18.4
			12	0	2	21.1	17.7
			12	6	2	21.1	17.8
			12	11	2	21.1	17.8
			25	0	2	21.0	17.8

Note(s):

10/5 MHz Bandwidths does not support at least three non-overlapping channels in certain channel bandwidths. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing per KDB 941225 D05 SAR for LTE Devices

10. Measured and Reported (Scaled) SAR Results

SAR Test Reduction criteria are as follows:

KDB 447498 D01 General RF Exposure Guidance:
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

KDB 941225 D01 SAR test for 3G devices:
When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode

KDB 941225 D05 SAR for LTE Devices:
SAR test reduction is applied using the following criteria:

- Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB, and 50% RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel.
- When the reported SAR is > 0.8 W/kg, testing for other Channels 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.

KDB 248227 D01 SAR meas for 802.11 v02:
SAR test reduction for 802.11 Wi-Fi transmission mode configurations are considered separately for DSSS and OFDM. An initial test position is determined to reduce the number of tests required for certain exposure configurations with multiple test positions. An initial test configuration is determined for each frequency band and aggregated band according to maximum output power, channel bandwidth, wireless mode configurations and other operating parameters to streamline the measurement requirements. For 2.4 GHz DSSS, either the initial test position or DSSS procedure is applied to reduce the number of SAR tests; these are mutually exclusive. For OFDM, an initial test position is only applicable to next to the ear, UMPC mini-tablet and hotspot mode configurations, which is tested using the initial test configuration to facilitate test reduction. For other exposure conditions with a fixed test position, SAR test reduction is determined using only the initial test configuration.

The multiple test positions require SAR measurements in head, hotspot mode or UMPC mini-tablet configurations may be reduced according to the highest reported SAR determined using the ***initial test position(s)*** by applying the DSSS or OFDM SAR measurement procedures in the required wireless mode test configuration(s). The ***initial test position(s)*** is measured using the highest measured maximum output power channel in the required wireless mode test configuration(s). When the ***reported*** SAR for the ***initial test position*** is:

- ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and wireless mode combination within the frequency band or aggregated band. DSSS and OFDM configurations are considered separately according to the required SAR procedures.
- > 0.4 W/kg, SAR is repeated using the same wireless mode test configuration tested in the ***initial test position*** to measure the subsequent next closet/smallest test separation distance and maximum coupling test position, on the highest maximum output power channel, until the ***reported*** SAR is ≤ 0.8 W/kg or all required test positions are tested.
  - For subsequent test positions with equivalent test separation distance or when exposure is dominated by coupling conditions, the position for maximum coupling condition should be tested.
  - When it is unclear, all equivalent conditions must be tested.

- For all positions/configurations tested using the ***initial test position*** and subsequent test positions, when the ***reported*** SAR is > 0.8 W/kg, measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the ***reported*** SAR is ≤ 1.2 W/kg or all required test channels are considered.
  - The additional power measurements required for this step should be limited to those necessary for identifying subsequent highest output power channels to apply the test reduction.
- When the specified maximum output power is the same for both UNII 1 and UNII 2A, begin SAR measurements in UNII 2A with the channel with the highest measured output power. If the reported SAR for UNII 2A is ≤ 1.2 W/kg, SAR is not required for UNII 1; otherwise treat the remaining bands separately and test them independently for SAR.
- When the specified maximum output power is different between UNII 1 and UNII 2A, begin SAR with the band that has the higher specified maximum output. If the highest reported SAR for the band with the highest specified power is ≤ 1.2 W/kg, testing for the band with the lower specified output power is not required; otherwise test the remaining bands independently for SAR.

To determine the ***initial test position***, Area Scans were performed to determine the position with the *Maximum Value of SAR (measured)*. The position that produced the highest *Maximum Value of SAR* is considered the worst case position; thus used as the ***initial test position***.

10.1. GSM850

Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
GPRS 1 Slots	ON	0	Rear	128	824.2	30.0	29.8	0.952	0.997	
				190	836.6	30.0	29.5	0.786	0.882	
				251	848.8	30.0	29.7	0.736	0.789	
			Edge 2	190	836.6	30.0	29.5	0.359	0.403	
			Edge 3	190	836.6	30.0	29.5	0.325	0.365	
GPRS 3 Slots	OFF	15	Rear	190	836.6	29.0	28.7	0.458	0.491	
		0	Edge 2	128	824.2	29.0	28.6	0.935	1.025	
				190	836.6	29.0	28.7	0.969	1.038	1
				251	848.8	29.0	28.9	0.851	0.871	
		5	Edge 3	190	836.6	29.0	28.7	0.269	0.288	

10.2. GSM1900

Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
GPRS 1 Slots	ON	0	Rear	661	1880.0	23.1	22.9	0.695	0.728	2
			Edge 2	661	1880.0	23.1	22.9	0.100	0.105	
			Edge 3	661	1880.0	23.1	22.9	0.168	0.176	
GPRS 2 Slots	OFF	15	Rear	661	1880.0	28.0	27.9	0.260	0.266	
		0	Edge 2	661	1880.0	28.0	27.9	0.421	0.431	
		5	Edge 3	661	1880.0	28.0	27.9	0.380	0.389	

10.3. W-CDMA Band V

Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Rel 99 RMC	ON	0	Rear	4132	826.4	20.5	20.1	0.784	0.864	
				4183	836.6	20.5	19.9	0.783	0.894	3
				4233	846.6	20.5	20.1	0.816	0.891	
			Edge 2	4183	836.6	20.5	19.9	0.286	0.327	
			Edge 3	4183	836.6	20.5	19.9	0.321	0.367	
Rel 99 RMC	OFF	15	Rear	4183	836.6	23.0	22.6	0.230	0.255	
		0	Edge 2	4183	836.6	23.0	22.6	0.528	0.584	
		5	Edge 3	4183	836.6	23.0	22.6	0.318	0.352	

10.4. W-CDMA Band IV

Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Rel 99 RMC	ON	0	Rear	1413	1732.6	13.5	13.4	0.440	0.451	
			Edge 2	1413	1732.6	13.5	13.4	0.045	0.046	
			Edge 3	1413	1732.6	13.5	13.4	0.100	0.103	
Rel 99 RMC	OFF	15	Rear	1413	1732.6	24.0	23.2	0.372	0.444	
		0	Edge 2	1312	1712.4	24.0	23.2	0.704	0.847	
				1413	1732.6	24.0	23.2	0.748	0.893	
				1513	1752.6	24.0	23.4	0.817	0.934	4
		5	Edge 3	1413	1732.6	24.0	23.2	0.612	0.731	

10.5. W-CDMA Band II

Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Rel 99 RMC	ON	0	Rear	9262	1852.4	13.5	13.2	0.799	0.847	
				9400	1880.0	13.5	13.2	0.854	0.921	
				9538	1907.6	13.5	12.3	0.577	0.769	
			Edge 2	9400	1880.0	13.5	13.2	0.134	0.144	
			Edge 3	9400	1880.0	13.5	13.2	0.234	0.252	
Rel 99 RMC	OFF	15	Rear	9400	1880.0	22.0	21.9	0.453	0.464	
		0	Edge 2	9262	1852.4	22.0	22.0	0.977	0.984	5
				9400	1880.0	22.0	21.9	0.943	0.965	
				9538	1907.6	22.0	21.8	0.876	0.909	
		5	Edge 3	9400	1880.0	22.0	21.9	0.723	0.740	

10.6. LTE Band 2 (20MHz Bandwidth)

Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
QPSK	ON	0	Rear	18700	1860.0	1	0	15.5	14.7	0.790	0.945	
				18900	1880.0	1	0	15.5	14.7	0.845	1.011	6
						50	0	14.5	13.5	0.632	0.797	
				19100	1900.0	1	0	15.5	14.7	0.781	0.935	
			Edge 2	18900	1880.0	1	0	15.5	14.7	0.121	0.145	
						50	0	14.5	13.5	0.092	0.116	
			Edge 3	18900	1880.0	1	0	15.5	14.7	0.247	0.296	
						50	0	14.5	13.5	0.181	0.228	
QPSK	OFF	15	Rear	18900	1880.0	1	0	24.0	23.3	0.351	0.412	
						50	0	23.0	21.6	0.269	0.370	
		0	Edge 2	18900	1880.0	1	0	24.0	23.3	0.679	0.798	
						50	0	23.0	21.6	0.517	0.710	
		5	Edge 3	18900	1880.0	1	0	24.0	23.3	0.552	0.649	
						50	0	23.0	21.6	0.411	0.565	

10.7. LTE Band 4 (20MHz Bandwidth)

Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
QPSK	ON	0	Rear	20050	1720.0	1	0	15.5	14.8	0.800	0.936	7
				20175	1732.5	1	0	15.5	14.8	0.785	0.918	
						50	0	14.5	13.2	0.575	0.774	
				20300	1745.0	1	0	15.5	14.8	0.777	0.909	
			Edge 2	20175	1732.5	1	0	15.5	14.8	0.147	0.172	
						50	0	14.5	13.2	0.107	0.144	
			Edge 3	20175	1732.5	1	0	15.5	14.8	0.196	0.229	
						50	0	14.5	13.2	0.155	0.209	
QPSK	OFF	15	Rear	20175	1732.5	1	0	23.6	23.3	0.309	0.335	
						50	0	22.6	22.3	0.241	0.256	
		0	Edge 2	20175	1732.5	1	0	23.6	23.3	0.664	0.720	
						50	0	22.6	22.3	0.517	0.550	
		5	Edge 3	20175	1732.5	1	0	23.6	23.3	0.491	0.532	
						50	0	22.6	22.3	0.357	0.380	

10.8. LTE Band 5 (10MHz Bandwidth)

7	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
QPSK	ON	0	Rear	20450	829.0	1	0	21.1	20.2	0.669	0.827	
				20525	836.5	1	0	21.1	20.2	0.650	0.803	
						25	0	20.1	19.2	0.538	0.668	
				20600	844.0	1	0	21.1	20.2	0.690	0.853	8
			Edge 2	20525	836.5	1	0	21.1	20.2	0.187	0.231	
						25	0	20.1	19.2	0.153	0.190	
			Edge 4	20525	836.5	1	0	21.1	20.2	0.321	0.397	
						25	0	20.1	19.2	0.272	0.338	
QPSK	OFF	15	Rear	20525	836.5	1	0	24.1	23.5	0.234	0.269	
						25	0	23.1	22.4	0.192	0.227	
		0	Edge 2	20525	836.5	1	0	24.1	23.5	0.319	0.366	
						25	0	23.1	22.4	0.262	0.310	
		5	Edge 4	20525	836.5	1	0	24.1	23.5	0.231	0.265	
						25	0	23.1	22.4	0.180	0.213	

10.9. LTE Band 17 (10MHz Bandwidth)

7	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
QPSK	ON	0	Rear	23790	710.0	1	49	20.0	20.0	0.625	0.629	9
						25	12	19.0	17.3	0.337	0.496	
			Edge 2	23790	710.0	1	49	20.0	20.0	0.142	0.143	
						25	12	19.0	17.3	0.075	0.110	
			Edge 3	23790	710.0	1	49	20.0	20.0	0.243	0.245	
						25	12	19.0	17.3	0.119	0.175	
QPSK	OFF	15	Rear	23790	710.0	1	0	23.0	22.9	0.163	0.168	
						25	0	22.0	20.6	0.092	0.129	
		0	Edge 2	23790	710.0	1	0	23.0	22.9	0.345	0.355	
						25	0	22.0	20.6	0.188	0.263	
		5	Edge 3	23790	710.0	1	0	23.0	22.9	0.185	0.190	
						25	0	22.0	20.6	0.107	0.149	

11. SAR Measurement Variability

In accordance with published RF Exposure KDB 865664 D01 SAR measurement 100 MHz to 6 GHz. 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.

Frequency Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	Repeated Measured SAR (W/kg)	Largest to Smallest SAR Ratio
750	LTE Band 17	Standalone	Rear	No	0.625	N/A	N/A
850	GSM 850	Standalone	Edge 2	Yes	0.969	1.020	1.05
	WCDMA Band V	Standalone	Rear	No	0.816	N/A	N/A
	LTE Band 5	Standalone	Rear	No	0.690	N/A	N/A
1700	LTE Band 4	Standalone	Rear	No	0.800	N/A	N/A
	WCDMA Band IV	Standalone	Edge 2	Yes	0.817	0.819	1.00
1900	GSM 1900	Standalone	Rear	Yes	0.986	1.000	1.01
	WCDMA Band II	Standalone	Edge 2	No	0.977	N/A	N/A
	LTE Band 2	Standalone	Rear	No	0.845	N/A	N/A

Note(s):
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.

12. Simultaneous Transmission SAR Analysis

Simultaneous Transmission Condition

RF Exposure Condition	Item	Capable Transmit Configurations		
Standalone	1	GSM(GPRS/EDGE)	+	DTS
	2	GSM(GPRS/EDGE)	+	U-NII
	3	GSM(GPRS/EDGE)	+	BT
	4	W-CDMA	+	DTS
	5	W-CDMA	+	U-NII
	6	W-CDMA	+	BT
	7	LTE	+	DTS
	8	LTE	+	U-NII
	9	LTE	+	BT

Notes:

1. Only DTS supports Hotspot.
2. GPRS/EDGE, W-CDMA, and LTE support Hotspot.
3. VoIP is supported in GPRS/EDGE, W-CDMA, and LTE.
4. DTS Radio cannot transmit simultaneously with Bluetooth Radio.
5. U-NII Radio cannot transmit simultaneously with Bluetooth Radio.
6. Wi-Fi 2.4/5.2/5.8 GHz Supports Wi-Fi Direct

Estimated SAR for Simultaneous Transmission SAR Analysis

Considerations for SAR estimation

1. When standalone SAR test exclusion applies, standalone SAR must also be estimated to determine simultaneous transmission SAR test exclusion.
2. Dedicated Host Approach criteria for SAR test exclusion is likewise applied to SAR estimation, with certain distinctions between test exclusion and SAR estimation:
   - o When the separation distance from the antenna to an adjacent edge is ≤ 5 mm, a distance of 5 mm is applied for SAR estimation; this is the same between test exclusion and SAR estimation calculations.
   - o When the separation distance from the antenna to an adjacent edge is > 5 mm but ≤ 50 mm, the actual antenna-to-edge separation distance is applied for SAR estimation.
   - o When the minimum test separation distance is > 50 mm, the estimated SAR value is 0.4 W/kg
3. Please refer to Estimated SAR Tables to see which test positions are inherently compliant as they consist of only estimated SAR values for all applicable transmitters and consequently will always have sum of SAR values < 1.2 W/kg. Simultaneous transmission SAR analysis was therefore not performed for these test positions.

Estimated SAR for WWAN

Antenna	Tx Interface	Frequency (MHz)	Output Power		Separation Distances (mm)						Estimated 1-g SAR Value (W/kg)					
			dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Full Power, Proximity Sensor Off																
Cellular	GPRS 3 Slots	848.8	29.00	298	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	GPRS 2 Slots	1909.8	26.00	100	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	W-CDMA 2	1907.6	22.00	158	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	W-CDMA 4	1752.6	24.00	251	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	W-CDMA 5	846.6	23.00	200	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	LTE Band 2	1900	24.00	251	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	LTE Band 4	1754.3	23.60	229	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	LTE Band 5	844	24.10	257	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	LTE Band 17	710	23.00	200	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Power Back-off, Proximity Sensor On																
Cellular	GPRS 1 Slots	848.8	30.00	125	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	GPRS 1 Slots	1909.8	23.10	26	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	W-CDMA 2	1907.6	13.50	22	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	W-CDMA 4	1752.6	13.50	22	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	W-CDMA 5	846.6	20.50	112	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	LTE Band 2	1900	15.50	35	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	LTE Band 4	1754.3	15.50	35	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	LTE Band 5	844	21.10	129	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	
Cellular	LTE Band 17	710	20.00	100	1.28	204.95	6.37	5.75	102.37		-MEASURE-	0.400	-MEASURE-	-MEASURE-	0.400	

Estimated SAR for WLAN

All Wi-Fi and Bluetooth SAR values- measured or estimated- used in this report were taken from SAR report 15I19961-S1, submitted under **FCC ID A3LSMP555**

12.1. Sum of the SAR for GSM850, Wi-Fi & BT

RF Exposure conditions	Pwr Back-off	① WWAN	② DTS	③ U-NII	④ BT	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Rear	ON	0.997	0.849	0.893		1.846	**Yes**	1.890	**Yes**		
Edge 1		0.400	0.152	0.375		0.552	No	0.775	No		
Edge 2		0.403	0.400	0.400		0.803	No	0.803	No		
Edge 3		0.365	0.400	0.400		0.765	No	0.765	No		
Edge 4		0.400	0.269	0.161		0.669	No	0.561	No		
Rear	OFF	0.491	0.969	0.251	0.469	1.460	No	0.742	No	0.960	No
Edge 1		0.400	0.501	0.400	0.385	0.901	No	0.800	No	0.785	No
Edge 2		1.038	0.400	0.400	0.400	1.438	No	1.438	No	1.438	No
Edge 3		0.288	0.400	0.400	0.400	0.688	No	0.688	No	0.688	No
Edge 4		0.400	0.063	0.400	0.165	0.463	No	0.800	No	0.565	No

Note(s):

All Wi-Fi and Bluetooth SAR values (measured or estimated) used in this report were taken from SAR report 15I19961-S1A, submitted under FCC ID A3LSMT555

12.2. Sum of the SAR for GSM1900, Wi-Fi & BT

RF Exposure conditions	Pwr Back-off	① WWAN	② DTS	③ U-NII	④ BT	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Rear	ON	0.728	0.849	0.893		1.577	No	1.621	**Yes**		
Edge 1		0.400	0.152	0.375		0.552	No	0.775	No		
Edge 2		0.105	0.400	0.400		0.505	No	0.505	No		
Edge 3		0.176	0.400	0.400		0.576	No	0.576	No		
Edge 4		0.400	0.269	0.161		0.669	No	0.561	No		
Rear	OFF	0.266	0.969	0.251	0.469	1.235	No	0.517	No	0.735	No
Edge 1		0.400	0.501	0.400	0.385	0.901	No	0.800	No	0.785	No
Edge 2		0.431	0.400	0.400	0.400	0.831	No	0.831	No	0.831	No
Edge 3		0.389	0.400	0.400	0.400	0.789	No	0.789	No	0.789	No
Edge 4		0.400	0.063	0.400	0.165	0.463	No	0.800	No	0.565	No

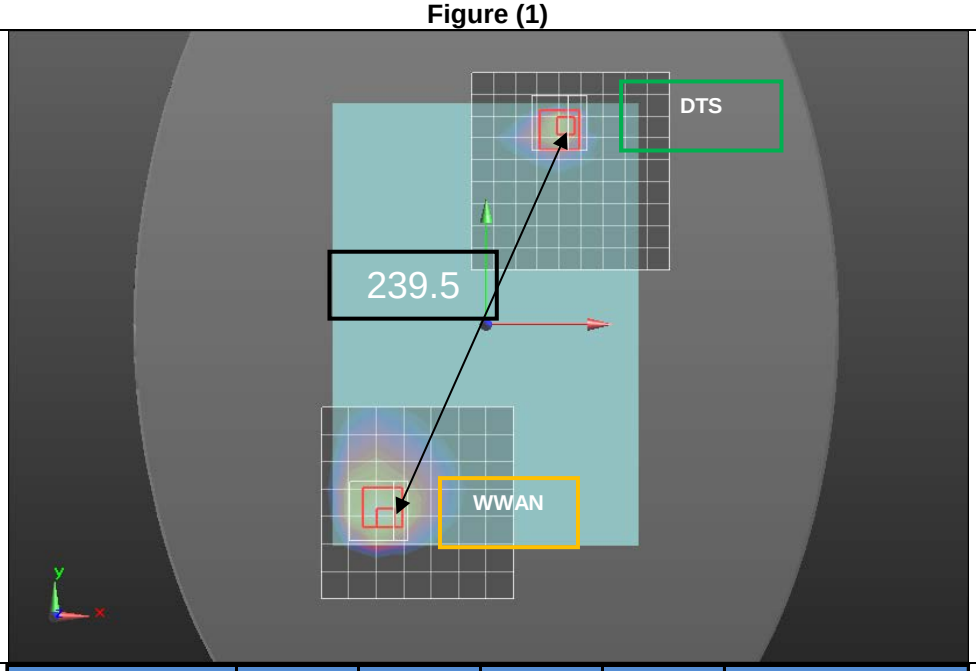
Note(s):

All Wi-Fi and Bluetooth SAR values (measured or estimated) used in this report were taken from SAR report 15I19961-S1A, submitted under FCC ID A3LSMT555

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Worst-case combination			∑ 1-g SAR (mW/g)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② DTS	③ U-NII						
Rear	0.997	0.849		① + ②	1.846	239.5	0.010	No	
	0.997		0.893	① + ③	1.890	242.4	0.011	No	
Rear	0.728		0.893	① + ③	1.621	250.5	0.008	No	

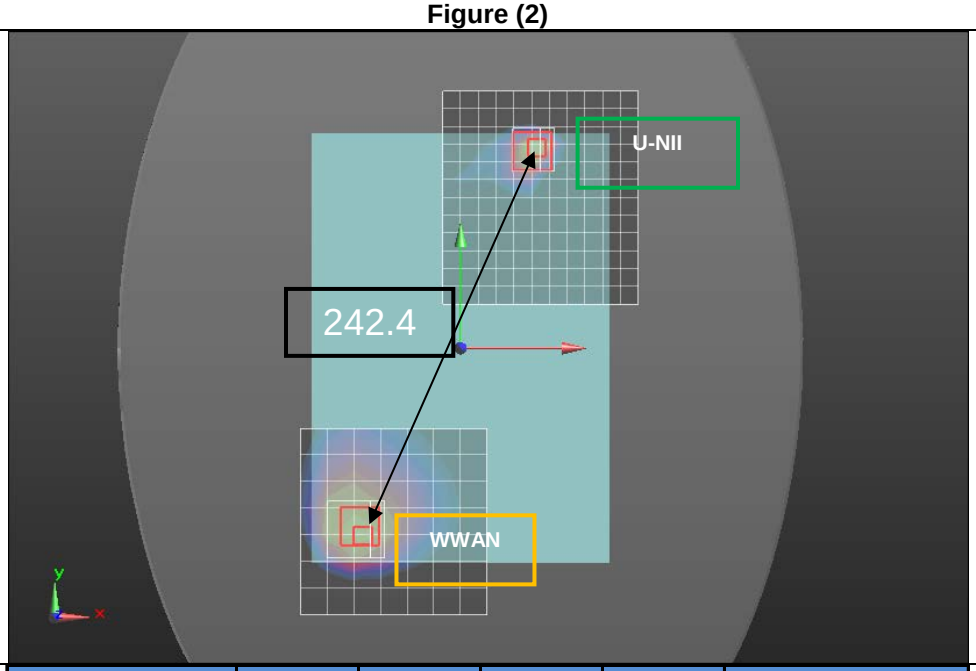
Figure (1)



Mode		Peak SAR	X	Y	Z	d: Calculated distance (mm)	
		mW/g	m	m	m		
WWAN	①	1.24	-0.052	-0.110	-0.004	① + ②	239.5
DTS	②	1.44	0.044	0.109	-0.004		

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

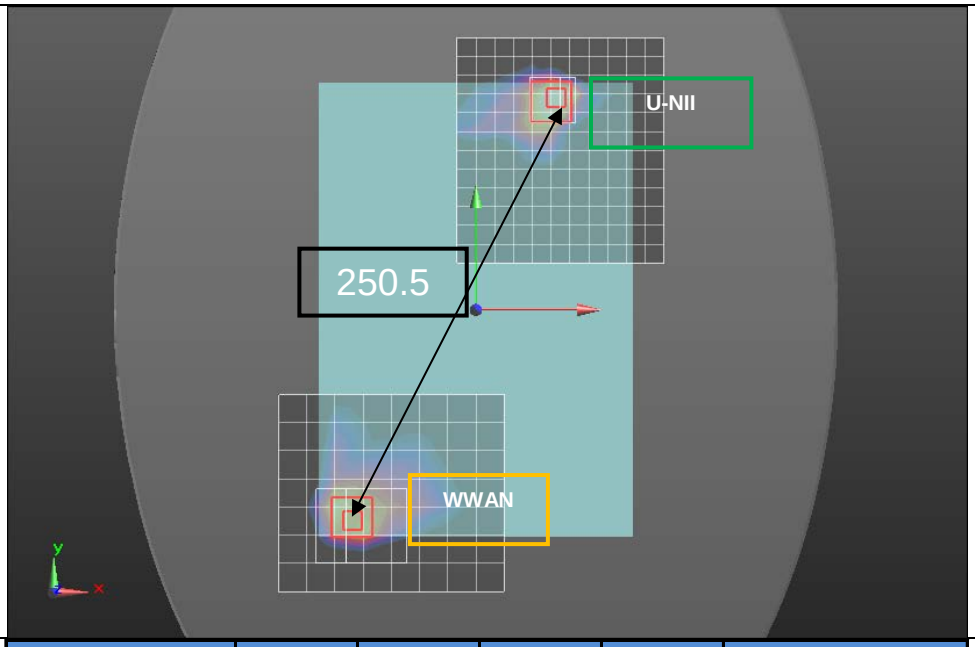
Figure (2)



Mode		Peak SAR	X	Y	Z	d: Calculated distance (mm)	
		mW/g	m	m	m		
WWAN	①	1.24	-0.052	-0.110	-0.004	① + ③	242.4
U-NII	③	2.18	0.043	0.113	-0.005		

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	d: Calculated distance (mm)	
		mW/g	m	m	m		
WWAN	①	0.944	-0.066	-0.113	-0.003	① + ③	250.5
U-NII	③	2.18	0.043	0.113	-0.005		

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

12.3. Sum of the SAR for WCDMA Band V, Wi-Fi & BT

RF Exposure conditions	Pwr Back-off	① WWAN	② DTS	③ U-NII	④ BT	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Rear	ON	0.894	0.849	0.893		1.743	**Yes**	1.787	**Yes**		
Edge 1		0.400	0.152	0.375		0.552	No	0.775	No		
Edge 2		0.327	0.400	0.400		0.727	No	0.727	No		
Edge 3		0.367	0.400	0.400		0.767	No	0.767	No		
Edge 4		0.400	0.269	0.161		0.669	No	0.561	No		
Rear	OFF	0.255	0.969	0.251	0.469	1.224	No	0.506	No	0.724	No
Edge 1		0.400	0.501	0.400	0.385	0.901	No	0.800	No	0.785	No
Edge 2		0.584	0.400	0.400	0.400	0.984	No	0.984	No	0.984	No
Edge 3		0.352	0.400	0.400	0.400	0.752	No	0.752	No	0.752	No
Edge 4		0.400	0.063	0.400	0.165	0.463	No	0.800	No	0.565	No

Note(s):

All Wi-Fi and Bluetooth SAR values (measured or estimated) used in this report were taken from SAR report 15I19961-S1A, submitted under FCC ID A3LSMT555

12.4. Sum of the SAR for WCDMA Band IV, Wi-Fi & BT

RF Exposure conditions	Pwr Back-off	① WWAN	② DTS	③ U-NII	④ BT	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Rear	ON	0.451	0.849	0.893		1.300	No	1.344	No		
Edge 1		0.400	0.152	0.375		0.552	No	0.775	No		
Edge 2		0.046	0.400	0.400		0.446	No	0.446	No		
Edge 3		0.103	0.400	0.400		0.503	No	0.503	No		
Edge 4		0.400	0.269	0.161		0.669	No	0.561	No		
Rear	OFF	0.444	0.969	0.251	0.469	1.413	No	0.695	No	0.913	No
Edge 1		0.400	0.501	0.400	0.385	0.901	No	0.800	No	0.785	No
Edge 2		0.934	0.400	0.400	0.400	1.334	No	1.334	No	1.334	No
Edge 3		0.731	0.400	0.400	0.400	1.131	No	1.131	No	1.131	No
Edge 4		0.400	0.063	0.400	0.165	0.463	No	0.800	No	0.565	No

Note(s):

All Wi-Fi and Bluetooth SAR values (measured or estimated) used in this report were taken from SAR report 15I19961-S1A, submitted under FCC ID A3LSMT555

12.5. Sum of the SAR for WCDMA Band II, Wi-Fi & BT

RF Exposure conditions	Pwr Back-off	① WWAN	② DTS	③ U-NII	④ BT	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Rear	ON	0.921	0.849	0.893		1.770	**Yes**	1.814	**Yes**		
Edge 1		0.400	0.152	0.375		0.552	No	0.775	No		
Edge 2		0.144	0.400	0.400		0.544	No	0.544	No		
Edge 3		0.252	0.400	0.400		0.652	No	0.652	No		
Edge 4		0.400	0.269	0.161		0.669	No	0.561	No		
Rear	OFF	0.464	0.969	0.251	0.469	1.433	No	0.715	No	0.933	No
Edge 1		0.400	0.501	0.400	0.385	0.901	No	0.800	No	0.785	No
Edge 2		0.984	0.400	0.400	0.400	1.384	No	1.384	No	1.384	No
Edge 3		0.740	0.400	0.400	0.400	1.140	No	1.140	No	1.140	No
Edge 4		0.400	0.063	0.400	0.165	0.463	No	0.800	No	0.565	No

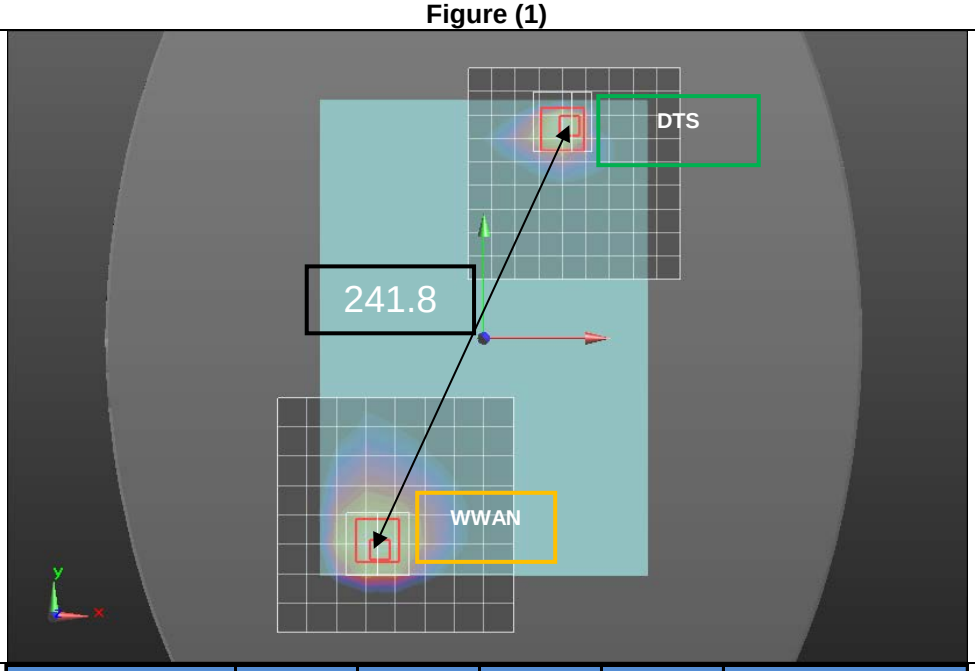
Note(s):

All Wi-Fi and Bluetooth SAR values (measured or estimated) used in this report were taken from SAR report 15I19961-S1A, submitted under FCC ID A3LSMT555

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Worst-case combination			∑ 1-g SAR (mW/g)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② DTS	③ U-NII						
Rear	0.894	0.849		① + ②	1.743	241.8	0.010	No	
	0.894		0.893	① + ③	1.787	244.7	0.010	No	
Rear	0.921	0.849		① + ②	1.770	251.1	0.009	No	
	0.921		0.893	① + ③	1.814	253.9	0.010	No	

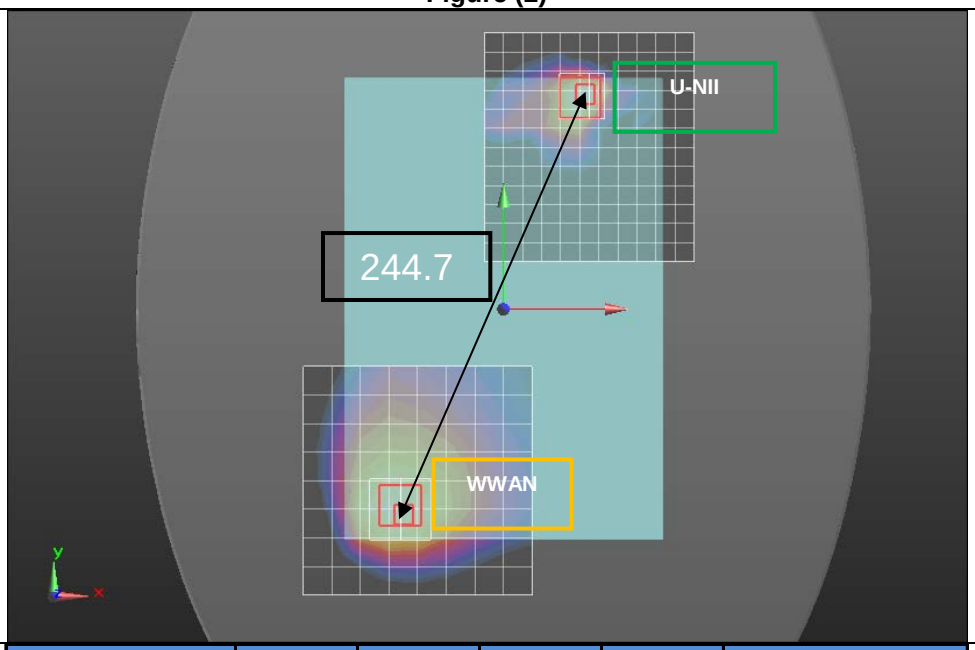
Figure (1)



Mode		Peak SAR	X	Y	Z	d: Calculated distance (mm)	
		mW/g	m	m	m		
WWAN	①	0.943	-0.051	-0.113	-0.004	① + ②	241.8
DTS	②	1.44	0.044	0.109	-0.004		

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

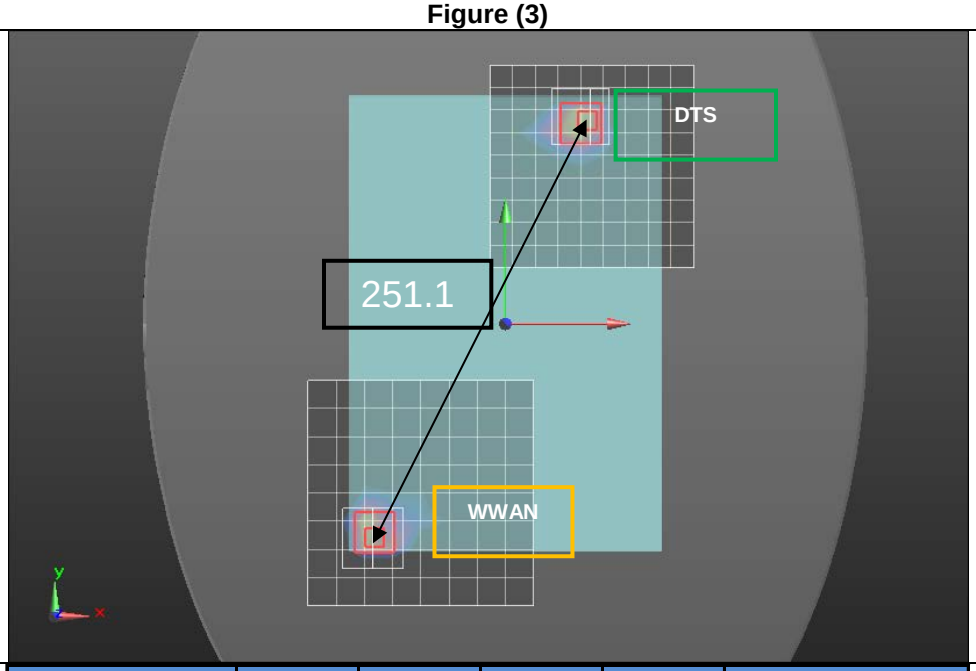
Figure (2)



Mode		Peak SAR	X	Y	Z	d: Calculated distance (mm)	
		mW/g	m	m	m		
WWAN	①	0.943	-0.051	-0.113	-0.004	① + ③	244.7
U-NII	③	2.18	0.043	0.113	-0.005		

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

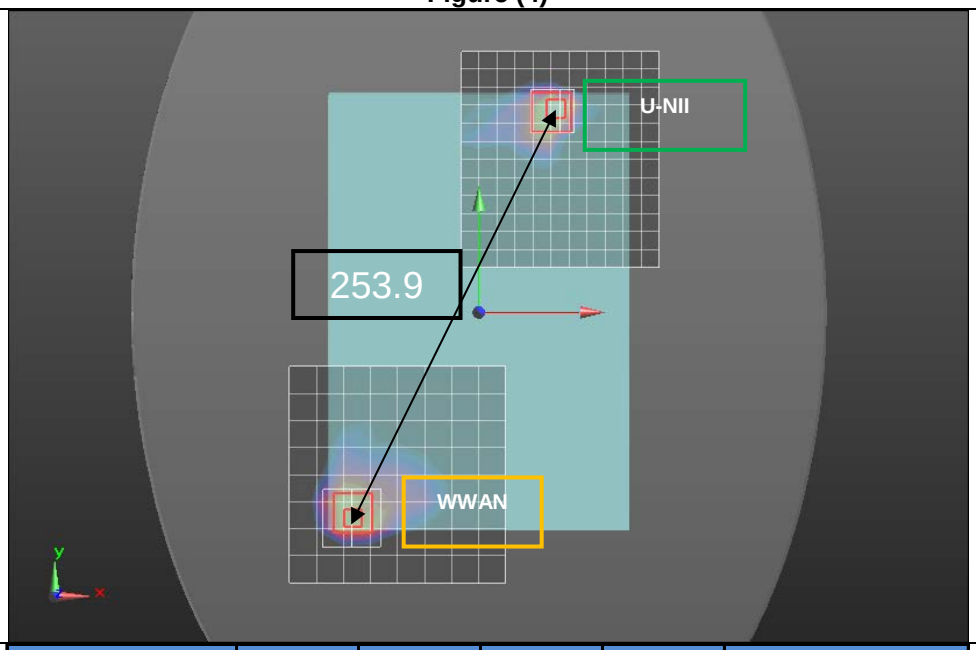
Figure (3)



Mode		Peak SAR mW/g	X m	Y m	Z m	d: Calculated distance (mm)	
WWAN	①	1.26	-0.074	-0.112	-0.001	① + ②	251.1
DTS	②	1.44	0.044	0.109	-0.004		

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 mW/g	X m	Y m	Z m	d: Calculated distance (mm)	
WWAN	①	1.26	-0.074	-0.112	-0.001	① + ③	253.9
U-NII	③	2.18	0.043	0.113	-0.005		

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

12.6. Sum of the SAR for LTE Band 2, Wi-Fi & BT

RF Exposure conditions	Pwr Back-off	① WWAN	② DTS	③ U-NII	④ BT	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Rear	ON	1.011	0.849	0.893		1.860	**Yes**	1.904	**Yes**		
Edge 1		0.400	0.152	0.375		0.552	No	0.775	No		
Edge 2		0.145	0.400	0.400		0.545	No	0.545	No		
Edge 3		0.296	0.400	0.400		0.696	No	0.696	No		
Edge 4		0.400	0.269	0.161		0.669	No	0.561	No		
Rear	OFF	0.412	0.969	0.251	0.469	1.381	No	0.663	No	0.881	No
Edge 1		0.400	0.501	0.400	0.385	0.901	No	0.800	No	0.785	No
Edge 2		0.798	0.400	0.400	0.400	1.198	No	1.198	No	1.198	No
Edge 3		0.649	0.400	0.400	0.400	1.049	No	1.049	No	1.049	No
Edge 4		0.400	0.063	0.400	0.165	0.463	No	0.800	No	0.565	No

Note(s):

All Wi-Fi and Bluetooth SAR values (measured or estimated) used in this report were taken from SAR report 15I19961-S1A, submitted under FCC ID A3LSMT555

12.7. Sum of the SAR for LTE Band 4, Wi-Fi & BT

RF Exposure conditions	Pwr Back-off	① WWAN	② DTS	③ U-NII	④ BT	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Rear	ON	0.936	0.849	0.893		1.785	**Yes**	1.829	**Yes**		
Edge 1		0.400	0.152	0.375		0.552	No	0.775	No		
Edge 2		0.172	0.400	0.400		0.572	No	0.572	No		
Edge 3		0.229	0.400	0.400		0.629	No	0.629	No		
Edge 4		0.400	0.269	0.161		0.669	No	0.561	No		
Rear	OFF	0.335	0.969	0.251	0.469	1.304	No	0.586	No	0.804	No
Edge 1		0.400	0.501	0.400	0.385	0.901	No	0.800	No	0.785	No
Edge 2		0.720	0.400	0.400	0.400	1.120	No	1.120	No	1.120	No
Edge 3		0.532	0.400	0.400	0.400	0.932	No	0.932	No	0.932	No
Edge 4		0.400	0.063	0.400	0.165	0.463	No	0.800	No	0.565	No

Note(s):

All Wi-Fi and Bluetooth SAR values (measured or estimated) used in this report were taken from SAR report 15I19961-S1A, submitted under FCC ID A3LSMT555

12.8. Sum of the SAR for LTE Band 5, Wi-Fi & BT

RF Exposure conditions	Pwr Back-off	① WWAN	② DTS	③ U-NII	④ BT	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Rear	ON	0.853	0.849	0.893		1.702	**Yes**	1.746	**Yes**		
Edge 1		0.400	0.152	0.375		0.552	No	0.775	No		
Edge 2		0.231	0.400	0.400		0.631	No	0.631	No		
Edge 3		0.397	0.400	0.400		0.797	No	0.797	No		
Edge 4		0.400	0.269	0.161		0.669	No	0.561	No		
Rear	OFF	0.629	0.969	0.251	0.469	1.598	No	0.880	No	1.098	No
Edge 1		0.400	0.501	0.400	0.385	0.901	No	0.800	No	0.785	No
Edge 2		0.143	0.400	0.400	0.400	0.543	No	0.543	No	0.543	No
Edge 3		0.245	0.400	0.400	0.400	0.645	No	0.645	No	0.645	No
Edge 4		0.400	0.063	0.400	0.165	0.463	No	0.800	No	0.565	No

Note(s):
All Wi-Fi and Bluetooth SAR values (measured or estimated) used in this report were taken from SAR report 15I19961-S1A, submitted under FCC ID A3LSMT555

12.9. Sum of the SAR for LTE Band 17, Wi-Fi & BT

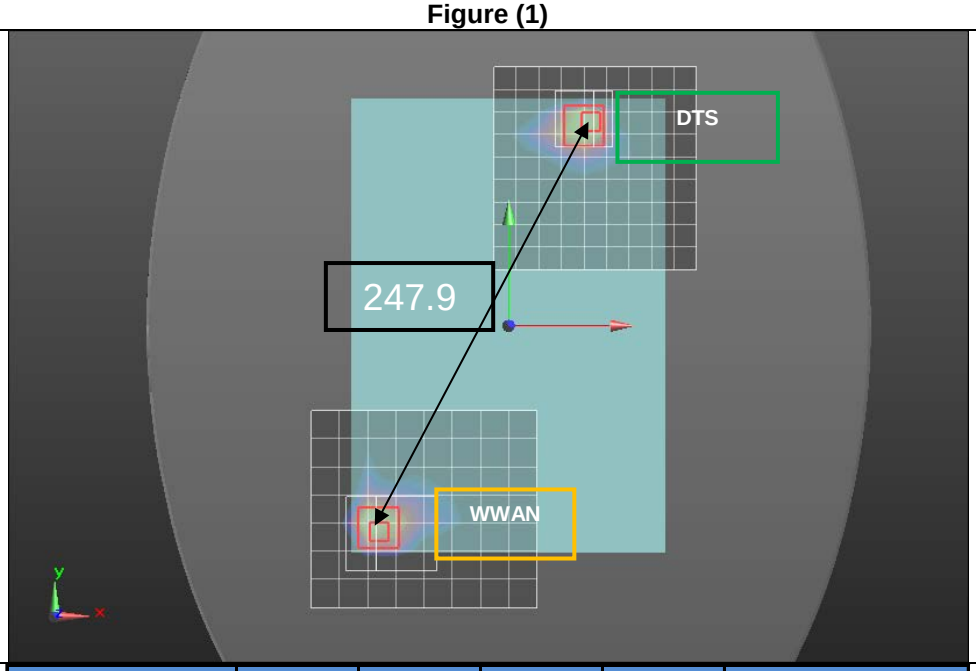
RF Exposure conditions	Pwr Back-off	① WWAN	② DTS	③ U-NII	④ BT	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Rear	ON	0.629	0.849	0.893		1.478	No	1.522	No		
Edge 1		0.400	0.152	0.375		0.552	No	0.775	No		
Edge 2		0.143	0.400	0.400		0.543	No	0.543	No		
Edge 3		0.245	0.400	0.400		0.645	No	0.645	No		
Edge 4		0.400	0.269	0.161		0.669	No	0.561	No		
Rear	OFF	0.168	0.969	0.251	0.469	1.137	No	0.419	No	0.637	No
Edge 1		0.400	0.501	0.400	0.385	0.901	No	0.800	No	0.785	No
Edge 2		0.355	0.400	0.400	0.400	0.755	No	0.755	No	0.755	No
Edge 3		0.190	0.400	0.400	0.400	0.590	No	0.590	No	0.590	No
Edge 4		0.400	0.063	0.400	0.165	0.463	No	0.800	No	0.565	No

Note(s):
All Wi-Fi and Bluetooth SAR values (measured or estimated) used in this report were taken from SAR report 15I19961-S1A, submitted under FCC ID A3LSMT555

SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Worst-case combination			∑ 1-g SAR (mW/g)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	② DTS	③ U-NII						
Rear	1.011	0.849		① + ②	1.860	247.9	0.010	No	
	1.011		0.893	① + ③	1.904	250.7	0.010	No	
Rear	0.936	0.849		① + ②	1.785	251.7	0.009	No	
	0.936		0.893	① + ③	1.829	254.5	0.010	No	
Rear	0.853	0.849		① + ②	1.702	242.2	0.009	No	
	0.853		0.893	① + ③	1.746	245.1	0.009	No	

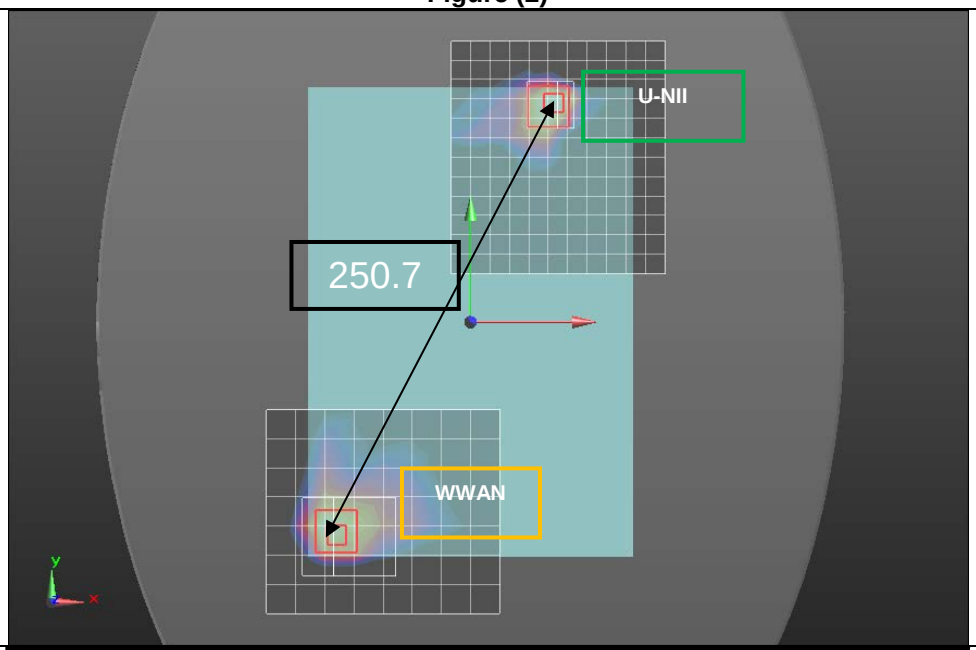
Figure (1)



Mode		Peak SAR mW/g	X m	Y m	Z m	d: Calculated distance (mm)	
WWAN	①	1.03	-0.069	-0.111	-0.003	① + ②	247.9
DTS	②	1.44	0.044	0.109	-0.004		

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

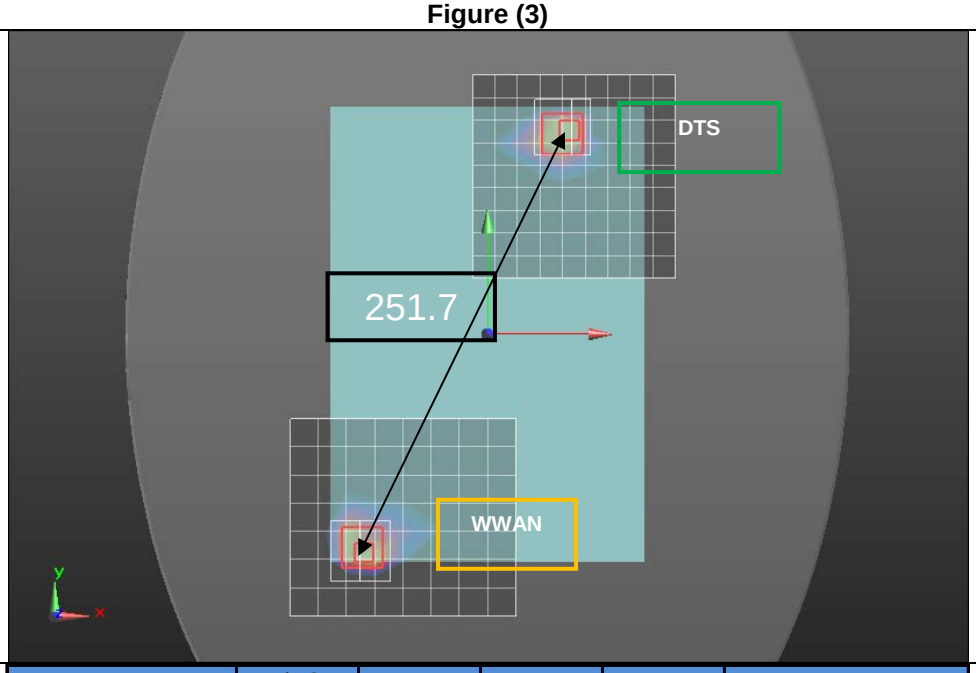
Figure (2)



Mode		Peak SAR mW/g	X m	Y m	Z m	d: Calculated distance (mm)	
WWAN	①	1.03	-0.069	-0.111	-0.003	① + ③	250.7
U-NII	③	2.18	0.043	0.113	-0.005		

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

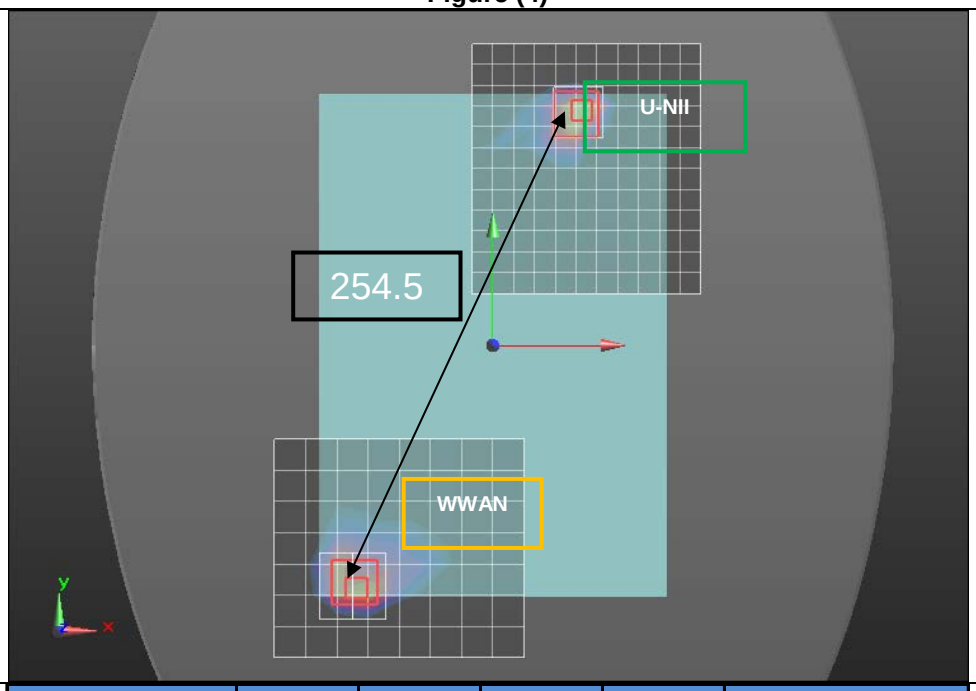
Figure (3)



Mode		Peak SAR	X	Y	Z	d: Calculated distance (mm)	
		mW/g	m	m	m		
WWAN	①	1.11	-0.072	-0.114	-0.001	① + ②	251.7
DTS	②	1.44	0.044	0.109	-0.004		

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

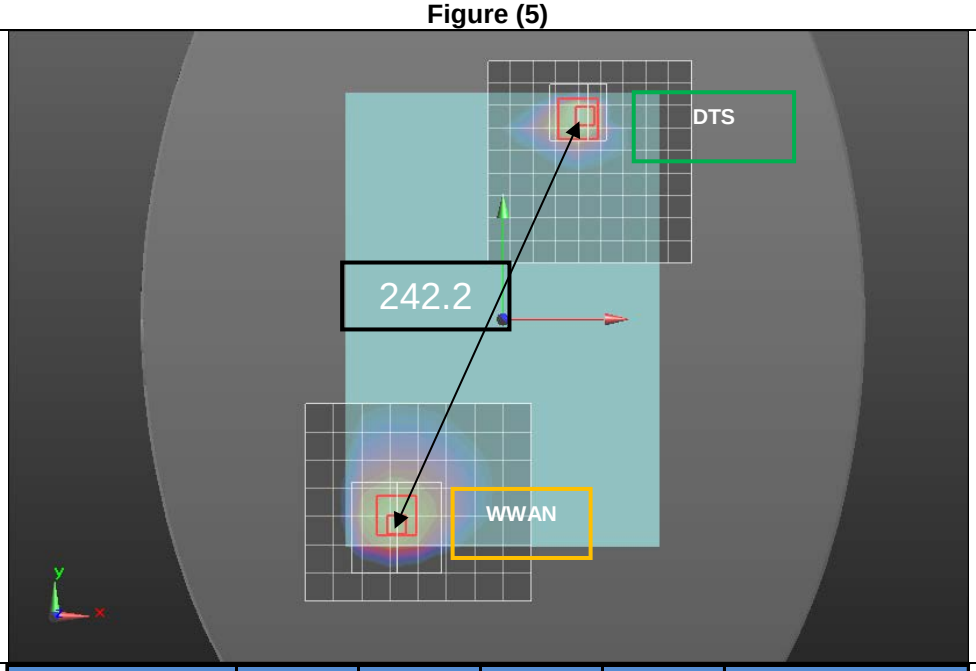
Figure (4)



Mode		Peak SAR	X	Y	Z	d: Calculated distance (mm)	
		mW/g	m	m	m		
WWAN	①	1.11	-0.072	-0.114	-0.001	① + ③	254.5
U-NII	③	2.18	0.043	0.113	-0.005		

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

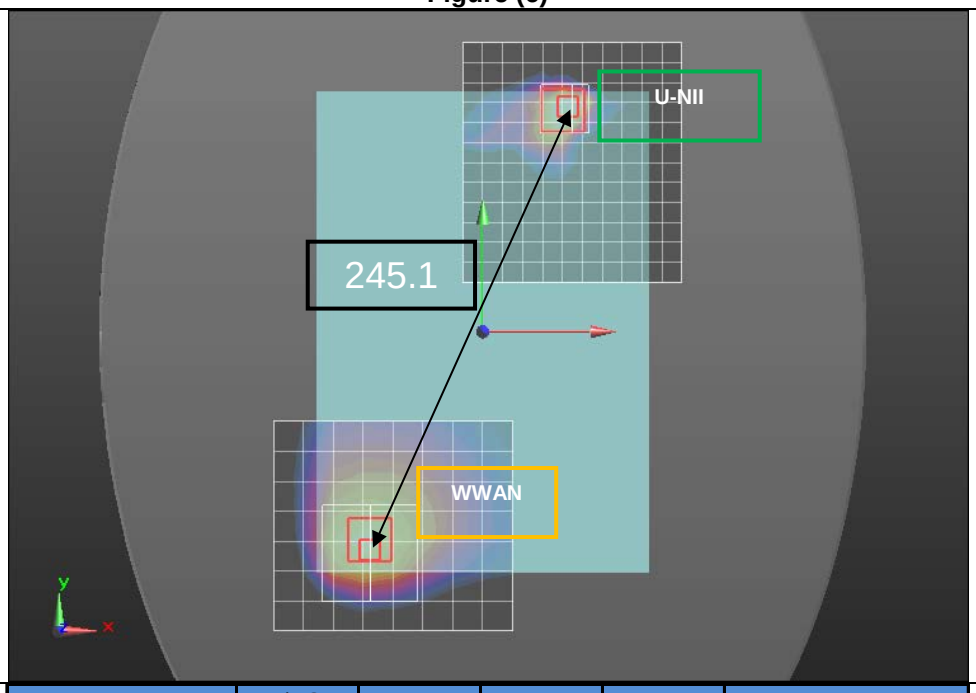
Figure (5)



Mode		Peak SAR mW/g	X m	Y m	Z m	d: Calculated distance (mm)	
WWAN	①	0.954	-0.057	-0.111	-0.003	① + ②	242.2
DTS	②	1.44	0.044	0.109	-0.004		

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

Figure (6)



Mode		Peak SAR mW/g	X m	Y m	Z m	d: Calculated distance (mm)	
WWAN	①	0.954	-0.057	-0.111	-0.003	① + ③	245.1
U-NII	③	2.18	0.043	0.113	-0.005		

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

Appendixes

Refer to separated files for the following appendixes.

A_15K20096 SAR Photos & Ant. Locations

B_15K20096 SAR Highest Test Plots

C_15K20096 SAR System Check Plots

D_15K20096 SAR Tissue Ingredients

E_15K20096 SAR Probe Cal. Certificates

F_15K20096 SAR Dipole Cal. Certificates

END OF REPORT